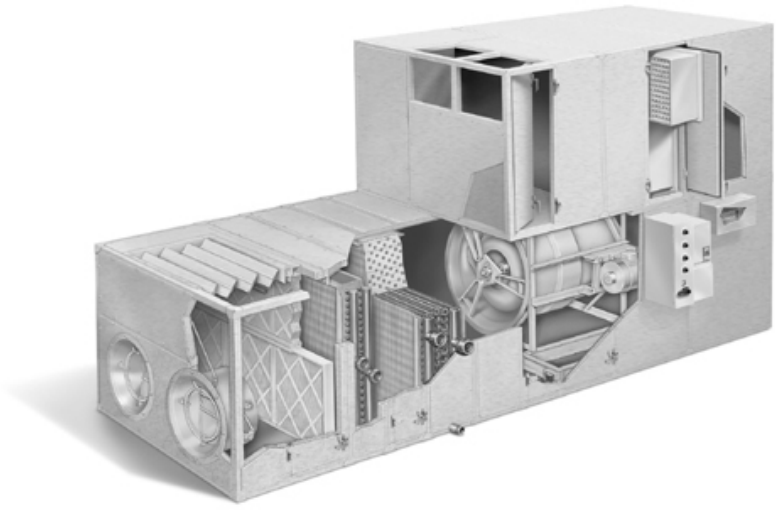
TRANE

Applied Central-Station Air Handlers

M-Series Climate Changer™ Air Handlers

Unit Sizes 3 to 120



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Feature Highlights

The M-Series Climate Changer™ air handler is a highly flexible, customizable, cataloged air handler that can meet most commercial, industrial and institutional applications. With its modular, "building-block" construction, the M-Series air handler can be tailored to meet specific job requirements for new or existing buildings. A wide range of standard and custom-engineered modules can be arranged and stacked in any number of configurations to address application and space requirements.

The wide array of available components is key to fine-tuning the performance of the M-Series air handler. The broad spectrum of fan, coil, filter and control options allows you to optimize the performance and efficiency of your air handler.

While several air-handling manufacturers offer some custom features, most find it difficult to incorporate those features into their standard cataloged unit, which leads to increased costs and extended lead times. Trane has engineered many custom solutions - with tested performance data - for the M-Series air handler, without the cost and lead times associated with full-blown custom units.

Trane continues to develop new options for M-Series air handlers, so that you remain firmly in control of performance and cost on every design project.

Table 1. Summary of Features and Benefits

Feature	Benefit
Flexible design	• Eases retrofit, renovation, and replacement
	• Allows stacked units to reduce footprint
	• Allows a wide variety of fans and coils
	• Optimizes coil and fan performance
	• Allows pre-engineered modules to be used in custom applications
	• Enables flexible module arrangement
Engineered construction and casing	• Provides sturdy unit construction for high performance and long life
	• Provides strength to stack units with post-and-panel construction
	• Enables flexible maintenance access to the unit interior
IAQ-ready unit	• Meets ASHRAE Standard 62.1 requirements
	• Lowers installation, startup, and operating costs
	• Controls ventilation airflow directly
	• Removes airborne contaminants
	• Inhibits microbial growth
Turnkey control options	• Enables single-source responsibility
	• Reduces control-system installation costs
	• Ensures reliable operation
	• Provides industry-standard open protocol communication
Acoustics solutions	• Allows the unit to meet required NC (noise criteria) levels
	• Minimizes sound source to reduce system first cost
	• Provides accurate, ARI Standard 260-tested sound data
Energy-efficient solutions	• Recovers energy from the exhaust air stream
	• Enables downsizing of the air-handling unit and other system components
	• Reduces energy consumption of system components
	• Increases operating efficiency with the low-flow, low-temperature EarthWise™ system

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Features and Benefits

Customizable Cataloged Air Handlers

Flexibility and versatility are standard in the M-Series air handler. As a customizable cataloged air handler, standard components can be arranged to meet most commercial, institutional and industrial applications for the indoor air handler market. Pre-engineered custom options expand that flexibility while ensuring proven, tested performance and dependability, and reducing the costs and long lead times associated with most custom units. Some projects call for an air handler that incorporates new, emerging technologies or a job-specific requirement. Trane's experienced team of professionals can tailor the M-Series air handler to meet these requirements. These factory-packaged specials deliver Trane quality, enable simplified on-site installation and startup.

Flexible Design

The M-Series air handler design adopts a "building-block" approach that allows you to design a unit specifically for your project. Choose the "blocks" you need from the wide range of standard and custom-engineered modules available, and arrange them to satisfy the air-handling requirements of the application.

Reduces Footprint when Stacked

The M-Series unit's post-and-panel construction design makes it easy to stack modules - even coil modules. Reducing the unit footprint is very advantageous, especially in tight mechanical rooms. The structural integrity remains intact, even when the panels are removed (see Figure 1).

Eases Retrofit, Renovation, and Replacement

Buildings age, usage changes, loads change, new technology emerges, codes and standards are revised. Change is inevitable.

Figure 1. The M-Series air handler post-and panel construction makes it easy to stack modules-even coil modules.

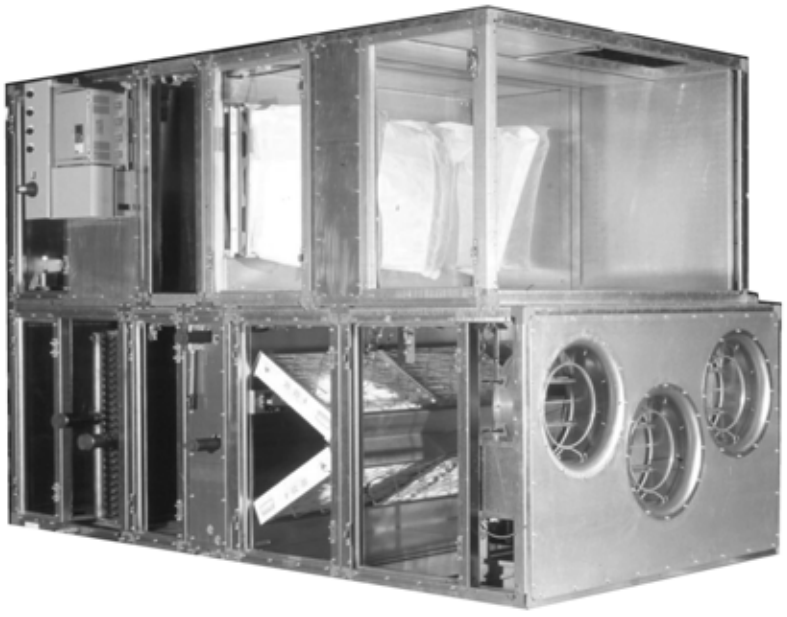


Figure 2. Building-block design eases retrofit, allowing segments to fit into tight spaces, such as elevators.

The M-Series air handler - with its modular components, bolted construction, and removable panels - readily lends itself to the special needs of the renovation, retrofit, and replacement markets. To integrate new features, simply separate the existing modules and add, enhance, or replace components.

The M-Series air handler can be shipped in small segments (see Figure 2) that can easily be moved into tight spaces of existing buildings.

Component Flexibility

Offers a Wide Variety of Fans

An extensive array of fan types and options, including variable-frequency drives for modulation in variable-air-volume systems, further enhance the flexibility of the M-Series air handler. You choose the fan that best satisfies your supply and exhaust or return fan needs. The wide variety of fans and options lets you optimize the fan in the unit to best fit not only the airflow and static pressure requirements, but also the acoustical, efficiency, and discharge requirements.

Figure 3. Typical airfoil (AF) fan

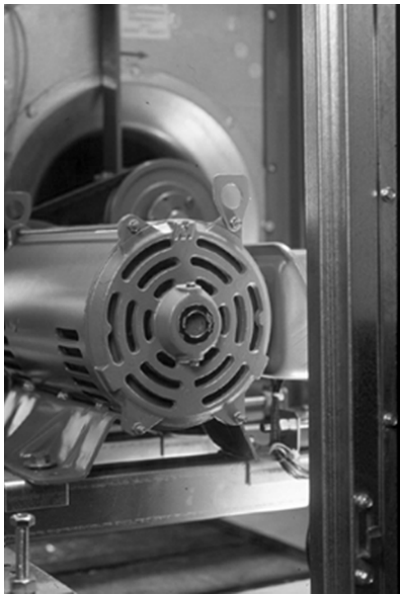


Figure 4. Typical airfoil vaneaxial (Q) fan

Fan types include:

- Double-width/double-inlet (DWDI) centrifugal fans with front, top, or bottom discharges in the following available types:
  - Forward-curved (FC)
  - Backward-curved (BC)
  - Airfoil (AF)
- Single-width/single-inlet (SWSI) plenum fans (commonly called plug fans) with multiple or single discharges on the front, top, bottom, or sides of the module
- Airfoil vaneaxial fans (Model Q™ fan) with horizontal discharge for unit sizes 12 to 120, and vertical discharge for unit sizes 6 to 120

Each fan is rated in accordance with Standard 430 of the Air Conditioning and Refrigeration Institute (ARI), and all DWDI fans are ARI Standard 430-certified to assure published performance.

Optimizes Coil Performance

Flexibility characterizes the broad coil offering on the M-Series air handler. The variety of types, sizes, arrangements, and materials available lets you customize a coil that is optimized for pressure drop and capacity requirements. Published coil performance is certified in accordance with ARI Standard 410.

Trane is at the leading edge of coil technology. Through extensive laboratory testing and numerous job-site installations, Trane has developed a unique fin surface for its coil offerings. This enhanced fin surface brings the capability of greater velocities of air through cooling coils without causing moisture carryover.

The industry is familiar with 500-fpm limits through cooling coils as a "rule of thumb" for moisture carryover. Trane's fin design extends this limit in excess of 625 fpm, depending upon air conditions, coil size, and coil-fin type and spacing. Tested data for moisture carryover is incorporated in the Trane Official Product Selection System (TOPSS). In cases where moisture carryover is possible, the TOPSS program alerts you to this fact with a moisture carryover warning. See "Face-Velocity Limits for Moisture Carryover" on page 101 for moisture carryover curves.

Coil options include:

- Two- to eight-row, 1/2-inch OD (outside diameter) chilled water or refrigerant coils
- Two- to 10-row, 5/8-inch OD chilled water or refrigerant coils
- One- or two-row 5/8-inch OD hot water coils
- Two-row, 1/2-inch OD hot water coils
- One-row, 1-inch OD distributing-type steam coils
- Half, full, and dual-serpentine, circuited water coils
- Full face, split face, and intertwined circuited refrigerant coils

Figure 5. Coil with copper header

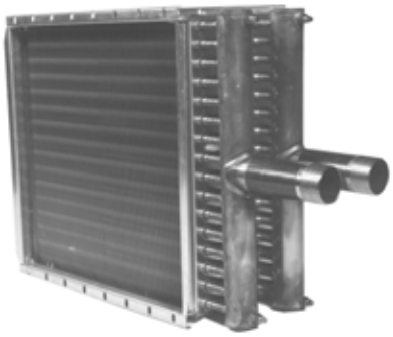


Figure 6. Coil with cast iron header

A variety of fin surfaces are also available, with the following options:

- Variable fin spacing on all fin types to fine-tune coil capacity and air-pressure drop
- Aluminum Delta-Flo™ H and Prima-Flo™ H fins that maximize the heat transfer and moisture carryover limits of the coils
- Aluminum Delta-Flo E and Prima-Flo E fins that minimize the coil air-pressure drop
- Copper Sigma-Flo™ fins for corrosion protection

Custom Capabilities

The M-Series air handler is easily the industry's most flexible, cataloged central-station air handler. Still, some installations demand special air-handling requirements that stretch beyond the normal published features. Recognizing this, Trane assembled a team of experienced air-handling system engineers whose job it is to design customized solutions for jobs with unique application needs.

These options provide even greater flexibility with the M-Series air handler, and can meet requirements in applications that traditionally called for a completely custom unit. These pre-engineered solutions not only minimize first cost, but also provide tested performance data, giving you confidence that the unit will perform as expected. Many of these options are available as standard components from Trane, including:

- Integral face-and-bypass heating coils
- Humidifiers
- Electric heat options
- Horizontal or vertical vaneaxial Q fans
- HEPA (high-efficiency particulate arrestance) filters
- Gas heat options
- Silencers
- Energy wheels

Trane also offers custom solutions for the M-Series air handler that are dependent on the specific application, but our pre-engineering work ensures proven performance and dependability. Some of these custom solutions are:

- Split dehumidification units
- Cool, Dry, Quiet (CDQ™) desiccant dehumidification units
- Special-purpose motors
- Heat-recovery coils (outside the scope of ARI Standard 410 certification)
- Alternative fan configurations
- Air-to-air, fixed-plate heat exchangers
- Triple-deck multizone arrangements
- Alternate damper types and locations
- Custom-length modules
- Electronic filtration
- Fan air-flow measurement

Contact your local Trane sales team for more information on these options.

Construction and Casing Integrity

Post-and-Panel Design

The key to the M-Series air handler flexibility is the robust structural integrity of its galvanized-steel, post-and-panel construction. Modules—even coil modules—can be stacked in a variety of space-saving configurations.

Casing Choices

Casing choices enable you to match the casing to the required application:

- Fiberglass insulation in 1 1/2 lb/ft^3 and 3 lb/ft^3 densities
- Solid double-wall panels that promote indoor air quality (IAQ)
- Single-wall and perforated, double-wall interior panels for acoustical benefits
- External support kit for ceiling suspension or external isolation

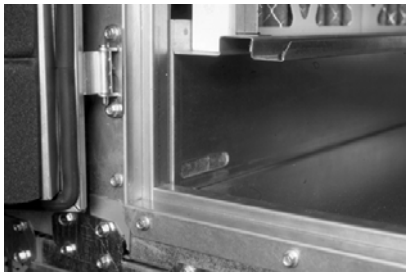
Tight, Robust Construction

Trane's engineered panel design (see Figure 7) creates four times greater edge stiffness than a single-layer panel. It also creates a consistent sealing surface and optimizes gasket compression, which helps maintain a tight panel seal.

Figure 7. Engineered panels help maintain a tight panel seal.

The flush-mounted access doors with integral thresholds (see Figure 8) limit the seams in the unit casing, which reduces locations for dirt to collect. The integral door threshold and heavy-duty door fit together to assure a tight seal for the life of the air handler.

Figure 8. Integral door threshold fits tight with heavy-duty doors.

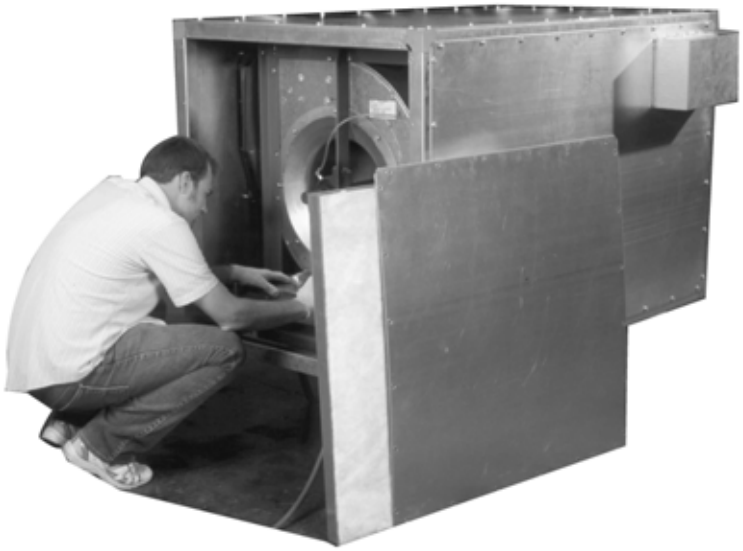


Inward-opening doors (see Figure 9) are available for positive-pressure access and discharge plenum modules. Positive pressure inside the module helps seal the door against the door frame. Also, the door opens against unit pressure to prevent it from blowing open, promoting safety.

Figure 9. Inward-opening doors are a safety feature on positive-pressure applications.

Heavy-duty door handles and hinges are surface-mounted, eliminating a potential leakage path since they do not pierce the casing. A removable hinge pin allows for easy door removal; the symmetrical handle and hinge mounting allows for easy field modification if it becomes necessary to change from a left-hand to a right-hand door.

Figure 10. Panels are fully removable to allow easy access for maintenance.



Serviceability/Cleanability

Fully removable panels (see Figure 10), full-size access doors, and access sections are available for easy cleaning of internal components. Smooth, cleanable interior double-wall surfaces help improve indoor air quality. Coils are raised up out of the drain pan to make all coils removable (see Figure 11) from the side and provide easier access to the drain pan for cleaning. When piping or wiring restricts access, doors are easily removed by pulling the hinge pins.

Figure 11. Coils are removable to make cleaning the drain pan easier.

IAQ Air Handlers

The M-Series air handler is engineered to address the complex issues of indoor air quality (IAQ). Building owners must give particular attention to maintaining and documenting IAQ to ensure occupant comfort and to meet industry and government regulatory standards.

In Standard 62, the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) defines acceptable IAQ to "avoid adverse health effects." It dictates that the air-handling system must bring sufficient outdoor air into the building, filter the air, and control microbial growth. However, applying these principles generally means greater energy consumption, larger and noisier units, and increased risk of coil freeze-up. The flexibility of the M-Series air handler enables you to configure unique, IAQ-ready air-handling systems that address all of these concerns.

Measure and Control Ventilation Airflow

Trane's Traq™ airflow-monitoring solution (see Figure 12), allows direct measurement and control of outdoor and/or return airflow. When applied as part of an Integrated Comfort™ system (ICS) with the Tracer Summit™ building automation system, ventilation airflow can be controlled dynamically and documented to verify compliance with ASHRAE Standard 62.1. (See Trane product catalog BAS-PRC001-EN for more information on Tracer Summit systems.) Factory-mounted and tested to reduce installation and startup costs, the Traq damper also requires significantly less straight duct than traditional airflow-monitoring stations.

Figure 12. Traq dampers measure and control ventilation airflow.

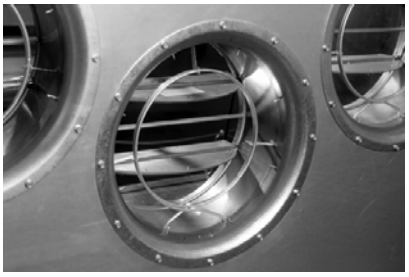


Figure 13. Trane offers a variety of filter options

Remove Airborne Contaminants

Effectively controlling particulate and gaseous contaminants by reducing their concentrations or removing them from the air stream altogether is key to good IAQ. That necessitates proper filter selection (see Figure 13). The M-Series air handler can be equipped with a variety of filtration options:

- Pleated media with 25-to 35-percent dust-spot efficiency (MERV 6 based on ASHRAE Standard 52.2).
- Bag or cartridge filters with 65- to 95-percent dust-spot efficiency (MERV 11 to 14 based on ASHRAE Standard 52.2).
- HEPA filtration with 99.97-percent dust-spot efficiency (MERV rating not applicable)
- Enhanced electronic filtration with low pressure drops and high equivilent MERV levels
- Antimicrobial treatments for filters to help to prevent microbial growth

Inhibit Microbial Growth

The M-Series air handler is designed with features that can inhibit microbial growth through proper condensate management, humidity control, and cleanability for regular maintenance and cleaning.

Proper Condensate Management

- The design of galvanized or stainless steel drain pans helps prevent corrosion.
- Drain pans that can extend beyond the cooling coil (see Figure 14) and allow for periodic cleaning of the drain pan are standard options.
- A variety of cooling coil fin options, including Trane's high-efficiency H-fin design, are available. These fins allow for coil selections with face velocities in excess of 625 fpm without moisture carryover.

Figure 14. Extended drain pan are standard options.

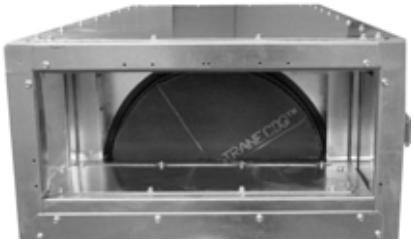
Humidity Control

Trane offers several solutions for addressing dehumidification:

- Dual path split dehumidification units (SDU)
- Cool Dry Quiet (CDQ™) desiccant dehumidification technology (see Figure 15.)
- Low sensible heat ratio coil selections
- Series recovery supply air tempering

See Trane Engineering bulletins CLCH-PRB005-EN and CLCH-PRB020-EN for additional information on dehumidification.

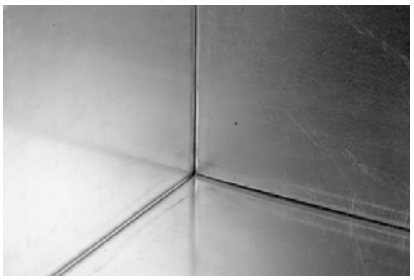
Figure 15. Cool Dry Quiet (CDQ) desiccant dehumidification module



Cleanability

The smooth, cleanable solid double-wall interior (see Figure 16) of the M-Series unit helps improve IAQ. Fully removable panels, full-size access doors, and access sections in 11- to 96-inch lengths are available for easy cleaning of internal components.

Figure 16. Smooth, interior double-wall surface makes cleaning easy.



Turnkey Control Options

The M-Series air handler offers one of the most comprehensive factory-packaged controls systems available, from end devices to total system integration, with industry-standard open protocols. An air handler turnkey control package can be used in a stand-alone operation, or it can be fully integrated into a comprehensive control system. Trane's Integrated Comfort™ system (ICS) incorporates the benefits of factory-installed controls and links the air handler to the Tracer Summit™ building management system.

These options are designed to lower installation costs and risk while dramatically improving the quality of the application and the performance of the air handler. The entire air handler control system is engineered, mounted, wired, and tested before leaving the factory. As a result of strict quality manufacturing methods, Tracer control options bring consistency and reliability to the control-system package and provide single-source responsibility.

The following control devices are available as standard on the M-Series air handler:

- Combination starters and disconnects
  - Available with Nema 1, 4/12 enclosure type
  - Uses International Electrotechnical Commission (IEC) standards
- Variable-frequency drives
  - VFD/OFF/Bypass Auto/Bypass Manual and speed potentiometer
  - Three-year parts and labor warranty
  - Open drive to provide easy serviceability

Figure 17. Unit-mounted MP580EX direct digital controller offers up to 81 points.

- Unit-mounted direct digital controllers (DDCs) See Figure 17.
  - A factory-wired, -configured, -tested, and -mounted Tracer AH540 controller is available for predefined air-handling functions. Because this controller is configured at the factory, it does not require field programming, enabling a quicker startup. Each point on the controller is pre-assigned a specific task.
  - A factory-wired and mounted Tracer MP580 programmable controller is also available. A combination of up to 81 inputs and outputs are available to meet job requirements. A user display and time clock are available for stand-alone applications.
- Valves
- Electronic damper actuators
- Temperature and pressure sensors
- Averaging temperature sensors
- Fan or filter status switches
- Low-limit switches (see Figure 18)
  - Double pole, single throw, manual reset
  - Available wired to low voltage and high voltage

Figure 18. Factory-mounting ensures quality installation, as shown with the low-limit radius bend.

Single-Source Responsibility

Equipment and interoperable controls, engineered and provided by a single manufacturer, provide faster construction cycles and simplify job-site coordination efforts. This simplification reduces installation time, expense, and risk.The M-Series equipment and controls package provides the best performance when integrated with a Tracer building management system, forming a Trane Integrated Comfort™ system (ICS). ICS is a powerful system architecture that unifies Trane HVAC equipment, direct digital control, and building management into a cohesive whole with an assured source of support. This system is managed with the Tracer Summit building management system.

The Tracer Summit building management system is based on ASHRAE and American National Standards Institute (ANSI) BACnet Standard 135.

Reduced Control-System Installation Costs

While the air-handling system is in the factory, trained technicians install the control end devices and controllers using state-of-the-art equipment and agency-approved wiring practices. The system is predesigned, pre-engineered, and checked out, making jobsite installation and commissioning fast and easy.

While many of these tasks and procedures could be done in the field, it is beneficial to do them in the factory due to time and accessibility constraints. As a result, field expenses for installation costs of conduit and wire are minimized, additional lead-time is alleviated, and jobsite coordination is simplified. Casing integrity is also maintained by minimized penetrations.

Simple, module-to-module factory wiring minimizes installation costs, too. Quick-connect wiring (see Figure 19) ensure integrity between modules without having to identify or check continuity. Also, modules can be easily replaced in retrofit applications.

Figure 19. Quick-connect wiring

In addition, job-site line-voltage wiring is reduced when controls are incorporated with either a combination starter and disconnect or a variable-frequency drive.

After installation, Tracer controllers enable information-sharing and complex control strategies, such as ventilation reset, throughout the HVAC system. They also ensure that each subsystem operates in the most efficient manner possible while continuing to satisfy current loads. The result is reduced building energy consumption through effective operation of the entire HVAC system at part-load conditions.

Controlling operating costs, such as the cost of energy, is critical to improving cash flow. Trane ICS incorporates the latest energy-saving concepts to produce comfort at the lowest possible cost. In addition, it offers sophisticated building management features, such as after-hours billing, for commercial properties. This revenue opportunity enables developers and owners to accurately monitor and bill the cost incurred by a single tenant in after-hours usage of a facility. Trane's optional DDC variable-air-volume (VAV) capability helps to accurately control each tenant space so that only an individual tenant's HVAC systems are activated. This helps minimize operating costs while providing flexible work hours.

Reliable Operation

Controller end devices, such as mixed-air low-limit switches and averaging temperature sensors, are properly sized, selected, laboratory-tested, and mounted for optimal system performance.

Trane engineers its unit-mounted controllers to provide the highest level of useful information possible. A computer-based test station tests low-voltage end-device functionality, surveys the input devices, and drives the output devices. This procedure ensures trouble-free installation and reliable operation when the M-Series unit reaches the job site. This feature can limit the number of call-backs and punch-list tasks.

Incorporating an M-Series unit with Trane ICS provides an engineered system of proven components and comfort concepts that is both state-of-the-art and reliable. Standard components are used to aid in serviceability and uniformity from building to building. These components, when tied to a Tracer Summit system, provide a powerful tool for scheduling preventive maintenance, reducing equipment downtime, and controlling service expense.

Open Protocol

Trane Tracer™ controllers also bring open communication protocols to the product offering. For building-level communications, Tracer controllers use BACnet®. BACnet is a standard, open communications protocol that allows integration and interoperability[1], enabling the controllers to not only tie into a Tracer Summit system, but also other building automation systems.

At the unit level, Trane uses LonTalk® for peer-to-peer communication between other Trane controllers and other approved LonTalk controllers. Trane's factory-configured air handler controller (AH540) and Trane's programmable controller (MP580) follow the certified Space Comfort Controller (SCC) Profile for constant-volume systems and the Discharge Air Controller (DAC) Profile for constant-volume or VAV systems. Adherence of this controller to these standardized, certified profiles enables it to communicate with other controllers that use the same certified LonTalk profiles. Go to www.lonmark.org for more information.

Acoustic Solutions

Air handlers designed for IAQ-required cleaning usually employ hard metal surfaces that do little to attenuate the primary source of noise: the fan. This problem is further compounded by the removal of duct linings and by ever-lower sound-level targets specified to create better working or teaching environments. However, the M-Series air handler has unique product flexibility that allows designers to use it in many low-NC (noise criteria) applications.

[1] Integration is the connectivity of equipment and controls purchased from multiple suppliers to a larger building automation system. Interoperability is the ability to share information between independent and dissimilar systems within a building or campus.

Figure 20. Schools and auditoriums are low NC applications

NC curves define not-to-exceed limits for a noise source to achieve a level of occupant acceptance. (See applications engineering manual FND-AM-5, "Acoustics in Air Conditioning," for more information about NC levels.) M-Series air handlers have been used successfully in NC 35 offices and schools as well as NC 15 performing arts and concert halls.

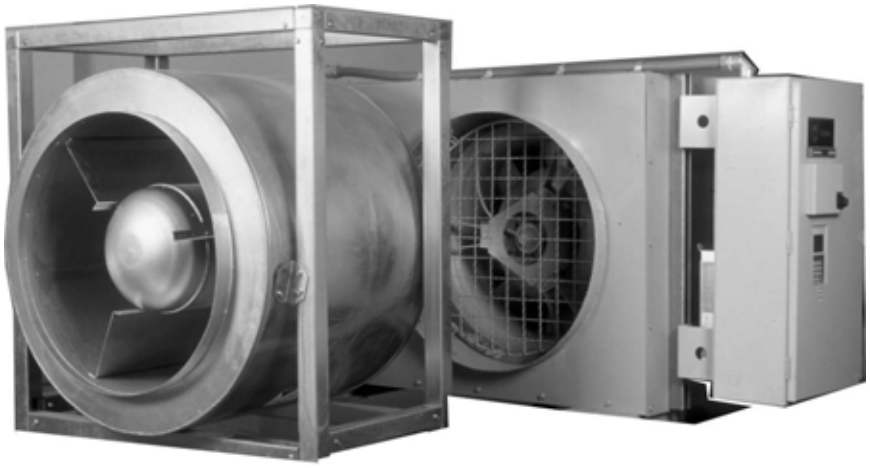
Provide Accurate, Tested Sound Data

Traditionally, ASHRAE algorithms have been used to predict the sound power levels of air-handling units. Although this method is easy to do, it can be inaccurate. It can produce results that deviate from tested data by as much as ±15 dB. For more accurate sound data, ARI has established Standard 260, which is a method of rating sound data for ducted air-handling equipment. It is intended to be a guide for the industry, including HVAC manufacturers, engineers, installers, contractors, and consumers. ARI Standard 260:

- Strengthens testing and calibration procedures
- Provides repeatable results
- Uses a reverberant-room approach, a mapped sound-rating concept, and reference sound-source calibration
- Is application driven
- Includes ducted outlet, ducted inlet, and casing (radiated) test configurations

It is important to note that sound data for the M-Series air handler is taken per ARI Standard 260. M-Series sound power covers eight octave bands (63–8000 Hz) and is unweighted (no dB corrections). The TOPSS program provides this ARI Standard 260-tested sound data.

Figure 21. In-line silencers for Q fan minimizes unit sound.



Minimize Sound Source

The key to a quiet design is to know which M-Series options and layouts have a sound source that achieves the target NC level when reduced by space attenuation. It all starts with accurate, tested sound data, and Trane has the most complete sound power data in the industry.

The design process involves designing the M-Series unit, predicting the unit sound power and projecting it to the space, then optimizing the path attenuation (ductwork and ceilings) and the unit sound (fan, plenums, silencers) to get the lowest cost system that meets the requirements. Designing the right unit is a matter of experience and solid acoustical data.

Obviously, the quieter the sound source, the less path attenuation is needed in the sound paths. Minimizing the sound source, using a quieter fan, or using more source attenuation increases the initial cost of the air handler. However, it is generally offset by significant path-reduction cost savings.

The M-Series air handler has many features to optimize the source sound level for job requirements while minimizing the cost of the air handler:

- *A variety of fan types*. Allows you to minimize the sound generated by the fan and to optimize your cost no matter what the application.
- *Double-wall perforated insulation.* Helps attenuate high-frequency noise.
- *Discharge plenums.* 2- or 4-inch discharge plenums reduce turbulence and create an end reflection that dampens low-frequency sound. The 4-inch-deep perforated option attenuates higher frequency sound.
- *Turning modules.* Used to turn the air and reduce turbulence. They work as effective, low-cost silencers.
- *Silencers.* Available in rectangular as a standard option (see Figure 21) and round as a custom option. Silencers are dissipative or film-lined for hospital and clean-room applications.

For more information on how to apply these options in your air handler, contact your local Trane sales representative.

Energy-Efficient Performance

Recover Energy

Increased ventilation airflow requires more energy to heat or cool and can significantly affect operating costs. Bringing in more fresh air when it is cold outside also increases the risk of coil freeze-up. Trane airside energy-recovery solutions address both energy consumption and coil protection by recovering heat from the exhaust air stream to precondition outdoor air entering the building. Many factory-packaged energy-recovery solutions are available for IAQ-ready M-Series air handlers:

- Total-energy wheels (see Figure 22, p. 15) to recover both sensible and latent energy (see Trane engineering bulletin CLCH-PRB012-EN and product catalog CLCH-PRC006-EN for more information).
- Coil-runaround loops to recover sensible energy (see Figure 23, p. 15).
- Air-to-air, fixed-plate heat exchangers to recover sensible energy (see Figure 24, p. 15).

Downsize

Trane's unique H-fin design permits coil selections with face velocities in excess of 625 fpm without moisture carryover. As a result, the size of the air-handling unit can often be reduced. In addition, the size of the chiller or boiler, system pumps, and fans may also be reduced, lowering the first cost of the entire system.

Figure 22. Energy wheels recover sensible and latent energy.

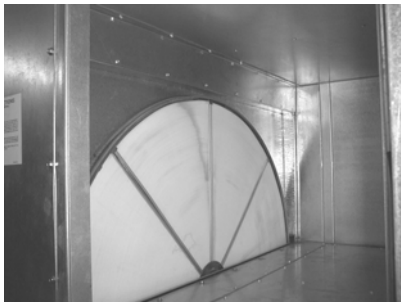


Figure 23. Coil-runaround loops recover sensible energy.

Figure 24. Air-to-air, fixed-plate heat exchanger recovers sensible energy

Reduce Energy Consumption

Standard air-handling units tend to bring in more outdoor air than is necessary to ensure that the amount of ventilation air meets the requirements of ASHRAE Standard 62.1. As a result, the air-handling system works harder to condition the air and uses more energy than might be necessary.

The Traq™ damper measures and controls ventilation airflow to assure that the requirements of ASHRAE Standard 62.1 are met without excessive demand on the air-handling system. As a result, heating and cooling coils, pumps, chillers, and boilers can work at part load, reducing energy consumption.

Increase Operating Efficiency

Trane's EarthWise™ system is a design philosophy that uses low flow rate and low temperature on both the waterside and airside, along with high-efficiency equipment. Along with reducing emissions, it also reduces first cost, lowers operating costs, and improves the acoustical characteristics and comfort of the HVAC system. Low-temperature, low-flow systems can challenge conventional cataloged air-handling units. The flexibility of the Trane M-Series air handler makes it ideally suited for low temperature applications:

- Trane has developed a unique high-efficiency fin surface that allows face velocities in excess of 625 fpm without moisture carryover. The fins have been engineered and tested to meet these higher face velocities at a given set of design conditions. This allows you to utilize the latest in airside heat transfer to further improve the efficiency of the overall system by lowering the coil approach temperature.
- The ability to choose the exact number of fins per foot of coil surface allows heat transfer and air-pressure-drop performance to be tuned to specifically meet project needs.
- The wide array of fan options lets you choose the right fan for the application.
- Factory-engineered, -mounted, and -tested controls provide the added insurance that the airside sensors and sequences meet your requirements.
- Further system enhancements can be made by taking advantage of the latest controls technology with fan pressurization control (required in most variable-air-volume systems per ASHRAE Standard 90.1) and/or resetting the outside air damper based upon equation 6.1 per ASHRAE Standard 62.

Agency Listings

ARI Standards

Trane combines comprehensive performance certification by ARI with thorough laboratory testing and advanced manufacturing methods. Together, these elements help assure that each M-Series unit operates predictably and reliably throughout the life of the unit.

Figure 25. ARI Standard 430

Unlike other rating methods that check fan performance alone, M-Series units are performance-tested in accordance with ARI Standard 430. This certification process evaluates the air handler on the basis of airflow, static pressure, fan speed, and brake horsepower.

Figure 26. ARI Standard 410

Heating and cooling coils are rigorously tested and certified with ARI Standard 410 to assure that they, too, deliver published performance.

Figure 27. ARI Standard 1060

ARI Standard 1060 is a certification standard for airside energy-recovery components. The M-Series energy wheel was one of the first wheels to obtain ARI Standard 1060 certification. Certified ARI performance is third-party assurance that your M-Series energy-recovery components will perform as predicted.

ARI Standard 260 is the first, ducted-air-handler sound rating procedure. It is intended to provide engineers with better, more accurate, ducted sound power levels so that they can design quieter and more cost-effective comfort systems. Trane M-Series units are rated per ARI Standard 260.

Demand Flow Technology

Our state-of-the-art manufacturing facility employs a system of “total quality checks” and verifications at each workstation to ensure consistent quality. And with implementation of Demand Flow® technology, we can better serve you by providing greater product flexibility, ever-improving product quality, and shorter manufacturing cycles.

ISO Certification

Certification by the International Standardization Organization (ISO) ensures that an organization can consistently deliver a product or service that meets the customer’s contractual requirements by following documented processes. The ISO 9001 quality assurance model establishes the requirements for an organization whose business processes range from design and development to production. Having the quality management system of our manufacturing plants ISO 9001-certified directly benefits Trane customers because our continuous process improvements can reduce business costs, improve product quality, and enable faster ship cycles.

Figure 28. ISO 9001 certification ensures consistent quality

Design Application Considerations

HVAC Design Fundamentals

In essence, an air-handling unit, or AHU, is no more than its name implies: a device that "handles" (moves and/or conditions) air. How it accomplishes this mission is determined by its application requirements. To satisfy these application requirements using the M-Series Climate Changer air handler in your HVAC designs, you must:

- Design the AHU in a manner consistent with good HVAC design practices
- Understand the impact of ASHRAE Standard 62.1, *Ventilation for Acceptable Indoor Air Quality*, and ASHRAE Standard 90.1, *Energy Standard for Buildings Except Low-Rise Residential Buildings*, on AHU functions and design
- Know how specific M-Series modules and components can address application requirements
- Deliver the performance you have designed with a well-functioning control system

Provide Proper Ventilation

Ventilation is the process of diluting the build-up of contaminants by introducing clean, fresh outdoor air into buildings. The lack of proper ventilation is identified as a leading cause of poor indoor air quality (IAQ) problems. ASHRAE Standard 62.1 sets the minimum ventilation rates and specifies basic HVAC equipment and system requirements to provide "acceptable indoor air quality." ASHRAE Standard 62.1 is considered the standard of care for designers to assure good IAQ in commercial buildings.

Assuring proper ventilation levels at all operating conditions can be challenging for a designer. Fixed outdoor-air damper arrangements on variable-air-volume systems can result in severe underventilation of the occupied spaces at part-load conditions. The M-Series air handler is available with the patented Traq™ outdoor airflow measurement and control damper, which can precisely control the volume of ventilation air entering the system and even dynamically vary the amount in response to specific operating conditions. With the Traq damper, the amount of outdoor air can be continuously logged using a Tracer Summit™ building automation system to document proper ventilation.

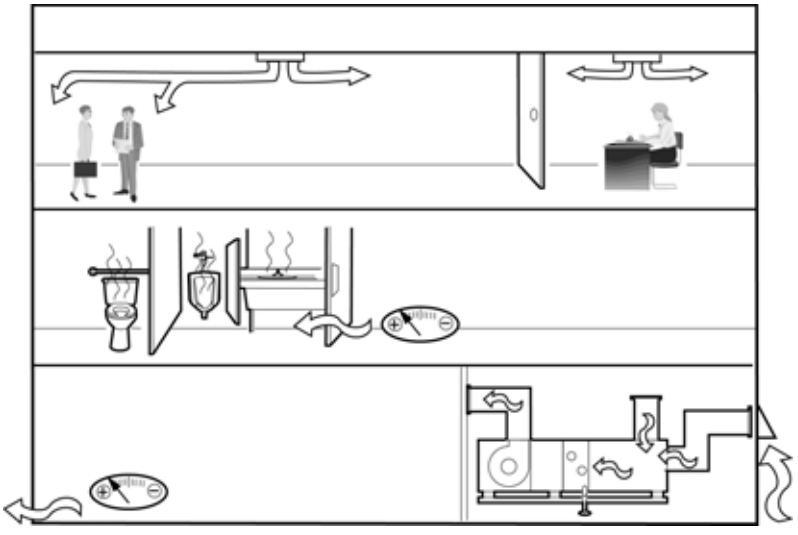
Maintain Building Pressure

An important aspect of establishing outdoor-air requirements is equalizing outdoor-air and exhaust-air volumes to maintain proper building pressurization (see Figure 29). *Building pressurization* describes an air-handling strategy that regulates pressure differences across the building envelope and between zones or rooms by adjusting the amount of air that is supplied and removed. The goals of this strategy are to:

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

Building-envelope pressurization is typically achieved by incorporating either an exhaust fan and economizer or a return fan and economizer in the air handler design. Careful analysis is required to determine which approach best suits the unique requirements of each application. To better understand the differences between exhaust-fan and return-fan systems, consult your local Trane sales representative or refer to applications engineering manual, *Building Pressurization Control* (AM-CON-17).

Figure 29. Maintain proper building pressurization



Protect Coils from Freezing

Figure 30. Low-limit sensor

Bringing more outdoor air into the air handler to satisfy the ventilation requirements of ASHRAE Standard 62.1 increases the likelihood of air stratification (see Figure 31). If a layer of freezing air moves through the air handler, it can damage unprotected, hydronic cooling and heating coils. Traditional freeze protection includes a low-limit thermostat (installed on the face of the cooling coil) that trips when it detects a dangerously low air temperature (see Figure 30). That stops the supply fan, closes the outdoor air damper, and ultimately degrades the building IAQ.

It is important to design the air handler so that it effectively treats the required amount of outdoor air—regardless of temperature—without risking coil damage, tripping the low-limit thermostat, or compromising IAQ. Trane has several means of providing coil protection. Choose the technique that best suits the application requirements.

- *Drain the coils.* This approach necessitates vent and drain connections on every coil, plus shutoff valves to isolate them from the chiller(s).
- Add glycol and an inhibitor to the cooling system water. The glycol lowers the water freezing point, and the inhibitor helps to resist corrosion.
- *Introduce ventilation air downstream of the cooling coil* with dual-path or bypass techniques.
- *Preheat the outdoor air stream.* Use a traditional or integral face-and-bypass steam coil or a hot hydronic coil to raise the air-stream temperature above freezing. An energy-recovery device can also be used for this purpose, such an air-to-air, fixed-plate heat exchanger (see Figure 32).

Figure 31. Protect coils from freezing by addressing air stratification

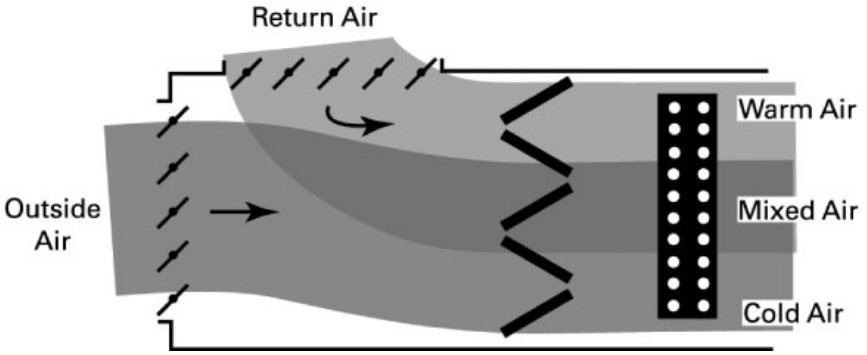
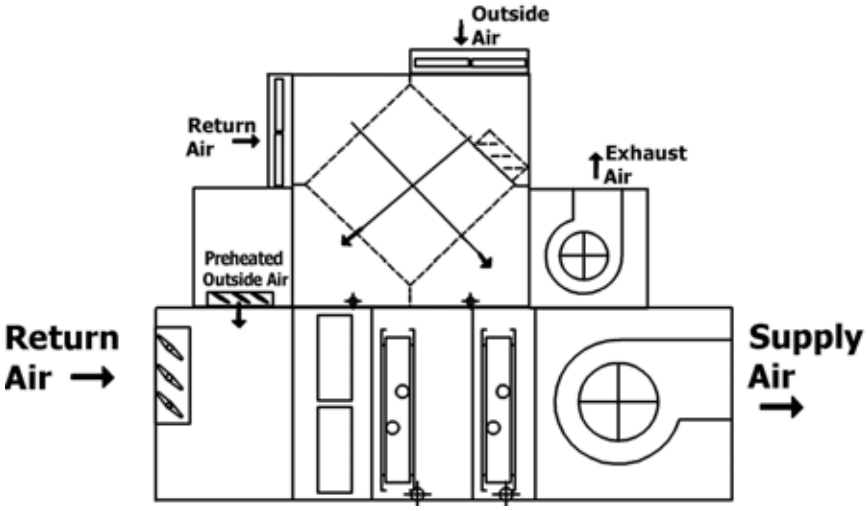
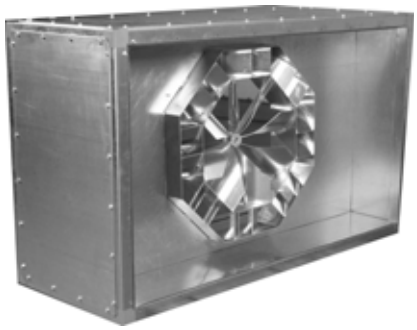


Figure 32. Protect coils from freezing by preheating outdoor air, shown here using an energy-recovery fixed-plate heat exchanger.



- *Use a blender module (see Figure 33).* This approach mixes the outdoor and recirculated air streams to address air stratification.

Figure 33. Blender module



Control Particulate and Gaseous Contaminants

ASHRAE Standard 62.1 emphasizes the importance of including appropriate filters in the air-handling system to effectively control particulate (dust and fibers) and gaseous (oxidants and formaldehyde) contaminants.

Particulates

To provide good IAQ, both the Environmental Protection Agency (EPA) and ASHRAE recommend that the concentration of particulates in the air not exceed 0.05 to 0.07 mg/m³. ASHRAE Standard 52 specifies the recognized procedure for testing particulate filters used in HVAC systems and defines arrestance and dust-spot efficiency as performance measures.

Filters with dust-spot efficiencies greater than 50 percent (MERV 9) remove most microorganisms from the passing air stream. National, state, or local codes established by government bodies or occupational groups may dictate more specific or stringent filtration requirements for a building depending on its type and/or location.

Gases and Vapors

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

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

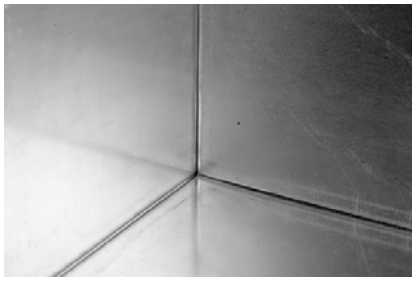
Figure 34. Use proper filtration for good indoor air quality

Minimize Microbial Growth

Although filtration effectively removes a number of common particulate and gaseous contaminants from the building environment, microbiological, or *microbial*, contaminants such as fungi (mold and mildew) and bacteria are sometimes too small to be filtered entirely from the air stream. To help control microbial growth, design the air handler to include:

- Hoods or moisture eliminators on outdoor-air intakes and exhausts
- Non-porous, cleanable interior wet surfaces
- Easy access to all areas of the air handler for inspection, service, and cleaning.

Figure 35. Keep surfaces clean



Regular cleaning and disinfecting with nonpolluting cleansers and antimicrobial coatings also helps, but none of these measures totally eliminates the growth of ever-present microorganisms. Consequently, moisture control becomes another important means of combating microbial contaminants.

Water Management

Cooling coils collect water from the passing air stream as they cool and dehumidify it. If not properly addressed, this condensed moisture encourages mold, mildew, and other microorganisms to colonize and breed. To reduce the likelihood of microbial growth:

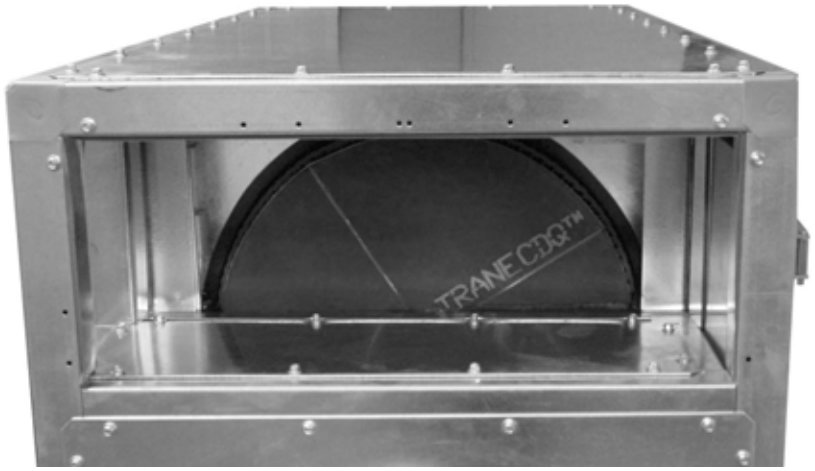
- Reduce moisture carryover by sizing the cooling coils for proper airflow velocities. Trane coils can be sized for velocities in excess of 625 fpm without moisture carryover, depending on air conditions, coil size, and coil-fin type and spacing. Refer to the “Coil Data” section on page 90 for the moisture-carryover curves and details about allowable velocities.

- Specify drain pans sloped in two planes to eliminate stagnant water conditions and to promote positive drainage.
- Locate coils on the second level of a stacked air handler to provide adequate trapping height.
- Properly size condensate traps to ensure proper drainage.
- Promote cleanability by providing adequate space around the unit, easily removable access panels, and a solid steel liner to isolate insulation from the air stream and to facilitate cleaning. Also, provide extended drain pans to allow for periodic cleaning.
- Condition the mechanical equipment room to prevent condensation on piping, ductwork, mechanical equipment, and other surfaces.

Dehumidification

ASHRAE Standard 62.1 observes that "high humidities can support the growth of pathogenic or allergenic organisms" and suggests that the relative humidity of the occupied space not exceed 60 percent. Higher humidities also require lower supply-air temperatures for thermal comfort. Most climates require dehumidification to achieve this design goal. Dehumidification can be accomplished by removing moisture from the air, that is, condensing the water vapor on cooling coils.

Figure 37. CDQ™ desiccant dehumidification wheel



However, cooling coils can overcool the occupied space when dehumidifying at sensible part-load conditions. There are several ways to control to both humidity and temperature at part load conditions.

- Placing a reheat device—usually a new-energy hot water or electric coil—downstream of the cooling coils solves this problem, but usually at an increased operating cost.
- Provide reheat from a recovered-energy source. The M-Series air handler's stackable design enables a split dehumidification unit (SDU) which dehumidifies while eliminating or minimizing the need for reheat (see Figure 36).
- Use a Trane CDQ™ (Cool Dry Quiet) unit with desiccant dehumidification wheel (see Figure 37) to lower the dewpoint below the dry-bulb temperature leaving the coil to reduce the need for reheat.

See "Dehumidify" on page 27 for more details on dehumidification options.

Figure 36. Split dehumidification unit (SDU)

Humidification

Low relative humidity - below 30 percent - in an occupied space is also undesirable because it requires higher supply-air temperatures for thermal comfort and promotes static electricity. Raising the space humidity to an appropriate level requires a humidifier to inject water particles into the passing air stream. To avoid promoting microbial growth, the unit design must assure that the injected water is fully absorbed within the air handler *without* collecting on its walls or components.

Three types of commercial humidifiers are generally used in central-station air-handling systems: wetted media, atomized water, and steam. Of these types, ASHRAE Standard 62.1 prefers steam "as the moisture source for humidifiers." The temperature and pressure properties of steam make it easy to introduce directly into the passing air stream and encourages complete absorption in a short distance.

Figure 38. Maintain proper humidity levels for indoor comfort

Meet Acoustical Requirements

Acceptable sound levels inside a building can improve occupant comfort and productivity. In fact, achieving an acceptable acoustical environment today is almost as important as simply conditioning it. To meet space sound levels, be sure to optimize the noise source (the air handler) using path attenuation (ducts, wall, and room carpeting).

The sound source can be projected using the TOPSS selection program or with the Trane *CLCHL*$_W$ program. The sound path can be projected using the Trane Acoustical Program (TAP). Compare the resulting NC projection with the designed value. If the NC projection is too high, the M-Series air handler can be made quieter with a selection focused on acoustics, or the path attenuation can be increased—or both strategies can be combined. In the end, the projection should meet the NC requirements for your job.

Creating quiet spaces is increasingly difficult because of the trend toward "IAQ-hardened" systems. "IAQ hardening" involves removing fiberglass insulation, which acts as a sound absorber, from inside the ducts and even the units. Without this insulation, the AHU makes too much noise. Use the flexibility of M-Series options and the TOPSS selection program to create the unit you need for your application.

M-Series options can permit air handler selections that are more than 20 dB quieter than a conventional unit. The starting point is the Trane M-Series ARI Standard 260 sound database.

M-Series sound power covers eight octave bands (63–8000 Hz). Data is collected in one of Trane's ANSI 12.32-qualified reverberant rooms.

To determine the most cost-effective acoustical solution for a given application, follow these steps:

1. Select the unit and predict the unit sound power using the TOPSS selection program.
2. Project the sound to the space using TAP.
3. Optimize the unit sound (fan, plenums, and silencers) with the path attenuation (ductwork and ceiling) for the lowest first cost that meets the sound requirements.

Figure 39. Silencers attenuate noise at the source

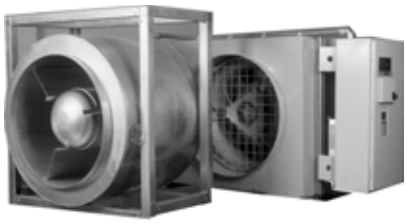


Table 2 summarizes the noise reduction ideas accumulated by Trane engineers during four decades of experience with central-station air handlers. Use the TOPSS program to predict the effect of each idea.

However, for acoustically sensitive applications, we strongly recommend that you work with your local Trane sales representative to find the most cost-effective solution that meets your job requirements.

Figure 40. Sound data, certified by AMCA, is collected in one of Trane's reverberant rooms.

Table 2. Noise reduction suggestions

Targeted Sound	Suggestions
Overall unit sound power (L_w)	• In VAV systems, use variable-frequency drives for fan modulation. • Change fan types. Vaneaxial fans generally have the lowest outlet and inlet sound of all fan types. • Increase the fan size. • Use a central exhaust fan rather than a return fan.
Discharge sound power	• Use discharge plenums. • Use rectangular or round outlet silencers. • Use perforated walls. • Use multiple-discharge plenum outlet ducts. • Use discharge plenums with side openings.
Inlet sound power	• Use a large inlet plenum. • Use rectangular or round inlet silencers. • Stack the inlet modules.
Casing (radiated) sound power	• Increase the gauge thickness of discharge-module casings.

Typical Application Considerations

The first things to consider when selecting an air handler for any given application include:

- *Design*. What overall system design best suits the required function?
- *Arrangements*. What is the best module arrangement for the specified function and layout?
- *Components*. Which components should be selected to support the function, layout, and arrangement of the application?

Air-Handling System Design

After determining the required airflows and functions for a particular application, the HVAC designer must determine which one of two path layouts for outdoor air best serves the application: single-path or dual-path.

Single-Path Design (Figure 41)

Single-path AHUs rely on one outdoor air path. Depending on application requirements, that path may provide ventilation air only or both ventilation air and economizing air for natural, non-mechanical cooling. Components for filtering and tempering the air are arranged in series. The single-path layout can accommodate passive or powered return- and/or exhaust-air paths as well as energy recovery.

Dual-Path Design (Figure 42)

Dual-path AHU layouts provide two air paths. Like a single-path design, dual-path designs can incorporate basic outdoor air, recirculation, exhaust-air, and energy-recovery functions. However, one path is dedicated to handling ventilation air to specifically address ASHRAE Standard 62.1 requirements. Each path is provided with its own air treatment components such as filters and heating and cooling coils.

Figure 41. Single-path design

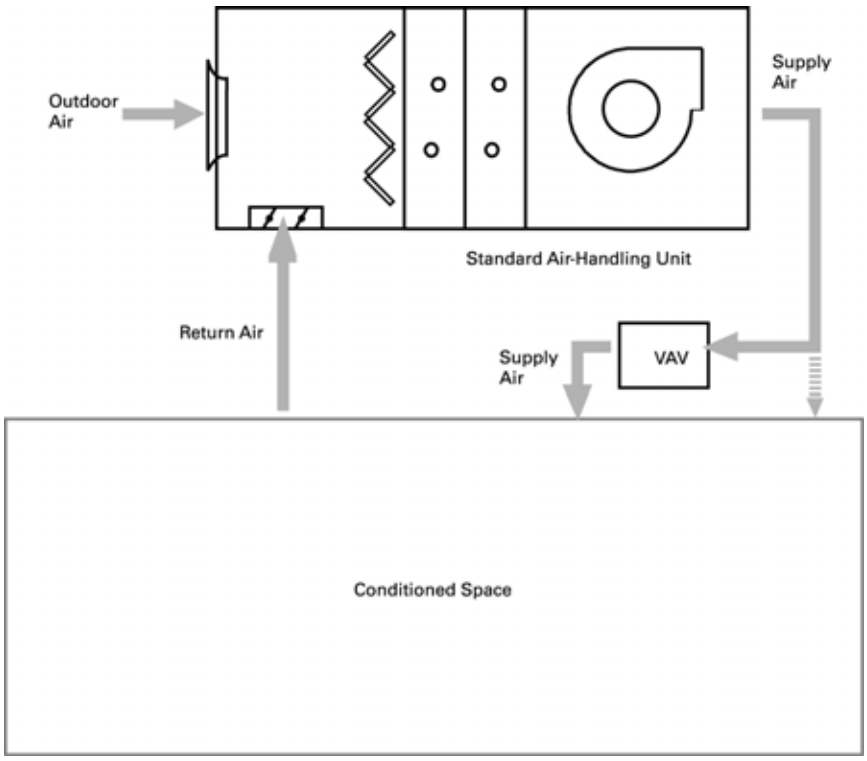
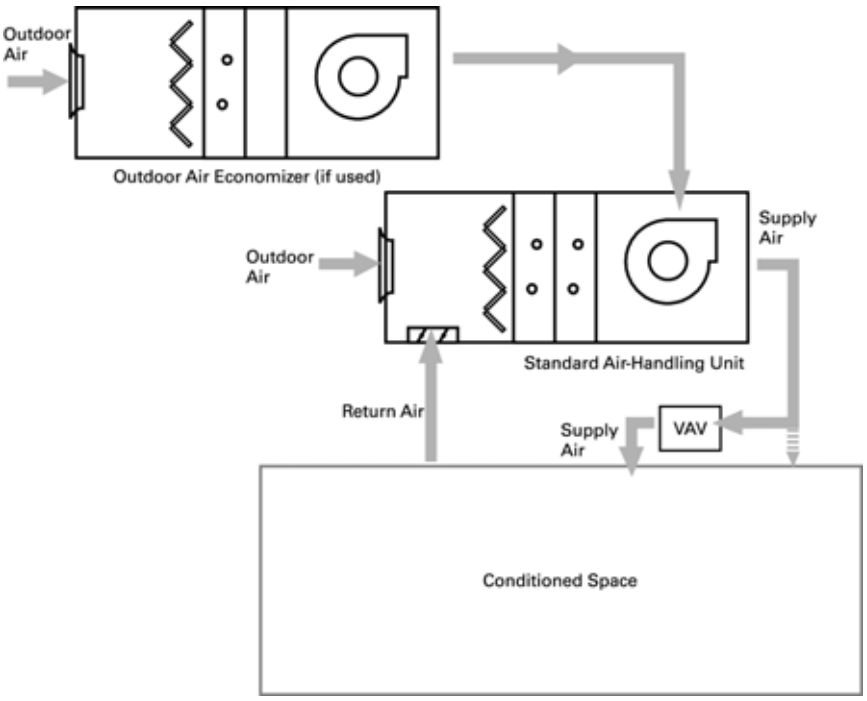


Figure 42. Dual-path design



A dual-path AHU design:

- reduces or eliminates reheat requirements, while providing an effective means of dehumidification for loads with low sensible-heat ratios (high latent cooling requirements)
- avoids increasing supply-fan static pressure due to high pressure drop components in the ventilation air stream (increases latent cooling and filtration capacity without increasing fan size)
- permits downsizing of the ventilation-path components
- enables compliance with the ASHRAE Standard 62.1 requirement for measuring outdoor airflow without significantly increasing the first cost of the air handler
- provides a cost-effective means to increase ventilation airflow in an existing system
- reduces cost by reducing the number of units (dedicated outdoor-air units can be eliminated)

Standard AHU Arrangements

To complete the AHU system, the modules must be physically arranged in a way that fits the available space. Conventional descriptions of AHU arrangements, *draw-thru* and *blow-thru*, reflect the means of establishing airflow through the coil based on the position of the coil relative to the fan: the fan either draws air through a coil located upstream or blows air through a downstream coil.

Figure 43. Horizontal draw-thru arrangement

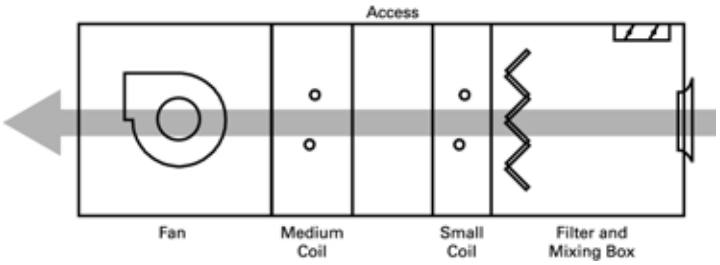
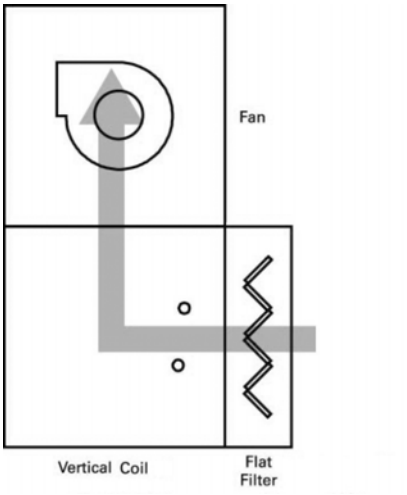


Figure 44. Vertical draw-thru arrangement



The M-Series air handler adds another dimension to air handler arrangements, letting you combine modules by stacking them on top of each other in space-saving configurations, by coupling them together in a side-by-side arrangement with transition panels, or by combining both techniques. Careful evaluation of the merits of each arrangement is a critical part of the design process.

Draw-Thru Arrangements

A draw-thru AHU arrangement places the coils and filters upstream of a ducted supply fan. It can be single- or dual-path.

Horizontal Draw-Thru (Figure 43)

Accepted system design practices are generally the only restrictions in a horizontal draw-thru application. However, certain application rules must be followed to promote proper airflow through filters and coils.

Vertical Draw-Thru (Figure 44)

M-Series air handlers in a vertical draw-thru arrangement typically result in a shorter footprint than horizontal draw-thru units. This arrangement stacks a fan on top of a vertical coil module. When designing an air handler in this configuration:

- The bottom deck must be equal to or longer than the fan module to avoid creating a “cantilever” effect
- Fan performance in CLCH-PRC008-EN (October 2004) for A, B, D, E, F, and G fans in vertical draw-thru applications include derates found in Table 3 to account for the airflow impingement by coils installed in vertical coil modules. TOPSS includes these derates in the selection of fans when installed in a vertical draw-thru application.

Table 3. Derates for vertical draw-thru applications

	AF Fans	FC Fans
BHP Multiplier	1.110	1.090
RPM Multiplier	1.035	1.025

Blow-Thru Arrangements

This type of AHU arrangement places the cooling coil downstream of the supply fan.

Single-Zone Blow-Thru (Figure 45)

This type of arrangement can provide only one supply-air temperature from the unit. To promote proper air distribution through each module and to reduce the risk of moisture carryover, certain application considerations apply based on the fan type. See Trane product catalog CLCH-PRC008-EN for more information about choosing fans.

Multizone Blow-Thru (Figure 46)

This arrangement provides multiple supply-air paths with varying supply-air temperatures. It consists of a multizone coil module immediately downstream of a fan module. A separate thermostat serves each zone.

When designing an air handler in this configuration, use:

- zone dampers to blend the air from the “hot” and “cold” decks of the unit and produce the desired temperature for each zone.
- baffles to equalize the pressure drops over both decks (the TOPSS selection program selects baffles automatically).
- three-deck multizones with bypass deck, available as a custom option.

Note: Be aware that ASHRAE Standard 90.1 does not allow for multizone configurations without bypass for new construction.

Figure 45. Single-zone blow-thru arrangement

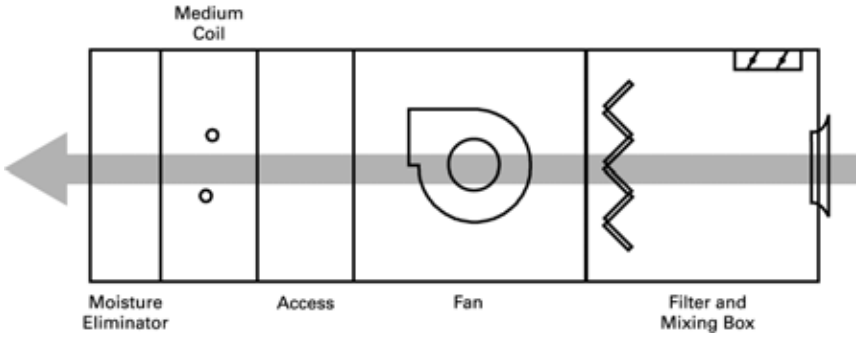
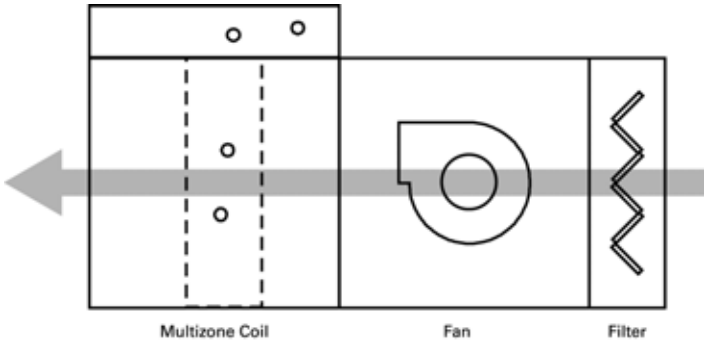


Figure 46. Multizone blow-thru arrangement



Stacked Units

A stacked AHU arrangement can be either draw-thru or blow-thru. It places the air handler modules on top of each other. This strategy can significantly reduce the length of the unit and provide better acoustical performance, yet has very little effect on unit static pressure drops.

Application considerations:

- Stacked module weight must not exceed the maximum stacking weight of the casing.
- Ductwork and dampers must not interfere with stacked modules.
- “Upper-deck” modules cannot overhang lower modules.
- Intermediate channel spacers should be used if the width of the upper deck is less than that of the bottom deck.

Figure 47. Return fan and economizer arrangement

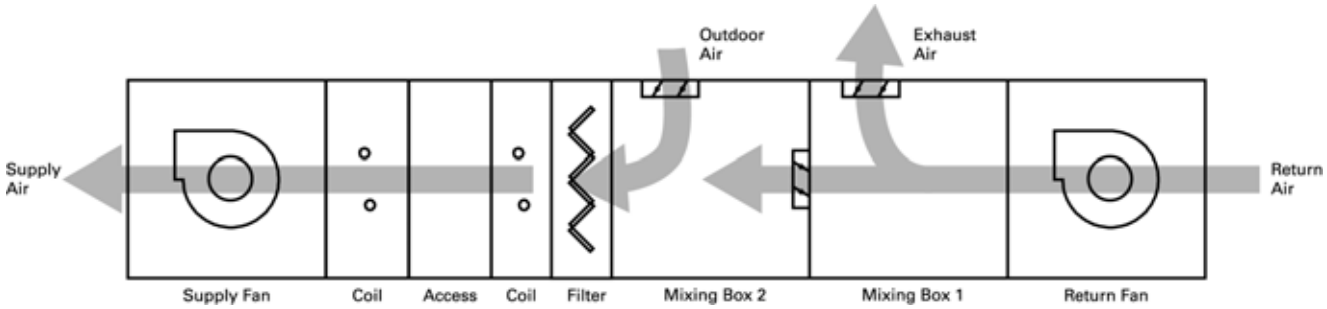
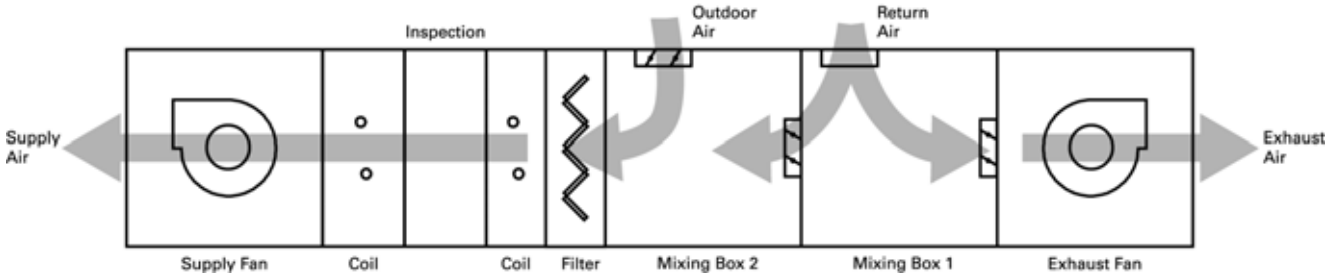


Figure 48. Exhaust fan and economizer arrangement



AHU Arrangements for Specific Applications

Draw-thru and blow-thru M-Series arrangements can be engineered for specific applications, including those to maintain proper building pressure, dehumidify, and recover energy.

Maintain Proper Building Pressure

Return fans and exhaust fans are used to maintain building pressurization. An M-Series air handler can include either of these components. To better understand the differences between exhaust-fan and return-fan systems, consult your local Trane sales engineer or refer to the Trane applications engineering manual, *Building Pressurization Control* (AM-CON-17).

Building Pressurization with a Return-Fan-and-Economizer Arrangement (Figure 47)

Figure 47 depicts a standard M-Series unit with a return fan and an economizer for outdoor air. The return fan typically runs continuously to balance the amount of air supplied to and removed from the occupied space. Although this approach makes precise space pressurization control more difficult, it is better suited to applications with high return static pressures than the exhaust-fan alternative. If the supply fan is unable to handle system static pressure, the return fan is sized to overcome the external static pressure of the return duct. Of course, the larger size and constant operation of the return fan also mean higher first and operating costs.

Application considerations:

- Size the *supply fan* to handle the static pressure requirements of a 100-percent *economizer* operation, including outdoor-air ductwork, dampers, filters, coils, other accessories in the outdoor air stream, and supply-duct static pressure.
- Size the *return fan* to handle the static pressure requirements of a 100-percent *return air* operation, including return duct, exhaust duct, and exhaust damper.
- Control the return fan to keep the outdoor/indoor static-pressure differential within design limits.
- Control the mixing box dampers to prevent all of them from closing simultaneously; otherwise, serious equipment damage could result.

Building Pressurization with Exhaust-Fan-and-Economizer Arrangement (Figure 48)

Figure 48 depicts a standard M-Series unit with an exhaust fan and an economizer for outdoor air. To balance the amount of air exhausted from the building with the amount of air brought into the building, the exhaust fan modulates, running at full capacity only when the economizer brings in 100-percent outdoor air. When the economizer is at minimum and the

exhaust fan is idle, dampers on the mixing box close to prevent outdoor air from being drawn into the air handler through the exhaust module.

The exhaust-fan-and-economizer combination provides strict space pressurization control, provided that the supply fan is sized to handle total system static pressure. Its first cost and operating cost are usually lower than the return-fan-and-economizer alternative, too. (An exhaust fan requires less capacity than a return fan and runs less often.)

Application considerations:

- Size the *supply fan* to handle the static pressure requirements of the higher of either a 100-percent *economizer* operation or 100-percent *return-air* operation.
- Size the *exhaust fan* to handle the static pressure requirements of a 100-percent *return-air* operation, including return duct, exhaust duct, and shutoff damper, when the unit is in full economizer mode.
- Control exhaust airflow to keep the outdoor/indoor static-pressure differential within design limits.
- Control the mixing box dampers to prevent all of them from closing simultaneously; otherwise, serious equipment damage could result.

Dehumidify

Excessive humidity in buildings can encourage mold and mildew growth and thermal discomfort. To cost effectively address these issues, first isolate the conditioned space from the unconditioned space. (See Trane applications engineering manual, *Managing Building Moisture*, SYS-AM-15.) Next, remove the humidity.

The two primary humidity sources in most buildings are people and outdoor air. In any coil-based HVAC system, it is the cooling coil that dehumidifies the air. This coil must be on and air must pass through it for dehumidification to occur. In M-Series enhanced dehumidification units, the priority for cooling coil control is humidity control. Temperature control is secondary and is generally provided by a separate reheat source.

Dehumidification can be obtained using:

- SDU (split dehumidification unit) arrangements
- CDQ™ (Cool, Dry, Quiet) units with desiccant wheels
- series, coil runaround loops
- air-to-air, fixed-plate heat exchangers

Free reheat options with dehumidification include:

- hot water heat-recovery coils
- refrigerant heat-recovery H coils

Dehumidification with a Split Dehumidification Unit (SDU) Arrangement (Figure 49)

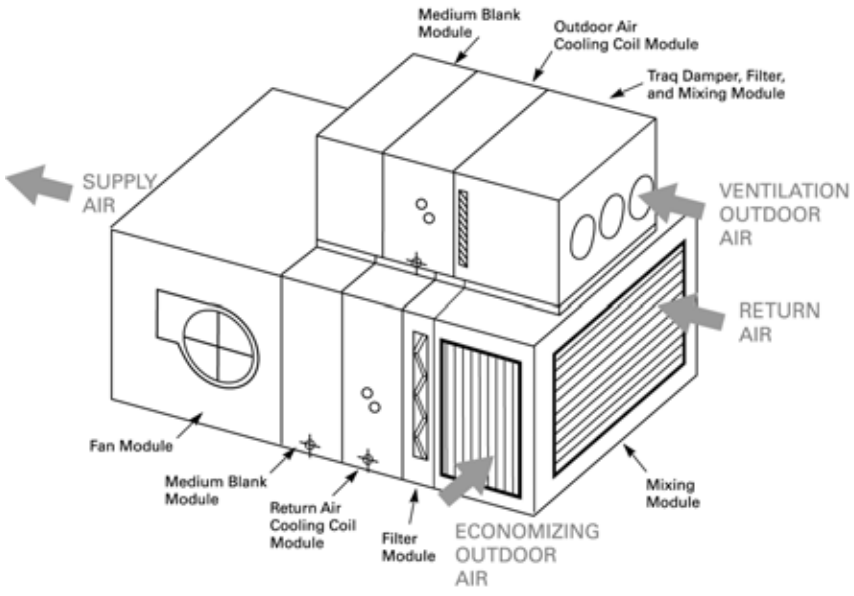
The SDU is a dual-path, return-air-bypass air handler. It consists of two units that are stacked together in a draw-thru arrangement and that share one supply fan. All of the ventilation (outdoor) air is ducted to the upper unit where it is dehumidified, typically down to 50ºF or lower.

The lower unit is sized to handle the return air needed to achieve the desired air-change rate in the space. The warmer return air in the lower unit mixes with the cooler, drier air from the upper unit. The resulting mixed air provides humidity control by achieving a sensible heat ratio (SHR) of down to 0.4, but also provides sensible reheat without using any new energy.

A vertical unit stacks the supply fan on top of a vertical coil module; the outdoor air enters the back of the fan module. This unit is shorter than the horizontal SDU.

Outdoor air economizers can also be used with an SDU. Simply add a mixing module to the return-air unit and bring outdoor air into this mixing module when conditions permit economizing.

Figure 49. Horizontal M-Series split dehumidification unit



The M-Series SDU:

- is a single-duct, factory-packaged dehumidification unit.
- does not require site-installed structural bracing
- provides excellent humidity control in recirculating units, achieving SHR down to 0.4 without using new energy for reheat
- can offer significantly lower operating costs and a low first cost
- Has a small footprint
- Can be used in retrofits due to its modular construction
- Uses standard M-Series components
- Is available in sizes 3 to 30, with the upper unit being equal to or smaller than the lower unit

For application guidelines concerning SDUs, refer to Trane engineering bulletin CLCH-PRB005-EN.

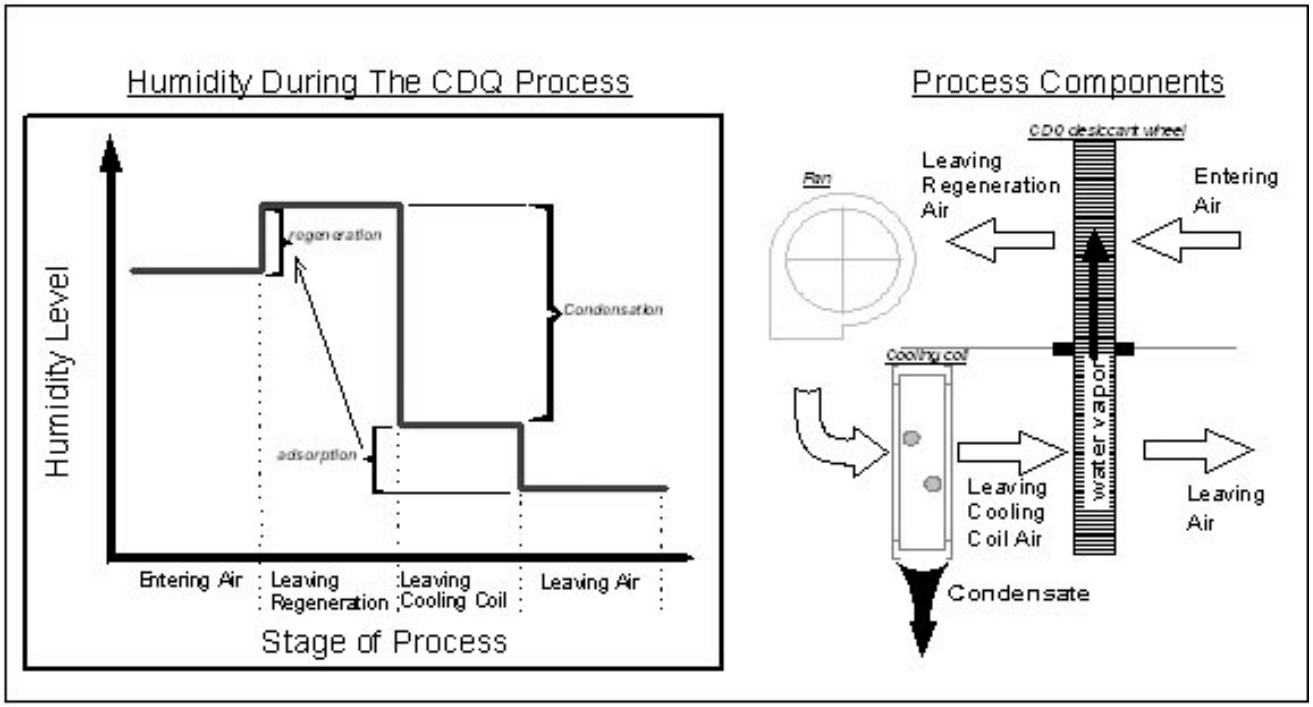
Dehumidification with CDQ™ (Cool, Dry, Quiet) Desiccant Wheels (Figure 50)

The addition of the CDQ desiccant wheel to the system enhances the dehumidification performance of the traditional cooling coil. The CDQ wheel transfers water vapor and the cooling coil does all the dehumidification work in the system. The latent capacity of the cooling coil increases without increasing its total cooling capacity. The system can achieve a lower supply air dew point without lowering the coil temperature. Unlike a system with a cooling coil alone, the dew point of the air leaving the coil can be lower than the dry bulb temperature leaving the coil.

- Increased cooling coil latent (dehumidification) capacity
- Lower achievable supply-air dew points.
- Decreased need for reheat
- Lower unit cooling sensible heat ratios.
- Warmer required chilled water temperatures.
- Improved energy efficiency for dehumidification.
- Decreased required cooling capacity when dehumidifying.
- Eliminates exhaust air as a requirement

For application guidelines concerningCDQ, refer to Trane engineering bulletin CLCH-PRB020-EN.

Figure 50. Dehumidification with Trane CDQ (Cool, Dry, Quiet) units



Dehumidification with Coil Runaround Loops (Figure 51)

Series, coil runaround loops consist of finned-tube water coils connected in a closed loop that is "wrapped" around an active cooling coil. Operation is psychrometrically similar to the air-to-air, fixed-plate heat exchanger. The first coil in the loop precools the incoming outdoor air. The active cooling coil absorbs more heat from the air stream and further dehumidifies the air to the design point. The second coil in the loop is placed after the active cooling coil and reheats the air with the heat absorbed by the first coil. Loop components include a pump to move the fluid within the loop and an expansion tank.

Series, coil runaround loops occupy little space and have a relatively low first cost. Like the series air-to-air, fixed-plate heat exchangers, series coil loops are only effective during the cooling season. Additional heating may be required on cool, humid or cold days.

Series, coil runaround loops:

- Provide free reheat at design conditions
- Allow downsizing of new energy cooling and reheat coils
- Add a minimal pressure drop through each coil (only 0.4 to 0.6 in. wg)
- Are available in all M-Series units
- Can be fully modulated by varying water flow

Figure 51. Series dehumidification with coil runaround loops

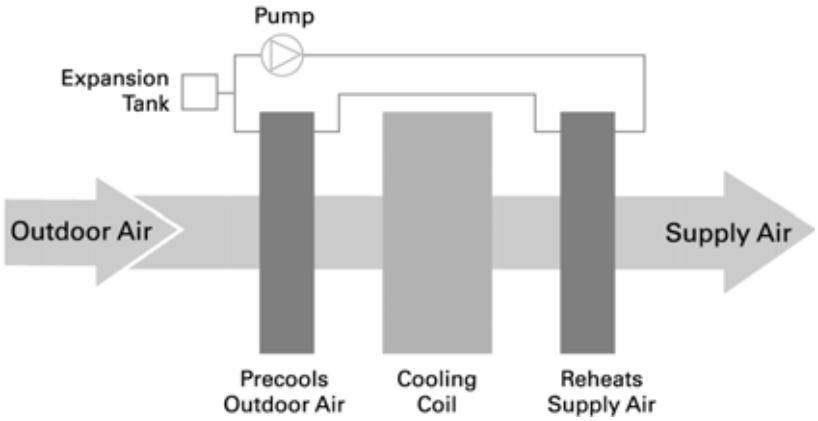
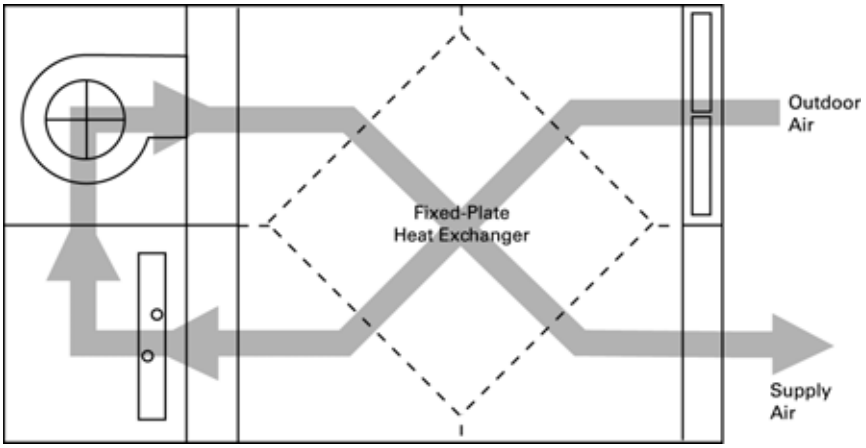


Figure 52. Series dehumidification with air-to-air, fixed-plate heat exchanger



Dehumidification with Air-to-Air, Fixed-Plate Heat Exchangers (Figure 52)

This arrangement creates a dedicated, 100-percent-outdoor-air unit that provides dehumidified ventilation air to a space at room-neutral temperature. It is used in conjunction with additional recirculating air handlers or fan-coil units that handle the sensible cooling load at the space. It is also used where the ventilation cooling load accounts for the majority of the system cooling load and in humid environments where comfort and moisture control are the primary concerns.

This type of system matches the volume of the ventilation air to the current occupancy level without changing the humidity of the air delivered to the system zones. Ventilation air first enters the air-to-air, fixed-plate heat exchanger; there, the air is precooled below the outdoor-air dew point, reducing the latent load on the coil. The ventilation air then goes through the cooling coil where it is cooled to the desired supply-air dew point. Finally, it is reheated to room-neutral temperature as it flows through the heat exchanger again. See Figure 52.

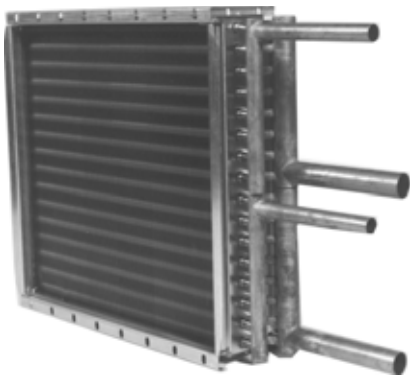
To prevent the exchanger from overheating the air during summer design conditions, it may be necessary to add an optional outdoor-air, face-and-bypass damper to the heat exchanger. Overheating the air may further reduce the cooling load on the ventilation unit; however, this additional sensible load must be added to the space-sensible cooling devices.

At summer design conditions, using an air-to-air, fixed-plate heat exchanger in a series dehumidification application typically:

- can reduce ventilation cooling loads by 25 to 30 percent and eliminate the need of reheat.
- saves 40 to 50 percent of the ventilation unit energy at summer peak conditions.
- allows downsizing of the cooling and reheat coils.

During most part-load conditions, the percent of energy saved increases, though additional reheat may be needed.

Figure 53. Typical heat recovery refrigerant coil



Dehumidification with Heat-Recovery Refrigerant Coils (Figure 53)

This dehumidification strategy also uses waste compressor heat to provide free dehumidification reheat. An auxiliary condenser coil, the Trane Type H refrigerant coil, is installed downstream of the active cooling coil. Hot gas leaving the compressor flows through the H coil to the condenser. Many direct-expansion applications require dehumidification control and are suitable for refrigerant heat recovery. Examples include supermarkets, computer rooms, and schools.

Refrigerant heat-recovery coils:

- work with recirculating or 100-percent makeup-air units.
- provide excellent humidity control at any sensible-heat-ratio condition without using new-energy reheat.
- can reduce operating costs significantly.
- can be used in retrofits.
- use standard M-Series components.
- provide proven, low-cost technology.

Dehumidification with Hot-Water Heat-Recovery Coils

Using waste condenser heat from the chiller or compressor is a simple way to provide dehumidification reheat. With this dehumidification strategy, an M-Series hot-water coil is installed after the active cooling coil. Hot water from the chiller—or from an auxiliary condenser on the chiller—is piped to this coil. Free reheat is available any time the chiller is on.

Hot-water heat-recovery coils:

- work with recirculating or 100-percent makeup-air units.
- provide excellent humidity control at any sensible-heat-ratio condition without using new-energy reheat.
- can reduce operating costs significantly.
- can be used in retrofits.
- use standard M-Series components.
- provide proven, low-cost technology.

Energy Recovery

Trane M-Series air handlers offer three high-performance solutions for airside energy recovery:

- Total-energy recovery wheels
- Runaround coil loops
- Air-to-air, fixed-plate heat exchangers

Each of these technologies transfers energy between the exhaust and outdoor air streams. Total energy recovery wheels transfer both sensible and latent energy between the air streams, while the coil loop and air-to-air, fixed-plate heat exchanger transfer sensible energy.

Energy-recovery arrangements of M-Series air handlers:

- reduce operating costs.
- can reduce first cost by allowing downsizing of chillers and boilers.

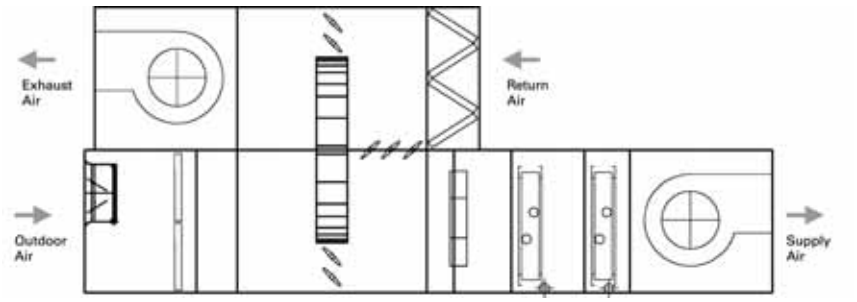
Energy-recovery systems can offer excellent energy savings when properly applied. Economic considerations must be carefully evaluated to determine the payback period of any energy-recovery system.

Consult Trane application manual, *Air-to-Air Energy Recovery in HVAC Systems* (SYS-APM003-EN), for more information.

Energy Recovery with a Total-Energy Wheel (Figure 54)

This type of application is used to recover energy and moisture from the exhaust air stream. The wheel preheats and humidifies the supply air during the winter season and precools and dehumidifies the supply air during the summer season. Figure 54 shows an M-Series arrangement with an exhaust fan, an economizer, and a total-energy wheel.

Figure 54. Energy-recovery with a total-energy wheel



As the return air enters the unit, a portion is recirculated through the return-air damper and the remainder goes through the wheel and is exhausted to maintain the required building pressure. Outdoor air enters an outdoor-air damper, then goes through the wheel and mixes with return air. During the economizing mode, the energy wheel is not used, and both wheel bypass dampers are open to allow up to 100-percent outdoor and exhaust airflow.

If the energy wheel module is used in a VAV system or in a unit that supplies cold supply air, modulating the exhaust-air bypass damper at the wheel can prevent the air from overheating during onset of the heating mode. If frosting conditions exist, modulating the outdoor-air bypass damper at the wheel can prevent vapor in the exhaust air from freezing on the wheel. If bypass frost control is used as freeze protection for the wheel, add a blender module to adequately mix the outdoor and exhaust air streams. If bypass frost control is not used, add outdoor-air preheat or return-air reheat.

Energy Recovery with Coil Runaround Loops (Figure 55)

Outdoor-air and exhaust-air coil runaround loops recover energy that would normally be exhausted. They precool the outdoor air during the cooling season and preheat the outdoor air during the heating season. With coil loops, the outdoor and exhaust air streams do not need to be adjacent. This provides design flexibility for building renovations and new construction—at a first cost that is often lower than other methods of energy recovery.

Multiple exhaust and outdoor-air coils can be piped together with relative ease. Coil runaround loops use finned-tube hydronic coils in a closed loop to transfer energy. A typical runaround system is shown in Figure 55. The heat-transfer fluid pumped within the loop is usually an inhibited solution of ethylene glycol and water to avoid freeze up.

Coil loops offer complete separation of the air streams, thus eliminating any risk of cross-contamination. Loop components include the coils, a pump, expansion tank, and a three-way valve or variable-frequency drive (VFD). The expansion tank accommodates expansion and contraction of the internal fluid. The three-way valve or VFD modulates coil capacity. To prevent moisture in the exhaust air from freezing on the exhaust coil, the three-way valve can divert the warm fluid returning from the exhaust coil to the supply side of the coil.

Application considerations:

- Typical coil-loop effectiveness ranges from 45 to 65 percent with equal airflow and no condensation. Adhere to standard guidelines regarding coil construction, based on conditions. (See Trane catalog COIL-DS-1 and engineering bulletin COIL-EB-19 for more information.)
- Coil performance and airside pressure drops can be determined using Trane selection tools.

Energy Recovery with Air-to-Air, Fixed-Plate Heat Exchangers (Figure 56)

This arrangement is usually employed to recover sensible energy. It is more cost-effective in smaller units (less than 10,000 cfm). It is also used in cases where cross-flow issues are critical.

The exchanger preheats the supply air during winter and precools the supply air during summer. The optional frost-protection damper mounted on the outdoor-air face of the heat exchanger closes if the temperature drops below freezing at the cold corner of the exchanger (the leaving-exhaust-air corner, toward the outdoor air). The frost-protection damper reduces the recovery effectiveness of the heat exchanger and minimizes the amount of outdoor airflow at the cold corner as well as the possibility of frost forming on the exchanger.

Figure 55. Energy recovery with a runaround coil loop

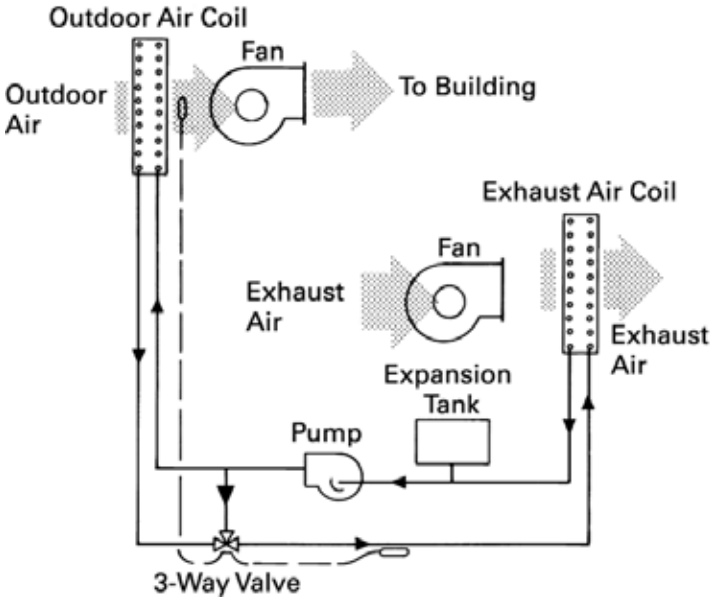
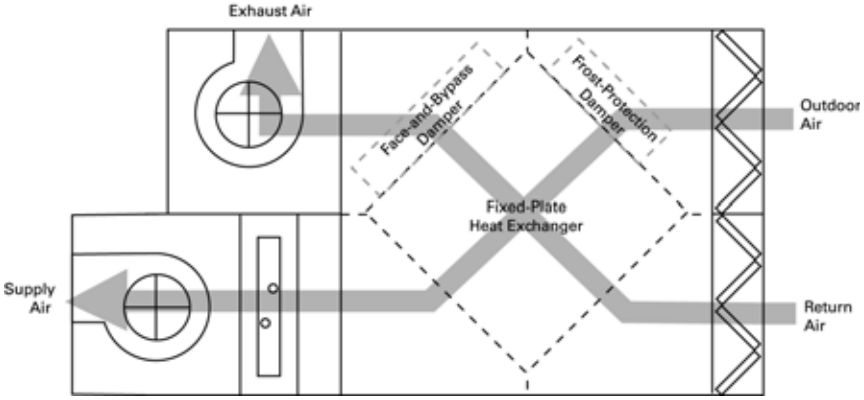


Figure 56. Energy recovery with an air-to-air, fixed-plate heat exchanger (100 percent outdoor air)



Also, if the air handler is designed to deliver cold supply air, an optional face-and-bypass damper mounted on the exhaust side of the exchanger is needed to prevent the heat exchanger from recovering too much energy from the warm exhaust air when it is not needed. Using exhaust air energy recovery can significantly decrease the cooling and heating load on the system.

Trane's Energy Recovery Performance (ERP) program can calculate total-energy wheel performance and determine if frost protection is needed. Contact your local Trane sales representative for more information about the ERP program. (See Trane engineering bulletin CLCH-PRB012-EN for more information.

M-Series Modules and Application Considerations

M-Series air handlers adopt a "building-block" approach to AHU design. Each building block, or module, contains one or more components that serve a specific purpose unique to each application. The required function, layout, and arrangement of the air-handling system determine which modules must be included for a particular application.

Access/Blank and Turning Module

Access or blank modules can be incorporated into the air handler design to provide access to internal components for cleaning, maintenance, and service or to promote proper airflow through the unit.

A turning module is a blank module that alters the direction of airflow and reduces turbulence. It can also serve as an effective sound attenuator. When compared to a field-mounted, rectangular duct silencer, the turning module is less expensive to install, has a lower pressure drop, and provides more predictable performance. Perforated lining in the turning module attenuates mid- to high-frequency sound.

Note: Only large and extra-large blank modules can be selected as turning modules.

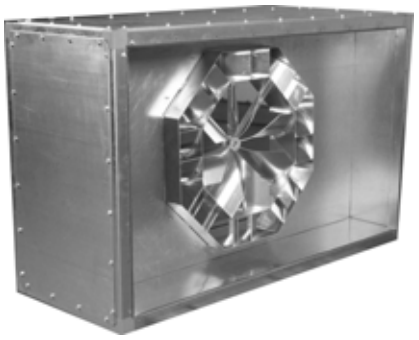
Blender Module

Blender modules contain air-mixing baffles, or blenders, that impart rotational energy to the passing air streams, boosting their velocity for improved mixing. It is usually placed immediately downstream of a mixing box module and upstream of filters and coils. Figure 58 documents blender module performance at a downstream coil entering air temperature of 55ºF and return-air temperatures of 70ºF and 75ºF.

Application considerations:

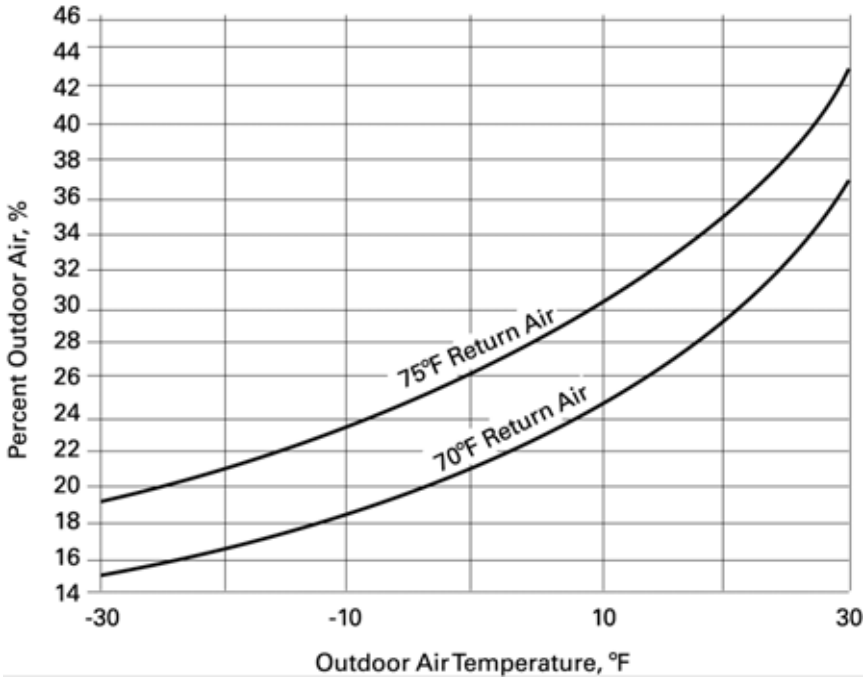
- The face velocity of the blender should exceed 400 fpm for proper mixing.
- When operated at temperatures within its design range, the blender module may eliminate the need for preheat.

Figure 58. Blender module



- The M-Series blender module allows complete air mixing.
- Select the mixing box module such that the dampers are positioned at the top, back, or bottom when used with a blender module.

Figure 57. Blender module performance with 55ºF leaving air temperature



Coils

Coil modules temper all (full-face) or part (modified-size) of the passing air stream by heating, cooling, or dehumidifying it with a factory-mounted coil. To select the right coil for the unique requirements of the application, be sure to optimize its capacity, face velocity, pressure drop, and construction. The unique H-fin design from Trane permits coil selections with face velocities in excess of 625 fpm without moisture carryover.

Table 4 shows the application considerations for the various coil types. Table 5 summarizes the available sizes for Trane coils.

M-Series Climate Changer™ air handler coil performance is certified in accordance with ARI Standard 410. Coils containing ethylene glycol are also rated in accordance with ARI Standard 410. Propylene glycol and calcium chlorate, or a mixture thereof, are outside the scope of ARI Standard 410.

Typical coil-face velocities are 200 to 625 fpm for cooling and 200 to 800 fpm for heating. The convention to determine the coil connection side of a single-level unit is to stand at the leaving air side of the coil with the air blowing in your face.

1/2-Inch Unit Coils

One-half-inch unit coils may be selected for these applications:

- Chilled water
- Hot water
- Direct-expansion (DX) refrigeration (R22)

These coils have aluminum fins and are available with or without baked phenolic coating. All 1/2-inch chilled-water unit coils have copper headers with external-threaded steel-pipe connections.

Table 6. 1/2-inch unit coil types

UW	• Chilled water or hot water • General purpose • Single-row serpentine • 2, 4, 6, or 8 rows
UU	• Chilled water or hot water • Dual-row serpentine • Low water-pressure drop • High flow rate • 4 or 8 rows • Unit sizes 12–120 only
UF	• Refrigerant • Standard, intertwined, and horizontal-split circuiting • 4, 6, or 8 rows

Table 4. Coil application considerations

Coil type	Application considerations
Hydronic cooling and refrigerant (direct expansion) cooling	• Size the coil to prevent moisture carryover due to high airflow velocities. The high-efficiency design of Trane Type H fins allows much higher face velocities than traditional coils. It is possible to exceed 625 fpm face velocities without moisture carryover. Refer to the moisture carryover curves in the “Coil Data” section for velocity limits. • Properly size the condensate trap to provide positive drainage. • Specify two-way-sloped drain pans to eliminate level seams and promote condensate flow directly to the drain outlet. Use stainless-steel construction to extend drain-pan life. • Provide adequate freeze protection for chilled hydronic coils.
Hydronic heating	• Hot-water heating is an attractive option for buildings without a ready source of steam. Hot water from the chiller condenser circuit is excellent for providing free dehumidification reheat. • Providing effective freeze protection is more challenging with hot-water preheat coils than it is for steam. To minimize the risk of coil freeze-up, use face-and-bypass preheat coils and operate the hot-water coil at full capacity.
Steam heating	• Properly pipe and trap the coil to provide positive drainage. • Steam coils are less susceptible to freeze-up than hot water coils. Trane Type N and NS steam-distributing coils use steam pressure to blow condensate from the coil. Double-trap the coil for a virtually freeze-proof installation.

Table 5. Trane coil sizes

Coil tube sizes	Description
1/2-inch OD (outside diameter)	Available in one face-area size per unit size Copper tubes 0.016-inch or 0.025-inch tube wall options Available in 2, 4, 6, or 8 rows Aluminum fins available only; baked phenolic coatings optional
5/8-inch OD	Available in three face-area sizes: unit (full face area), modified, and hot deck Available in 1–4, 6, 8, or 10 rows in all sizes except hot deck (Hot deck coils are available in one or two rows.) Available with 0.020-, 0.024- or 0.035-inch tube walls, typified by 5/8-inch OD tubes Available with aluminum or copper fins, with or without baked phenolic coatings
1-inch OD	Can be selected in unit and modified sizes Modulating, steam-distributing-type coils, available in one row only Available with 0.031-inch thick copper tubes or 0.049-inch thick red brass tubes and aluminum or copper fins. Available with aluminum or copper fins, with or without baked phenolic coatings

5/8-Inch Unit Coils

Five-eighths-inch unit coils may be selected for these applications:

- Chilled water
- Hot water
- DX refrigeration (R22)

These coils are available with aluminum fins (with or without baked phenolic coating) or copper fins (with or without baked phenolic coating). All 5/8-inch chilled-water unit coils—except P2, P4, P8, 1-row W, DD, and TT coils—have copper headers with external-threaded steel-pipe connections.

One-Inch Steam Coils

All 1-inch unit coils are steam coils. They are available with aluminum fins (with or without baked phenolic coating) and copper fins (with or without baked phenolic coating). One-inch steam coils are one-row coils and have cast iron headers with internal-threaded pipe connections.

Type N and Type NS

- Modulating steam
- Steam-distributing type
- NS—same-end connections
- N—opposite-end connections
- One row

Modified Coils

Modified coils are 5/8-inch and 1-inch tube coils with reduced face areas. Use them with internal face-and-bypass dampers or in low-capacity applications.

Hot-Deck Coils

Hot-deck coils are used in the hot decks of multizone units and are available in all types of one-row and two-row heating coils with 5/8-inch and 1-inch tubes.

Table 7. 5/8-inch unit coil types

W	• Chilled water or hot water • Single-row serpentine • 1, 3, 4, 6, 8, or 10 rows One-row W coils have opposite-end connections.	**D**	• Chilled water • Single-row serpentine • Drainable at each row • 4, 6, 8, or 10 rows
5W	• Chilled water or hot water • Same-end connections • 1 or 2 rows	**DD**	• Chilled water • Dual-row serpentine • Low water-pressure drop • High flow rate • Drainable at each row • 4, 6, 8, or 10 rows Six- and 10-row coils have opposite-end connections.
WD	• Chilled water or hot water • Dual-row serpentine • Low water-pressure drop • High flow rate • 6, 8, or 10 rows • Unit sizes 10–120 only	**K**	• Chilled or hot water • Single-row serpentine • Drainable at each row • Cleanable tubes • 2, 4, 6, 8, or 10 rows
5D	• Chilled water or hot water • Dual-row serpentine • Horizontally split • Dual supply and return connections • Low water-pressure drop • High flow rate • 6, 8, or 10 rows • Unit sizes 21–120 only	**P2, P4, P8**	• Chilled water • Ultra-low flow rate • P2—two-tube feed (2, 4, or 6 rows) • P4—four-tube feed (2, 4, 6, or 8 rows) • P8—eight-tube feed (4 or 8 rows)
5A	• Hot water • Alternate-tube feed • Low flow rate • 2 rows	**F**	• Refrigerant • Standard and horizontal circuiting • 2, 4, 6, or 8 rows
WA	• Hot water • Alternate-tube feed • Low flow rate • 1 row • Opposite-end connections	**TT**	• Hot water • Low flow rate • Common duct coil • Two-tube feed

Figure 59. Typical 5/8-inch coil

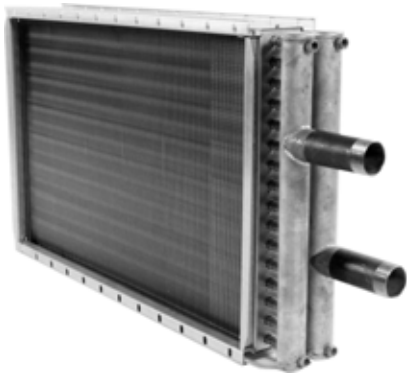


Figure 60. Typical 1-inch steam coil

Integral Face-and-Bypass Coil

Conventional preheat systems are subject to coil freeze-up, stratification, and air-volume variation. The integral face-and-bypass (IFB) coil is specifically designed to minimize these problems, alternating heating and bypass channels with face-and-bypass dampers before and after the coil. If heat is needed, both dampers modulate open; otherwise, they remain closed to prevent "coil wiping" on the leaving side of the coil and to avoid unwanted heat pickup. This design effectively provides good freeze protection, constant airflow, and uniformly mixed and unstratified air.

The IFB coil comes as a complete package (including heating coil, linkage, and dampers), thus assuring maximum system reliability. The module uses horizontal coil-tube arrangements in unit sizes 3 to 40 and vertical coil-tube arrangements in unit sizes 50 to 120.

- Size 3 units require a large module immediately downstream of the coil.
- Unit sizes 6 to 40 require a medium module immediately downstream of the coil.
- Unit sizes 50 to 120 require an extended-medium module immediately downstream of the coil.

Air-to-Air, Fixed-Plate Heat Exchanger

An air-to-air, fixed-plate heat exchanger is used to reclaim exhaust-air energy as well as to provide dehumidified ventilation air to a space at room-neutral temperature. It is a sensible-energy-recovery device that consists of alternate layers of aluminum plates that are separated and sealed to form passages for the outdoor and exhaust air streams. This design minimizes cross-contamination and relies on thermal conduction to induce heat transfer. It is also easy to clean and service.

The fixed-plate surface is uniquely designed to equalize uneven entering airflow as the air travels through the heat exchanger. Air can enter the module on any side except the bottom, where there are drain pans to catch condensate.

An optional Trane frost-protection damper (see Figure 61) discourages icing, permitting exchanger operation at ambient temperatures as low as -20ºF. A factory-applied PVC (polyvinyl chloride) coating is available for high-temperature (140º–400ºF) or corrosive applications.

Application considerations:

- The heat exchanger module is available as a custom option for M-Series air handlers in 10 unit sizes ranging from 3 to 30. Two heat exchanger options per size and three plate-spacing options per heat exchanger for most unit sizes give substantial performance flexibility.
- Recovery is limited to primarily sensible energy; effectiveness typically ranges from 50 to 70 percent or about equal to an eight-row coil loop.

Figure 61. Frost-protection damper

- M-Series heat exchanger has a pressure drop of 0.6 to 1.0 in. wg per side.
- A frost-protection damper is required if the outdoor air drops below the frost formation point (typically around 20ºF, but possibly as high as 32ºF).
- Optional face-and-bypass dampers (see Figure 66, p. 38) can bypass exhaust air through the exchanger to provide capacity control.
- The maximum pressure differential between the two air streams in the heat exchanger is 6 in. wg.
- Factory coatings are available for high temperature and/or corrosive air streams.
- If located directly downstream of a fan, put a 90-degree discharge plenum or diffuser module between the fan and the exchanger.
- Do *not* apply fixed-plate heat exchanger modules in systems where toxic or harmful gases must be isolated from the supply air stream.

Diffuser

A diffuser module consists of pressure-equalizing baffles that are designed to provide even airflow across components downstream of a fan. The diffuser module is typically used immediately downstream of a centrifugal fan in a blow-thru filter, coil, or silencer application.

Figure 62. Diffuser modules provide even airflow.

Discharge Plenum

Figure 63. Discharge plenums can lessen low-frequency sound.

Before leaving the air handler, supply air can be ducted to a discharge plenum module. The rapid air-stream expansion as it passes into the plenum reduces turbulence and creates an acoustical end reflection that dampens low-frequency sound. Two configurations enable supply-duct connections from any side:

- *Vertical-mounted* plenum modules mount atop an adjacent module. Openings can be factory- or field-cut.
- *Horizontal-mounted* plenum modules mount on the front of an adjacent module. Openings can be factory- or field-cut.

Note: All discharge plenum modules are available with 2-inch, insulated casing walls of solid or perforated construction, or with 4-inch perforated, double-wall casings to further attenuate high-frequency sound.

Electric Heat

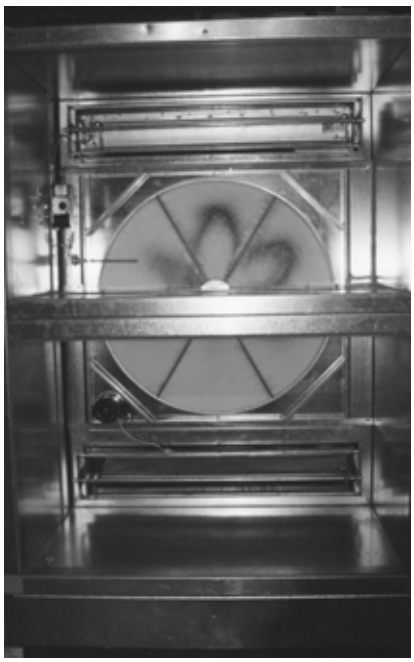
Electric heat is a relatively inexpensive first cost heating option compared to central plant boiler systems. The M-Series air handler has a factory-installed, UL-listed, electric heat option for unit sizes 3 to 66 in constant-volume or VAV applications.

Application considerations:

- Blow-thru arrangements require a minimum of a medium blank module between the supply fan and the electric heat module to ensure even air distribution across the electric heater.
- A large access or discharge plenum module with a door for field-wiring access is required downstream of the electric heat module in a blow-thru arrangement.

Figure 64. M-Series factory-installed electric heat option is UL-listed.

Figure 65. Energy wheel module



Energy Wheel

M-Series energy wheel module is a total-energy-recovery device; it recovers both sensible and latent energy. The energy wheel module consists of a rotating wheel that contains heat exchange media surfaces. A desiccant material specifically designed for absorption and desorption of water vapor is permanently bonded into the heat exchanger matrix. The wheel rotates between the outdoor- and return-air paths, whose air streams are counter-flow.

Energy wheels are sized based on the ventilation air requirement and can be applied in a 100-percent-outdoor-air unit or a recirculation unit. Internal wheel-bypass dampers vary the effectiveness of the wheel.

For more application information, refer to these Trane publications: engineering bulletin CLCH-PRB012-EN, catalog CLCH-PRC006-EN, and applications manual SYS-APM003-EN.

Highlights of the M-Series energy wheel module include the following:

- Certified in accordance to ARI Standard 1060
- Available in 13 sizes, depending on ventilation requirements ranging from 1,500 to 25,000 cfm
- Single wheels for M-Series sizes 3 to 50 with up to six wheels available per unit size
- Greater than 70 percent total effectiveness at a pressure drop of 1 to 1.15 in. wg and nominal airflow through the wheel
- Bypass dampers are standard for partial-flow energy wheel modules
- Standard, built-in return damper for partial-flow, recirculating wheels for sizes 6 to 50
- Module includes required space upstream and downstream of the wheel
- Required access and doors in module
- Variable effectiveness control using air bypass
- Frost protection using an air bypass damper or a separate preheat module

Face-and-Bypass Dampers

Designed to divert airflow around a coil, the face-and-bypass damper module can be used to control humidity or provide freeze protection for hydronic coils. Face-and-bypass dampers are available in two module configurations, internal and external, and also in an integral face-and-bypass coil (see p. 36).

Figure 66. Face-and-bypass damper

Internal Face-and-Bypass Dampers

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

Application considerations:

- To ensure full airflow coverage across downstream coil banks, provide extra distance (see Table 8) after the modified-size coil module.
- Consider the effect of reduced bypass area, higher velocities, and higher pressure drops when designing internal face-and-bypass configurations that require 100-percent bypass. External face-and-bypass dampers may be better suited for these configurations.

Table 8. Recommended distance between coils to ensure full airflow coverage

Unit size	Distance between coils (inches)
3, 6	12
8, 10	18
12, 14	24
17	30
21	33
25, 30, 35, 40	36
50	48
57, 66	57
80	69
100, 120	78

External Face-and-Bypass Dampers

External face-and-bypass dampers perform the same function as their internal counterpart. However, they are used upstream of a full-face coil, and they route air around the coil through an external bypass duct. See Table 9 for recommended duct sizes that permit 100-percent bypass. Duct placement varies with each air handler arrangement. Ensure that the external bypass duct does not interfere with stacked modules.

Use Table 9 in conjunction with Figure 68D.

Table 9. Recommended bypass duct sizes (inches)

Unit size	H	W	L
3	12	27	12
6	14	40	14
8	14	44	14
10	14	56	14
12	18	60	18
14	18	64	18
17	18	70	18
21	24	72	24
25	24	74	24
30	24	87	24
35	28	91	28
40	28	104	28
50	28	115	28
57	40	115	40
66	40	132	40
80	40	132	40
100	40	147	40
120	40	174	40

Figure 67. Internal face-and-bypass configuration

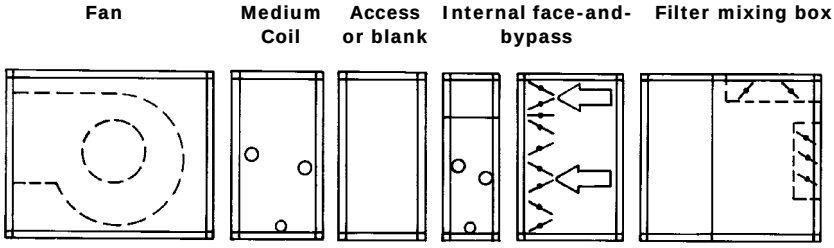


Figure 68. A. External face-and-bypass configurations

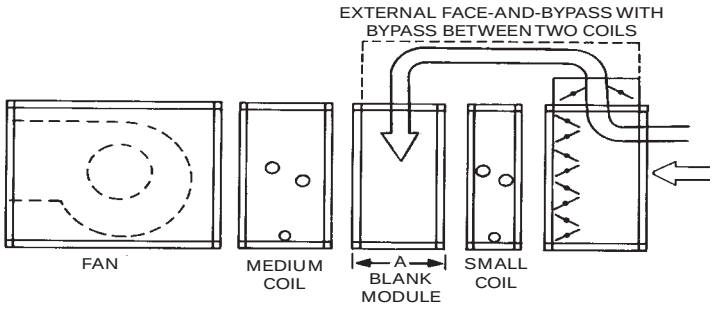


Figure 68 B.

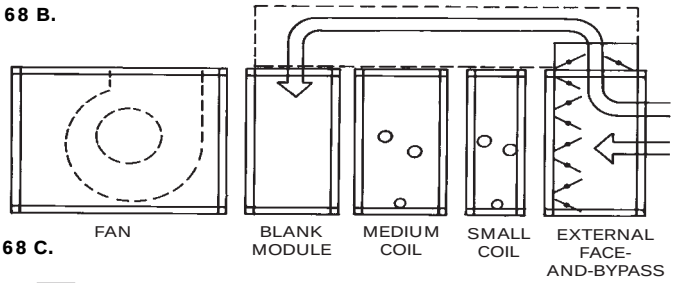


Figure 68 C.

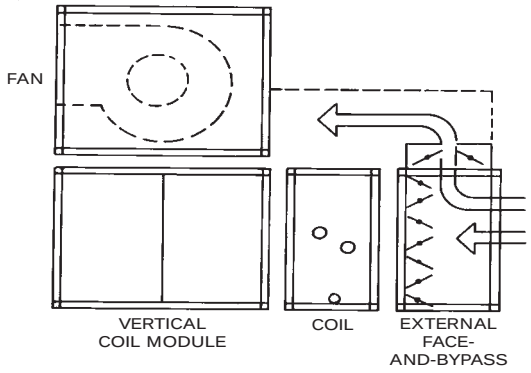


Figure 68 D.

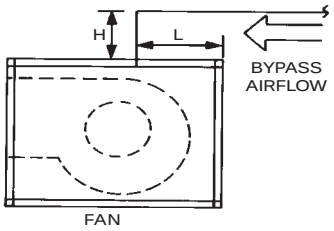


Figure 68 A.

Size 3-30 $$A = 4 + \frac{CFM \times .114}{B \times \sqrt{\Delta P}}$$

Size 35-100 $$A = 5 + \frac{CFM \times .114}{B \times \sqrt{\Delta P}}$$

A=The minimum module depth to allow even air distribution over the full face of the downstream coil at full bypass condition.

B=Opening width (see Table 9)

∇P = coil design air pressure drop of downstream coil (in. w.g.)

Figure 68 B.

Unit Size	Blank Size
3-10	Small
12-40	Medium
50-57	Extended Medium
66-120	Large

Figure 68 C.

Area of opening in fan module should be equal to "H" and "W" dimensions from Table 9 on page 38.

Fans

Designers can choose from four common fan types—airfoil (AF) and forward-curved (FC) centrifugal, airfoil plenum, and airfoil vaneaxial—to tailor air handler performance to application requirements. Table 11 on page 41 summarizes and compares the characteristics and application considerations of these fans. When evaluating the merits of each fan type for a given application, consider the volumetric rate of airflow, static pressure, required sound characteristics, and available space.

To verify that fan performance will satisfy design requirements, use the TOPSS selection program or refer to Trane fan performance catalog CLCH-PRC008-EN. The ARI Standard 430-certified fan curves include the fan module casing effect. The catalog also discusses how ductwork connections, air density, fan and motor heat, drive losses, and use of high-performance (greater than 65-percent efficiency) filters affect fan performance.

Depending on the fan-control method used, the fan can provide either a constant or variable volume of supply air. In a constant-volume system, the fan delivers a consistent amount of air and cooling and heating devices adjust the air temperature for occupant comfort. Because the fan runs at constant horsepower under all load conditions, system operating costs are higher than those of a VAV system.

Fan Identification

Each fan is identified by unit size and a letter. The letter defines the fan application; see below.

Table 10. Fan identification

Identifier	Fan application
A	Low pressure (housed)
B	Medium pressure (housed)
D, E	High pressure (housed—large diameter)
F, G	High pressure (housed—small diameter)
P	Plenum (plug)
Q	Horizontal airfoil vaneaxial (Q™ fan, small diameter)
R	Horizontal airfoil vaneaxial (Q fan, large diameter)
V	Vertical airfoil vaneaxial (Q™ fan, small diameter)
W	Vertical airfoil vaneaxial (Q fan, large diameter)

A VAV system provides occupant comfort by delivering a modulated amount of constant-temperature air. Usually, supply-duct static pressure determines how much air the fan provides. Varying fan horsepower with building load can offer substantial energy savings and do a better job of controlling space humidity.

Fan modulation is accomplished with a variable-frequency drive (VFD) that adjusts fan speed and airflow by varying motor speed. VFD modulation is quiet and energy efficient; it can also prolong the life of the fan motor by “soft starting” it.

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

Figure 69. Typical FC fan

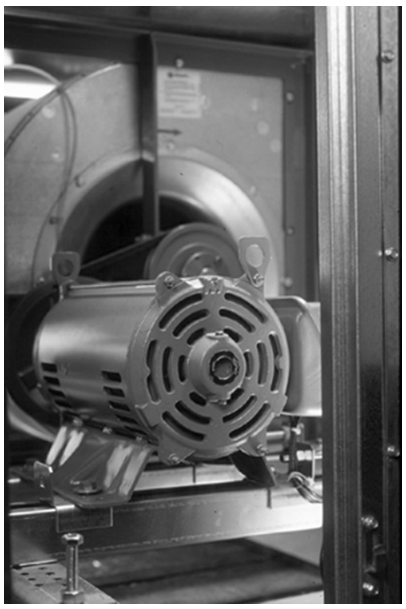


Figure 70. Typical Q fan

Table 11. Fan summary information

Fan type	FC Fan	Backward-curved (BC) Fan	AF Fan	Model Q Fan	Plenum Fan
	Centrifugal, housed	Centrifugal, housed	Centrifugal, housed	Vaneaxial	Unhoused
Inlet	Double	Double	Double	Single	Single
Airflow direction	Radial	Radial	Radial	Axial	Pressurized, all directions
Optimal pressure range	Low to medium (0 to 5 in. wg)	High (4 to 8 in. wg)	High (4 to 8 in. wg)	Medium (2 to 5 in. wg)	Medium (2 to 5 in. wg)
First cost (relative)	Low	Medium	Medium	High	High
Operating cost (relative)	Medium	Medium-high	Medium-high	Low	Medium
Typical speed range	400–1,200 rpm	1,000–2,600 rpm	1,000–2,600 rpm	1,400–2,900 rpm	600–1,200 rpm
Blade shape	Curved	Curved	Airfoil	Airfoil	Airfoil
Acoustical characteristics	Significant air turbulence that quickly abates; little blade-tone noise	Significant air turbulence; strong blade tones in 250-Hz octave band	Significant air turbulence; strong blade tones in 250-Hz octave band	Little turbulence; quiet at hard-to-attenuate low frequencies	Discharge sound similar to Q fan, but higher inlet noise[1]
Suggested source attenuation	Add a discharge plenum	Avoid using inlet vanes; use discharge plenums and/or silencers	Avoid using inlet vanes; use discharge plenums and/or silencers	Avoid using inlet vanes; use discharge plenums and/or silencers	Add a discharge plenum or outlet/inlet silencer
Direct upstream space required in draw-thru arrangements	None	None	None	Medium module	Medium module
Direct downstream space required in blow-thru arrangements	Medium blank or diffuser module	Medium blank or diffuser module	Medium blank or diffuser module	Two turning modules or a large module and diffuser module	Medium blank module
When to use?	Low-pressure applications	High-pressure applications	High-pressure applications	Quiet application, especially 6,000–60,000 cfm	Multiple-duct arrangement, blow-thru applications[2]
K_t loss, abrupt discharge[3]	1.8	1.0	1.0	0.8	n/a

1. Add duct takeoff losses from the plenum fan module to external static pressure; see Trane fan performance catalog CLCH-PRC008-EN for details.

2. Same as Note 1; the uniform discharge velocity of the plenum fan may eliminate the need for turns in supply-air ductwork and diffusers, suiting it for installations with limited equipment room space.

3. In draw-thru applications, fan curves assume three diameters of straight duct downstream of the fan. Refer to AMCA 201-90, Fans and Systems, for more information when this assumption is not valid.

Filters

Filter modules contain particulate filtering media that remove contaminants from the passing air stream to improve IAQ. Filter options include high-performance (greater than 65-percent efficiency) pleated, bag, or cartridge filters. HEPA-type (99.97-percent efficiency) filters are also available. The continuous operating range of both the high-efficiency filters and the disposable prefilter is 0ºF to 150ºF.

Application considerations:

- Higher filter efficiencies cost more, but provide cleaner air and better system performance. National, state, and local codes may also specify filter performance.
- Filter resistance and first cost may increase with efficiency.
- High filtration efficiencies sometimes require more space, which lowers velocity, and may enlarge the air handler footprint.
- A high degree of filtration can lower cleaning costs in the occupied space.
- Exceeding the face velocity limit of the filter increases its resistance (as well as fan energy consumption) and necessitates more frequent maintenance or replacement.
- Use disposable prefilters with HEPA filters to enhance filtration efficiency and reduce filter replacement costs.
- Use disposable prefilters upstream of high-efficiency filters to increase the life of the filter and minimize replacement costs.
- Exercise special care to avoid moisture carryover whenever final filters are used. Never place a blow-thru final filter module directly downstream of a cooling coil without providing an intervening source of reheat (such as fan motor). Tests have shown that certain entering-coil conditions can create water vapor that *will* collect on the final filter. The only known solution for this intermittent application issue is two degrees of reheat.
- Treating filter media with an antimicrobial coating can reduce the likelihood of microbial contamination. Trane's coated pleated media filters are treated with an antimicrobial coating.
- Always place HEPA filters in the last section of the air handler to prevent infiltration through the unit casing from degrading the otherwise high performance of the filter.
- Install bag filters with the pleats vertical to the floor of the unit.
- Provide easy access to encourage regular filter maintenance.
- High-efficiency filters and disposable prefilters may be operated up to 100 percent relative humidity; however, they may not come in direct contact with water droplets.
- Keep filters dry

Figure 71. Bag filter module (entering air side)

Figure 72. Bag filter module (leaving air side)

Figure 73. HEPA filter module

Gas Heat

Gas heat can be an economical source of heat in M-Series Climate Changer air handlers when compared to traditional sources of heating such as central plant boilers with hot water or steam coils installed inside air handlers, or electric resistance heating installed inside air handlers.

Gas heat can be a good heating option for any of the following applications:

- Climates and applications with large heat loads
- Applications with high outside air requirements to comply with ASHRAE Standard 62
- Buildings without a central boiler plant
- Remote locations where boiler capacity or water piping expense is prohibitive
- Areas with relatively inexpensive natural gas or expensive electricity

When considering gas heat as the primary heat source in an M-Series unit, include these application considerations:

Figure 74. Gas heat module

- Gas heater must be applied in a blow-thru configuration to insure that combustion gases will not enter the airstream due to the positive static pressure
- Maximum discharge air temperature is 101° F
- When reducing airflow, the control system should not allow the temperature rise through the gas heat section to exceed the nominal at full airflow.
- On high altitude applications, derate the heating capacity (MBh) by 4 percent for every 1,000 feet over 2,000 feet.

Additional information on gas heat features, options, applications, and installation can be found in Engineering Bulletin CLCH-PRB010-EN.

Humidifier

ASHRAE Standard 62.1 suggests maintaining a relative humidity of no less than 30 percent to provide a comfortable, healthy indoor environment. The M-Series air handler humidifier module uses low-pressure steam distributors to add moisture to the air. It includes accessories such as valves, strainers, and traps. Factory mounting within the air handler lowers the installed cost of the humidifier and keeps moisture out of the supply duct.

Application considerations:

- Airflow through the humidifier must be horizontal and of relatively uniform velocity (400 to 700 fpm).
- Do not locate the humidifier upstream of filters, gas heat, electric heat, or active cooling coils.
- Blow-thru applications with housed fans require at least a four-row coil between the fan and humidifier modules. The diffuser alone is unacceptable.
- To prevent condensate formation, the relative humidity leaving the humidifier should not exceed 83 percent. Contact your local Trane sales representative for application-specific guidance.
- The required dispersion distance is designed into the humidifier module.
- Vertical airflow turning immediately upstream and downstream of the humidifier module requires a large module.

Figure 75. Humidifier module

Intake

As its name implies, this module provides a means for outdoor air to enter the air handler. A screen on the intake opening prevents foreign objects from entering the air handler. The module also contains a moisture eliminator and a drain pan to remove water from the outdoor air stream if it enters the air handler.

Mixing Box and Economizer

Figure 76. Mixing Box

A mixing box module typically combines the incoming outdoor air with recirculated return air collected from the occupied space. It is commonly included in an air handler design to control this mixture. When equipped with an optional Traq damper, the mixing box module permits direct measurement of outdoor airflow to assure compliance with ASHRAE Standard 62.1.

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

Application considerations:

- The Traq damper mixing box requires only one duct diameter of straight inlet duct (as much as 80 percent less than other airflow monitoring techniques).
- Connecting a Traq-damper-equipped air handler to a building automation system, such as a Tracer building management system, permits:
  - Dynamic calculation of the outdoor air needed to adequately ventilate a multispace VAV system and reset the outdoor-air setpoint accordingly to save energy.
  - Trend logs and custom reports to document compliance with ASHRAE Standard 62.1.
- An additional mixing box can be used as an economizer to provide an exhaust path for return air, allowing the main mixing box to provide natural, non-mechanical cooling when outdoor air conditions are suitable (see Figure 45 on page 25).
- Use freeze protection for coils downstream of the mixing box when incoming outdoor air is below 35ºF (see the "Protect Coils from Freezing" section on page 18).

Moisture Eliminator

A moisture eliminator is used to remove entrained water from the passing air stream. It may also be used immediately downstream of a cooling coil module to prevent moisture carryover in single-zone blow-thru arrangements; however, it is not required with plenum-type fan modules.

Multizone

The multizone module consists of a cooling coil, heating coil, and dampers with multiple zones. It is split into two decks, each with a separate air stream. The "cold" deck cools one air stream and the "hot" deck heats another air stream. The damper then mixes these two air streams to achieve a certain mixed-air temperature. The damper is divided into segments so that one AHU can deliver multiple supply air temperatures. Baffles ensure equal pressure drops through each deck of the unit.

The multizone module is always used in a blow-thru arrangement and is typically placed directly downstream of the supply fan.

Note: The number of zones that one multizone AHU can supply varies by unit size.

Note: Be aware that ASHRAE Standard 90.1 does not allow for multizone configurations without bypass for new construction.

Quick Select

Selection Procedure

1. Size the air-handling unit based on airflow through the cooling coil (see Table 12). The unique fin design of Trane coils enables cooling coil selections at velocities in excess of 625 fpm with no moisture carryover. The coil moisture carryover curves from tested data are built into the Trane Official Product Selection System (the TOPSS™ program). Use this system to select coils.
2. Choose the coil module (see Table 13). Unit size, coil type, and coil rows determine the minimum coil module size required.
3. Select a filter type and check face velocities (see Table 14). The maximum recommended face velocity for pleated media, permanent, bag, and 12-inch cartridge filters is 625 fpm; for throwaway and HEPA filters, it is 500 fpm.
4. Design the basic air-handling system. Choose all required sections, including custom modules. Contact your local Trane sales office for more information on custom modules.
5. Estimate system static pressure requirements and select a fan (see Table 15). Refer to "Module Performance Data" on page 109 for pressure drops and catalog CLCH-PRC008-EN for fan curves.
6. Total the overall air-handling unit dimensions and weights. Use Table 16 for module dimensions and weights.
7. Select a control system. Factory-mounted, -wired, and -tested end devices, starters, VFDs, and direct-digital, interoperable controllers are available to minimize construction cycles and job-site coordination.
8. Contact your local Trane sales office to order an air-handling system or to ask questions.

Table 12. Size the air-handling unit

Coil type	Unit size	3	6	8	10	12	14
1/2-inch unit	Area ($ft^{2)}$	3.32	5.86	7.54	9.64	12.30	14.22
	Qty-Size	1-21.25 x 22.5	1-23.75 x 35.5	1-27.5 x 39.5	1-27.5 x 50.5	1-32.5 x 54.5	1-35 x 58.5
5/8-inch unit[1]	Area (ft^2)	2.98	5.47	7.31	9.38	12.38	13.90
	Qty-Size	1-19.5 x 22	1-22.5 x 35	1-27 x 39	1-27 x 50	1-33 x 54	1-34.5 x 58
5/8-inch modified	Area (ft^2)	1.83	2.92	4.88	6.25	9.00	9.67
	Qty-Size	1-12. x 22	1-12 x 35	1-18 x 39	1-18 x 50	1-24 x 54	1-24 x 58
Coil type	**Unit size**	**17**	**21**	**25**	**30**	**35**	**40**
1/2-inch Unit	Area (ft^2)	16.80	20.78	24.38	29.01	34.14	39.33
	Qty-Size	1-37.5 x 64.5	1-45 x 66.5	1-51.25 x 68.5	1-51.25 x 81.5	1-57.5 x 85.5	1-57.5 x 98.5
5/8-inch Unit[1]	Area (ft^2)	16.67	19.94	23.38	27.84	32.76	37.77
	Qty-Size	1-37.5 x 64	1-43.5 x 66	1-49.5 x 68	1-49.25 x 81	1-55.5 x 85	1-55.5 x 98
5/8-inch modified	Area (ft^2)	13.33	15.13	17.00	20.25	21.25	24.50
	Qty-Size	1-30 x 64	1-33 x 66	2-18 x 68	2-18 x 81	2-18 x 85	2-18 x 98
Coil type	**Unit size**	**50**	**57**	**66**	**80**	**100**	**120**
1/2-inch unit	Area (ft^2)	49.43	57.03	65.63	78.75	100.36	119.58
	Qty-Size	2-32.5 x 109.5	2-37.5 x 109.5	2-37.5 x 126	2-45 x 126	2-51.25 x 141	2-51.25 x 168
5/8-inch unit[1]	Area (ft^2)	47.69	56.77	65.63	78.75	99.88	119.00
	Qty-Size	1-30 x 109 1-33 x 109	2-37.5 x 109	2-37.5 x 126	2-45 x 126	2-51 x 141	2-51 x 168
5/8-inch modified	Area (ft^2)	36.33	43.15	49.88	60.38	76.38	91.00
	Qty-Size	2-24 x 109	1-24 x 109 1-33 x 109	1-24 x 126 1-33 x 126	2-18 x 126 1-33 x 126	2-24 x 141 1-30 x 141	2-24 x 168 1-30 x 168

(1) The area given is for the largest 5/8-inch coil per unit size. Other 5/8-inch unit coil areas are available; refer to product catalog CLCH-PRC003-EN or the TOPSS program.

Table 13. Size the coil module

Coil type	Unit size	Rows available					
		3-6	8-30	35-40	50	57	66-120
1/2-inch	Small	2	2	2	2 and 4	2 and 4	2 and 4
	Medium	2-8	2-8	2-8	n/a	n/a	n/a
	Extended-Medium	2-8	2-8	2-8	2-8	2-8	2-8
	Medium large	n/a	2-8	2-8	2-8	2-8	2-8
	Medium large w/ access	n/a	2-8	2-8	2-8	2-8	2-8
	Large	2-8	2-8	2-8	2-8	2-8	n/a
	Large w/ access	n/a	2-8	2-8	2-8	2-8	n/a
	Large vertical	2-8	2-8	2-8	2-8	n/a	n/a
	Multizone (cold deck)	2-8	2-8	2-8	2-8	n/a	n/a
5/8-inch	Small	1 and 2	1 and 2	1 and 2	1-4	1-4	1-4
	Medium	1-4	1-4	1-4	n/a	n/a	n/a
	Extended-Medium	1-6	1-6	1-6	1-6	1-6	1-6
	Medium large	n/a	1-10	1-10	1-10	1-10	1-10
	Medium large w/ access	n/a	1-4	1-6	1-6	1-6	1-6
	Large	1-10	1-10	1-10	1-10	1-10	n/a
	Large w/ access	n/a	1-8[1]	1-10	1-10	1-10	n/a
	Large vertical	1-6	1-6	1-6	1-6	1-6	n/a
	Multizone (cold deck)	1-4	1-4	1-4	1-6	n/a	n/a

(1) On unit size 21, there is a 6-row maximum for stacked coils.

Table 14. Select the filter type

Filter type	Unit size	3	6	8	10	12	14	17	21	25
Flat (2-in., 4-in.) T.A., permanent, pleated media, combination	Area (ft^2)	3.47	5.56	6.94	9.72	13.33	14.44	17.50	20.00	24.00
	Qty–Size	1–25 × 20	2–20 × 20	2–20 × 25	2–20 × 25 1–16 × 25	6–20 × 16	4–20 × 16 2–25 × 16	1–20 x 16 1–20 x 20 2–25 × 16 2–25 × 20	4–20 × 20 4–16 × 20	6–24× 24
Angled (2-in. or 4-in.) T.A., permanent, pleated media	Area (ft^2)	5.56	8.89	11.11	13.89	16.67	26.67	28.89	31.11	38.89
	Qty–Size	2–25 × 16	4–20 × 16	4–20 × 20	4–25 × 20	6–20 × 20	12–20 × 16	8–20 × 16 4–25 × 16	4–20 × 16 8–25 × 16	4–20 × 20 8–25 × 20
Bag/cartridge, 2-in. prefilters	Area (ft^2)	3.33	5.56	6.67	9.33	10.00	12.89	15.33	20.00	24.00
	Qty–Size	1–24 × 20	2–20 × 20	2–20 × 24	3–12 × 24 1–20 × 24	3–20 × 24	2–20 × 20 1–24 × 20 2–24 × 12	2–24 x 24 2–24 x 12 1–20 x 24	6–24 × 20	6–24 × 24
HEPA	Area (ft^2)	4	6	8	10	12	14	18	22	26
	Qty–Size	2–12 × 24	2-12 × 24 1–24 × 12	1–12 x24 1-24 x 24 1-24 x 12	1–12 × 24 2–24 x 24	2–12 × 24 2–24 × 24	2–12 × 24 2-24 x 30	4–24 × 24 1-24 × 12	2–24 × 30 2–24 × 24 2–24 × 12	2–12 × 24 2-24 x 30 2-24 x 24 2-24 x 12
Filter type	**Unit size**	**30**	**35**	**40**	**50**	**57**	**66**	**80**	**100**	**120**
Flat (2-in., 4-in.) T.A., permanent, pleated media, combination	Area (ft^2)	28	31.94	36.11	48.33	57.50	65.00	80.67	102.78	122.22
	Qty–Size	6–20 × 24 2–24 × 24	6–20 × 25 4–16 × 25	4–20 × 25 8–16 × 25	3–16 × 20 12–25 × 20	4-20 x 16 4-20 x 20 6-25 x 16 6-25 x 20	8-20 x 16 8-20 × 20 4-25 × 16 4-25 × 20	6–20 × 20 6–20 × 24 6–24 × 20 6–24 × 24	12-16 × 25 20-20 × 25	4-16 x 25 32-20 x 25
Angled (2-in. or 4-in.) T.A., permanent, pleated media	Area (ft^2)	47.22	61.33	69.33	80.56	96.67	108.33	132.00	161.11	194.44
	Qty–Size	12–20 × 20 4–25 × 20	4–20 × 24 12–24 × 24	16–20 × 24 4–24 × 24	20–20 × 25 4–16 × 25	30-20 x 20 6-16 x 20	12–25 × 20 24–20 × 20	6–24 × 12 30–24 × 24	40–25 × 20 8–20 × 20	56-25 x 20
Bag/cartridge, 2-in. prefilters	Area (ft^2)	28.00	30.67	36.89	51.56	54.67	64.00	80.67	106.22	125.78
	Qty–Size	6–24 × 24 2–12 × 24	6–24 × 24 2–20 × 24	4-24 x 12 8–20 × 20 2–24 × 20	4–24 × 24 8–24 × 20 2–20 × 20 1–20 x 24	8-24 x 12 2-20 x 24 8-24 x 24	6–20 × 24 10–24 × 12 6–24 x 24	6–20 × 24 6–20 × 20 6–24 × 24 6–24 x 20	20–20 × 20 12–24 × 12 8–24 × 20	16–20 x 20 14–24 x 12 16–24 x 20
HEPA	Area (ft^2)	32	34	40	51	54	65	75	93	113
	Qty–Size	3-12 × 24 2–24 × 30 4–24 x 24	3–12 × 24 4–24 × 30 2–24 × 24	4–12 × 24 8–24 × 24	3–24 × 30 9–24 × 24	4-30 x 24 2-24 x 30 6-24 x 24	5–30 × 24 10–24 × 24	15–30 × 24	5–30 × 24 15–24 × 24 4-24 x 12	6–30 x 24 15–24 x 30 4-24 x 12

Table 15. Select a fan

	Nominal Airflow[1]	1500	3000	4000	5000	6000	7000	8500	10500	12500
	Airflow @ 625 fpm[2]	2169	3475	4338	6075	8331	9025	10938	12500	15000
	Fan ID/unit size	**3**	**6**	**8**	**10**	**12**	**14**	**17**	**21**	**25**
A	Fan size /type	9.5 FC	12.25 FC	13.5 FC	15 FC	16.5 FC	18.25 FC	20 FC	22.38 FC	25 FC
	Max TSP/rpm	2.5/1800	2.5/1403	2.5/1273	2.5/1146	2.5/1042	2.5/942	2.5/859	3-972	3/811
	Motor hp range (ODP)	0.17-2	0.25-5	0.5-5	1-5	1-7.5	1-7.5	1-10	1-10	1-10
	Outlet area (ft^2)	0.85	1.90	2.31	2.79	3.39	4.14	5.05	5.16	6.82
B	Fan size/type	9.5 FC	10.5 FC	12.25 FC	13.5 FC	15 FC	16.5 FC	18.25 FC	20 FC	22.38 FC
	Max TSP/rpm	5/2800	5/2365	5-2027	5/1839	5/1655	5/1505	5/1360	5-1241	5/1273
	Motor hp range (ODP)	1-5	1-5	1-7.5	1-7.5	1-10	1-10	1-15	1-15	1-20
	Outlet area (ft^2)	0.65	1.41	1.90	2.31	2.79	3.39	4.14	5.05	5.16
D	Fan size/type	9 BC	12 AF	12 AF	15 AF	18 AF	18 AF	20 AF	22 AF	22 AF
	Max TSP/rpm	6/4375	6/3700	6/3700	6/2900	6/2450	6/2450	6/2300	6/1900	6/1900
	Motor hp range (ODP)	1-3	1-7.5	1-7.5	1-10	1-10	1-10	1-15	1-15	1-15
	Outlet area (ft^2)	0.84	1.45	1.45	2.04	2.86	2.86	4.38	5.50	5.50
E	Fan size / type	9 BC	12 AF	12 AF	15 AF	18 AF	18 AF	20 AF	22 AF	22 AF
	Max TSP / rpm	8/5000	8/4350	8/4350	8/3500	8/3100	8/3100	8/2750	8/2500	8/2500
	Motor hp range (ODP)	1-5	1-7.5	1-10	1-15	1-15	1-15	1-20	1-25	1-30
	Outlet area (ft^2)	0.84	1.45	1.45	2.04	2.86	2.86	4.38	5.50	5.50
F	Fan size / type	n/a[3]	n/a	n/a	12 AF	15 AF	15 AF	18 AF	20 AF	20 AF
	Max TSP / rpm	n/a	n/a	n/a	6/3700	6/2900	6/2900	6//2450	6/2300	6/2300
	Motor hp range (ODP)	n/a	n/a	n/a	1-7.5	1-10	1-10	1-10	1-15	1-15
	Outlet area (ft^2)	n/a	n/a	n/a	1.45	2.04	2.04	2.86	4.38	4.38
G	Fan size / type	n/a	n/a	n/a	12 AF	15 AF	15 AF	18 AF	20 AF	20 AF
	Max TSP / rpm	n/a	n/a	n/a	8/4350	8/3500	8/3500	8/3100	8/2750	8/2750
	Motor hp range (ODP)	n/a	n/a	n/a	1-10	1-15	1-15	1-20	1-25	1-30
	Outlet area (ft^2)	n/a	n/a	n/a	1.45	2.04	2.04	2.86	4.38	4.38
P	Fan size / type	13.22 AF	14.56 AF	16.19 AF	17.81 AF	19.69 AF	21.56 AF	24.00 AF	29.13 AF	32.38 AF
	Max TSP / rpm	6/4150	6/4017	6/3596	6/3525	6/3165	6/2959	6/2425	6/1886	6/1611
	Motor hp range (ODP)	1-3	1-7.5	1-7.5	1-10	1-15	1-15	1-15	2-15	3-20
Q	Fan size / type	n/a	n/a	n/a	n/a	19 Q	19 Q	21.5 Q	24.5 Q	27 Q
	Max TSP / rpm	n/a	n/a	n/a	n/a	6/3145	6/3145	6/2780	6/2380	6/2160
	Motor hp range (ODP)	n/a	n/a	n/a	n/a	3 -7.5	3 -7.5	3 -10	5-15	5-15
	Outlet area (ft^2)	n/a	n/a	n/a	n/a	2.30	2.30	2.88	3.73	4.54
R	Fan size / type	n/a	n/a	n/a	n/a	21.5 Q	21.5 Q	24.5 Q	27 Q	30 Q
	Max TSP / rpm	n/a	n/a	n/a	n/a	6/2780	6/2780	6/2380	6/2160	6/1940
	Motor hp range (ODP)	n/a	n/a	n/a	n/a	3 -10	3 -10	5-15	5-15	7.5-20
	Outlet area (ft^2)	n/a	n/a	n/a	n/a	2.88	2.88	3.73	4.54	5.66
V	Fan size / type	n/a	16.5 Q	16.5 Q	16.5 Q	19 Q	19 Q	21.5 Q	24.5 Q	27 Q
	Max TSP / rpm	n/a	6/3460	6/3460	6/3460	6/3145	6/3145	6/2780	6/2380	6/2160
	Motor hp range (ODP)	n/a	1.5-5	1.5-5	1.5-5	3 -7.5	3 -7.5	3 -10	5-15	5-15
	Outlet area (ft^2)	n/a	1.40	1.40	1.40	2.30	2.30	2.88	3.73	4.54
W	Fan size / type	n/a	19 Q	19 Q	19 Q	21.5 Q	21.5 Q	24.5 Q	27 Q	30 Q
	Max TSP / rpm	n/a	6/3145	6/3145	6/3145	6/2780	6/2780	6/2380	6/2160	6/1940
	Motor hp range (ODP)	n/a	3-7.5	3 -7.5	3 -7.5	3 -10	3 -10	5-15	5-15	7.5-20
	Outlet area (ft^2)	n/a	2.30	2.30	2.30	2.88	2.88	3.73	4.54	5.66

(1) Nominal airflow is based on 500 fpm through a nominal coil (i.e. 500 x unit size 8 = 4000 cfm).

(2) Airflow @ 625 fpm through the flat filter (maximum filter velocity)

(3) "n/a" selections are not available as standard, however, contact your local Trane sales representative for possible specials.

Table 15. (continued) Select a fan

	Nominal Airflow[1]	15000	17500	20000	25000	28500	33000	40000	50000	60000
	Airflow @ 625 fpm[2]	17500	19963	22569	30206	35938	40625	50419	64238	76388
	Fan ID / Unit Size	**30**	**35**	**40**	**50**	**57**	**66**	**80**	**100**	**120**
A	Fan size/type	25 FC	27.63 FC	30.25 FC	33 FC	33 FC	33 FC	36 FC	40 FC	40 FC
	Max TSP/rpm	3/811	3/698	3-664	3/580	3/580	6/760	3/600	3/550	3/550
	Motor hp range (ODP)	1-20	5-25	5-25	5-30	5-30	10-60	15-40	15-40	15-40
	Outlet area (ft^2)	6.73	8.08	9.79	11.69	11.69	11.69	13.62	17.14	17.14
B	Fan size/type	22.38 FC	25 FC	27.63 FC	30.25 FC	30.25 FC	36 FC	36 FC	40 FC	40 FC
	Max TSP/rpm	5/1273	5/1062	5/905	5/870	5/870	5/665	5/665	5/600	5/600
	Motor hp range (ODP)	1-25	5-30	5-30	5-40	5-40	15-75	20-75	25-75	25-75
	Outlet area (ft2)	5.16	6.73	8.08	9.79	9.79	13.62	13.62	17.14	17.14
D	Fan size / type	25 AF	25 AF	28 AF	32 AF	32 AF	36 AF	40 AF	44 AF	49 AF
	Max TSP / rpm	6/1650	6/1650	6/1500	6/1300	6/1300	6/1250	6/1200	6/850	6/800
	Motor hp range (ODP)	1-20	7.5-20	7.5-20	7.5-30	7.5-30	10-30	20-60	25-40	30-75
	Outlet area (ft^2)	6.84	6.84	8.61	10.86	10.86	13.65	17.27	17.12	21.40
E	Fan size / type	25 AF	25 AF	28 AF	32 AF	32 AF	36 AF	40 AF	44 AF	49 AF
	Max TSP / rpm	8/2200	8/2200	8/2050	8/1700	8/1700	8/1550	8/1350	8/1150	8/1100
	Motor hp range (ODP)	1-40	7.5-40	7.5-50	7.5-60	7.5-60	15-75	20-100	25-100	30-125
	Outlet area (ft^2)	6.84	6.84	8.61	10.86	10.86	13.65	17.27	17.12	21.40
F	Fan size/type	22 AF	22 AF	25 AF	28 AF	28 AF	32 AF	36 AF	40 AF	44 AF
	Max TSP/rpm	6/1900	6/1900	6/1650	6/1500	6/1500	6/1300	6/1250	6/1200	6/850
	Motor hp range (ODP)	1-15	7.5-15	7.5-20	7.5-25	7.5-25	10-30	20-30	25-60	30-40
	Outlet area (ft^2)	5.43	5.43	6.48	8.61	8.61	10.86	13.59	17.27	17.13
G	Fan size/type	22 AF	22 AF	25 AF	28 AF	28 AF	32 AF	36 AF	40 AF	44 AF
	Max TSP/rpm	8/2500	8/2500	8/2200	8/2050	8/2050	8/1700	8/1550	8/1350	8/1150
	Motor hp range (ODP)	1-30	7.5-40	7.5-50	7.5-60	7.5-60	10-60	20-75	25-100	30-125
	Outlet area (ft^2)	5.43	5.43	6.48	8.61	8.61	10.86	13.59	17.27	17.13
P	Fan size/type	35.56 AF	35.56 AF	39.38 AF	43.44 AF	43.44 AF	52.88 AF	58.5 AF	64.75 AF	64.75 AF
	Max TSP/rpm	6/1643	6/1643	6/1412	6/1334	6/1334	6/885	6/792	6/791	6/791
	Motor hp range (ODP)	3-25	5-30	5-30	5-40	5-40	7.5-50	7.5-60	10-75	10-75
Q	Fan size/type	30 Q	33 Q	33 Q	36.5 Q	36.5 Q	40.25 Q	44.5 Q	n/a	n/a
	Max TSP/rpm	6/1,940	6/1822	6/1822	6/1647	6/1647	6/1492	6/1352	n/a	n/a
	Motor hp range (ODP)	7.5-20	7.5-25	7.5-25	10-30	10-40	10-40	15-40	n/a	n/a
	Outlet area (ft^2)	5.66	6.84	6.84	8.36	10.16	10.16	12.40	n/a	n/a
R	Fan size/type	33 Q	36.5 Q	36.5 Q	40.25 Q	40.25 Q	44.5 Q	n/a	n/a	n/a
	Max TSP/rpm	6/1,822	6/1647	6/1647	6/1492	6/1492	6/1352	n/a	n/a	n/a
	Motor hp range (ODP)	7.5-25	10-30	10-30	10-40	15-40	15-40	n/a	n/a	n/a
	Outlet area (ft^2)	6.84	8.36	8.36	10.16	12.44	12.40	n/a	n/a	n/a
V	Fan size / type	30 Q	33 Q	33 Q	36.5 Q	36.5 Q	40.25 Q	44.5 Q	n/a	n/a
	Max TSP / rpm	6/1940	6/1822	6/1647	6/1647	6/1647	6/1492	6/1352	n/a	n/a
	Motor hp range (ODP)	7.5-20	7.5-25	7.5-25	10-30	10-40	10-40	15-40	n/a	n/a
	Outlet area (ft^2)	5.66	6.84	6.84	8.36	10.16	10.16	12.40	n/a	n/a
W	Fan size / type	33 Q	36.5 Q	36.5 Q	40.25 Q	40.25 Q	44.5 Q	n/a	n/a	n/a
	Max TSP / rpm	6/1822	6/1647	6/1647	6/1492	6/1492	6/1352	n/a	n/a	n/a
	Motor hp range (ODP)	7.5-25	10-30	10-30	10-40	15-40	15-40	n/a	n/a	n/a
	Outlet area (ft^2)	6.84	8.36	8.36	10.16	12.44	12.40	n/a	n/a	n/a

(1) Nominal airflow is based on 500 fpm through a nominal coil (i.e. 500 x unit size 8 = 4000 cfm).

(2) Airflow @ 625 fpm through the flat filter (maximum filter velocity)

(3) "n/a" selections are not available as standard, however, contact your local Trane sales representative for possible specials.

Table 16. Module dimensions (inches) and weights (pounds)

- For each module-to-module connection, add 0.19 inch to the total unit length to account for gasketing.
- These module weights are for double-wall panels.

Nominal airflow[1]	1500	3000	4000	5000	6000	7000	8500	10500	12500	15000	17500	20000	25000	28500	33000	40000	50000	60000
Airflow at 625 fpm[2]	2169	3475	4338	6075	8331	9025	10938	12500	15000	17500	19963	22569	30206	35938	40625	50419	64238	76388
Unit size	**3**	**6**	**8**	**10**	**12**	**14**	**17**	**21**	**25**	**30**	**35**	**40**	**50**	**57**	**66**	**80**	**100**	**120**
Height (inches)	26.25	28.75	34	34	39	40.5	44	50.25	56.5	56.5	63.75	63.75	75	86.5	92	107	119.5	119.5
Width (inches)	31	44	48	60	64	68	74	76	78	91	96	109	120	120	137	137	152	179
Data listed length above weight																		
Intake **length**	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	16	16	20	20	29.5	29.5	29.5	29.5
weight	134	183	221	263	307	332	380	432	485	553	670	747	973	1096	1513	1699	2023	2326
Mixing box with filter	36	28.75	34	34	34	34	34	34	40	40	48	48	48	48	49	54	60	60
	181	223	277	319	367	390	437	495	577	646	890	982	1158	1290	1589	1798	2133	2387
Mixing box without filter	26.25	28.75	34	34	34	34	34	34	40	40	48	48	48	48	49	54	60	60
	142	202	253	288	332	341	381	432	512	573	809	891	1051	1143	1410	1575	1847	2056
Traq™ mixing box	36	28.75	34	34	34	34	34	50.25	40	56.5	48	48	48	48	84	92	96	96
	159	191	239	275	309	341	376	512	487	676	770	840	978	1056	1743	1936	2161	2328
Blender	26.25	26.25	34	34	39	40.5	34	34	40	40	48	48	48	48	49	54	60	96
	129	174	193	221	297	322	282	309	366	407	507	564	646	700	801	902	1071	1665
Filter, angled	26.25	28.75	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5
	126	168	169	194	212	235	258	278	294	321	390	421	480	549	791	852	967	1082
Filter, short bag or cartridge-18 in	26.25	28.75	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5
	128	170	168	193	213	243	268	276	295	324	446	495	571	637	857	927	1042	1175
Filter, flat	11	11	11	11	11	11	11	11	11	11	11.5	11.5	14.5	14.5	14.5	14.5	14.5	14.5
	62	78	89	99	115	121	131	143	151	165	221	238	314	352	543	585	666	748
Filter, flat combination	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	16	16	14.5	14.5	14.5	14.5	14.5	14.5
	91	116	131	148	178	190	207	219	232	257	287	313	353	397	598	649	745	841
Filter, flat, open-return	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25
	11	16	19	22	34	39	43	44	45	53	68	78	99	120	146	169	210	247
Filter, HEPA	36	41	44	39	39	40.5	44	50.25	56.5	56.5	48	48	48	48	49	54	60	60
	213	296	363	400	450	493	608	710	840	972	1028	1150	1374	1467	1735	1969	2383	2740
height	30.75	30.75	41	41	41	42.5	53	54.5	65.5	65.5	68	68	78.5	86.5	92	107	119.5	119.5
Filter, long bag 30-in.	36	41	44	34	39	40.5	44	50.25	56.5	56.5	48	48	48	48	49	54	60	60
	158	218	257	241	292	334	408	443	516	565	586	642	728	793	1104	1244	1464	1635
Blank/inspection, small	11	11	11	11	11	11	11	11	11	11	11.5	11.5	14.5	14.5	14.5	14.5	14.5	14.5
	65	79	88	99	107	112	121	131	139	150	193	207	265	283	484	495	541	605
Blank/access, medium	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	16.0	16.0	n/a	n/a	n/a	n/a	n/a	n/a
	80	95	105	119	129	136	147	158	168	182	228	244	n/a	n/a	n/a	n/a	n/a	n/a
Blank/access, extended med	19	19	19	19	19	19	19	19	19	19	20	20	20	20	20	20	20	20
	92	109	122	137	150	157	170	182	193	210	262	282	318	339	516	529	575	638
Blank/access, medium-large	n/a	n/a	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5
	n/a	n/a	151	171	186	195	210	225	238	259	357	384	431	460	669	686	746	828
Blank/access/ turning, large	26.25	28.75	34	34	34	34	34	34	40	40	48	48	48	48	49	54	60	60
	115	152	190	221	240	247	267	290	344	376	514	551	619	659	965	1058	1252	1384
Blank/access/ turning, X-large	36	41	44	39	39	40.5	44	50.25	56.5	56.5	63.75	63.75	68.5	68.5	84	92	96	96
	141	195	231	236	261	282	326	395	463	502	697	744	873	926	1197	1361	1548	1686
Face-and-bypass, external	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	20	20	20	20	20	20	20	20
	117	156	185	221	256	271	315	350	385	439	500	548	674	732	1061	1186	1398	1623
height	31.25	33.75	39	39	44	45.5	49	55.25	61.5	61.5	68.75	68.75	80	91.5	97.08	112.08	124.58	124.58
Face-and-bypass, internal	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	16	16	20	20	20	20	20	20	20
	94	127	153	181	213	224	244	293	328	372	453	495	654	734	990	1082	1274	1467
Face damper	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	16	16	20	20	20	20	20	20	20
	99	129	156	184	216	228	268	301	335	381	427	468	584	642	905	1030	1223	1415
Coil, small w/ 2-row UW	11	11	11	11	11	11	11	11	11	11	11.5	11.50	14.5	14.5	14.5	14.5	14.5	14.5
	108	139	159	186	215	232	256	296	329	370	444	483	625	693	899	1008	1169	1333

Table 16. (continued) Module dimensions (inches) and weights (pounds)

Nominal airflow[1]	1500	3000	4000	5000	6000	7000	8500	10500	12500	15000	17500	20000	25000	28500	33000	40000	50000	60000	
Airflow at 625 fpm[2]	2169	3475	4338	6075	8331	9025	10938	12500	15000	17500	19963	22569	30206	35938	40625	50419	64238	76388	
Unit size	**3**	**6**	**8**	**10**	**12**	**14**	**17**	**21**	**25**	**30**	**35**	**40**	**50**	**57**	**66**	**80**	**100**	**120**	
Height (inches)	26.25	28.75	34	34	39	40.5	44	50.25	56.5	56.5	63.75	63.75	75	86.5	92	107	119.5	119.5	
Width (inches)	31	44	48	60	64	68	74	76	78	91	96	109	120	120	137	137	152	179	
Data listed length above weight																			
Coil, medium with 8-row UW	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	16	16	n/a	n/a	n/a	n/a	n/a	n/a	
	174	238	281	339	405	447	505	597	678	782	921	1025	n/a	n/a	n/a	n/a	n/a	n/a	
Coil, extended-med w/8-row UW	19	19	19	19	19	19	19	19	19	19	20	20	20	20	20	20	20	20	
	187	253	299	359	426	469	532	627	709	816	958	1065	1317	1488	1804	2092	2534	2721	
Coil, medium-large w/ 10-row W	n/a	n/a	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	29.5	29	29.5	29.5	29.5	29.5	29.5	29.5	
	n/a	n/a	499	602	731	798	925	1027	1168	1362	1630	1827	2331	2697	3220	3715	4511	5287	
Coil, large or vertical[3] w/10-row W	26.25	28.75	34	34	34	34	34	34	40	40	48	48	48	48	n/a	n/a	n/a	n/a	
	293	432	543	656	790	859	992	1098	1294	1499	1835	2045	2573	3078	n/a	n/a	n/a	n/a	
Coil, electric heat[4]	26.25	28.75	34	34	34	34	34	34	40	40	48	48	48	48	49	n/a	n/a	n/a	
	201	309	372	440	483	518	583	634	758	836	1056	1169	1434	1611	2261	n/a	n/a	n/a	
Coil, integral face-and-bypass[5]	26.25	28.75	34	34	34	34	34	34	40	40	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	
	312	398	500	559	611	677	788	820	1019	1064	1161	1188	1691	1715	1901	2014	2162	2371	
Coil, multizone/ double-duct	n/a	46.8	46.8	46.8	65.3	65.3	65.2	65.3	71.3	71.3	80.3	80.3	88.3	n/a	n/a	n/a	n/a	n/a	
	n/a	733	818	1031	1303	1384	1511	1719	1897	2139	2718	2993	3818	n/a	n/a	n/a	n/a	n/a	
height	n/a	45.75	51	54	59	60.5	64	73.25	79.5	79.5	91.75	91.75	103	n/a	n/a	n/a	n/a	n/a	
Humidifier	31	31	31	31	31	31	31	31	31	31	32	32	29	29	29	43.5	43.5	43.5	
	198	256	281	317	363	386	439	462	512	565	743	810	1039	1076	1511	1617	1780	1898	
Moisture eliminator	11	11	11	11	11	11	11	11	11	11	11.5	11.5	14.5	14.5	14.5	14.5	14.5	14.5	
	120	166	201	240	281	304	348	396	446	510	611	683	885	999	1317	1483	1779	2061	
Fan[6]	36	41	44	39	39	40.5	44	50.25	56.5	56.5	63.75	63.75	68.5	68.5	84	92	96	96	
	371	519	551	633	782	813	1008	1266	1344	1804	2424	2325	3162	3216	4378	5137	6014	6629	
Diffuser	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	16	16	20	20	49	54	60	60	
	84	106	119	140	154	210	229	246	262	289	366	398	506	549	1120	1263	1509	1684	
Discharge plenum, horizontal	26.25	28.75	34	34	34	34	34	34	40	40	48	48	48	48	49	54	60	60	
	133	180	223	263	292	305	336	366	431	480	674	731	850	926	1286	1432	1713	1919	
Discharge plenum, vertical	36	41	44	39	39	40.5	44	50.25	56.5	56.5	63.75	63.75	75	75	n/a	n/a	n/a	n/a	
	148	205	249	268	279	296	327	357	428	475	633	689	801	801	n/a	n/a	n/a	n/a	
height	26.25	28.75	34	34	34	34	34	34	40	40	48	48	48	48	n/a	n/a	n/a	n/a	
Silencer, 3 ft.	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	
	354	431	468	528	604	639	705	757	803	971	1047	1130	1390	1657	1890	2034	2499	2891	
Silencer, 5 ft.	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	
	534	648	707	794	966	1009	1115	1197	1591	1606	1730	1860	2218	2604	2920	3155	3911	4516	
Energy wheel- length	29	29	29	45	48	48	50	50	52	57.5	58	59	67	n/a	n/a	n/a	n/a	n/a	
weight[7]	417	555	617	837	1051	1165	1311	1399	1778	1979	2325	2634	3079	n/a	n/a	n/a	n/a	n/a	
height	52.75	57.75	68.25	68.25	78.25	81.25	88.0	100.75	113.25	113.25	127.75	127.75	150.5	n/a	n/a	n/a	n/a	n/a	
width[8]	38	48	52	60	68	72	78	80	89	95	101	114	120	n/a	n/a	n/a	n/a	n/a	
Gas heat[9]	n/a	72	78	70	70	70.5	82	93.75	83	81	95.75	95.75	108.5	108.5	98.5	106.5	96	96	
	n/a	1170	1226	1407	1437	1491	1806	2482	2450	2441	3133	3222	3854	3949	4491	4750	4508	4646	

(**1**) Nominal airflow is based on 500 fpm through a nominal coil (i.e. 500 x unit size 8 = 4000 cfm).

(**2**) Airflow @ 625 fpm through the flat filter (maximum filter velocity)

(**3**) Refer to Table 13 for row limitations in vertical coil modules.

(**4**) For sizes 3-50 blow-thru applications, electric heat modules require, at a minimum, a large module immediately downstream and a medium module immediately upstream. For size 66 blow-thru applications, electric heat modules require, at a minimum, a medium-large access module downstream and a medium module immediately upstream.

(**5**) IFB coil modules require a module immediately downstream: (at a minimum) a large module on size 3. medium module on sizes 6 to 40, or an extended-medium module on sizes 50 to 120.

(**6**) Fan module weights include the heaviest fan with the largest ODP motor available.

(**7**) The weight of the energy wheel module is with the largest wheel available for each unit size. The weights include all dampers and filter rack, they do not include end devices, control wiring or a starter.

(**8**) All energy wheel widths will be the same for 100 percent and mixed air units except the size 25 mixed air energy wheel module is 82 inches wide.

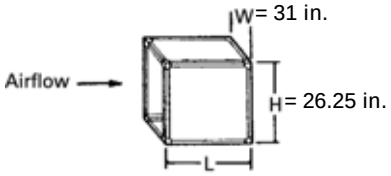
(**9**) Lengths and weights of the gas heat modules are with the largest capacity burner. Refer to the M-Series Gas Heat Quick Select (CLCH-SLB004-EN) or the TOPSS selection program for detailed dimensions.

Items listed as n/a refer to standard products. Contact your local sales engineer for design specials.

Notes

General Data

This section includes summary information per M-Series unit size, including module dimensions and weights for single-wall and double-wall construction, coil availability details, filter areas and sizes, fan module weights and application data, and damper areas.



General Data
Unit Size 3

Table 17. Module dimensions

Module type	Length (in.)	Weight (lb) - single wall	Weight (lb) - double-wall
Intake	15.50	n/a	134
Mixing box			
-with angled filters	36.00	156	181
-without angled filters	26.25	124	142
-with Traq™ dampers	36.00	136	159
-with Traq™ dampers and filters	36.00	143	166
Blender	26.57	106	129
Filters			
-2-in. angled	26.25	106	126
-4-in. angled	26.25	113	133
-Cartridge (6-in. or 12-in.) or short bag (18-in.)	26.25	108	128
-2-in. flat	11.00	54	62
-4-in. flat	11.00	57	66
-2-in. and 4-in. high-efficiency flat	15.50	79	91
-2-in. or 4-in. flat open return	4.25	11	11
-HEPA	L= 36.00, H= 30.75	n/a	213
-Long bag (30-in. bag)	36.00	128	158
Access or blank			
-Small horizontal	11.00	59	65
-Medium horizontal	15.50	72	80
-Extended-medium horizontal	19.00	82	92
-Medium-large horizontal	n/a	n/a	n/a
-Large horizontal or turning	26.25	102	115
-Extra-large horizontal or turning	36.00	111	141
Face-and-bypass damper			
-External	L=15.50, H=31.25	101	117
-Internal	15.50	78	94
-Face damper only	15.50	83	99
Coil[1]			
-Small horizontal (with 2-row UW)	11.00	n/a	108
-Medium horizontal (with 8-row UW)	15.50	n/a	174
-Extended-medium horizontal (with 8-row UW)	19.00	n/a	187
-Medium-large horizontal (with 10-row W)	n/a	n/a	n/a
-Large horizontal or vertical (with 10-row W)	26.25	n/a	293
-Electric heat[2]	26.25	n/a	201
-Integral face-and-bypass (IFB) coil[3]	26.25	n/a	312
-Multizone/double-duct	n/a	n/a	n/a
Humidifier	31.00	n/a	198
Moisture eliminator	11.00	n/a	120
Fan	36.00	See Table 23 for fan module weights	
Diffuser	15.50	68	84
Discharge plenum			
-Horizontal	26.25	n/a	133
-Vertical	36.00	n/a	148
Silencer			
-3 feet	36	n/a	354
-5 feet	60	n/a	534
Energy Wheel	29		417
Gas Heat	n/a	n/a	n/a

[1]Coil module weights include the coil noted with 144 aluminum fins per foot, standard tubes, and no water. Refer to the coil selection for exact coil weights.

[2]Electric heat requires a large access or blank module downstream for blow-thru applications.

[3]IFB coils require a large access or blank module downstream.

Table 18. Coil availability

Module Type	1/2-inch Coils	5/8-inch Coils
Small	2 rows	1 and 2 rows
Medium	2–4, 6, and 8 rows	1–4 rows
Extended-medium	2–8 rows	1–6 rows
Medium-large	n/a	n/a
Large horizontal	2–8 rows	1–10 rows
-with access	n/a	n/a
Large vertical	2–8 rows	1–6 rows

See Table 143 on page 90 for drainpan cleaning access availability with coil installed in a module.

Table 19. Filter data

Filter Type	Area (ft²)	Qty–Size (in.)
Flat (2 in., 4 in., or 2 in./4 in.) *(Traq™ mixing boxes use flat filters)*	3.50	1–25 × 20
Angled or mixing box (2 in. or 4 in.)	5.60	2–25 × 16
Bag or cartridge, 2-in. Prefilters	3.30	1–24 × 20
HEPA	4.00	2–12 × 24

2-inch filters available in permanent, throwaway, or pleated media; 4-inch filters available in pleated media, 65%, 85%, or 95% efficiency; Bag or cartridge filters available in 65%, 85%, or 95% efficiency, HEPA filers 99.97% efficient.

Table 22. Damper areas

Module Type	Area (ft²)
Mixing box - Airfoil blade	
-Top, back, bottom	1.75
-Side	0.88
Mixing box - Traq damper	
-Top, back, bottom	0.92
Internal face-and-bypass	
-Face	2.12
-Bypass	1.52
External face-and-bypass	
-Face	3.63
-Bypass	2.58
Face damper	3.63

Table 23. Fan module weights[1]

	Casing Construction	
Fan type	Single-wall	Double-wall
FC Fans	292	322
BC Fans	342	371
Plenum	323	353

[1]Fan module weights (pounds) include a high-efficiency, open and drip-proof (ODP) motor.

Table 20. Fan data

	Housed Fans				Plenum Fans
Fan Characteristic	3A	3B	D3	E3	3P
Size/type	9.5 FC	9.5 FC	9 BC	9 BC	13.22 AF
Max rpm	1800	2800	4375	5000	4150
ODP motor hp range	0.17–2	1–5	1–3	1–5	1-3
Outlet area (ft²)	0.85	0.65	0.84	0.84	n/a
Blast area (ft²)	0.40	0.40	0.50	0.50	n/a
Bearing size (in.)	0.75	1.1875	0.75	1	1.1875
Shaft size (in.)	0.75	1.1875	0.75	1	1.1875

Table 21. Coil data

Coil Type	Rows	Fin Type	Area (ft²)	Qty–Size (in.)
1/2-inch unit coils (UW, UF)	2 to 8	Aluminum	3.32	1–21.25 × 22.5
5/8-inch unit coils				
-W	4 to 10	Aluminum	2.98	1–19.5 × 22
-W	1 to 10	Copper	2.75	1–18 × 22
-W	1	Aluminum	2.75	1–18 × 22
-5W, 5A, F, P2, P4, P8, K, D, DD, TT	All available rows	Aluminum or Copper	2.75	1–18 × 22
1-inch unit coils (N, NS)	1	Aluminum or Copper	2.75	1–18 × 22
Modified coils (W, 5W, 5A, F, P2, P4, K, D, TT, N, NS)	All available rows	Aluminum or Copper	1.83	1–12 × 22

General Data
Unit Size 6

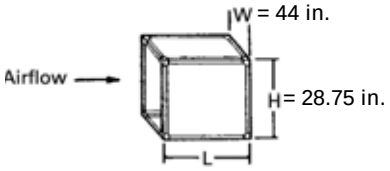


Table 24. Module dimensions

Module Type	Length (in.)	Weight (lb) - single wall	Weight (lb) - double-wall
Intake	15.50	n/a	183
Mixing box			
-with angled filters	28.75	195	223
-without angled filters	28.75	174	202
-with Traq™ dampers	28.75	168	191
-with Traq™ dampers and filters	28.75	180	203
Blender	30.07	141	174
Filters			
-2-in. angled	28.75	139	168
-4-in. angled	28.75	146	175
-Cartridge (6-in. or 12-in.) or short bag (18-in.)	28.75	140	170
-2-in. flat	11.00	67	78
-4-in. flat	11.00	71	82
-2-in. and 4-in. high-efficiency flat	15.50	100	116
-2-in. or 4-in. flat open return	4.25	16	16
-HEPA	L=41.00, H=30.75	n/a	296
-Long bag (30-in. bag)	41.00	171	218
Access or blank			
-Small horizontal	11.00	72	79
-Medium horizontal	15.50	85	95
-Extended-medium horizontal	19.00	97	109
-Medium-large horizontal	n/a	n/a	n/a
-Large horizontal or turning	28.75	134	152
-Extra-large horizontal or turning	41.00	148	195
Face-and-bypass damper			
-External	L=15.50, H=33.75	136	156
-Internal	15.50	107	127
-Face damper only	15.50	109	129
Coil[1]			
-Small horizontal (with 2-row UW)	11.00	n/a	139
-Medium horizontal (with 8-row UW)	15.50	n/a	238
-Extended-medium horizontal (with 8-row UW)	19.00	n/a	253
-Medium-large horizontal (with 10-row W)	n/a	n/a	n/a
-Large horizontal or vertical (with 10-row W)	28.75	n/a	432
-Electric heat[2]	28.75	n/a	309
-Integral face-and-bypass (IFB) coil[3]	28.75	n/a	398
-Multizone/double-duct	L=46.80, H=45.75	n/a	733
Humidifier	31.00	n/a	256
Moisture eliminator	11.00	n/a	166
Fan	41.00	See Table 30 for fan module weights	
Diffuser	15.50	86	106
Discharge plenum			
-Horizontal	28.75	n/a	180
-Vertical	41.00	n/a	205
Silencer			
-3 feet	36	n/a	431
-5 feet	60	n/a	648
Energy Wheel	29	n/a	555
Gas Heat[4]	72	n/a	1170

[1]Coil module weights include the coil noted with 144 aluminum fins per foot, standard tubes, and no water. Refer to the coil selection for exact coil weights.

[2]Electric heat requires a large access or blank module downstream for blow-thru applications.

[3]IFB coils require a large access or blank module downstream.

[4]Length and weight shown for largest MBh heater.

Table 25. Coil availability

Module Type	1/2-inch Coils	5/8-inch Coils
Small	2 rows	1 and 2 rows
Medium	2–4, 6, and 8 rows	1–4 rows
Extended-medium	2–8 rows	1–6 rows
Medium-large	n/a	n/a
Large horizontal	2–8 rows	1–10 rows
-with access	n/a	n/a
Large vertical	2–8 rows	1–6 rows
Multizone (cold deck)	2–4, 6, and 8 rows	1–4 rows

See Table 143 on page 90 for drainpan cleaning access availability with coil installed in a module.

Table 26. Filter data

Filter Type	Area (ft²)	Qty–Size (in.)
Flat (2 in., 4 in., or 2 in./4 in.) *(Traq™ mixing boxes use flat filters)*	5.60	2–20 × 20
Angled or mixing box (2 in. or 4 in.)	8.90	4–20 × 16
Bag or cartridge, 2-in. Prefilters	5.60	2–20 × 20
HEPA	6.00	2–12 × 24 1–24 × 12

2-inch filters available in permanent, throwaway, or pleated media; 4-inch filters available in pleated media, 65%, 85%, or 95% efficiency; Bag or cartridge filters available in 65%, 85%, or 95% efficiency, HEPA filers 99.97% efficient.

Table 29. Damper areas

Module Type	Area (ft²)
Mixing box - Airfoil blade	
-Top, back, bottom	3.01
-Side	1.46
Mixing box - Traq damper	
-Top, back, bottom	1.84
Internal face-and-bypass	
-Face	3.84
-Bypass	2.26
External face-and-bypass	
-Face	5.42
-Bypass	3.84
Face damper	5.42
Multizones	
-Per deck	3.65
-Maximum zones per deck	6

Table 30. Fan module weights[1]

	Casing Construction	
Fan type	Single-wall	Double-wall
FC Fans	371	418
AF Fans	472	519
Horz. vaneaxial	n/a	n/a
Vert. vaneaxial	n/a	1060
Plenum	410	456

[1]Fan module weights (pounds) include a high-efficiency, open and drip-proof (ODP) motor.

Table 27. Fan data

	Housed Fans				Plenum Fans	Vaneaxial Fans	
Fan Characteristic	6A	6B	D6	E6	6P	6V	6W
Size/type	12.25 FC	10.5 FC	12 AF	12 AF	14.56 AF	16.5 Q	19 Q
Max rpm	1403	2365	3700	4350	4017	3460	3145
ODP motor hp range	0.25–5	1–5	1–7.5	1–7.5	1-7.5	1.5-5	3-7.5
Outlet area (ft²)	1.90	1.41	1.45	1.45	n/a	1.70	2.30
Blast area (ft²)	0.91	0.68	0.65	0.65	n/a	0.44	1.32
Bearing size (in.)	1	1	1	1.4375	1.1875	0.9375	0.9375
Shaft size (in.)	1	1	1	1.4375	1.1875	0.9375	0.9375

Table 28. Coil data

Coil Type	Rows	Fin Type	Area (ft²)	Qty–Size (in.)
1/2-inch unit coils (UW, UF)	2 to 8	Aluminum	5.86	1–23.75 × 35.5
5/8-inch unit coils				
-W	4 to 10	Aluminum	5.47	1–22.5 × 35
-5W	1 to 2	Aluminum or Copper	5.10	1–21 × 35
-W	1	Aluminum	4.38	1–18 × 35
-W	1 to 10	Copper	4.38	1–18 × 35
-5A, F, P2, P4, P8, K, D, DD, TT	All available rows	Aluminum or Copper	4.38	1–18 × 35
1-inch unit coils (N, NS)	1	Aluminum or Copper	4.38	1–18 × 35
Modified coils (W, 5W, 5A, F, P2, P4, K, D, TT, N, NS)	All available rows	Aluminum or Copper	2.92	1–12 × 35

General Data
Unit Size 8

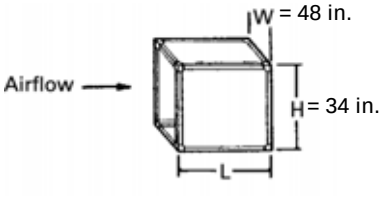


Table 31. Module dimensions

Module Type	Length (in.)	Weight (lb) - single wall	Weight (lb) - double-wall
Intake	15.50	n/a	221
Mixing box			
-with angled filters	34.00	237	277
-without angled filters	34.00	212	253
-with Traq™ dampers	34.00	206	239
-with Traq™ dampers and filters	34.00	220	253
Blender	34.00	153	193
Filters			
-2-in. angled	24.50	141	169
-4-in. angled	24.50	151	178
-Cartridge (6-in. or 12-in.) or short bag (18-in.)	24.50	141	168
-2-in. flat	11.00	76	89
-4-in. flat	11.00	81	94
-2-in. and 4-in. high-efficiency flat	15.50	114	131
-2-in. or 4-in. flat open return	4.25	19	19
-HEPA	L=44.00, H=41.00	n/a	363
-Long bag (30-in. bag)	44.00	200	257
Access or blank			
-Small horizontal	11.00	80	88
-Medium horizontal	15.50	94	105
-Extended-medium horizontal	19.00	108	122
-Medium-large horizontal	24.50	134	151
-Large horizontal or turning	34.00	164	190
-Extra-large horizontal or turning	44.00	174	231
Face-and-bypass damper			
-External	L=15.50, H=39.00	163	185
-Internal	15.50	131	153
-Face damper only	15.50	133	156
Coil[1]			
-Small horizontal (with 2-row UW)	11.00	n/a	159
-Medium horizontal (with 8-row UW)	15.50	n/a	281
-Extended-medium horizontal (with 8-row UW)	19.00	n/a	299
-Medium-large horizontal (with 10-row W)	24.50	n/a	499
-Large horizontal or vertical (with 10-row W)	34.00	n/a	543
-Electric heat[2]	34.00	n/a	372
-Integral face-and-bypass (IFB) coil[3]	34.00	n/a	500
-Multizone/double-duct	L=46.80, H=51.00	n/a	818
Humidifier	31.00	n/a	281
Moisture eliminator	11.00	n/a	201
Fan	44.00	See for Table 37 fan module weights	
Diffuser	15.50	97	119
Discharge plenum			
-Horizontal	34.00	n/a	223
-Vertical	44.00	n/a	249
Silencer			
-3 feet	36	n/a	468
-5 feet	60	n/a	707
Energy Wheel	29	n/a	617
Gas Heat[4]	78	n/a	1226

[1]Coil module weights include the coil noted with 144 aluminum fins per foot, standard tubes, and no water. Refer to the coil selection for exact coil weights.

[2]Electric heat requires a large access or blank module downstream for blow-thru applications.

[3]IFB coils require a large access or blank module downstream.

[4]Length and weight shown for largest MBh heater.

Table 32. Coil availability

Module Type	1/2-inch Coils	5/8-inch Coils
Small	2 rows	1 and 2 rows
Medium	2–4, 6, and 8 rows	1–4 rows
Extended-medium	2–8 rows	1–6 rows
Medium-large	2–8 rows	1–10 rows
-with access	2–6 rows	1–4 rows
Large horizontal	2–8 rows	1–10 rows
-with access	2–8 rows	1–8 rows
Large vertical	2–8 rows	1–6 rows
Multizone (cold deck)	2–4, 6, and 8 rows	1–4 rows

See Table 143 on page 90 for drainpan cleaning access availability with coil installed in a module.

Table 33. Filter data

Filter Type	Area (ft²)	Qty–Size (in.)
Flat (2 in., 4 in., or 2 in./4 in.) *(Traq™ mixing boxes use flat filters)*	6.90	2–20 × 25
Angled or mixing box (2 in. or 4 in.)	11.10	4–20 × 20
Bag or cartridge, 2-in. Prefilters	6.70	2–20 × 24
HEPA	8.00	1–12 × 24 1-24 x 24 1-24 x 12

2-inch filters available in permanent, throwaway, or pleated media; 4-inch filters available in pleated media, 65%, 85%, or 95% efficiency; Bag or cartridge filters available in 65%, 85%, or 95% efficiency, HEPA filers 99.97% efficient.

Table 36. Damper areas

Module Type	Area (ft²)
Mixing box - Airfoil blade	
-Top, back, bottom	3.40
-Side	1.85
Mixing box - Traq damper	
-Top, back, bottom	1.84
Internal face-and-bypass	
-Face	5.97
-Bypass	2.49
External face-and-bypass	
-Face	7.70
-Bypass	4.23
Face damper	7.70
Multizones	
-Per deck	4.01
-Maximum zones per deck	7

Table 37. Fan module weights[1]

	Casing Construction	
Fan type	Single-wall	Double-wall
FC Fans	461	518
AF Fans	494	551
Horz. vaneaxial	n/a	n/a
Vert. vaneaxial	n/a	1104
Plenum	447	502

[1]Fan module weights (pounds) include a high-efficiency, open and drip-proof (ODP) motor.

Table 34. Fan data

	Housed Fans				Plenum Fans	Vaneaxial Fans	
Fan Characteristic	8A	8B	D8	E8	8P	8V	8W
Size/type	13.5 FC	12.25 FC	12 AF	12 AF	16.19 AF	16.5 Q	19 Q
Max rpm	1273	2027	3700	4350	3596	3460	3145
ODP motor hp range	0.5–5	1–7.5	1–7.5	1–10	1-7.5	1.5-5	3-7.5
Outlet area (ft²)	2.31	1.90	1.45	1.45	n/a	1.70	2.30
Blast area (ft²)	1.09	0.91	0.89	0.89	n/a	0.44	1.32
Bearing size (in.)	1	1.1875	1	1.4375	1.1875	0.9375	0.9375
Shaft size (in.)	1	1.1875	1	1.4375	1.1875	0.9375	0.9375

Table 35. Coil data

Coil Type	Rows	Fin Type	Area (ft²)	Qty–Size (in.)
1/2-inch unit coils (UW, UF)	2 to 8	Aluminum	7.54	1–27.5 × 39.5
5/8-inch unit coils				
-W	3 to 10	Aluminum or Copper	7.31	1–27 × 39
-5W	1 to 2	Aluminum or Copper	7.31	1–27 × 39
-W	1	Aluminum or Copper	6.50	1–24 × 39
-5A, F, P2, P4, P8, K, D, DD, TT	All available rows	Aluminum or Copper	6.50	1–24 × 39
1-inch unit coils (N, NS)	1	Aluminum or Copper	6.50	1–24 × 39
Modified coils (W, 5W, F, P2, P4, P8, K, D, DD, TT, N, NS)	All available rows	Aluminum or Copper	4.88	1–18 × 39

General Data
Unit Size 10

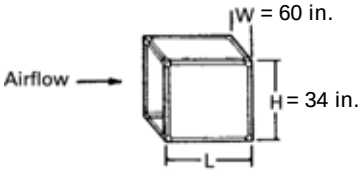


Table 38. Module dimensions

Module Type	Length (in.)	Weight (lb) - single wall	Weight (lb) - double-wall
Intake	15.50	n/a	263
Mixing box			
-with angled filters	34.00	271	319
-without angled filters	34.00	241	288
-with Traq™ dampers	34.00	236	275
-with Traq™ dampers and filters	34.00	253	291
Blender	34.00	174	221
Filters			
-2-in. angled	24.50	161	194
-4-in. angled	24.50	172	205
-Cartridge (6-in. or 12-in.) or short bag (18-in.)	24.50	160	193
-2-in. flat	11.00	84	99
-4-in. flat	11.00	90	105
-2-in. and 4-in. high-efficiency flat	15.50	127	148
-2-in. or 4-in. flat open return	4.25	22	22
-HEPA	L=39.00, H=41.00	n/a	400
-Long bag (30-in. bag)	34.00	192	241
Access or blank			
-Small horizontal	11.00	89	99
-Medium horizontal	15.50	106	119
-Extended-medium horizontal	19.00	122	137
-Medium-large horizontal	24.50	151	171
-Large horizontal or turning	34.00	191	221
-Extra-large horizontal or turning	39.00	179	236
Face-and-bypass damper			
-External	L=15.50, H=39.00	196	221
-Internal	15.50	155	181
-Face damper only	15.50	158	184
Coil[1]			
-Small horizontal (with 2-row UW)	11.00	n/a	186
-Medium horizontal (with 8-row UW)	15.50	n/a	339
-Extended-medium horizontal (with 8-row UW)	19.00	n/a	359
-Medium-large horizontal (with 10-row W)	24.50	n/a	602
-Large horizontal or vertical (with 10-row W)	34.00	n/a	656
-Electric heat[2]	34.00	n/a	440
-Integral face-and-bypass (IFB) coil[3]	34.00	n/a	559
-Multizone/double-duct	L=46.80, H=54.00	n/a	1031
Humidifier	31.00	n/a	317
Moisture eliminator	11.00	n/a	240
Fan	39.00	See Table 44 for fan module weights	
Diffuser	15.50	114	140
Discharge plenum			
-Horizontal	34.00	n/a	263
-Vertical	39.00	n/a	268
Silencer			
-3 feet	36	n/a	528
-5 feet	60	n/a	794
Energy Wheel	45	n/a	837
Gas Heat[4]	70	n/a	1407

[1]Coil module weights include the coil noted with 144 aluminum fins per foot, standard tubes, and no water. Refer to the coil selection for exact coil weights.

[2]Electric heat requires a large access or blank module downstream for blow-thru applications.

[3]IFB coils require a large access or blank module downstream.

[4]Length and weight shown for largest MBh heater.

Table 39. Coil availability

Module Type	1/2-inch Coils	5/8-inch Coils
Small	2 rows	1 and 2 rows
Medium	2–4, 6, and 8 rows	1–4 rows
Extended-medium	2–8 rows	1–6 rows
Medium-large	2–8 rows	1–10 rows
-with access	2–6 rows	1–4 rows
Large horizontal	2–8 rows	1–10 rows
-with access	2–8 rows	1–8 rows
Large vertical	2–8 rows	1–6 rows
Multizone (cold deck)	2–4, 6, and 8 rows	1–4 rows

See Table 143 on page 90 for drainpan cleaning access availability with coil installed in a module.

Table 40. Filter data

Filter Type	Area (ft²)	Qty–Size (in.)
Flat (2 in., 4 in., or 2 in./4 in.)	9.70	2–20 × 25
(Traq™ mixing boxes use flat filters)		1–16 × 25
Angled or mixing box (2 in. or 4 in.)	13.90	4–25 × 20
Bag or cartridge, 2-in. Prefilters	9.30	3–12 × 24
		1–20 × 24
HEPA	10.00	1–12 × 24
		2–24 × 24

2-inch filters available in permanent, throwaway, or pleated media; 4-inch filters available in pleated media, 65%, 85%, or 95% efficiency; Bag or cartridge filters available in 65%, 85%, or 95% efficiency, HEPA filers 99.97% efficient.

Table 43. Damper areas

Module Type	Area (ft²)
Mixing box - Airfoil blade	
-Top, back, bottom	4.08
-Side	2.47
Mixing box - Traq damper	
-Top, back, bottom	2.77
Internal face-and-bypass	
-Face	7.61
-Bypass	3.18
External face-and-bypass	
-Face	9.83
-Bypass	5.40
Face damper	9.83
Multizones	
-Per deck	6.27
-Maximum zones per deck	9

Table 44. Fan module weights[1]

	Casing Construction	
Fan type	Single-wall	Double-wall
FC Fans	501	558
AF Fans	576	633
Horz. vaneaxial	n/a	n/a
Vert. vaneaxial	n/a	1116
Plenum	518	567

[1]Fan module weights (pounds) include a high-efficiency, open and drip-proof (ODP) motor.

Table 41. Fan data

	Housed Fans						Plenum Fans	Vaneaxial Fans	
Fan Characteristic	10A	10B	D10	E10	F10	G10	10P	10V	10W
Size/type	15 FC	13.5 FC	15 AF	15 AF	12 AF	12 AF	17.81 AF	16.5 Q	19 Q
Max rpm	1146	1839	2900	3500	3700	4350	3525	3460	3145
ODP motor hp range	1–5	1–7.5	1–10	1–15	1–7.5	1–10	1-10	1.5-5	3-7.5
Outlet area (ft²)	2.79	2.31	2.04	2.04	1.45	1.45	n/a	1.70	2.30
Blast area (ft²)	1.34	1.09	1.26	1.26	0.89	0.89	n/a	0.44	1.32
Bearing size (in.)	1.1875	1.1875	1.1875	1.4375	1	1.4375	1.4375	0.9375	0.9375
Shaft size (in.)	1.1875	1.1875	1.1875	1.4375	1	1.4375	1.4375	0.9375	0.9375

Table 42. Coil data

Coil Type	Rows	Fin Type	Area (ft²)	Qty–Size (in.)
1/2-inch unit coils (UW, UF)	2 to 8	Aluminum	9.64	1–27.5 × 50.5
5/8-inch unit coils				
-W, WD	3 to 10	Aluminum or Copper	9.38	1–27 × 50
-5W	1 to 2	Aluminum or Copper	9.38	1–27 × 50
-W	1	Aluminum or Copper	8.33	1–24 × 50
-5A, F, P2, P4, P8, K, D, DD, TT	All available rows	Aluminum or Copper	8.33	1–24 × 50
1-inch unit coils (N, NS)	1	Aluminum or Copper	8.33	1–24 × 50
Modified coils (W, WD, 5W, 5A, F, P2, P4, P8, K, D, DD, TT, N, NS)	All available rows	Aluminum or Copper	6.25	1–18 × 50

General Data
Unit Size 12

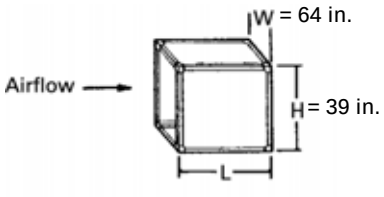


Table 45. Module dimensions

Module Type	Length (in.)	Weight (lb) - single wall	Weight (lb) - double-wall
Intake	15.50	n/a	307
Mixing box			
-with angled filters	34.00	312	367
-without angled filters	34.00	278	332
-with Traq™ dampers	34.00	268	309
-with Traq™ dampers and filters	34.00	292	334
Blender	39.00	232	297
Filters			
-2-in. angled	24.50	176	212
-4-in. angled	24.50	187	223
-Cartridge (6-in. or 12-in.) or short bag (18-in.)	24.50	177	213
-2-in. flat	11.00	98	115
-4-in. flat	11.00	108	124
-2-in. and 4-in. high-efficiency flat	15.50	155	178
-2-in. or 4-in. flat open return	4.25	34	34
-HEPA	L= 39.00, H= 41.00	n/a	450
-Long bag (30-in. bag)	39.00	227	292
Access or blank			
-Small horizontal	11.00	97	107
-Medium horizontal	15.50	115	129
-Extended-medium horizontal	19.00	132	150
-Medium-large horizontal	24.50	164	186
-Large horizontal or turning	34.00	207	240
-Extra-large horizontal or turning	39.00	197	261
Face-and-bypass damper			
-External	L=15.50, H=44.00	228	256
-Internal	15.50	185	213
-Face damper only	15.50	188	216
Coil[1]			
-Small horizontal (with 2-row UW)	11.00	n/a	215
-Medium horizontal (with 8-row UW)	15.50	n/a	405
-Extended-medium horizontal (with 8-row UW)	19.00	n/a	426
-Medium-large horizontal (with 10-row W)	24.50	n/a	731
-Large horizontal or vertical (with 10-row W)	34.00	n/a	790
-Electric heat[2]	34.00	432	483
-Integral face-and-bypass (IFB) coil[3]	34.00	599	611
-Multizone/double-duct	L=65.30, H=59.00	n/a	1303
Humidifier	31.00	n/a	363
Moisture eliminator	11.00	n/a	281
Fan	39.00	See Table 51 for fan module weights	
Diffuser	15.50	126	154
Discharge plenum			
-Horizontal	34.00	n/a	292
-Vertical	L=39.00 H=34.00	n/a	279
Silencer			
-3 feet	36	n/a	604
-5 feet	60	n/a	966
Energy Wheel	48	n/a	1051
Gas Heat[4]	70	n/a	1437

[1]Coil module weights include the coil noted with 144 aluminum fins per foot, standard tubes, and no water. Refer to the coil selection for exact coil weights.

[2]Electric heat requires a large access or blank module downstream for blow-thru applications.

[3]IFB coils require a large access or blank module downstream.

[4]Length and weight shown for largest MBh heater.

Table 46. Coil availability

Module Type	1/2-inch Coils	5/8-inch Coils
Small	2 row	1 and 2 row
Medium	2–4, 6, and 8 row	1–4 row
Extended-medium	2–8 row	1–6 row
Medium-large	2–8 row	1–10 row
-with access	2–6 row	1–4 row
Large horizontal	2–8 row	1–10 row
-with access	2–8 row	1–8 row
Large vertical	2–8 row	1–6 row
Multizone (cold deck)	2–4, 6, and 8 rows	1–4 rows

See Table 143 on page 90 for drainpan cleaning access availability with coil installed in a module.

Table 47. Filter data

Filter Type	Area (ft²)	Qty–Size (in.)
Flat (2 in., 4 in., or 2 in./4 in.) *(Traq™ mixing boxes use flat filters)*	13.70	6–20 x 16
Angled or mixing box (2 in. or 4 in.)	16.70	6–20 x 20
Bag or cartridge, 2-in. Prefilters	10.00	3–20 x 24
HEPA	12.00	2–12 × 24 2–24 × 24

2-inch filters available in permanent, throwaway, or pleated media; 4-inch filters available in pleated media, 65%, 85%, or 95% efficiency; Bag or cartridge filters available in 65%, 85%, or 95% efficiency, HEPA filers 99.97% efficient.

Table 50. Damper areas

Module Type	Area (ft²)
Mixing box - Airfoil blade	
-Top, back, bottom	5.15
-Side	3.02
Mixing box - Traq damper	
-Top, back, bottom	4.19
Internal face-and-bypass	
-Face	10.54
-Bypass	3.41
External face-and-bypass	
-Face	12.91
-Bypass	5.78
Face damper	12.91
Multizones	
-Per deck	6.72
-Maximum zones per deck	9

Table 51. Fan module weights[1]

	Casing Construction	
Fan type	Single-wall	Double-wall
FC Fans	567	632
AF Fans	717	782
Horz. vaneaxial	778	842
Vert. vaneaxial	n/a	1309
Plenum	638	700

[1]Fan module weights (pounds) include a high-efficiency, open and drip-proof (ODP) motor.

Table 48. Fan data

	Housed Fans						Plenum Fans	Vaneaxial Fans	
Fan Characteristic	12A	12B	D12	E12	F12	G12	12P	12Q/V	12R/W
Size/type	16.5 FC	15 FC	18 AF	18 AF	15 AF	15 AF	19.69 AF	19 Q	21.5 Q
Max rpm	1042	1655	2450	3100	2900	3500	3165	3145	2780
ODP motor hp range	1–7.5	1–10	1–10	1–15	1–10	1–15	1-15	3–7.5	3–10
Outlet area (ft²)	3.39	2.79	2.86	2.86	2.04	2.04	n/a	2.30	2.88
Blast area (ft²)	1.60	1.34	1.75	1.75	1.26	1.26	n/a	1.32	1.69
Bearing size (in.)	1.1875	1.4375	1.1875	1.5	1.1875	1.4375	2.1875	0.9375	1.1875
Shaft size (in.)	1.1875	1.4375	1.1875	1.5	1.1875	1.4375	2.1875	0.9375	1.1875

Table 49. Coil data

Coil Type	Rows	Fin Type	Area (ft²)	Qty–Size (in.)
1/2-inch unit coils (UW, UU, UF)	2 to 8	Aluminum	12.30	1–32.5 x 54.5
5/8-inch unit coils (W, WD, 5W, 5A, F, K, D, DD, TT)	All available rows	Aluminum or Copper	12.38	1–33 x 54
1-inch unit coils (N, NS)	1	Aluminum or Copper	11.25	1–30 x 54
Modified coils (W, WD, 5W, 5A, F, P2, P4, P8, K, D, DD, TT, N, NS)	All available rows	Aluminum or Copper	9.00	1–24 x 54

General Data
Unit Size 14

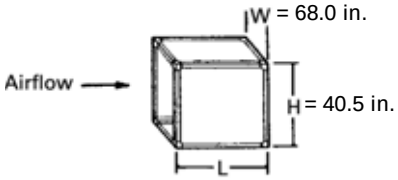


Table 52. Module dimensions

Module Type	Length (in.)	Weight (lb) - single wall	Weight (lb) - double-wall
Intake	15.50	n/a	332
Mixing box			
-with angled filters	34.00	339	390
-without angled filters	34.00	289	341
-with Traq™ dampers	34.00	301	341
-with Traq™ dampers with filters	34.00	327	368
Blender	40.50	251	322
Filters			
-2-in. angled	24.50	198	235
-4-in. angled	24.50	222	260
-Cartridge (6-in. or 12-in.) or short bag (18-in.)	24.50	206	243
-2-in. flat	11.00	104	121
-4-in. flat	11.00	117	134
-2-in. and 4-in. high-efficiency flat	15.50	166	190
-2-in. or 4-in. flat open return	4.25	39	39
-HEPA	L= 40.50, H=42.50	n/a	493
-Long bag (30-in. bag)	40.50	264	334
Access or blank			
-Small horizontal	11.00	102	112
-Medium horizontal	15.50	121	136
-Extended-medium horizontal	19.00	139	157
-Medium-large horizontal	24.50	171	195
-Large horizontal or turning	34.00	215	247
-Extra-large horizontal or turning	40.50	211	282
Face-and-bypass damper			
-External	L=15.50 H=45.50	242	271
-Internal	15.50	195	224
-Face damper only	15.50	199	228
Coil[1]			
-Small horizontal (with 2-row UW)	11.00	n/a	232
-Medium horizontal (with 8-row UW)	15.50	n/a	447
-Extended-medium horizontal (with 8-row UW)	19.00	n/a	469
-Medium-large horizontal (with 10-row W)	24.50	n/a	798
-Large horizontal or vertical (with 10-row W)	34.00	n/a	859
-Electric heat[2]	34.00	466	518
-Integral face-and-bypass (IFB) coil[3]	34.00	633	677
-Multizone/double-duct	L=65.30 H=60.50	n/a	1384
Humidifier	31.00	n/a	386
Moisture eliminator	11.00	n/a	304
Fan	40.50	See Table 58 for fan module weights	
Diffuser	15.50	180	210
Discharge plenum			
-Horizontal	34.00	n/a	305
-Vertical	L=40.50 H=34.00	n/a	296
Silencer			
-3 feet	36	n/a	639
-5 feet	60	n/a	1009
Energy Wheel	48	n/a	1165
Gas Heat[4]	70.5	n/a	1491

[1]Coil module weights include the coil noted with 144 aluminum fins per foot, standard tubes, and no water. Refer to the coil selection for exact coil weights.

[2]Electric heat requires a large access or blank module downstream for blow-thru applications.

[3]IFB coils require a large access or blank module downstream.

[4]Length and weight shown for largest MBh heater.

Table 53. Coil availability

Module Type	1/2-inch Coils	5/8-inch Coils
Small	2 rows	1 and 2 rows
Medium	2–4, 6, and 8 rows	1–4 rows
Extended-medium	2–8 rows	1–6 rows
Medium-large	2–8 rows	1–10 rows
-with access	2–6 rows	1–4 rows
Large horizontal	2–8 rows	1–10 rows
-with access	2–8 rows	1–8 rows
Large vertical	2–8 rows	1–6 rows
Multizone (cold deck)	2–4, 6, and 8 rows	1–4 rows

See Table 143 on page 90 for drainpan cleaning access availability with coil installed in a module.

Table 54. Filter data

Filter Type	Area (ft²)	Qty–Size (in.)
Flat (2 in., 4 in., or 2 in./4 in.)	14.40	4–20 × 16
(Traq™ mixing boxes use flat filters)		2–25 × 16
Angled or mixing box (2 in. or 4 in.)	26.70	12–20 × 16
Bag or cartridge, 2-in. Prefilters	12.90	2–20 × 20
		1–24 × 20
		2–24 × 12
HEPA	14.00	2–12 × 242
		2–24 × 30

2-inch filters available in permanent, throwaway, or pleated media; 4-inch filters available in pleated media, 65%, 85%, or 95% efficiency; Bag or cartridge filters available in 65%, 85%, or 95% efficiency, HEPA filers 99.97% efficient.

Table 57. Damper areas

Module Type	Area (ft²)
Mixing box - Airfoil blade	
-Top, back, bottom	5.90
-Side	3.57
Mixing box - Traq damper	
-Top, back, bottom	4.19
Internal face-and-bypass	
-Face	11.24
-Bypass	3.64
External face-and-bypass	
-Face	13.78
-Bypass	6.17
Face damper	13.78
Multizones	
-Per deck	7.17
-Maximum zones per deck	10

Table 58. Fan module weights[1]

	Casing Construction	
Fan type	Single-wall	Double-wall
FC Fans	629	699
AF Fans	742	813
Horz. vaneaxial	802	872
Vert. vaneaxial	n/a	1411
Plenum	645	713

[1]Fan module weights (pounds) include a high-efficiency, open and drip-proof (ODP) motor.

Table 55. Fan data

	Housed Fans						Plenum Fans	Vaneaxial Fans	
Fan Characteristic	14A	14B	D14	E14	F14	G14	14P	14Q/V	14R/W
Size/type	18.25 FC	16.5 FC	18 AF	18 AF	15 AF	15 AF	21.56	19 Q	21.5 Q
Max rpm	942	1505	2450	3100	2900	3500	2959	3145	2780
ODP motor hp range	1–7.5	1–10	1–10	1–15	1–10	1–15	1-15	3–7.5	3–10
Outlet area (ft²)	4.14	3.39	2.86	2.86	2.04	2.04	n/a	2.30	2.88
Blast area (ft²)	2.00	1.601.75	1.75	1.75	1.26	1.26	n/a	1.32	1.69
Bearing size (in.)	1.1875	1.4375	1.1875	1.5	1.1875	1.4375	1.6875	0.9375	1.1875
Shaft size (in.)	1.1875	1.4375	1.1875	1.5	1.1875	1.4375	1.6875	0.9375	1.1875

Table 56. Coil data

Coil Type	Rows	Fin Type	Area (ft²)	Qty–Size (in.)
1/2-inch unit coils (UW, UU, UF)	2 to 8	Aluminum	14.22	1–35 × 58.5
5/8-inch unit coils				
-W, WD	4 to 10	Aluminum	13.90	1–34.5 × 58
-W, WD	4 to 10	Copper	13.29	1–33 × 58
-W	1	Aluminum or Copper	13.29	1-33 x 58
-W	3	Copper	13.29	1–33 × 58
-5W, 5A, F, K, D, DD, TT	All available rows	Aluminum or Copper	13.29	1–33 × 58
1-inch unit coils (N, NS)	1	Aluminum or Copper	13.29	1–33 × 58
Modified coils (W, WD, 5W, 5A, F, P2, P4, P8, K, D, DD, TT, N, NS)	All available rows	Aluminum or Copper	9.67	1–24 × 58

General Data
Unit Size 17

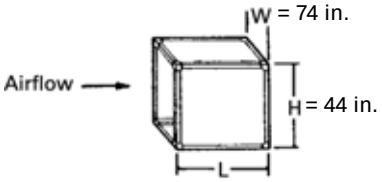


Table 59. Module dimensions

Module Type	Length (in.)	Weight (lb) - single wall	Weight (lb) - double-wall
Intake	15.50	n/a	380
Mixing box			
-with angled filters	34.00	379	437
-without angled filters	34.00	323	381
-with Traq™ dampers	34.00	332	376
-with Traq™ dampers and filters	34.00	361	405
Blender	34.00	226	282
Filters			
-2-in. angled	24.50	217	258
-4-in. angled	24.50	244	284
-Cartridge (6-in. or 12-in.) or short bag (18-in.)	24.50	227	268
-2-in. flat	11.00	113	131
-4-in. flat	11.00	126	145
-2-in. and 4-in. high-efficiency flat	15.50	180	207
-2-in. or 4-in. flat open return	4.25	43	43
-HEPA	L=44.00, H=53.00	n/a	608
-Long bag (30-in. bag)	44.00	326	408
Access or blank			
-Small horizontal	11.00	110	121
-Medium horizontal	15.50	131	147
-Extended-medium horizontal	19.00	150	170
-Medium-large horizontal	24.50	185	210
-Large horizontal or turning	34.00	232	267
-Extra-large horizontal or turning	44.00	244	326
Face-and-bypass damper			
-External	L=15.50 H=49.00	283	315
-Internal	15.50	212	244
-Face damper only	15.50	236	268
Coil[1]			
-Small horizontal (with 2-row UW)	11.00	n/a	256
-Medium horizontal (with 8-row UW)	15.50	n/a	505
-Extended-medium horizontal (with 8-row UW)	19.00	n/a	532
-Medium-large horizontal (with 10-row W)	24.50	n/a	925
-Large horizontal or vertical (with 10-row W)	34.00	n/a	992
-Electric heat[2]	34.00	527	583
-Integral face-and-bypass (IFB) coil[3]	34.00	740	788
-Multizone/double-duct	L=65.30 H=64.00	n/a	1511
Humidifier	31.00	n/a	439
Moisture eliminator	11.00	n/a	348
Fan	44.00	See Table 65 for fan module weights	
Diffuser	15.50	197	229
Discharge plenum			
-Horizontal	34.00	n/a	336
-Vertical	L=44.00 H=34.00	n/a	327
Silencer			
-3 feet	36	n/a	705
-5 feet	60	n/a	1115
Energy Wheel	50	n/a	1311
Gas Heat[4]	82	n/a	1806

[1]Coil module weights include the coil noted with 144 aluminum fins per foot, standard tubes, and no water. Refer to the coil selection for exact coil weights.

[2]Electric heat requires a large access or blank module downstream for blow-thru applications.

[3]IFB coils require a large access or blank module downstream.

[4]Length and weight shown for largest MBh heater.

Table 60. Coil availability

Module Type	1/2-inch Coils	5/8-inch Coils
Small	2 rows	1 and 2 rows
Medium	2–4, 6, and 8 rows	1–4 rows
Extended-medium	2–8 rows	1–6 rows
Medium-large	2–8 rows	1–10 rows
-with access	2–6 rows	1–4 rows
Large horizontal	2–8 rows	1–10 rows
-with access	2–8 rows	1–8 rows
Large vertical	2–8 rows	1–6 rows
Multizone (cold deck)	2–4, 6, and 8 rows	1–4 rows

See Table 143 on page 90 for drainpan cleaning access availability with coil installed in a module.

Table 61. Filter data

Filter Type	Area (ft²)	Qty–Size (in.)
Flat (2 in., 4 in., or 2 in./4 in.) *(Traq™ mixing boxes use flat filters)*	17.50	1–20 × 16
		1–20 × 20
		2–25 × 16
		2–25 × 20
Angled or mixing box (2 in. or 4 in.)	28.90	8–20 × 16
		4–25 × 16
Bag or cartridge, 2-in. Prefilters	15.30	2–24 × 24
		2–24 × 12
		1–20 × 24
HEPA	18.00	4–24 × 24
		1–24 × 12

2-inch filters available in permanent, throwaway, or pleated media; 4-inch filters available in pleated media, 65%, 85%, or 95% efficiency; Bag or cartridge filters available in 65%, 85%, or 95% efficiency, HEPA filers 99.97% efficient.

Table 64. Damper areas

Module Type	Area (ft²)
Mixing box - Airfoil blade	
-Top, back, bottom	6.99
-Side	4.11
Mixing box - Traq damper	
-Top, back, bottom	4.19
Internal face-and-bypass	
-Face	12.31
-Bypass	3.98
External face-and-bypass	
-Face	17.86
-Bypass	6.76
Face damper	17.86
Multizones	
-Per deck	7.84
-Maximum zones per deck	11

Table 65. Fan module weights[1]

	Casing Construction	
Fan type	Single-wall	Double-wall
FC Fans	786	868
AF Fans	926	1008
Horz. vaneaxial	1000	1082
Vert. vaneaxial	n/a	1680
Plenum	710	791

[1]Fan module weights (pounds) include a high-efficiency, open and drip-proof (ODP) motor.

Table 62. Fan data

	Housed Fans						Plenum Fans	Vaneaxial Fans	
Fan Characteristic	17A	17B	D17	E17	F17	G17	17P	17Q/V	17R/W
Size/type	20 FC	18.25 FC	20 AF	20 AF	18 AF	18 AF	24 AF	21.5 Q	24.5 Q
Max rpm	859	1360	2300	2750	2450	3100	2425	2780	2380
ODP motor hp range	1–10	1–15	1–15	1–20	1–10	1–20	1-15	3–10	5–15
Outlet area (ft²)	5.05	4.14	4.38	4.38	2.86	2.86	n/a	2.88	3.73
Blast area (ft²)	2.40	2.00	2.60	2.60	1.75	1.75	n/a	1.69	2.18
Bearing size (in.)	1.6875	1.4375	1.5	1.6875	1.1875	1.5	1.6875	1.1875	1.1875
Shaft size (in.)	1.6875	1.4375	1.5	1.6875	1.1875	1.5	1.6875	1.1875	1.1875

Table 63. Coil data

Coil Type	Rows	Fin Type	Area (ft²)	Qty–Size (in.)
1/2-inch unit coils (UW, UU, UF)	2 to 8	Aluminum	16.80	1–37.5 × 64.5
5/8-inch unit coils				
-W, WD	4 to 10	Aluminum	16.67	1–37.5 × 64
-W, WD	4 to 8	Copper	16.00	1–36 × 64
-K	2 to 10	Aluminum	16.00	1–36 × 64
-K	2 to 8	Copper	16.00	1–36 × 64
-5W	1 to 2	Aluminum or Copper	16.00	1–36 × 64
-W	3	Copper	16.00	1–36 × 64
-W	1	Aluminum or Copper	14.67	1–33 × 64
-WA, WD, K	10	Copper	14.67	1–33 × 64
-5A, F, D, DD, TT	All available rows	Aluminum or Copper	14.67	1–33 × 64
1-inch unit coils (N, NS)	1	Aluminum or Copper	14.67	1–33 × 64
Modified coils (W, WD, 5W, 5A, F, P2, P4, P8, K, D, DD, TT, N, NS)	All available rows	Aluminum or Copper	13.33	1–30 × 64

General Data
Unit Size 21

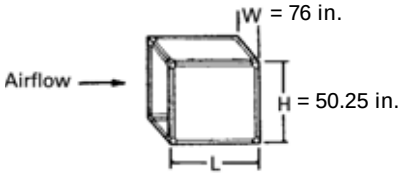


Table 66. Module dimensions

Module Type	Length (in.)	Weight (lb) - single wall	Weight (lb) - double-wall
Intake	15.50	n/a	432
Mixing box			
-with angled filters	34.00	429	495
-without angled filters	34.00	366	432
-with Traq™ dampers	50.25	426	512
-with Traq™ dampers and filters	50.25	458	544
Blender	34.00	250	309
Filters			
-2-in. angled	24.50	235	278
-4-in. angled	24.50	252	295
-Cartridge (6-in. or 12-in.) or short bag (18-in.)	24.50	233	276
-2-in. flat	11.00	124	143
-4-in. flat	11.00	135	155
-2-in. and 4-in. high-efficiency flat	15.50	192	219
-2-in. or 4-in. flat open return	4.25	44	44
-HEPA	L=50.25, H=54.50	n/a	710
-Long bag (30-in. bag)	50.25	344	443
Access or blank			
-Small horizontal	11.00	118	131
-Medium horizontal	15.50	141	158
-Extended-medium horizontal	19.00	161	182
-Medium-large horizontal	24.50	198	225
-Large horizontal or turning	34.00	253	290
-Extra-large horizontal or turning	50.25	296	395
Face-and-bypass damper			
-External	L=15.50 H=55.25	315	350
-Internal	15.50	259	293
-Face damper only	15.50	267	301
Coil[1]			
-Small horizontal (with 2-row UW)	11.00	n/a	296
-Medium horizontal (with 8-row UW)	15.50	n/a	597
-Extended-medium horizontal (with 8-row UW)	19.00	n/a	627
-Medium-large horizontal (with 10-row W)	24.50	n/a	1027
-Large horizontal or vertical (with 10-row W)	34.00	n/a	1098
-Electric heat[2]	34.00	575	634
-Integral face-and-bypass (IFB) coil[3]	34.00	768	820
-Multizone/double-duct	L=65.30 H=73.25	n/a	1719
Humidifier	31.00	n/a	462
Moisture eliminator	11.00	n/a	396
Fan	50.25	See Table 72 for fan module weights	
Diffuser	15.50	212	246
Discharge plenum			
-Horizontal	34.00	n/a	366
-Vertical	L=50.25 H=34.00	n/a	357
Silencer			
-3 feet	36	n/a	757
-5 feet	60	n/a	1197
Energy Wheel	50	n/a	1399
Gas Heat[4]	93.75	n/a	2482

[1]Coil module weights include the coil noted with 144 aluminum fins per foot, standard tubes, and no water. Refer to the coil selection for exact coil weights.

[2]Electric heat requires a large access or blank module downstream for blow-thru applications.

[3]IFB coils require a large access or blank module downstream.

[4]Length and weight shown for largest MBh heater.

Table 67. Coil availability

Module Type	1/2-inch Coils	5/8-inch Coils
Small	2 rows	1 and 2 rows
Medium	2–4, 6, and 8 rows	1–4 rows
Extended-medium	2–8 rows	1–6 rows
Medium-large	2–8 rows	1–10 rows
-with access	2–6 rows	1–4 rows
Large horizontal	2–8 rows	1–10 rows
-with access	2–8 rows	1–8 rows
Large vertical	2–8 rows	1–6 rows
Multizone (cold deck)	2–4, 6, and 8 rows	1–4 rows

See Table 143 on page 90 for drainpan cleaning access availability with coil installed in a module.

Table 68. Filter data

Filter Type	Area (ft²)	Qty–Size (in.)
Flat (2 in., 4 in., or 2 in./4 in.)	20.00	4–20 × 20
(Traq™ mixing boxes use flat filters)		4–16 × 20
Angled or mixing box (2 in. or 4 in.)	31.10	4–20 × 16
		8–25 × 16
Bag or cartridge, 2-in. Prefilters	20.00	6–24 × 20
HEPA	22.00	2–24 × 30
		2–24 × 24
		2–24 × 12

2-inch filters available in permanent, throwaway, or pleated media; 4-inch filters available in pleated media, 65%, 85%, or 95% efficiency; Bag or cartridge filters available in 65%, 85%, or 95% efficiency, HEPA filers 99.97% efficient.

Table 71. Damper areas

Module Type	Area (ft²)
Mixing box - Airfoil blade	
-Top, back, bottom	8.64
-Side	4.80
Mixing box - Traq damper	
-Top, back, bottom	6.28
Internal face-and-bypass	
-Face	15.52
-Bypass	6.95
External face-and-bypass	
-Face	21.23
-Bypass	6.95
Face damper	21.23
Multizones	
-Per deck	9.56
-Maximum zones per deck	11

Table 72. Fan module weights[1]

	Casing Construction	
Fan type	Single-wall	Double-wall
FC Fans	912	1012
AF Fans	1167	1266
Horz. vaneaxial	1157	1257
Vert. vaneaxial	n/a	1824
Plenum	1119	1218

[1]Fan module weights (pounds) include a high-efficiency, open and drip-proof (ODP) motor.

Table 69. Fan data

	Housed Fans						Plenum Fans	Vaneaxial Fans	
Fan Characteristic	21A	21B	D21	E21	F21	G21	21P	21Q/V	21R/W
Size/type	22.38 FC	20 FC	22 AF	22 AF	20 AF	20 AF	29.13 AF	24.5 Q	27 Q
Max rpm	972	1241	1900	2500	2300	2750	1886	2380	2160
ODP motor hp range	1–10	1–15	1–15	1–25	1–15	1–25	2–15	5–15	5–15
Outlet area (ft²)	5.16	5.05	5.50	5.50	4.38	4.38	n/a	3.73	4.54
Blast area (ft²)	2.78	2.40	3.42	3.42	2.60	2.60	n/a	2.18	2.64
Bearing size (in.)	1.4375	1.6875	1.5	2	1.5	1.6875	1.4375	1.1875	1.4375
Shaft size (in.)	1.4375	1.6875	1.5	2	1.5	1.6875	1.4375	1.1875	1.4375

Table 70. Coil data

Coil Type	Rows	Fin Type	Area (ft²)	Qty–Size (in.)
1/2-inch unit coils (UW, UU, UF)	2 to 8	Aluminum	20.78	1–45 x 66.5
5/8-inch unit coils				
-W, WD, 5D	4 to 10	Aluminum	19.94	1–43.5 × 66
-W, WD	4 to 8	Copper	19.25	1–42 × 66
-K	2 to 10	Aluminum	19.25	1–42 × 66
-K	2 to 8	Copper	19.25	1–42 × 66
-5W	1 to 2	Aluminum or Copper	19.25	1–42 × 66
-W	3	Copper	19.25	1–42 × 66
-W	1	Aluminum or Copper	19.25	1–18 x 66 1-24 x 66
-W, WD, K	10	Copper	19.25	1–18 x 66 1-24 x 66
-5A, F, P2, P4, P8, D, DD, TT	All available rows	Aluminum or Copper	19.25	1–18 × 66 1–24 × 66
1-inch unit coils (N, NS)	1	Aluminum or Copper	16.50	2–18 × 66
Modified coils (W, WD, 5W, 5A, F, K, D, DD, TT, N, NS)	All available rows	Aluminum or Copper	15.13	1–33 × 66

General Data
Unit Size 25

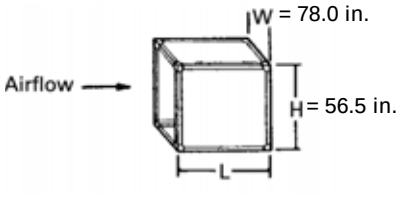


Table 73. Module dimensions

Module Type	Length (in.)	Weight (lb) - single wall	Weight (lb) - double-wall
Intake	15.50	n/a	485
Mixing box			
-with angled filters	40.00	498	577
-without angled filters	40.00	433	512
-with Traq™ dampers	40.00	427	487
-with Traq™ dampers and filters	40.00	459	519
Blender	40.00	292	366
Filters			
-2-in. angled	24.50	248	294
-4-in. angled	24.50	266	312
-Cartridge (6-in. or 12-in.) or short bag (18-in.)	24.50	250	295
-2-in. flat	11.00	130	151
-4-in. flat	11.00	144	164
-2-in. and 4-in. high-efficiency flat	15.50	203	232
-2-in. or 4-in. flat open return	4.25	45	45
-HEPA	L=56.5, H=65.50	n/a	840
-Long bag (30-in. bag)	56.50	398	516
Access or blank			
-Small horizontal	11.00	126	139
-Medium horizontal	15.50	149	168
-Extended-medium horizontal	19.00	171	193
-Medium-large horizontal	24.50	210	238
-Large horizontal or turning	40.00	297	344
-Extra-large horizontal or turning	56.50	345	463
Face-and-bypass damper			
-External	L=15.50 H=61.50	349	385
-Internal	15.50	291	328
-Face damper only	15.50	299	335
Coil[1]			
-Small horizontal (with 2-row UW)	11.00	n/a	329
-Medium horizontal (with 8-row UW)	15.50	n/a	678
-Extended-medium horizontal (with 8-row UW)	19.00	n/a	709
-Medium-large horizontal (with 10-row W)	24.50	n/a	1168
-Large horizontal or vertical (with 10-row W)	40.00	n/a	1294
-Electric heat[2]	40.00	685	758
-Integral face-and-bypass (IFB) coil[3]	40.00	953	1019
-Multizone/double-duct	L=71.30 H=79.50	n/a	1897
Humidifier	31.00	n/a	512
Moisture eliminator	11.00	n/a	446
Fan	56.50	See Table 79 for fan module weights	
Diffuser	15.50	225	262
Discharge plenum			
-Horizontal	40.00	n/a	431
-Vertical	L=56.50 H=40.00	n/a	428
Silencer			
-3 feet	36	n/a	803
-5 feet	60	n/a	1591
Energy Wheel	52	n/a	1778
Gas Heat[4]	83	n/a	2450

[1]Coil module weights include the coil noted with 144 aluminum fins per foot, standard tubes, and no water. Refer to the coil selection for exact coil weights.

[2]Electric heat requires a large access or blank module downstream for blow-thru applications.

[3]IFB coils require a large access or blank module downstream.

[4]Length and weight shown for largest MBh heater.

Table 74. Coil availability

Module Type	1/2-inch Coils	5/8-inch Coils
Small	2 rows	1 and 2 rows
Medium	2–4, 6, and 8 rows	1–4 rows
Extended-medium	2–8 rows	1–6 rows
Medium-large	2–8 rows	1–10 rows
-with access	2–6 rows	1–4 rows
Large horizontal	2–8 rows	1–10 rows
-with access	2–8 rows	1–8 rows
Large vertical	2–8 rows	1–6 rows
Multizone (cold deck)	2–4, 6, and 8 rows	1–4 rows

See Table 143 on page 90 for drainpan cleaning access availability with coil installed in a module.

Table 75. Filter data

Filter Type	Area (ft²)	Qty–Size (in.)
Flat (2 in., 4 in., or 2 in./4 in.) *(Traq™ mixing boxes use flat filters)*	24.00	6–24 × 24
Angled or mixing box (2 in. or 4 in.)	38.90	4–20 × 20 8–25 × 20
Bag or cartridge, 2-in. Prefilters	24.00	6–24 × 24
HEPA	26.00	2–12 × 24 2-24 x 30 2-24 x 24 2-24 x 12

2-inch filters available in permanent, throwaway, or pleated media; 4-inch filters available in pleated media, 65%, 85%, or 95% efficiency; Bag or cartridge filters available in 65%, 85%, or 95% efficiency, HEPA filers 99.97% efficient.

Table 78. Damper areas

Module Type	Area (ft²)
Mixing box - Airfoil blade	
-Top, back, bottom	10.27
-Side	5.62
Mixing box - Traq damper	
-Top, back, bottom	6.28
Internal face-and-bypass	
-Face	18.89
-Bypass	7.15
External face-and-bypass	
-Face	24.76
-Bypass	7.15
Face damper	24.76
Multizones	
-Per deck	9.83
-Maximum zones per deck	12

Table 79. Fan module weights[1]

	Casing Construction	
Fan type	Single-wall	Double-wall
FC Fans	1042	1160
AF Fans	1226	1344
Horz. vaneaxial	n/a	1533
Vert. vaneaxial	n/a	2130
Plenum	1292	1410

[1]Fan module weights (pounds) include a high-efficiency, open and drip-proof (ODP) motor.

Table 76. Fan data

	Housed Fans						Plenum Fans	Vaneaxial Fans	
Fan Characteristic	25A	25B	D25	E25	F25	G25	25P	25Q/V	25R/W
Size/type	25 FC	22.38 FC	22 AF	22 AF	20 AF	20 AF	32.38 AF	27 Q	30 Q
Max rpm	811	1273	1900	2500	2300	2750	1611	2160	1940
ODP motor hp range	1–10	1–20	1–15	1–30	1–15	1–30	3–20	5–15	7.5–20
Outlet area (ft²)	6.70	5.16	5.50	5.50	4.38	4.38	n/a	4.54	5.60
Blast area (ft²)	3.69	2.78	3.42	3.42	2.60	2.60	n/a	2.64	3.26
Bearing size (in.)	1.6875	2.1875	1.5	2	1.5	1.6875	1.6875	1.4375	1.4375
Shaft size (in.)	1.6875	2.1875	1.5	2	1.5	1.6875	1.6875	1.4375	1.4375

Table 77. Coil data

Coil Type	Rows	Fin Type	Area (ft²)	Qty–Size (in.)
1/2-inch unit coils (UW, UU, UF)	2 to 8	Aluminum	24.38	1–51.25 × 68.5
5/8-inch unit coils				
-W, WD, 5D	4 to 10	Aluminum	23.38	1–49.5 × 68
-W, WD	4 to 8	Copper	23.38	1–48 × 68
-K	2 to 10	Aluminum	22.67	1–48 × 68
-K	2 to 8	Copper	22.67	1–48 × 68
-5W	1 to 2	Aluminum or Copper	22.67	1–48 × 68
-W	3	Copper	22.67	1–48 × 68
-W	1	Aluminum or Copper	22.67	2–24 × 68
-W, WD,K	10	Copper	22.67	2–24 × 68
-5A, F, P2, P4, P8, D, DD, TT	All available rows	Aluminum or Copper	22.67	2–24 × 68
1-inch unit coils (N, NS)	1	Aluminum or Copper	19.83	1–18 × 68 1–24 × 68
Modified coils (W, WD, 5W, 5A, F, P2, P4, P8, K, D, DD, TT, N, NS)	All available rows	Aluminum or Copper	17.00	2–18 × 68

General Data
Unit Size 30

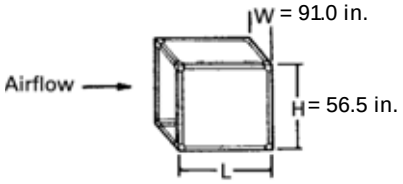


Table 80. Module dimensions

Module Type	Length (in.)	Weight (lb) - single wall	Weight (lb) - double-wall
Intake	15.50	n/a	553
Mixing box			
-with angled filters	40.00	558	646
-without angled filters	40.00	485	573
-with Traq™ dampers	56.50	565	676
-with Traq™ dampers and filters	56.50	602	713
Blender	40.00	325	407
Filters			
-2-in. angled	24.50	271	321
-4-in. angled	24.50	291	342
-Cartridge (6-in. or 12-in.) or short bag (18-in.)	24.50	274	324
-2-in. flat	11.00	142	165
-4-in. flat	11.00	157	180
-2-in. and 4-in. high-efficiency flat	15.50	224	257
-2-in. or 4-in. flat open return	4.25	53	53
-HEPA	L=56.50, H=65.50	n/a	972
-Long bag (30-in. bag)	56.50	434	565
Access or blank			
-Small horizontal	11.00	136	150
-Medium horizontal	15.50	162	182
-Extended-medium horizontal	19.00	186	210
-Medium-large horizontal	24.50	228	259
-Large horizontal or turning	40.00	325	376
-Extra-large horizontal or turning	56.50	371	502
Face-and-bypass damper			
-External	L=15.50 H=61.50	399	439
-Internal	15.50	332	372
-Face damper only	15.50	340	381
Coil[1]			
-Small horizontal (with 2-row UW)	11.00	n/a	370
-Medium horizontal (with 8-row UW)	15.50	n/a	782
-Extended-medium horizontal (with 8-row UW)	19.00	n/a	816
-Medium-large horizontal (with 10-row W)	24.50	n/a	1362
-Large horizontal or vertical (with 10-row W)	40.00	n/a	1499
-Electric heat[2]	40.00	754	836
-Integral face-and-bypass (IFB) coil[3]	40.00	993	1064
-Multizone/double-duct	L=71.30 H=79.50	n/a	2139
Humidifier	31.00	n/a	565
Moisture eliminator	11.00	n/a	510
Fan	56.50	See Table 86 for fan module weights	
Diffuser	15.50	249	289
Discharge plenum			
-Horizontal	40.00	n/a	480
-Vertical	L=56.50 H=40.00	n/a	475
Silencer			
-3 feet	36	n/a	971
-5 feet	60	n/a	1606
Energy Wheel	57.5	n/a	2387
Gas Heat[4]	81	n/a	2441

[1]Coil module weights include the coil noted with 144 aluminum fins per foot, standard tubes, and no water. Refer to the coil selection for exact coil weights.

[2]Electric heat requires a large access or blank module downstream for blow-thru applications.

[3]IFB coils require a large access or blank module downstream.

[4]Length and weight shown for largest MBh heater.

Table 81. Coil availability

Module Type	1/2-inch Coils	5/8-inch Coils
Small	2 rows	1 and 2 rows
Medium	2–4, 6, and 8 rows	1–4 rows
Extended-medium	2–8 rows	1–6 rows
Medium-large	2–8 rows	1–10 rows
-with access	2–6 rows	1–4 rows
Large horizontal	2–8 rows	1–10 rows
-with access	2–8 rows	1–8 rows
Large vertical	2–8 rows	1–6 rows
Multizone (cold deck)	2–4, 6, and 8 rows	1–4 rows

See Table 143 on page 90 for drainpan cleaning access availability with coil installed in a module.

Table 82. Filter data

Filter Type	Area (ft²)	Qty–Size (in.)
Flat (2 in., 4 in., or 2 in./4 in.) *(Traq™ mixing boxes use flat filters)*	28.00	6–20 × 24 2–24 × 24
Angled or mixing box (2 in. or 4 in.)	47.10	12–20 × 20 4–25 × 20
Bag or cartridge, 2-in. Prefilters	28.00	6–24 × 24 2–12 × 24
HEPA	32.00	3–12 × 24 2–24 × 30 4-24 x 24

2-inch filters available in permanent, throwaway, or pleated media; 4-inch filters available in pleated media, 65%, 85%, or 95% efficiency; Bag or cartridge filters available in 65%, 85%, or 95% efficiency, HEPA filers 99.97% efficient.

Table 85. Damper areas

Module Type	Area (ft²)
Mixing box - Airfoil blade	
-Top, back, bottom	12.04
-Side	7.26
Mixing box - Traq damper	
-Top, back, bottom	6.54
Internal face-and-bypass	
-Face	22.23
-Bypass	8.41
External face-and-bypass	
-Face	29.13
-Bypass	8.41
Face damper	29.13
Multizones	
-Per deck	11.55
-Maximum zones per deck	14

Table 86. Fan module weights[1]

	Casing Construction	
Fan type	Single-wall	Double-wall
FC Fans	1152	1282
AF Fans	1674	1804
Horz. vaneaxial	1690	1821
Vert. vaneaxial	n/a	2557
Plenum	1423	1554

[1]Fan module weights (pounds) include a high-efficiency, open and drip-proof (ODP) motor.

Table 83. Fan data

	Housed Fans						Plenum Fans	Vaneaxial Fans	
Fan Characteristic	30A	30B	D30	E30	F30	G30	30P	30Q/V	30R/W
Size/type	25 FC	22.38 FC	25 AF	25 AF	22 AF	22 AF	35.56 AF	30 Q	33 Q
Max rpm	811	1273	1650	2200	1900	2500	1643	1940	1822
ODP motor hp range	1–20	1–25	1–20	1–40	1–15	1–30	3–25	7.5–20	7.5–25
Outlet area (ft²)	6.70	5.16	6.90	6.90	5.50	5.50	n/a	5.60	6.78
Blast area (ft²)	3.69	2.78	4.83	4.83	3.66	3.66	n/a	3.26	3.94
Bearing size (in.)	1.6875	2.1875	1.6875	2	1.5	2	1.6875	1.4375	1.4375
Shaft size (in.)	1.6875	2.1875	1.6875	2	1.5	2	1.6875	1.4375	1.4375

Table 84. Coil data

Coil Type	Rows	Fin Type	Area (ft²)	Qty–Size (in.)
1/2-inch unit coils (UW, UU, UF)	2 to 8	Aluminum	29.01	1–51.25 × 81.5
5/8-inch unit coils				
-W, WD, 5D	4 to 10	Aluminum	27.84	1–49.5 × 81
-W, WD	4 to 8	Copper	27.00	1-48 × 81
-K	2 to 10	Aluminum	27.00	1–48 × 81
-K	2 to 8	Copper	27.00	1–48 × 81
-5W	1 to 2	Aluminum or Copper	27.00	1–48 × 81
-W	3	Copper	27.00	1–48 × 81
-W	1	Aluminum or Copper	27.00	2–24 × 81
-W, WD, K	10	Copper	27.00	2–24 × 81
-5A, F, P2, P4, P8, D, DD, TT	All available rows	Aluminum or Copper	27.00	2–24 × 81
1-inch unit coils (N, NS)	1	Aluminum or Copper	23.63	1–18 × 81 1–24 × 81
Modified coils (W, WD, 5W, 5A, F, P2, P4, P8, K, D, DD, TT, N, NS)	All available rows	Aluminum or Copper	20.25	2–18 × 81

General Data
Unit Size 35

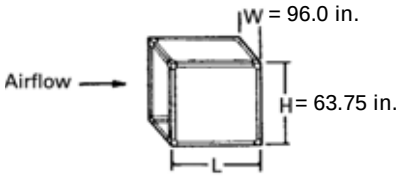


Table 87. Module dimensions

Module Type	Length (in.)	Weight (lb) - single wall	Weight (lb) - double-wall
Intake	16.00	n/a	670
Mixing box			
-with angled filters	48.00	780	890
-without angled filters	48.00	699	809
-with Traq™ dampers	48.00	684	770
-with Traq™ dampers and filters	48.00	739	825
Blender	48.00	402	507
Filters			
-2-in. angled	29.50	325	390
-4-in. angled	29.50	344	409
-Cartridge (6-in. or 12-in.) or short bag (18-in.)	29.50	380	446
-2-in. flat	11.50	195	221
-4-in. flat	11.50	208	234
-2-in. and 4-in. high-efficiency flat	16.00	251	287
-2-in. or 4-in. flat open return	4.25	68	68
-HEPA	L=48.00 H=68.00	n/a	1028
-Long bag (30-in. bag)	48.00	472	586
Access or blank			
-Small horizontal	11.50	177	193
-Medium horizontal	16.00	205	228
-Extended-medium horizontal	20.00	235	262
-Medium-large horizontal	29.50	316	357
-Large horizontal or turning	48.00	448	514
-Extra-large horizontal or turning	63.75	542	697
Face-and-bypass damper			
-External	L=16.00 H=68.75	444	500
-Internal	16.00	409	453
-Face damper only	16.00	372	427
Coil[1]			
-Small horizontal (with 2-row UW)	11.50	n/a	444
-Medium horizontal (with 8-row UW)	16.00	n/a	921
-Extended-medium horizontal (with 8-row UW)	20.00	n/a	958
-Medium-large horizontal (with 10-row W)	29.50	n/a	1630
-Large horizontal or vertical (with 10-row W)	48.00	n/a	1835
-Electric heat[2]	48.00	950	1056
-Integral face-and-bypass (IFB) coil[3]	29.50	1104	1161
-Multizone/double-duct	L=80.30 H=91.75	n/a	2718
Humidifier	32.00	n/a	743
Moisture eliminator	11.50	n/a	611
Fan	63.75	See Table 93 for fan module weights	
Diffuser	16.00	322	366
Discharge plenum			
-Horizontal	48.00	n/a	674
-Vertical	L=63.75 H=48.00	n/a	633
Silencer			
-3 feet	36	n/a	1047
-5 feet	60	n/a	1730
Energy Wheel	58	n/a	2516
Gas Heat[4]	95.75	n/a	3133

[1]Coil module weights include the coil noted with 144 aluminum fins per foot, standard tubes, and no water. Refer to the coil selection for exact coil weights.

[2]Electric heat requires a large access or blank module downstream for blow-thru applications.

[3]IFB coils require a large access or blank module downstream.

[4]Length and weight shown for largest MBh heater.

Table 88. Coil availability

Module Type	1/2-inch Coils	5/8-inch Coils
Small	2 rows	1 and 2 rows
Medium	2–4, 6, and 8 rows	1–4 rows
Extended-medium	2–8 rows	1–6 rows
Medium-large	2–8 rows	1–10 rows
-with access	2–8 rows	1–6 rows
Large horizontal	2–8 rows	1–10 rows
-with access	2–8 rows	1–10 rows
Large vertical	2–8 rows	1–6 rows
Multizone (cold deck)	2–4, 6, and 8 rows	1–4 rows

See Table 143 on page 90 for drainpan cleaning access availability with coil installed in a module.

Table 89. Filter data

Filter Type	Area (ft²)	Qty–Size (in.)
Flat (2 in., 4 in., or 2 in./4 in.) *(Traq™ mixing boxes use flat filters)*	31.90	6–20 × 25 4–16 × 25
Angled or mixing box (2 in. or 4 in.)	61.30	4–20 × 24 12–24 × 24
Bag or cartridge, 2-in. Prefilters	30.70	6–24 × 24 2–20 × 24
HEPA	34.00	3–12 × 24 4–24 x 30 2–24 × 24

2-inch filters available in permanent, throwaway, or pleated media; 4-inch filters available in pleated media, 65%, 85%, or 95% efficiency; Bag or cartridge filters available in 65%, 85%, or 95% efficiency, HEPA filers 99.97% efficient.

Table 92. Damper areas

Module Type	Area (ft²)
Mixing box - Airfoil blade	
-Top, back, bottom	14.32
-Side	8.50
Mixing box - Traq damper	
-Top, back, bottom	9.42
Internal face-and-bypass	
-Face	22.48
-Bypass	12.00
External face-and-bypass	
-Face	32.96
-Bypass	8.51
Face damper	32.96
Multizones	
-Per deck	15.09
-Maximum zones per deck	15

Table 93. Fan module weights[1]

	Casing Construction	
Fan type	Single-wall	Double-wall
FC Fans	1785	1941
AF Fans	2269	2424
Horz. vaneaxial	2717	2872
Vert. vaneaxial	n/a	2765
Plenum	1671	1826

[1]Fan module weights (pounds) include a high-efficiency, open and drip-proof (ODP) motor.

Table 90. Fan data

	Housed Fans						Plenum Fans	Vaneaxial Fans	
Fan Characteristic	35A	35B	D35	E35	F35	G35	35P	35Q/V	35R/W
Size/type	27.63 FC	25 FC	25 AF	25 AF	22 AF	22 AF	35.56 AF	33 Q	36.5 Q
Max rpm	698	1062	1650	2200	1900	2500	1643	1822	1647
ODP motor hp range	5–25	5–30	7.5-20	7.5-40	7.5-15	7.5-40	5–30	7.5–25	10–30
Outlet area (ft²)	8.08	6.73	6.95	6.95	5.64	5.64	n/a	6.78	8.30
Blast area (ft²)	5.12	3.69	4.40	4.40	3.38	3.38	n/a	3.94	4.81
Bearing size (in.)	2.1875	2.4375	1.6875	2	1.5	2	1.9375	1.4375	1.6875
Shaft size (in.)	2.1875	2.4375	1.6875	2	1.5	2	1.9375	1.4375	1.6875

Table 91. Coil data

Coil Type	Rows	Fin Type	Area (ft²)	Qty–Size (in.)
1/2-inch unit coils (UW, UU, UF)	2 to 8	Aluminum	34.14	1–57.5 × 85.5
5/8-inch unit coils				
-W, WD, 5D	4 to 10	Aluminum	32.76	1-55.5 x 85
-W, WD	4 to 8	Copper	31.88	1–54 × 85
-K	2 to 10	Aluminum	31.88	1–54 × 85
-K	2 to 8	Copper	31.88	1–54 × 85
-5W	1 to 2	Aluminum or Copper	31.88	1–54 × 85
-W	3	Copper	31.88	1-54 x 85
-W	1	Aluminum or Copper	30.10	1–18 × 85 1–33 × 85
-W, WD, K	10	Copper	30.10	1–18 × 85 1–33 × 85
-5A, F, D, DD	All available rows	Aluminum or Copper	30.10	1–18 × 85 1–33 × 85
1-inch unit coils (N, NS)	1	Aluminum or Copper	30.10	1–18 × 85 1–33 × 85
Modified coils (W, WD, 5W, WA, 5A, F, K, D, DD, N, NS)	All available rows	Aluminum or Copper	21.25	2–18 × 85

General Data
Unit Size 40

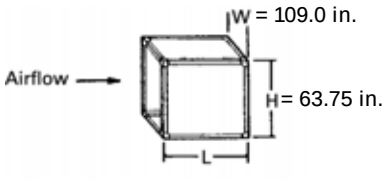


Table 94. Module dimensions

Module Type	Length (in.)	Weight (lb) - single wall	Weight (lb) - double-wall
Intake	16.00	n/a	747
Mixing box			
-with angled filters	48.00	861	982
-without angled filters	48.00	771	891
-with Traq™ dampers	48.00	747	840
-with Traq™ dampers and filters	48.00	809	902
Blender	48.00	448	564
Filters			
-2-in. angled	29.50	349	421
-4-in. angled	29.50	385	457
-Cartridge (6-in. or 12-in.) or short bag (18-in.)	29.50	423	495
-2-in. flat	11.50	210	238
-4-in. flat	11.50	226	258
-2-in. and 4-in. high-efficiency flat	16.00	274	313
-2-in. or 4-in. flat open return	4.25	78	78
-HEPA	L=48.00 H=68.00	n/a	1150
-Long bag (30-in. bag)	48.00	517	642
Access or blank			
-Small horizontal	11.50	189	207
-Medium horizontal	16.00	220	244
-Extended-medium horizontal	20.00	252	282
-Medium-large horizontal	29.50	340	384
-Large horizontal or turning	48.00	480	551
-Extra-large horizontal or turning	63.75	575	744
Face-and-bypass damper			
-External	L=16.00 H=68.75	488	548
-Internal	16.00	446	495
-Face damper only	16.00	408	468
Coil[1]			
-Small horizontal (with 2-row UW)	11.50	n/a	483
-Medium horizontal (with 8-row UW)	16.00	n/a	1025
-Extended-medium horizontal (with 8-row UW)	20.00	n/a	1065
-Medium-large horizontal (with 10-row W)	29.50	n/a	1827
-Large horizontal or vertical (with 10-row W)	48.00	n/a	2045
-Electric heat[2]	48.00	1053	1169
-Integral face-and-bypass (IFB) coil[3]	29.50	1128	1188
-Multizone/double-duct	L=80.30 H=91.75	n/a	2993
Humidifier	32.00	n/a	810
Moisture eliminator	11.50	n/a	683
Fan	63.75	See Table 100 for fan module weights	
Diffuser	16.00	350	398
Discharge plenum			
-Horizontal	48.00	n/a	731
-Vertical	L=63.75 H=48.00	n/a	689
Silencer			
-3 feet	36	n/a	1130
-5 feet	60	n/a	1860
Energy Wheel	59	n/a	3015
Gas Heat[4]	95.75	n/a	3222

[1]Coil module weights include the coil noted with 144 aluminum fins per foot, standard tubes, and no water. Refer to the coil selection for exact coil weights.

[2]Electric heat requires a large access or blank module downstream for blow-thru applications.

[3]IFB coils require a large access or blank module downstream.

[4]Length and weight shown for largest MBh heater.

Table 95. Coil availability

Module Type	1/2-inch Coils	5/8-inch Coils
Small	2 rows	1 and 2 rows
Medium	2–4, 6, and 8 rows	1–4 rows
Extended-medium	2–8 rows	1–6 rows
Medium-large	2–8 rows	1–10 rows
-with access	2–8 rows	1–6 rows
Large horizontal	2–8 rows	1–10 rows
-with access	2–8 rows	1–10 rows
Large vertical	2–8 rows	1–6 rows
Multizone (cold deck)	2–4, 6, and 8 rows	1–4 rows

See Table 143 on page 90 for drainpan cleaning access availability with coil installed in a module.

Table 96. Filter data

Filter Type	Area (ft²)	Qty–Size (in.)
Flat (2 in., 4 in., or 2 in./4 in.)	36.10	4–20 × 25
(Traq™ mixing boxes use flat filters)		8–16 × 25
Angled or mixing box (2 in. or 4 in.)	69.30	16–20 × 24
		4–24 × 24
Bag or cartridge, 2-in. Prefilters	36.90	4–24 × 12
		8–20 × 20
		2–24 × 20
HEPA	40.00	4–12 × 24
		8–24 × 24

2-inch filters available in permanent, throwaway, or pleated media; 4-inch filters available in pleated media, 65%, 85%, or 95% efficiency; Bag or cartridge filters available in 65%, 85%, or 95% efficiency, HEPA filers 99.97% efficient.

Table 99. Damper areas

Module Type	Area (ft²)
Mixing box - Airfoil blade	
-Top, back, bottom	16.49
-Side	9.77
Mixing box - Traq damper	
-Top, back, bottom	9.42
Internal face-and-bypass	
-Face	25.05
-Bypass	13.37
External face-and-bypass	
-Face	36.73
-Bypass	9.48
Face damper	36.73
Multizones	
-Per deck	17.23
-Maximum zones per deck	17

Table 100. Fan module weights[1]

	Casing Construction	
Fan type	Single-wall	Double-wall
FC Fans	1937	2106
AF Fans	2156	2325
Horz. vaneaxial	2835	3005
Vert. vaneaxial	n/a	2970
Plenum	1838	2007

[1]Fan module weights (pounds) include a high-efficiency, open and drip-proof (ODP) motor.

Table 97. Fan data

	Housed Fans						Plenum Fans	Vaneaxial Fans	
Fan Characteristic	40A	40B	D40	E40	F40	G40	40P	40Q/V	40R/W
Size/type	30.25 FC	27.63 FC	28 AF	28 AF	25 AF	25	39.38 AF	33 Q	36.5 Q
Max rpm	664	905	1500	2050	1650	2200	1412	1822	1647
ODP motor hp range	5–25	5–30	7.5-20	7.5-50	7.5-20	7.5-50	5–30	7.5–25	10–30
Outlet area (ft²)	9.79	8.08	8.69	8.69	6.95	6.95	n/a	6.78	8.30
Blast area (ft²)	6.10	5.12	5.65	5.65	4.40	4.40	n/a	3.94	4.81
Bearing size (in.)	2.4375	2.4375	1.9375	2.1875	1.6875	2	1.9375	1.4375	1.6875
Shaft size (in.)	2.4375	2.4375	1.9375	2.4375	1.6875	2	1.9375	1.4375	1.6875

Table 98. Coil data

Coil Type	Rows	Fin Type	Area (ft²)	Qty–Size (in.)
1/2-inch unit coils (UW, UU, UF)	2 to 8	Aluminum	39.33	1–57.5 × 98.5
5/8-inch unit coils				
-W, WD, 5D	4 to 10	Aluminum	37.77	1–55.5 × 98
-W, WD	4 to 8	Copper	36.75	1–54 × 98
-K	2 to 10	Aluminum	36.75	1–54 × 98
-K	2 to 8	Copper	36.75	1–54 × 98
-5W	1 to 2	Aluminum or Copper	36.75	1–54 × 98
-W	3	Copper	36.75	1–54 × 98
-W	1	Aluminum or Copper	34.71	1–18 × 98 1–33 × 98
-W, WD, K	10	Copper	34.71	1–18 × 98 1–33 × 98
-5A, F, D, DD	All available rows	Aluminum or Copper	34.71	1–18 × 98 1–33 × 98
1-inch unit coils (N, NS)	1	Aluminum or Copper	34.71	1–18 × 98 1–33 × 98
Modified coils (W, WD, 5W, 5A, F, K, D, DD, N, NS)	All available rows	Aluminum or Copper	24.50	2–18 × 98

General Data
Unit Size 50

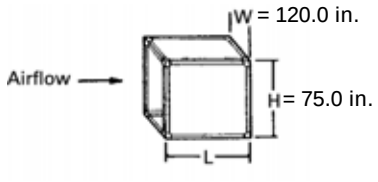


Table 101. Module dimensions

Module Type	Length (in.)	Weight (lb) - single wall	Weight (lb) - double-wall
Intake	20.00	n/a	973
Mixing box			
-with angled filters	48.00	1010	1158
-without angled filters	48.00	904	1051
-with Traq™ dampers	48.00	873	978
-with Traq™ dampers and filters	48.00	958	1063
Blender	48.00	516	646
Filters			
-2-in. angled	29.50	399	480
-4-in. angled	29.50	429	509
-Cartridge (6-in. or 12-in.) or short bag (18-in.)	29.50	491	571
-2-in. flat	14.50	274	314
-4-in. flat	14.50	288	328
-2-in. and 4-in. high-efficiency flat	14.50	313	353
-2-in. or 4-in. flat open return	4.25	99	99
-HEPA	L=48.00 H=78.50	n/a	1374
-Long bag (30-in. bag)	48.00	588	728
Access or blank			
-Small horizontal	14.50	240	265
-Medium horizontal	n/a	n/a	n/a
-Extended-medium horizontal	20.00	284	318
-Medium-large horizontal	29.50	381	431
-Large horizontal or turning	48.00	538	619
-Extra-large horizontal or turning	68.50	668	873
Face-and-bypass damper			
-External	L=20.00 H=80.00	606	674
-Internal	20.00	586	654
-Face damper only	20.00	517	584
Coil[1]			
-Small horizontal (with 2-row UW)	14.50	n/a	625
-Medium horizontal (with 8-row UW)	n/a	n/a	n/a
-Extended-medium horizontal (with 8-row UW)	20.00	n/a	1317
-Medium-large horizontal (with 10-row W)	29.50	n/a	2331
-Large horizontal or vertical (with 10-row W)	48.00	n/a	2573
-Electric heat[2]	48.00	1304	1434
-Integral face-and-bypass (IFB) coil[3]	29.50	1622	1691
-Multizone/double-duct	L=88.30 H=103.00	n/a	3818
Humidifier	29.00	n/a	1039
Moisture eliminator	14.50	n/a	885
Fan	68.50	See Table 107 for fan module weights	
Diffuser	20.00	438	506
Discharge plenum			
-Horizontal	48.00	n/a	850
-Vertical	L=75.00 H=48.00	n/a	801
Silencer			
-3 feet	36	n/a	1390
-5 feet	60	n/a	2218
Energy Wheel	67	n/a	3079
Gas Heat[4]	108.5	n/a	3854

[1]Coil module weights include the coil noted with 144 aluminum fins per foot, standard tubes, and no water. Refer to the coil selection for exact coil weights.

[2]Electric heat requires a large access or blank module downstream for blow-thru applications.

[3]IFB coils require a large access or blank module downstream.

[4]Length and weight shown for largest MBh heater.

Table 102. Coil availability

Module Type	1/2-inch Coils	5/8-inch Coils
Small	2 and 4 rows	1–4 rows
Medium	n/a	n/a
Extended-medium	2–8 rows	1–6 rows
Medium-large	2–8 rows	1–10 rows
-with access	2–8 rows	1–6 rows
Large horizontal	2–8 rows	1–10 rows
-with access	2–8 rows	1–10 rows
Large vertical	2–8 rows	1–6 rows
Multizone (cold deck)	2–4, 6, and 8 rows	1–6 rows

See Table 143 on page 90 for drainpan cleaning access availability with coil installed in a module.

Table 103. Filter data

Filter Type	Area (ft²)	Qty–Size (in.)
Flat (2 in., 4 in., or 2 in./4 in.)	48.30	3–16 × 20
(Traq™ mixing boxes use flat filters)		12–25 × 20
Angled or mixing box (2 in. or 4 in.)	80.60	20–20 × 25
		4–16 × 25
Bag or cartridge, 2-in. Prefilters	51.60	4–24 × 24
		8–24 × 20
		2–20 × 20
		1–20 × 24
HEPA	51.00	3–24 × 30
		9–24 × 24

2-inch filters available in permanent, throwaway, or pleated media; 4-inch filters available in pleated media, 65%, 85%, or 95% efficiency; Bag or cartridge filters available in 65%, 85%, or 95% efficiency, HEPA filers 99.97% efficient.

Table 106. Damper areas

Module Type	Area (ft²)
Mixing box - Airfoil blade	
-Top, back, bottom	20.83
-Side	12.37
Mixing box - Traq damper	
-Top, back, bottom	12.83
Internal face-and-bypass	
-Face	36.63
-Bypass	14.92
External face-and-bypass	
-Face	49.48
-Bypass	10.57
Face damper	49.48
Multizones	
-Per deck	19.03
-Maximum zones per deck	19

Table 107. Fan module weights[1]

	Casing Construction	
Fan type	Single-wall	Double-wall
FC Fans	2543	2747
AF Fans	2957	3162
Horz. vaneaxial	3246	3451
Vert. vaneaxial	n/a	3804
Plenum	2485	2689

[1]Fan module weights (pounds) include a high-efficiency, open and drip-proof (ODP) motor.

Table 104. Fan data

	Housed Fans						Plenum Fans	Vaneaxial Fans	
Fan Characteristic	50A	50B	D50	E50	F50	G50	50P	50Q/V	50R/W
Size/type	33 FC	30.25 FC	32 AF	32 AF	28 AF	28 AF	43.44 AF	36.5 Q	40.25 Q
Max rpm	580	870	1300	1700	1500	2050	1334	1647	1492
ODP motor hp range	5–30	5–40	7.5-30	7.5-60	7.5-25	7.5-60	5–40	10–30	10–40
Outlet area (ft²)	11.69	9.79	10.97	10.97	8.69	8.69	n/a	8.30	10.09
Blast area (ft²)	7.54	6.10	7.21	7.21	5.65	5.65	n/a	4.81	5.84
Bearing size (in.)	2.4375	2.6875	2.1875	2.1875	1.9375	2.1875	2.1875	1.6875	1.6875
Shaft size (in.)	2.4375	2.6875	2.1875	2.4375	1.9375	2.4375	2.1875	1.6875	1.6875

Table 105. Coil data

Coil Type	Rows	Fin Type	Area (ft²)	Qty–Size (in.)
1/2-inch unit coils (UW, UU, UF)	2 to 8	Aluminum	49.43	2–32.5 × 109.5
5/8-inch unit coils				
-W, WD, 5W, 5A, F, K, D, DD	All available rows	Aluminum or Copper	47.69	1–30 × 109
				1–33 × 109
1-inch unit coils (N, NS)	1	Aluminum or Copper	47.69	1–30 × 109
				1–33 × 109
Modified coils (W, WD, 5W, 5A, F, K, D, DD, N, NS)	All available rows	Aluminum or Copper	36.33	2–24 × 109

General Data
Unit Size 57

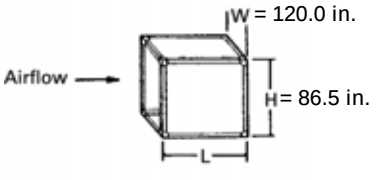


Table 108. Module dimensions

Module Type	Length (in.)	Weight (lb) - single wall	Weight (lb) - double-wall
Intake	20.00	n/a	1096
Mixing box			
-with angled filters	48.00	1144	1290
-without angled filters	48.00	997	1143
-with Traq™ dampers	48.00	959	1056
-with Traq™ dampers and filters	48.00	1063	1161
Blender	48.00	565	700
Filters			
-2-in. angled	29.50	466	549
-4-in. angled	29.50	516	599
-Cartridge (6-in. or 12-in.) or short bag (18-in.)	29.50	554	637
-2-in. flat	14.50	310	352
-4-in. flat	14.50	325	367
-2-in. and 4-in. high-efficiency flat	14.50	355	397
-2-in. or 4-in. flat open return	4.25	120	120
-HEPA	48.00	n/a	1467
-Long bag (30-in. bag)	48.00	646	793
Access or blank			
-Small horizontal	14.50	257	283
-Medium horizontal	n/a	n/a	n/a
-Extended-medium horizontal	20.00	303	339
-Medium-large horizontal	29.50	407	460
-Large horizontal or turning	48.00	574	659
-Extra-large horizontal or turning	68.50	707	926
Face-and-bypass damper			
-External	L=20.00 H=91.50	660	732
-Internal	20.00	662	734
-Face damper only	20.00	570	642
Coil[1]			
-Small horizontal (with 2-row UW)	14.50	n/a	693
-Medium horizontal (with 8-row UW)	n/a	n/a	n/a
-Extended-medium horizontal (with 8-row UW)	20.00	n/a	1488
-Medium-large horizontal (with 10-row W)	29.50	n/a	2697
-Large horizontal or vertical (with 10-row W)	48.00	n/a	2952
-Electric heat[2]	48.00	1477	1611
-Integral face-and-bypass (IFB) coil[3]	29.50	1640	1715
-Multizone/double-duct	n/a	n/a	n/a
Humidifier	29.00	n/a	1076
Moisture eliminator	14.50	n/a	999
Fan	68.50	See Table 114 for fan module weights	
Diffuser	20.00	477	549
Discharge plenum			
-Horizontal	48.00	n/a	926
-Vertical	L=75.00, H=48.00	n/a	801
Silencer			
-3 feet	36	n/a	1657
-5 feet	60	n/a	2604
Energy Wheel	n/a	n/a	n/a
Gas Heat[4]	108.5	n/a	3949

[1]Coil module weights include the coil noted with 144 aluminum fins per foot, standard tubes, and no water. Refer to the coil selection for exact coil weights.

[2]Electric heat requires a large access or blank module downstream for blow-thru applications.

[3]IFB coils require a large access or blank module downstream.

[4]Length and weight shown for largest MBh heater.

Table 109. Coil availability

Module Type	1/2-inch Coils	5/8-inch Coils
Small	2 and 4 rows	1–4 rows
Medium	n/a	n/a
Extended-medium	2–8 rows	1–6 rows
Medium-large	2–8 rows	1–10 rows
-with access	2–8 rows	1–6 rows
Large horizontal	2–8 rows	1–10 rows
-with access	2–8 rows	1–10 rows
Large vertical	2–8 rows	1–6 rows

See Table 143 on page 90 for drainpan cleaning access availability with coil installed in a module.

Table 110. Filter data

Filter Type	Area (ft²)	Qty–Size (in.)
Flat (2 in., 4 in., or 2 in./4 in.) *(Traq™ mixing boxes use flat filters)*	57.50	4–20 × 16 4–20 × 20 6–25 × 16 6–25 × 20
Angled or mixing box (2 in. or 4 in.)	96.70	30–20 × 20 6–16 × 20
Bag or cartridge, 2-in. Prefilters	54.70	8–24 × 12 2–20 × 24 8–24 × 24
HEPA	54.00	4–30 × 24 2–24 × 30 6-24 x 24

2-inch filters available in permanent, throwaway, or pleated media; 4-inch filters available in pleated media, 65%, 85%, or 95% efficiency; Bag or cartridge filters available in 65%, 85%, or 95% efficiency, HEPA filers 99.97% efficient.

Table 113. Damper areas

Module Type	Area (ft²)
Mixing box - Airfoil blade	
-Top, back, bottom	28.39
-Side	14.11
Mixing box - Traq damper	
-Top, back, bottom	12.83
Internal face-and-bypass	
-Face	45.31
-Bypass	14.92
External face-and-bypass	
-Face	55.69
-Bypass	10.57
Face damper	55.69

Table 114. Fan module weights[1]

	Casing Construction	
Fan type	Single-wall	Double-wall
FC Fans	2582	2800
AF Fans	2997	3216
Horz. vaneaxial	3295	3504
Vert. vaneaxial	n/a	4070
Plenum	2524	2742

[1]Fan module weights (pounds) include a high-efficiency, open and drip-proof (ODP) motor.

Table 111. Fan data

	Housed Fans						Plenum Fans	Vaneaxial Fans	
Fan Characteristic	57A	57B	D57	E57	F57	G57	57P	57Q/V	57R/W
Size/type	33 FC	30.25 FC	32 AF	32 AF	28 AF	28 AF	43.44 AF	40.25 Q	44.5 Q
Max rpm	580	870	1300	1700	1500	2050	1334	1492	1352
ODP motor hp range	5–30	5–40	7.5-30	7.5-60	7.5-25	7.5-60	5–40	10–40	15-40
Outlet area (ft²)	11.69	9.79	10.97	10.97	8.69	8.69	n/a	10.09	12.33
Blast area (ft²)	7.407	6.166	7.21	7.21	5.65	5.65	n/a	5.84	7.12
Bearing size (in.)	2.4375	2.6875	2.1875	2.1875	1.9375	2.1875	2.1875	1.6875	1.9375
Shaft size (in.)	2.4375	2.6875	2.1875	2.4375	1.9375	2.4375	2.1875	1.6875	1.9375

Table 112. Coil data

Coil Type	Rows	Fin Type	Area (ft²)	Qty–Size (in.)
1/2-inch unit coils (UW, UU, UF)	2 to 8	Aluminum	57.03	2–37.5 × 109.5
5/8-inch unit coils				
-W, WD	4 to 10	Aluminum	56.77	2–37.5 × 109
-W, WD	4 to 8	Copper	54.50	2–36 × 109
-K	2 to 10	Aluminum	54.50	2–36 × 109
-K	2 to 8	Copper	54.50	2–36 × 109
-5W	1 to 2	Aluminum or Copper	54.50	2–36 × 109
-W	3	Copper	54.50	2–36 × 109
-W	1	Aluminum or Copper	54.50	3–24 × 109
-W, WD, K	10	Copper	54.50	3–24 × 109
-5A, F, D, DD	All available rows	Aluminum or Copper	54.50	3–24 × 109
1-inch unit coils (N, NS)	1	Aluminum or Copper	54.50	3–24 × 109
Modified coils (W, WD, 5W, 5A, F, K, D, DD, N, NS)	All available rows	Aluminum or Copper	43.15	1–24 × 109 1–33 × 109

General Data
Unit Size 66

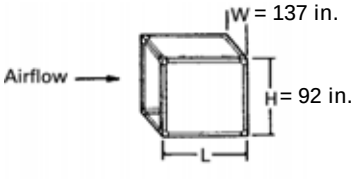


Table 115. Module dimensions

Module Type	Length (in.)	Weight (lb) - single wall	Weight (lb) - double-wall
Intake	29.50	n/a	1513
Mixing box			
-with angled filters	49.00	1430	1589
-without angled filters	49.00	1251	1410
-with Traq™ dampers	84.00	1281	1743
-with Traq™ dampers and filters	84.00	1408	1875
Blender	49.00	647	801
Filters			
-2-in. angled	29.50	698	791
-4-in. angled	29.50	759	852
-Cartridge (6-in. or 12-in.) or short bag (18-in.)	29.50	764	857
-2-in. flat	14.50	497	543
-4-in. flat	14.50	516	562
-2-in. and 4-in. high-efficiency flat	14.50	552	598
-2-in. or 4-in. flat open return	4.25	146	146
-HEPA	49.00	n/a	1735
-Long bag (30-in. bag)	49.00	937	1104
Access or blank			
-Small horizontal	14.50	455	484
-Medium horizontal	n/a	n/a	n/a
-Extended-medium horizontal	20.00	476	516
-Medium-large horizontal	29.50	610	669
-Large horizontal or turning	49.00	869	965
-Extra-large horizontal or turning	84.00	893	1197
Face-and-bypass damper			
-External	L=29.50 H=97.08	982	1061
-Internal	20.00	910	990
-Face damper only	20.00	825	905
Coil[1]			
-Small horizontal (with 2-row UW)	14.50	n/a	899
-Medium horizontal (with 8-row UW)	n/a	n/a	n/a
-Extended-medium horizontal (with 8-row UW)	20.00	n/a	1804
-Medium-large horizontal (with 10-row W)	29.50	n/a	3220
-Large horizontal or vertical (with 10-row W)	n/a	n/a	n/a
-Electric heat[2]	49.00	2107	2261
-Integral face-and-bypass (IFB) coil[3]	29.50	1819	1901
-Multizone/double-duct	n/a	n/a	n/a
Humidifier	29.00	n/a	1511
Moisture eliminator	14.50	n/a	1317
Fan	84.00	See Table 121 for fan module weights	
Diffuser	49.00	927	1120
Discharge plenum			
-Horizontal	48.00	n/a	1286
-Vertical	n/a	n/a	n/a
Silencer			
-3 feet	36	n/a	1890
-5 feet	60	n/a	2920
Energy Wheel	n/a	n/a	n/a
Gas Heat[4]	98.5	n/a	4491

[1]Coil module weights include the coil noted with 144 aluminum fins per foot, standard tubes, and no water. Refer to the coil selection for exact coil weights.

[2]Electric heat requires a large access or blank module downstream for blow-thru applications.

[3]IFB coils require a large access or blank module downstream.

[4]Length and weight shown for largest MBh heater.

Table 116. Coil availability

Module Type	1/2-inch Coils	5/8-inch Coils
Small	2–6 rows	1–6 rows
Medium	n/a	n/a
Extended-medium	2–8 rows	1–6 rows
Medium-large	2–8 rows	1–10 rows
-with access	2–8 rows	1–6 rows
Large horizontal	n/a	n/a

See Table 143 on page 90 for drainpan cleaning access availability with coil installed in a module.

Table 117. Filter data

Filter Type	Area (ft²)	Qty–Size (in.)
Flat (2 in., 4 in., or 2 in./4 in.) *(Traq™ mixing boxes use flat filters)*	65.00	8–20 × 16
		8–20 × 20
		4–25 × 16
		4–25 × 20
Angled or mixing box (2 in. or 4 in.)	108.30	12–25 × 20
		24–20 × 20
Bag or cartridge, 2-in. Prefilters	64.00	6–20 × 24
		10–24 × 12
		6–24 × 24
HEPA	65.00	5–30 × 24
		10–24 × 24

2-inch filters available in permanent, throwaway, or pleated media; 4-inch filters available in pleated media, 65%, 85%, or 95% efficiency; Bag or cartridge filters available in 65%, 85%, or 95% efficiency, HEPA filers 99.97% efficient.

Table 120. Damper areas

Module Type	Area (ft²)
Mixing box - Airfoil blade	
-Top, back, bottom	28.39
-Side	16.70
Mixing box - Traq damper	
-Top, back, bottom	17.10
Internal face-and-bypass	
-Face	52.34
-Bypass	17.23
External face-and-bypass	
-Face	64.56
-Bypass	22.25
Face damper	64.56

Table 121. Fan module weights[1]

	Casing Construction	
Fan type	Single-wall	Double-wall
FC Fans	3923	4227
AF Fans	3766	4378
Horz. vaneaxial	4468	4772
Vert. vaneaxial	n/a	4336
Plenum	3228	3532

[1]Fan module weights (pounds) include a high-efficiency, open and drip-proof (ODP) motor.

Table 118. Fan data

	Housed Fans						Plenum Fans	Vaneaxial Fans	
Fan Characteristic	66A	B66	D66	E66	F66	G66	66P	66Q/V	66R/W
Size/type	33 FC	36 FC	36 AF	36 AF	32 AF	32 AF	52.88 AF	40.25 Q	44.5 Q
Max rpm	760	665	1250	1550	1300	1700	885	1492	1352
ODP motor hp range	10–60	15–75	10-30	15-75	10-30	10-60	7.5–50	10–40	15-40
Outlet area (ft²)	11.69	13.81	13.81	13.81	10.97	10.97	n/a	10.09	12.33
Blast area (ft²)	7.407	13.648	8.81	8.81	7.212	7.212	n/a	5.84	7.12
Bearing size (in.)	2.4375	2.4375	2.4375	2.4375	2.1875	2.1875	2.4375	1.6875	1.9375
Shaft size (in.)	2.4375	2.4375	2.4375	2.4375	2.1875	2.4375	2.4375	1.6875	1.9375

Table 119. Coil data

Coil Type	Rows	Fin Type	Area (ft²)	Qty–Size (in.)
1/2-inch unit coils (UW, UU, UF)	2 to 8	Aluminum	65.63	2–37.5 × 126
5/8-inch unit coils				
-W, WD	4 to 10	Aluminum	65.63	2–37.5 × 126
-W, WD	4 to 8	Copper	63.00	2–36 × 126
-K	2 to 10	Aluminum	63.00	2–36 × 126
-K	2 to 8	Copper	63.00	2–36 × 126
-5W	1 to 2	Aluminum or Copper	63.00	2–36 × 126
-W	3	Copper	63.00	2–36 × 126
-W	1	Aluminum or Copper	63.00	3–24 × 126
-W, WD, K	10	Copper	63.00	3–24 × 126
-5A, F, D, DD	All available rows	Aluminum or Copper	63.00	3–24 × 126
1-inch unit coils (N, NS)	1	Aluminum or Copper	63.00	3–24 × 126
Modified coils (W, WD, 5W, 5A, F, K, D, DD, N, NS)	All available rows	Aluminum or Copper	49.88	1–24 × 126 1–33 × 126

General Data
Unit Size 80

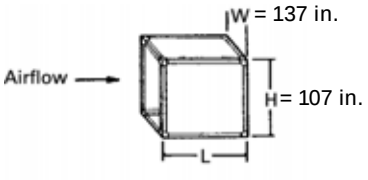


Table 122. Module dimensions

Module Type	Length (in.)	Weight (lb) - single wall	Weight (lb) - double-wall
Intake	29.50	n/a	1699
Mixing box			
-with angled filters	54.00	1616	1798
-without angled filters	54.00	1392	1575
-with Traq™ dampers	92.00	1433	1936
-with Traq™ dampers and filters	92.00	1581	2084
Blender	54.00	725	902
Filters			
-2-in. angled	29.50	755	852
-4-in. angled	29.50	826	923
-Cartridge (6-in. or 12-in.) or short bag (18-in.)	29.50	830	927
-2-in. flat	14.50	537	585
-4-in. flat	14.50	558	607
-2-in. and 4-in. high-efficiency flat	14.50	601	649
-2-in. or 4-in. flat open return	4.25	169	169
-HEPA	54.00	n/a	1969
-Long bag (30-in. bag)	54.00	1052	1244
Access or blank			
-Small horizontal	14.50	464	495
-Medium horizontal	n/a	n/a	n/a
-Extended-medium horizontal	20.00	487	529
-Medium-large horizontal	29.50	624	686
-Large horizontal or turning	54.00	945	1058
-Extra-large horizontal or turning	92.00	1007	1361
Face-and-bypass damper			
-External	L=29.50 H=112.08	1101	1186
-Internal	20.00	997	1082
-Face damper only	20.00	945	1030
Coil[1]			
-Small horizontal (with 2-row UW)	14.50	n/a	1008
-Medium horizontal (with 8-row UW)	n/a	n/a	n/a
-Extended-medium horizontal (with 8-row UW)	20.00	n/a	2092
-Medium-large horizontal (with 10-row W)	29.50	n/a	3715
-Large horizontal or vertical (with 10-row W)	n/a	n/a	n/a
-Electric heat[2]	n/a	n/a	n/a
-Integral face-and-bypass (IFB) coil[3]	29.50	1,925	2014
-Multizone/double-duct	n/a	n/a	n/a
Humidifier	43.50	n/a	1617
Moisture eliminator	14.50	n/a	1483
Fan	92.00	See Table 128 for fan module weights	
Diffuser	54.00	1037	1263
Discharge plenum			
-Horizontal	54.00	n/a	1432
-Vertical	n/a	n/a	n/a
Silencer			
-3 feet	36	n/a	2034
-5 feet	60	n/a	3155
Energy Wheel	n/a	n/a	n/a
Gas Heat[4]	106.5	n/a	4750

[1]Coil module weights include the coil noted with 144 aluminum fins per foot, standard tubes, and no water. Refer to the coil selection for exact coil weights.

[2]Electric heat requires a large access or blank module downstream for blow-thru applications.

[3]IFB coils require a large access or blank module downstream.

[4]Length and weight shown for largest MBh heater.

Table 123. Coil availability

Module Type	1/2-inch Coils	5/8-inch Coils
Small	2–6 rows	1–6 rows
Medium	n/a	n/a
Extended-medium	2–8 rows	1–6 rows
Medium-large	2–8 rows	1–10 rows
-with access	2–8 rows	1–6 rows
Large horizontal	n/a	n/a

See Table 143 on page 90 for drainpan cleaning access availability with coil installed in a module.

Table 124. Filter data

Filter Type	Area (ft²)	Qty–Size (in.)
Flat (2 in., 4 in., or 2 in./4 in.) *(Traq™ mixing boxes use flat filters)*	80.70	6–20 × 20 6–20 × 24 6–24 × 20 6–24 × 24
Angled or mixing box (2 in. or 4 in.)	132.00	6–24 × 12 30–24 × 24
Bag or cartridge, 2-in. Prefilters	80.70	6–20 × 24 6–20 × 20 6–24 × 24 6–24 × 20
HEPA	75.00	15–30 × 24

2-inch filters available in permanent, throwaway, or pleated media; 4-inch filters available in pleated media, 65%, 85%, or 95% efficiency; Bag or cartridge filters available in 65%, 85%, or 95% efficiency, HEPA filers 99.97% efficient.

Table 127. Damper areas

Module Type	Area (ft²)
Mixing box - Airfoil blade	
-Top, back, bottom	33.25
-Side	20.04
Mixing box - Traq damper	
-Top, back, bottom	21.38
Internal face-and-bypass	
-Face	62.38
-Bypass	17.23
External face-and-bypass	
-Face	79.61
-Bypass	22.25
Face damper	79.61

Table 128. Fan module weights[1]

	Casing Construction	
Fan type	Single-wall	Double-wall
FC Fans	4130	4484
AF Fans	4349	5137
Horz. vaneaxial	4612	4966
Vert. vaneaxial	n/a	4389
Plenum	4077	4431

[1]Fan module weights (pounds) include a high-efficiency, open and drip-proof (ODP) motor.

Table 125. Fan data

	Housed Fans						Plenum Fans	Vaneaxial Fans	
Fan Characteristic	A80	B80	D80	E80	F80	G80	80P	80Q/V	80R/W
Size/type	36 FC	36 FC	40 AF	40 AF	36 AF	36 AF	58.5 AF	44.5 Q	n/a
Max rpm	600	665	1200	1350	1250	1550	792	1352	n/a
ODP motor hp range	15–40	20-75	20–60	20–100	20–30	20–75	7.5–60	15-40	n/a
Outlet area (ft²)	20.17	16.44	17.28	17.28	13.75	13.75	n/a	12.33	n/a
Blast area (ft²)	13.648	13.648	11.125	11.125	8.806	8.806	n/a	7.12	n/a
Bearing size (in.)	2.4375	2.4375	2.1875	2.4375	2.4375	2.4375	2.6875	1.9375	n/a
Shaft size (in.)	2.4375	2.4375	2.1875	2.4375	2.4375	2.4375	1.4375	1.9375	n/a

Table 126. Coil data

Coil Type	Rows	Fin Type	Area (ft²)	Qty–Size (in.)
1/2-inch unit coils (UW, UU, UF)	2 to 8	Aluminum	78.75	2–45 × 126
5/8-inch unit coils				
-W, WD, 5D	4 to 10	Aluminum	78.75	2–45 × 126
-W, WD, 5D	4 to 8	Copper	78.75	2–45 × 126
-5W	1 to 2	Aluminum or Copper	78.75	2–45 × 126
-W	3	Aluminum or Copper	78.75	2–45 × 126
-W	1	Aluminum or Copper	76.13	1–24 × 126 1–30 × 126 1–33 × 126
-W, WD	10	Copper	76.13	1–24 × 126 1–30 × 126 1–33 × 126
-5A, F, K, D, DD	All available rows	Aluminum or Copper	76.13	1–24 × 126 1–30 × 126 1–33 × 126
1-inch unit coils (N, NS)	1	Aluminum or Copper	76.13	1–24 × 126 1–30 × 126 1–33 × 126
Modified coils (W, WD, 5W, 5A, F, K, D, DD, N, NS)	All available rows	Aluminum or Copper	60.38	2–18 × 126 1–33 × 126

General Data
Unit Size 100

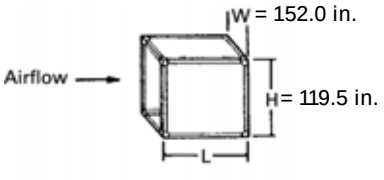


Table 129. Module dimensions

Module Type	Length (in.)	Weight (lb) - single wall	Weight (lb) - double-wall
Intake	29.50	n/a	2023
Mixing box			
-with angled filters	60.00	1915	2133
-without angled filters	60.00	1630	1847
-with Traq™ dampers	96.00	1661	2161
-with Traq™ dampers and filters	96.00	1844	2344
Blender	60.00	853	1071
Filters			
-2-in. angled	29.50	859	967
-4-in. angled	29.50	946	1054
-Cartridge (6-in. or 12-in.) or short bag (18-in.)	29.50	935	1042
-2-in. flat	14.50	612	666
-4-in. flat	14.50	639	692
-2-in. and 4-in. high-efficiency flat	14.50	691	745
-2-in. or 4-in. flat open return	4.25	210	210
-HEPA	60.00	n/a	2383
-Long bag (30-in. bag)	60.00	1229	1464
Access or blank			
-Small horizontal	14.50	506	541
-Medium horizontal	n/a	n/a	n/a
-Extended-medium horizontal	20.00	528	575
-Medium-large horizontal	29.50	677	746
-Large horizontal or turning	60.00	1113	1252
-Extra-large horizontal or turning	96.00	1135	1548
Face-and-bypass damper			
-External	L=29.50 H=124.58	1304	1398
-Internal	20.00	1180	1274
-Face damper only	20.00	1128	1223
Coil[1]			
-Small horizontal (with 2-row UW)	14.50	n/a	1169
-Medium horizontal (with 8-row UW)	n/a	n/a	n/a
-Extended-medium horizontal (with 8-row UW)	20.00	n/a	2534
-Medium-large horizontal (with 10-row W)	29.50	n/a	4511
-Large horizontal or vertical (with 10-row W)	n/a	n/a	n/a
-Electric heat[2]	n/a	n/a	n/a
-Integral face-and-bypass (IFB) coil[3]	29.50	2063	2162
-Multizone/double-duct	n/a	n/a	n/a
Humidifier	43.50	n/a	1780
Moisture eliminator	14.50	n/a	1779
Fan	96.00	See Table 135 for fan module weights	
Diffuser	60.00	1230	1509
Discharge plenum			
-Horizontal	60.00	n/a	1713
-Vertical	n/a	n/a	n/a
Silencer			
-3 feet	36	n/a	2499
-5 feet	60	n/a	3911
Energy Wheel	n/a	n/a	n/a
Gas Heat[4]	96	n/a	4508

[1]Coil module weights include the coil noted with 144 aluminum fins per foot, standard tubes, and no water. Refer to the coil selection for exact coil weights.

[2]Electric heat requires a large access or blank module downstream for blow-thru applications.

[3]IFB coils require a large access or blank module downstream.

[4]Length and weight shown for largest MBh heater.

Table 130. Coil availability

Module Type	1/2-inch Coils	5/8-inch Coils
Small	2–6 rows	1–6 rows
Medium	n/a	n/a
Extended-medium	2–8 rows	1–6 rows
Medium-large	2–8 rows	1–10 rows
-with access	2–8 rows	1–6 rows
Large horizontal	n/a	n/a

See Table 143 on page 90 for drainpan cleaning access availability with coil installed in a module.

Table 131. Filter data

Filter Type	Area (ft²)	Qty–Size (in.)
Flat (2 in., 4 in., or 2 in./4 in.) *(Traq™ mixing boxes use flat filters)*	102.80	12–16 × 25 20–20 × 25
Angled or mixing box (2 in. or 4 in.)	161.10	40–25 × 20 8–20 × 20
Bag or cartridge, 2-in. Prefilters	106.20	20–20 × 20 12–24 × 12 8–24 × 20
HEPA	93.00	5–30 × 24 15–24 × 24 4–24 x 12

2-inch filters available in permanent, throwaway, or pleated media; 4-inch filters available in pleated media, 65%, 85%, or 95% efficiency; Bag or cartridge filters available in 65%, 85%, or 95% efficiency, HEPA filers 99.97% efficient.

Table 134. Damper areas

Module Type	Area (ft²)
Mixing box - Airfoil blade	
-Top, back, bottom	41.76
-Side	24.67
Mixing box - Traq damper	
-Top, back, bottom	25.66
Internal face-and-bypass	
-Face	81.06
-Bypass	19.29
External face-and-bypass	
-Face	100.35
-Bypass	24.90
Face damper	100.35

Table 135. Fan module weights[1]

	Casing Construction	
Fan type	Single-wall	Double-wall
FC Fans	4455	4868
AF Fans	5189	6014
Vaneaxial	n/a	n/a
Plenum	4665	5077

[1]Fan module weights (pounds) include a high-efficiency, open and drip-proof (ODP) motor.

Table 132. Fan data

	Housed Fans						Plenum Fans	Vaneaxial Fans	
Fan Characteristic	A100	B100	D100	E100	F100	G100	100P	100Q/V	100R/W
Size/type	40 FC	40 FC	44 AF	44 AF	40 AF	40 AF	64.75 AF	n/a	n/a
Max rpm	550	600	850	1150	1200	1350	791	n/a	n/a
ODP motor hp range	15–40	25–75	25–40	25–100	25–60	25–100	10–75	n/a	n/a
Outlet area (ft²)	17.32	17.32	17.06	17.06	17.28	17.28	n/a	n/a	n/a
Blast area (ft²)	17.169	17.169	13.674	13.649	11.125	11.125	n/a	n/a	n/a
Bearing size (in.)	2.4375	2.4375	2.9375	2.9375	2.1875	2.4375	2.9375	n/a	n/a
Shaft size (in.)	2.4375	2.4375	2.9375	3.1875	2.75	2.9375	2.9375	n/a	n/a

Table 133. Coil data

Coil Type	Rows	Fin Type	Area (ft²)	Qty–Size (in.)
1/2-inch unit coils (UW, UU, UF)	2 to 8	Aluminum	100.36	2–51.25 × 141
5/8-inch unit coils				
-W, WD, 5D	4 to 10	Aluminum	99.88	2–51 × 141
-W, WD, 5D	4 to 8	Copper	99.88	2–51 × 141
-5W	1 to 2	Aluminum or Copper	99.88	2–51 × 141
-W	3	Aluminum or Copper	99.88	2–51 × 141
-W	1	Aluminum or Copper	96.94	3–33 × 141
-W, WD	10	Copper	96.94	3–33 × 141
-5A, F, K, D, DD	All available rows	Aluminum or Copper	96.94	3–33 × 141
1-inch unit coils (N, NS)	1	Aluminum or Copper	96.94	3–33 × 141
Modified coils (W, WD, 5W, 5A, F, K, D, DD, N, NS)	All available rows	Aluminum or Copper	76.38	2–24 × 141 1–30 × 141

General Data
Unit Size 120

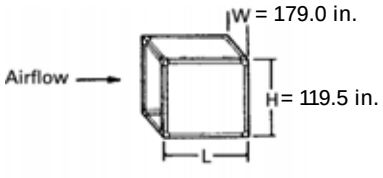


Table 136. Module dimensions

Module Type	Length (in.)	Weight (lb) - single wall	Weight (lb) - double-wall
Intake	29.50	n/a	2326
Mixing box			
-with angled filters	60.00	2156	2387
-without angled filters	60.00	1825	2056
-with Traq™ dampers	96.00	1867	2328
-with Traq™ dampers and filters	96.00	2083	2544
Blender	60.00	1273	1665
Filters			
-2-in. angled	29.50	960	1082
-4-in. angled	29.50	1063	1185
-Cartridge (6-in. or 12-in.) or short bag (18-in.)	29.50	1054	1175
-2-in. flat	14.50	688	748
-4-in. flat	14.50	719	779
-2-in. and 4-in. high-efficiency flat	14.50	781	841
-2-in. or 4-in. flat open return	4.25	247	247
-HEPA	60.00	n/a	2740
-Long bag (30-in. bag)	60.00	1373	1635
Access or blank			
-Small horizontal	14.50	567	605
-Medium horizontal	n/a	n/a	n/a
-Extended-medium horizontal	20.00	586	638
-Medium-large horizontal	29.50	752	828
-Large horizontal or turning	60.00	1230	1384
-Extra-large horizontal or turning	96.00	1229	1686
F**ace-and-bypass damper**			
-External	L=29.50 H=124.58	1519	1623
-Internal	20.00	1363	1467
-Face damper only	20.00	1311	1415
Coil[1]			
-Small horizontal (with 2-row UW)	14.50	n/a	1333
-Medium horizontal (with 8-row UW)	n/a	n/a	n/a
-Extended-medium horizontal (with 8-row UW)	20.00	n/a	2721
-Medium-large horizontal (with 10-row W)	29.50	n/a	5287
-Large horizontal or vertical (with 10-row W)	n/a	n/a	n/a
-Electric heat[2]	n/a	n/a	n/a
-Integral face-and-bypass (IFB) coil[3]	29.50	2264	2371
-Multizone/double-duct	n/a	n/a	n/a
Humidifier	43.50	n/a	1898
Moisture eliminator	14.50	n/a	2061
Fan	96.00	See Table 142 for fan module weights	
Diffuser	60.00	1377	1684
Discharge plenum			
-Horizontal	60.00	n/a	1919
-Vertical	n/a	n/a	n/a
Silencer			
-3 feet	36	n/a	2891
-5 feet	60	n/a	4516
Energy Wheel	n/a	n/a	n/a
Gas Heat[4]	96	n/a	4646

[1]Coil module weights include the coil noted with 144 aluminum fins per foot, standard tubes, and no water. Refer to the coil selection for exact coil weights.

[2]Electric heat requires a large access or blank module downstream for blow-thru applications.

[3]IFB coils require a large access or blank module downstream.

[4]Length and weight shown for largest MBh heater.

Table 137. Coil availability

Module Type	1/2-Inch Coils	5/8-Inch Coils
Small	2–6 rows	1–6 rows
Medium	n/a	n/a
Extended-medium	2–8 rows	1–6 rows
Medium-large	2–8 rows	1–10 rows
-with access	2–8 rows	1–6 rows
Large horizontal	n/a	n/a

See Table 143 on page 90 for drainpan cleaning access availability with coil installed in a module.

Table 138. Filter data

Filter Type	Area (ft²)	Qty–Size (in.)
Flat (2 in., 4 in., or 2 in./4 in.)	122.20	4–16 × 25
(Traq™ mixing boxes use flat filters)		32–20 × 25
Angled or mixing box (2 in. or 4 in.)	194.40	56–25 × 20
Bag or cartridge, 2-in. Prefilters	125.80	16–20 × 20
		14–24 × 12
		16–24 × 20
HEPA	113.00	6–30 × 24
		15–24 × 30
		4–24 x 12

2-inch filters available in permanent, throwaway, or pleated media; 4-inch filters available in pleated media, 65%, 85%, or 95% efficiency; Bag or cartridge filters available in 65%, 85%, or 95% efficiency, HEPA filers 99.97% efficient.

Table 141. Damper areas

Module Type	Area (ft²)
Mixing box - Airfoil blade	
-Top, back, bottom	50.52
-Side	28.50
Mixing box - Traq damper	
-Top, back, bottom	25.66
Internal face-and-bypass	
-Face	96.62
-Bypass	22.99
External face-and-bypass	
-Face	119.62
-Bypass	29.68
Face damper	119.62

Table 142. Fan module weights[1]

	Casing Construction	
Fan type	Single-wall	Double-wall
FC Fans	4587	5044
AF Fans	5732	6629
Vaneaxial	n/a	n/a
Plenum	5066	5523

[1]Fan module weights (pounds) include a high-efficiency, open and drip-proof (ODP) motor.

Table 139. Fan data

	Housed Fans						Plenum Fans	Vaneaxial Fans	
Fan Characteristic	A120	B120	D120	E120	F120	G120	120P	Q/V	R/W
Size/type	40 FC	40 FC	49 AF	49 AF	44 AF	44 AF	64.75 AF	n/a	n/a
Max rpm	550	600	800	1100	850	1150	791	n/a	n/a
ODP motor hp range	15–40	25–75	30-75	30–125	30–40	30–125	10–75	n/a	n/a
Outlet area (ft²)	17.32	17.32	21.43	21.43	17.06	17.06	n/a	n/a	n/a
Blast area (ft²)	17.169	17.169	16.992	16.992	13.674	13.649	n/a	n/a	n/a
Bearing size (in.)	2.4375	2.9375	2.75	2.9375	2.9375	2.9375	2.9375	n/a	n/a
Shaft size (in.)	2.4375	2.9375	2.75	2.9375	2.9375	2.9375	2.9375	n/a	n/a

Table 140. Coil data

Coil Type	Rows	Fin Type	Area (ft²)	Qty–Size (in.)
1/2-inch unit coils (UW, UU, UF)	2 to 8	Aluminum	119.58	2–51.25 × 168
5/8-inch unit coils				
-W, WD, 5D	4 to 10	Aluminum	119.00	2–51 × 168
-5W	4 to 8	Copper	119.00	2–51 × 168
-W	1 to 2	Aluminum or Copper	119.00	2–51 × 168
-W	3	Aluminum or Copper	119.00	2–51 × 168
-W, WD	1	Aluminum or Copper	115.50	3–33 × 168
-5W	10	Copper	115.50	3–33 × 168
-5A, F, K, D, DD	All available rows	Aluminum or Copper	115.50	3–33 × 168
1-inch unit coils (N, NS)	1	Aluminum or Copper	99.00	3–33 × 144
Modified coils (W, WD, 5W, 5A, F, K, D, DD, N, NS)	All available rows	Aluminum or Copper	91.00	2–24 × 168 1–30 × 168

Coil Data

Drain Pans

Table 143. Drain pan cleaning access availability with coil installed in a module

Unit Size	Coil Space (inches)				
	Small	Medium	Extended-Medium	Medium-Large	Large
3	7	11.5	15		22.25
6	7	11.5	15		24.75
8	7	11.5	15	20.5	30
10	7	11.5	15	20.5	30
12	7	11.5	15	20.5	30
14	7	11.5	15	20.5	30
17	7	11.5	15	20.5	30
21	7	11.5	15	20.5	30
25	7	11.5	15	20.5	36
30	7	11.5	15	20.5	36
35	6.5	11	15	24.5	43
40	6.5	11	15	24.5	43
50	9.5		15	24.5	43
57	9.5		15	24.5	43
66	9.5		15	24.5	
80	9.5		15	24.5	
100	9.5		15	24.5	
120	9.5		15	24.5	

Table 144. Coil Depth by Rows (inches)

Tube Diameter	Coil Rows							
	1	2	3	4	6	8	10	12
1 inch	5.25	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1/2 inch	n/a	5.7	n/a	7.9	10.1	12.2	n/a	n/a
5/8 inch	4	6.5	8	9.5	12.5	15.5	18.5	21.5

Example: In a size 30 with 6-row W coil in a medium-large coil module, there would be 8 inches of drainpan exposed beyond the coil casing for cleaning access.

Connection Diameters for Hydronic and Steam Coils

Table 145. Water coils with 1/2-inch diameter

Coil Type	Rows	Unit Sizes	Quantity	Connection Diameter (inches)		
				Supply	Return	Drain/Vent
UW	2, 4, 6, 8	3–10	1	1.50	1.50	0.38
		12–17	1	2.00	2.00	0.38
		21–40	1	2.50	2.50	0.38
		50–66	2	2.00	2.00	0.38
		80-120	2	2.50	2.50	0.38
UU	4, 8	12–40	1	2.50	2.50	0.38
		50–120	2	2.50	2.50	0.38

Note: All connections have external threads.

Table 146. Water coils with 5/8-inch tubes

Coil Type	Rows	Header Height (inches)	Connection Diameter (inches)		
			Supply	Return	Drain/Vent
5W	1	12–21	1.25	1.25	0.38
		24–54	1.50	1.50	0.38
	2	12–27	2.00	2.00	0.38
		30–54	2.50	2.50	0.38
W	1	12	1.25	1.25	0.50
		18–33	2.50	2.50	0.50
	4, 6, 8, 10	12–27	2.00	2.00	0.38
		30–55.5	2.50	2.50	0.38
WA	1	12	1.25	1.25	0.50
		18–33	2.50	2.50	0.50
5A	2	12–24	2.00	2.00	0.38
		30–33	2.50	2.50	0.38
WD, 5D	6, 8, 10	18–55.5	2.50	2.50	0.38
P2	2, 4, 6	12–30	0.75	0.75	0.50
P4	2, 4, 6, 8	12–30	1.00	1.00	0.50
P8	4, 8	18–30	1.25	1.25	0.50
DD*	4, 6, 8, 10	12–33	2.50	2.50	0.50
D*	4, 6, 8, 10	12–24	2.00	2.00	0.38
		30–33	2.50	2.50	0.38
K	2, 4, 6, 8, 10	12–24	2.00	2.00	0.38
		30–54	2.50	2.50	0.38
TT	1	12–30	0.75	0.75	n/a
	2	12–33	0.75	0.75	n/a

Note: 5A, 5W, W (4–10 row), D, K, WD, and 5D connections have external threads; and, W (1 row), WA, P2, P4, P8, DD, and TT connections have internal threads. **DD and D coils have intermediate headers with 0.5 inch drain/vent connection diameter.

Table 147. Steam coils with 1-inch tubes

Coil Type	Rows	Header Height (inches)	Connection Diameter (inches)		
			Supply	Return	Drain/Vent
N, NS	1	12	1.50	1.00	1.00
		18	2.00	1.00	1.00
		24	2.50	1.25	1.25
		30–33	3.00	1.25	1.25

Note: All connections have internal threads.

Refrigerant Coil Connections

Table 148. Type UF refrigerant coil connection sizes for unit sizes 3 to 50

Unit Size	Header Height (inches)	Rows	Distributor Tube	Number of Circuits	Circuiting	Connection Diameter (inches)					
						1 Distributor		2 Distributors		4 Distributors	
						Liquid	Suction	Liquid	Suction	Liquid	Suction
3	21	4, 6, 8	0.25	16	Full	n/a	n/a	1.13	1.63	n/a	n/a
			0.19	16	Full	n/a	n/a	1.13	1.63	n/a	n/a
		4, 6	0.25	8	Half	1.13	1.63	0.88	1.38	n/a	n/a
			0.19	8	Half	1.13	1.63	0.63	1.38	n/a	n/a
		4	0.25	4	Quarter	0.88	1.38	0.88	1.38	n/a	n/a
			0.19	4	Quarter	0.63	1.38	0.63	1.38	n/a	n/a
6	23	4, 6, 8	0.25	18	Full	n/a	n/a	1.13	1.63	n/a	n/a
			0.19	18	Full	n/a	n/a	1.13	1.63	n/a	n/a
		4, 6	0.25	9	Half	1.13	1.63	0.88	1.38	n/a	n/a
			0.19	9	Half	1.13	1.63	Note[1]	1.38	n/a	n/a
		4	0.25	4	Quarter	0.88	1.38	0.88	1.38	n/a	n/a
			0.19	4	Quarter	0.63	1.38	0.63	1.38	n/a	n/a
8, 10	27	4, 6, 8	0.25	21	Full	n/a	n/a	Note[2]	1.63	n/a	n/a
			0.19	21	Full	n/a	n/a	1.13	1.63	n/a	n/a
		4, 6	0.25	10	Half	1.13	1.63	0.88	1.38	n/a	n/a
			0.19	10	Half	1.13	1.63	0.88	1.38	n/a	n/a
		4	0.25	5	Quarter	0.88	1.38	0.88	1.38	n/a	n/a
			0.19	5	Quarter	0.88	1.38	0.63	1.38	n/a	n/a
12	32	4, 6, 8	0.25	25	Full	n/a	n/a	1.38	1.63	n/a	n/a
			0.19	25	Full	n/a	n/a	1.13	1.63	n/a	n/a
		4, 6	0.25	12	Half	1.38	1.63	1.13	1.38	n/a	n/a
			0.19	12	Half	1.13	1.63	0.88	1.38	n/a	n/a
		4	0.25	6	Quarter	1.13	1.38	0.88	1.38	n/a	n/a
			0.19	6	Quarter	0.88	1.38	0.63	1.38	n/a	n/a
14	35	4, 6, 8	0.25	27	Full	n/a	n/a	1.38	1.63	n/a	n/a
			0.19	27	Full	n/a	n/a	1.13	1.63	n/a	n/a
		4, 6	0.25	13	Half	1.38	1.63	1.13	1.38	n/a	n/a
			0.19	13	Half	1.13	1.63	0.88	1.38	n/a	n/a
17	37	4, 6, 8	0.25	29	Full	n/a	n/a	n/a	n/a	1.13	Note[4]
			0.19	29	Full	n/a	n/a	n/a	n/a	Note[3]	
		4, 6	0.25	14	Half	n/a	n/a	1.13	1.38	n/a	n/a
			0.19	14	Half	n/a	n/a	0.88	1.38	n/a	n/a
21	45	4, 6, 8	0.25	35	Full	n/a	n/a	n/a	n/a	1.13	1.63
			0.19	35	Full	n/a	n/a	n/a	n/a	1.13	1.63
		4, 6	0.25	17	Half	n/a	n/a	1.13	1.63	0.88	1.38
			0.19	17	Half	n/a	n/a	1.13	1.63	Note[5]	1.38
25, 30	51	4, 6, 8	0.25	40	Full	n/a	n/a	n/a	n/a	1.13	1.63
			0.19	40	Full	n/a	n/a	n/a	n/a	1.13	1.63
		4, 6	0.25	20	Half	n/a	n/a	1.13	1.63	0.88	1.38
			0.19	20	Half	n/a	n/a	1.13	1.63	0.88	1.38
35, 40	57	4, 6, 8	0.25	45	Full	n/a	n/a	n/a	n/a	1.38	1.63
			0.19	45	Full	n/a	n/a	n/a	n/a	1.13	1.63
		4, 6	0.25	22	Half	n/a	n/a	1.38	1.63	Note[6]	1.38
			0.19	22	Half	n/a	n/a	1.13	1.63	0.88	1.38
50	32, 32	4, 6, 8	0.25	50	Full	n/a	n/a	n/a	n/a	1.38	1.63
			0.19	50	Full	n/a	n/a	n/a	n/a	1.13	1.63
		4, 6	0.25	24	Half	n/a	n/a	1.38	1.63	1.13	1.38
			0.19	24	Half	n/a	n/a	1.13	1.63	0.88	1.38
		4	0.25	12	Qtr.	n/a	n/a	1.13	1.38	0.88	1.38
			0.19	12	Qtr.	n/a	n/a	0.88	1.38	0.63	1.38

1. One connection is 0.63 inch and one is 0.88 inch. **2**. One connection is 1.13 inches and one is 1.38 inches. **3.** Three connections are 0.88 inch and one is 1.13 inches

4. Three connections are 1.38 inches and one is 1.63 inches. **5**. Three connections are 0.63 inch and one is 0.88 inches. **6**. Two connections are 0.88 and two are 1.13 inches

Table 149. Type UF refrigerant coil connections sizes for unit sizes 57 to 120

Unit Size	Header Height (inches)	Rows	Distributor Tube	Number of Circuits	Circuiting	Connection Diameter (inches)			
						4 Distributor		8 Distributors	
						Liquid	Suction	Liquid	Suction
57, 66	37, 37	4, 6, 8	0.25	58	Full	n/a	n/a	1.13	Note[1]
			0.19	58	Full	n/a	n/a	Note[2]	Note[1]
		4, 6, 8	0.25	28	Half	1.13	1.38	n/a	n/a
			0.19	28	Half	0.88	1.38	n/a	n/a
80	45, 45	4, 6, 8	0.25	70	Full	n/a	n/a	1.13	1.63
			0.19	70	Full	n/a	n/a	1.13	1.63
		4, 6, 8	0.25	34	Half	1.13	1.63	0.88	1.38
			0.19	34	Half	1.13	1.63	Note[3]	1.38
100, 120	51, 51	4, 6, 8	0.25	80	Full	n/a	n/a	1.13	1.63
			0.19	80	Full	n/a	n/a	1.13	1.63
		4, 6, 8	0.25	40	Half	1.13	1.63	0.88	1.38
			0.19	40	Half	1.13	1.63	0.88	1.38

1. Six connections are 1.38 inches and two are 1.63 inches. **2**. Six connections are 0.88 inches and two are 1.13 inches. **3**. Six connections are 0.63 inch and two are 0.88 inch.

Table 150. Type F refrigerant coil connection sizes with 5/8-inch tubes

Header Height (inches)	Circuiting	Number of Circuits	Connection Diameter[1] (inches)			
			1 Distributor		2 Distributors	
			Liquid	Suction	Liquid	Suction
12	Full	8	1.13	2.13	0.88	1.63
	Half	4	0.88	1.63	0.88	1.38
	Quarter	2	0.88	1.38	0.63	0.63
	Eighth	1	0.63	0.63	n/a	n/a
	Sixteenth	n/a	n/a	n/a	n/a	n/a
18	Full	12	1.38	2.13	1.13	2.13
	Half	6	1.13	2.13	0.88	1.63
	Quarter	3	0.88	1.63	n/a	n/a
	Eighth	2	0.88	1.38	0.63	0.63
	Sixteenth	1	0.63	0.63	n/a	n/a
24	Full	16	n/a	n/a	1.13	2.13
	Half	8	1.13	2.13	0.88	1.63
	Quarter	4	0.88	1.63	0.88	1.38
	Eighth	2	0.88	1.38	0.63	0.63
30	Full	20	n/a	n/a	1.38	2.13
	Half	10	1.38	2.13	0.88	2.13
	Quarter	5	0.88	2.13	n/a	n/a
	Eighth	4	0.88	1.63	0.88	1.38
	Sixteenth	2	0.88	1.38	0.63	0.63
33	Full	22	n/a	n/a	1.38	2.13
	Half	11	1.38	2.13	Note[2]	2.13
	Quarter	7	1.13	2.13	0.88	1.63
	Eighth	3	0.88	1.63	n/a	n/a

1. Same-end connections only. **2**. A six-circuit connection is 1.13 inches and a five-circuit connection is 0.88 inch.

Coil Circuiting

Refrigerant coil circuiting is first defined by how the distributors are arranged on the coil and then by the number of tubes on the coil being fed refrigerant.

Distributor Arrangement

The term *standard circuiting* (available on F and UF coils) means the number of distributors used on a coil is the minimum required to meet capacity. If more than one distributor is required, then the coil is horizontally split so sections of the coil can be de-energized to unload the coil.

The term *horizontally split* circuiting (available on F and UF coils) means that at a minimum, each coil (or each coil in a bank) will have two or more distributors per coil. As each coil is horizontally split, sections of the coil can be de-energized to unload the coil.

The term *intertwined circuiting* (available only on UF coils) means that at a minimum each coil (or each coil in a bank) will have two or more distributors per coil. Since each distributor is circuited from the top to the bottom of the coil, the full face of the coil remains energized even if a circuit is de-energized to unload the coil. If four distributors are used on a coil, then the coil is first horizontally split, with the top half of the coil intertwined using two distributors, and the bottom half of the coil intertwined using the other two distributors.

Distributor Circuiting

The terms *full, half, quarter, eighth, and sixteenth* refers to the number of tubes on a coil being fed refrigerant by each distributor of that coil. For example, full means that each tube in one row of the coil is being fed refrigerant from the distributor(s), while half means every other tube in a row is being fed refrigerant.

Circuiting Example

Table 151 lists standard distributor arrangements (minimum number or distributors) for UF coils. On a size 12 unit, 6-row coil with half circuiting (every other tube in a row being fed), there is one distributor, with 12 tubes in one row of the coil being fed refrigerant.

Circuiting data is show by unit size and coil rows.

Table 151. Type UF coil standard circuiting

Unit Size	Header Height (inches)	Coil Rows	Full		Half		Quarter	
			Dist Qty	Circuits per Dist	Dist Qty	Circuits per Dist	Dist Qty	Circuits per Dist
3	21	4	2	8, 8	1	8	1	4
		6	2	8, 8	1	8	n/a	n/a
		8	2	8, 8	n/a	n/a	n/a	n/a
6	23	4	2	9, 9	1	9	1	4
		6	2	9, 9	1	9	n/a	n/a
		8	2	9, 9	n/a	n/a	n/a	n/a
8 or 10	27	4	2	10, 11	1	10	1	5
		6	2	10, 11	1	10	n/a	n/a
		8	2	10, 11	n/a	n/a	n/a	n/a
12	32	4 or 6	2	12, 13	1	12	1	6
		8	2	12, 13	n/a	n/a	n/a	n/a
14	35	4 or 6	2	13, 14	1	13	n/a	n/a
		8	2	13, 14	n/a	n/a	n/a	n/a
17	37	4 or 6	4	7, 7, 7, 8	2	7, 7	n/a	n/a
		8	4	7, 7, 7, 8	n/a	n/a	n/a	n/a
21	45	4 or 6	4	8, 9, 9, 9	2	8, 9	n/a	n/a
		8	4	8, 9, 9, 9	n/a	n/a	n/a	n/a
25 or 30	51	4 or 6	4	10, 10, 10, 10	2	10, 10	n/a	n/a
		8	4	10, 10, 10, 10	n/a	n/a	n/a	n/a
35 or 40	57	4 or 6	4	11, 11, 11, 12	2	11, 11	n/a	n/a
		8	4	11, 11, 11, 12	n/a	n/a	n/a	n/a
50	32	4 or 6	2	12, 13	1	12	1	6
		8	2	12, 13	n/a	n/a	n/a	n/a
	32	4 or 6	2	12, 13	1	12	1	6
		8	2	12, 13	n/a	n/a	n/a	n/a
57 or 66	37	4 or 6	4	7, 7, 7, 8	2	7, 7	n/a	n/a
		8	4	7, 7, 7, 8	n/a	n/a	n/a	n/a
	37	4 or 6	4	7, 7, 7, 8	2	7, 7	n/a	n/a
		8	4	7, 7, 7, 8	n/a	n/a	n/a	n/a
80	45	4 or 6	4	8, 9, 9, 9	2	8, 9	n/a	n/a
		8	4	8, 9, 9, 9	n/a	n/a	n/a	n/a
	45	4 or 6	4	8, 9, 9, 9	2	8, 9	n/a	n/a
		8	4	8, 9, 9, 9	n/a	n/a	n/a	n/a
100 or 120	51	4 or 6	4	10, 10, 10, 10	2	10, 10	n/a	n/a
		8	4	10, 10, 10, 10	n/a	n/a	n/a	n/a
	51	4 or 6	4	10, 10, 10, 10	2	10, 10	n/a	n/a
		8	4	10, 10, 10, 10	n/a	n/a	n/a	n/a

Table 152. Type UF coil horizontal split and intertwined circuiting

Unit Size	Header Height (inches)	Coil Rows	Full		Half		Quarter	
			Dist Qty	Circuits per Dist	Dist Qty	Circuits per Dist	Dist Qty	Circuits per Dist
3	21	4	2	8, 8	2	4, 4	2	2, 2
		6	2	8, 8	2	4, 4	n/a	n/a
		8	2	8, 8	n/a	n/a	n/a	n/a
6	23	4	2	9, 9	2	4, 5	2	2, 2
		6	2	9, 9	2	4, 5	n/a	n/a
		8	2	9, 9	n/a	n/a	n/a	n/a
8 or 10	27	4	2	10, 11	2	5, 5	2	2, 3
		6	2	10, 11	2	5, 5	n/a	n/a
		8	2	10, 11	n/a	n/a	n/a	n/a
12	32	4 or 6	2	12, 13	2	6, 6	2	3, 3
		8	2	12, 13	n/a	n/a	n/a	n/a
14	35	4 or 6	2	13, 14	2	6, 7	n/a	n/a
		8	2	13, 14	n/a	n/a	n/a	n/a
17	37	4 or 6	4	7, 7, 7, 8	2	7, 7	n/a	n/a
		8	4	7, 7, 7, 8	n/a	n/a	n/a	n/a
21	45	4 or 6	4	8, 9, 9, 9	4	4, 4, 4, 5	n/a	n/a
		8	4	8, 9, 9, 9	n/a	n/a	n/a	n/a
25 or 30	51	4 or 6	4	10, 10, 10, 10	4	5, 5, 5, 5	n/a	n/a
		8	4	10, 10, 10, 10	n/a	n/a	n/a	n/a
35 or 40	57	4 or 6	4	11, 11, 11, 12	4	5, 5, 6, 6	n/a	n/a
		8	4	11, 11, 11, 12	n/a	n/a	n/a	n/a
50	32	4 or 6	2	12, 13	2	6, 6	2	3, 3
		8	2	12, 13	n/a	n/a	n/a	n/a
	32	4 or 6	2	12, 13	2	6, 6	2	3, 3
		8	2	12, 13	n/a	n/a	n/a	n/a
57 or 66	37	4 or 6	4	7, 7, 7, 8	2	7, 7	n/a	n/a
		8	4	7, 7, 7, 8	n/a	n/a	n/a	n/a
	37	4 or 6	4	7, 7, 7, 8	2	7, 7	n/a	n/a
		8	4	7, 7, 7, 8	n/a	n/a	n/a	n/a
80	45	4 or 6	4	8, 9, 9, 9	4	4, 4, 4, 5	n/a	n/a
		8	4	8, 9, 9, 9	n/a	n/a	n/a	n/a
	45	4 or 6	4	8, 9, 9, 9	4	4, 4, 4, 5	n/a	n/a
		8	4	8, 9, 9, 9	n/a	n/a	n/a	n/a
100 or 120	51	4 or 6	4	10, 10, 10, 10	4	5, 5, 5, 5	n/a	n/a
		8	4	10, 10, 10, 10	n/a	n/a	n/a	n/a
	51	4 or 6	4	10, 10, 10, 10	4	5, 5, 5, 5	n/a	n/a
		8	4	10, 10, 10, 10	n/a	n/a	n/a	n/a

Table 153. Type F coil 5/8-inch standard circuiting

Unit Size	Header Height (inches)	Coil Rows [1]	Full		Half		Quarter		Eighth		Sixteenth	
			Dist Qty	Circuits per Dist	Dist Qty	Circuits per Dist	Dist Qty	Circuits per Dist	Dist Qty	Circuits per Dist	Dist Qty	Circuits per Dist
3 or 6	18	2 or 3	1	12	1	6	1	3	1	2	1	1
		4	1	12	1	6	1	3	1	2	n/a	n/a
		6 or 8	1	12	1	6	1	3	n/a	n/a	n/a	n/a
8 or 10	24	2, 3 or 4	2	8, 8	1	8	1	4	1	2	n/a	n/a
		6 or 8	2	8, 8	1	8	1	4	n/a	n/a	n/a	n/a
12, 14 or 17	33	2 or 3	2	11, 11	1	11	1	7	1	3	n/a	n/a
		4 or 6	2	11, 11	1	11	1	7	n/a	n/a	n/a	n/a
		8	2	11, 11	1	11	1	7	n/a	n/a	n/a	n/a
21	18	2, 3 or 4	1	12	1	6	1	3	1	2	n/a	n/a
		6 or 8	1	12	1	6	1	3	n/a	n/a	n/a	n/a
	24	2, 3 or 4	2	8, 8	1	8	1	4	1	2	n/a	n/a
		6, or 8	2	8, 8	1	8	1	4	n/a	n/a	n/a	n/a
25 or 30	24	2, 3 or 4	2	8, 8	1	8	1	4	1	2	n/a	n/a
		6 or 8	2	8, 8	1	8	1	4	n/a	n/a	n/a	n/a
	24	2, 3 or 4	2	8, 8	1	8	1	4	1	2	n/a	n/a
		6 or 8	2	8, 8	1	8	1	4	n/a	n/a	n/a	n/a
35 or 40	18	2 or 3	1	12	1	6	1	3	1	2	n/a	n/a
		4 or 6	1	12	1	6	1	3	n/a	n/a	n/a	n/a
		8	1	12	1	6	n/a	n/a	n/a	n/a	n/a	n/a
	33	2 or 3	2	11, 11	1	11	1	7	1	3	n/a	n/a
		4 or 6	2	11, 11	1	11	1	7	n/a	n/a	n/a	n/a
		8	2	11, 11	1	11	n/a	n/a	n/a	n/a	n/a	n/a
50	30	2 or 3	2	10, 10	1	10	1	5	1	4	n/a	n/a
		4 or 6	2	10, 10	1	10	1	5	n/a	n/a	n/a	n/a
		8	2	10, 10	1	10	n/a	n/a	n/a	n/a	n/a	n/a
	33	2 or 3	2	11, 11	1	11	1	7	1	3	n/a	n/a
		4 or 6	2	11, 11	1	11	1	7	n/a	n/a	n/a	n/a
		8	2	11, 11	1	11	n/a	n/a	n/a	n/a	n/a	n/a
57 or 66	24	2, 3 or 4	2	8, 8	1	8	1	4	1	2	n/a	n/a
		6 or 8	2	8, 8	1	8	1	4	n/a	n/a	n/a	n/a
	24	2, 3 or 4	2	8, 8	1	8	1	4	1	2	n/a	n/a
		6 or 8	2	8, 8	1	8	1	4	n/a	n/a	n/a	n/a
	24	2, 3 or 4	2	8, 8	1	8	1	4	1	2	n/a	n/a
		6 or 8	2	8, 8	1	8	1	4	n/a	n/a	n/a	n/a
80	24	2 or 3	2	8, 8	1	8	1	4	1	2	n/a	n/a
		4 or 6	2	8, 8	1	8	1	4	n/a	n/a	n/a	n/a
		8	2	8, 8	1	8	n/a	n/a	n/a	n/a	n/a	n/a
	30	2 or 3	2	10, 10	1	10	1	5	1	4	n/a	n/a
		4 or 6	2	10, 10	1	10	1	5	n/a	n/a	n/a	n/a
		8	2	10, 10	1	10	n/a	n/a	n/a	n/a	n/a	n/a
	33	2 or 3	2	11, 11	1	11	1	7	1	3	n/a	n/a
		4 or 6	2	11, 11	1	11	1	7	n/a	n/a	n/a	n/a
		8	2	11, 11	1	11	n/a	n/a	n/a	n/a	n/a	n/a
100 or 120	33	2 or 3	2	11, 11	1	11	1	7	1	3	n/a	n/a
		4 or 6	2	11, 11	1	11	1	7	n/a	n/a	n/a	n/a
		8	2	11, 11	1	11	n/a	n/a	n/a	n/a	n/a	n/a
	33	2 or 3	2	11, 11	1	11	1	7	1	3	n/a	n/a
		4 or 6	2	11, 11	1	11	1	7	n/a	n/a	n/a	n/a
		8	2	11, 11	1	11	n/a	n/a	n/a	n/a	n/a	n/a
	33	2 or 3	2	11, 11	1	11	1	7	1	3	n/a	n/a
		4 or 6	2	11, 11	1	11	1	7	n/a	n/a	n/a	n/a
		8	2	11, 11	1	11	n/a	n/a	n/a	n/a	n/a	n/a

1. Three-row coils are not available in 5/8-inch coils with standard circuiting in the following header heights: 12, 18, 24, 30, and 33-inch with full, 33-inch with quarter, and 30-inch with eighth.

Table 154. Type F coil 5/8-inch horizontal split circuiting

Unit Size	Header Height (inches)	Coil Rows	Full		Half		Quarter		Eighth	
			Dist Qty	Circuits per Dist	Dist Qty	Circuits per Dist	Dist Qty	Circuits per Dist	Dist Qty	Circuits per Dist
3 or 6	18	2, 3, or 4	2	6, 6	2	3, 3	n/a	n/a	2	1, 1
		6 or 8	2	6, 6	2	3, 3	n/a	n/a	n/a	n/a
8 or 10	24	2, 3 or 4	2	8, 8	2	4, 4	2	2, 2	2	1, 1
		6 or 8	2	8, 8	2	4, 4	2	2, 2	n/a	n/a
12, 14 or 17	33	2, 3, 4, or 6	2	11, 11	2	5, 6	2	3, 4	n/a	n/a
		8	2	11, 11	2	5, 6	n/a	n/a	n/a	n/a
21	18	2, 3 or 4	2	6, 6	2	3, 3	n/a	n/a	2	1, 1
		6 or 8	2	6, 6	2	3, 3	n/a	n/a	n/a	n/a
	24	2, 3 or 4	2	8, 8	2	4, 4	n/a	n/a	2	1, 1
		6, or 8	2	8, 8	2	4, 4	n/a	n/a	n/a	n/a
25 or 30	24	2, 3 or 4	2	8, 8	2	4, 4	2	2, 2	2	1, 1
		6 or 8	2	8, 8	2	4, 4	2	2, 2	n/a	n/a
	24	2, 3 or 4	2	8, 8	2	4, 4	2	2, 2	2	1, 1
		6 or 8	2	8, 8	2	4, 4	2	2, 2	n/a	n/a
35 or 40	18	2, 3, 4, 6 or 8	2	6, 6	2	3, 3	n/a	n/a	n/a	n/a
	33	2, 3, 4, 6 or 8	2	11, 11	2	5, 6	n/a	n/a	n/a	n/a
50	30	2, 3, 4, 6 or 8	2	10, 10	2	5, 5	n/a	n/a	n/a	n/a
	33	2, 3, 4, 6 or 8	2	11, 11	2	5, 6	n/a	n/a	n/a	n/a
57 or 66	24	2, 3 or 4	2	8, 8	2	4, 4	2	2, 2	2	1, 1
		6 or 8	2	8, 8	2	4, 4	2	2, 2	n/a	n/a
	24	2, 3 or 4	2	8, 8	2	4, 4	2	2, 2	2	1, 1
		6 or 8	2	8, 8	2	4, 4	2	2, 2	n/a	n/a
	24	2, 3 or 4	2	8, 8	2	4, 4	2	2, 2	2	1, 1
		6 or 8	2	8, 8	2	4, 4	2	2, 2	n/a	n/a
80	24	2, 3, 4, 6 or 8	2	8, 8	2	4, 4	n/a	n/a	n/a	n/a
	30	2, 3, 4, 6 or 8	2	10, 10	2	5, 5	n/a	n/a	n/a	n/a
	33	2, 3, 4, 6 or 8	2	11, 11	2	5, 6	n/a	n/a	n/a	n/a
100 or 120	33	2, 3, 4, 6 or 8	2	11, 11	2	5, 6	2	3, 4	n/a	n/a
	33	2, 3, 4, 6 or 8	2	11, 11	2	5, 6	2	3, 4	n/a	n/a
	33	2, 3, 4, 6 or 8	2	11, 11	2	5, 6	2	3, 4	n/a	n/a

Table 155. Type F coil modified standard circuiting

Unit Size	Header Height (inches)	Coil Rows	Full		Half		Quarter		Eighth		Sixteenth	
			Dist Qty	Circuits per Dist	Dist Qty	Circuits per Dist	Dist Qty	Circuits per Dist	Dist Qty	Circuits per Dist	Dist Qty	Circuits per Dist
3 or 6	12	2, 3, 4, or 6	1	8	1	4	1	2	1	1	n/a	n/a
		8	1	8	1	4	1	2	n/a	n/a	n/a	n/a
8 or 10	18	2 or 3	1	12	1	6	1	3	1	2	1	1
		4	1	12	1	6	1	3	1	2	n/a	n/a
		6 or 8	1	12	1	6	1	3	n/a	n/a	n/a	n/a
12 or 14	24	2, 3, or 4	2	8, 8	1	8	1	4	1	2	n/a	n/a
		6 or 8	2	8, 8	1	8	1	4	n/a	n/a	n/a	n/a
17	30	2	2	10, 10	1	10	1	5	1	4	1	2
		3 or 4	2	10, 10	1	10	1	5	1	4	n/a	n/a
		6 or 8	2	10, 10	1	10	n/a	n/a	n/a	n/a	n/a	n/a
21	33	2 or 3	2	11, 11	1	11	1	7	1	3	n/a	n/a
		4 or 6	2	11, 11	1	11	1	7	n/a	n/a	n/a	n/a
		8	2	11, 11	1	11	n/a	n/a	n/a	n/a	n/a	n/a
25, 30, 35 or 40	18	2 or 3	1	12	1	6	1	3	1	2	1	1
		4	1	12	1	6	1	3	1	2	n/a	n/a
		6 or 8	1	12	1	6	1	3	n/a	n/a	n/a	n/a
	18	2 or 3	1	12	1	6	1	3	1	2	1	1
		4	1	12	1	6	1	3	1	2	n/a	n/a
		6 or 8	1	12	1	6	1	3	n/a	n/a	n/a	n/a
50	24	2, 3, or 4	2	8, 8	1	8	1	4	1	2	n/a	n/a
		6 or 8	2	8, 8	1	8	1	4	n/a	n/a	n/a	n/a
	24	2, 3, or 4	2	8, 8	1	8	1	4	1	2	n/a	n/a
		6 or 8	2	8, 8	1	8	1	4	n/a	n/a	n/a	n/a
57 or 66	24	2 or 3	2	8, 8	1	8	1	4	1	2	n/a	n/a
		4 or 6	2	8, 8	1	8	1	4	n/a	n/a	n/a	n/a
		8	2	8, 8	1	8	n/a	n/a	n/a	n/a	n/a	n/a
	33	2 or 3	2	11, 11	1	11	1	7	1	3	n/a	n/a
		4 or 6	2	11, 11	1	11	1	7	n/a	n/a	n/a	n/a
		8	2	11, 11	1	11	n/a	n/a	n/a	n/a	n/a	n/a
80	18	2 or 3	1	12	1	6	1	3	1	2	n/a	n/a
		4 or 6	1	12	1	6	1	3	n/a	n/a	n/a	n/a
		8	1	12	1	6	n/a	n/a	n/a	n/a	n/a	n/a
	18	2 or 3	1	12	1	6	1	3	1	2	n/a	n/a
		4 or 6	1	12	1	6	1	3	n/a	n/a	n/a	n/a
		8	1	12	1	6	n/a	n/a	n/a	n/a	n/a	n/a
	33	2 or 3	2	11, 11	1	11	1	7	1	3	n/a	n/a
		4 or 6	2	11, 11	1	11	1	7	n/a	n/a	n/a	n/a
		8	2	11, 11	1	11	n/a	n/a	n/a	n/a	n/a	n/a
100 or 120	24	2 or 3	2	8, 8	1	8	1	4	1	2	n/a	n/a
		4 or 6	2	8, 8	1	8	1	4	n/a	n/a	n/a	n/a
		8	2	8, 8	1	8	n/a	n/a	n/a	n/a	n/a	n/a
	24	2 or 3	2	8, 8	1	8	1	4	1	2	n/a	n/a
		4 or 6	2	8, 8	1	8	1	4	n/a	n/a	n/a	n/a
		8	2	8, 8	1	8	n/a	n/a	n/a	n/a	n/a	n/a
	30	2 or 3	2	10, 10	1	10	1	5	1	4	n/a	n/a
		4 or 6	2	10, 10	1	10	1	5	n/a	n/a	n/a	n/a
		8	2	10, 10	1	10	n/a	n/a	n/a	n/a	n/a	n/a

Table 156. Type F coil modified horizontal split circuiting

Unit Size	Header Height (inches)	Coil Rows	Full		Half		Quarter		Eighth		Sixteenth	
			Dist Qty	Circuits per Dist	Dist Qty	Circuits per Dist	Dist Qty	Circuits per Dist	Dist Qty	Circuits per Dist	Dist Qty	Circuits per Dist
3 or 6	12	2, 3, 4, 6, or 8	2	4, 4	2	2, 2	2	1, 1	n/a	n/a	n/a	n/a
8 or 10	18	2, 3, or 4	2	6, 6	2	3, 3	n/a	n/a	2	1, 1	n/a	n/a
		6 or 8	2	6, 6	2	3, 3	n/a	n/a	n/a	n/a	n/a	n/a
12 or 14	24	2, 3, or 4	2	8, 8	2	4, 4	2	2, 2	2	1, 1	n/a	n/a
		6 or 8	2	8, 8	2	4, 4	2	2, 2	n/a	n/a	n/a	n/a
17	30	2	2	10, 10	2	5, 5	n/a	n/a	2	2, 2	2	1, 1
		3 or 4	2	10, 10	2	5, 5	n/a	n/a	2	2, 2	n/a	n/a
		6 or 8	2	10, 10	2	5, 5	n/a	n/a	n/a	n/a	n/a	n/a
21	33	2, 3, 4, or 6	2	11, 11	2	5, 6	2	3, 4	n/a	n/a	n/a	n/a
		8	2	11, 11	2	5, 6	n/a	n/a	n/a	n/a	n/a	n/a
25, 30, 35 or 40	18	2, 3, or 4	2	6, 6	2	3, 3	n/a	n/a	2	1, 1	n/a	n/a
		6 or 8	2	6, 6	2	3, 3	n/a	n/a	n/a	n/a	n/a	n/a
	18	2, 3, or 4	2	6, 6	2	3, 3	n/a	n/a	2	1, 1	n/a	n/a
		6 or 8	2	6, 6	2	3, 3	n/a	n/a	n/a	n/a	n/a	n/a
50	24	2, 3, or 4	2	8, 8	2	4, 4	2	2, 2	2	1, 1	n/a	n/a
		6 or 8	2	8, 8	2	4, 4	2	2, 2	n/a	n/a	n/a	n/a
	24	2, 3, or 4	2	8, 8	2	4, 4	2	2, 2	2	1, 1	n/a	n/a
		6 or 8	2	8, 8	2	4, 4	2	2, 2	n/a	n/a	n/a	n/a
57 or 66	24	2, 3, 4, or 6	2	8, 8	2	4, 4	2	2, 2	n/a	n/a	n/a	n/a
		8	2	8, 8	2	4, 4	n/a	n/a	n/a	n/a	n/a	n/a
	33	2, 3, 4, or 6	2	11, 11	2	5, 6	2	3, 4	n/a	n/a	n/a	n/a
		8	2	11, 11	2	5, 6	n/a	n/a	n/a	n/a	n/a	n/a
80	18	2, 3, 4, 6, or 8	2	6, 6	2	3, 3	n/a	n/a	n/a	n/a	n/a	n/a
	18	2, 3, 4, 6, or 8	2	6, 6	2	3, 3	n/a	n/a	n/a	n/a	n/a	n/a
	33	2, 3, 4, 6, or 8	2	11, 11	2	5, 6	n/a	n/a	n/a	n/a	n/a	n/a
100 or 120	24	2 or 3	2	8, 8	2	4, 4	n/a	n/a	2	1, 1	n/a	n/a
		4, 6, or 8	2	8, 8	2	4, 4	n/a	n/a	n/a	n/a	n/a	n/a
	24	2 or 3	2	8, 8	2	4, 4	n/a	n/a	2	1, 1	n/a	n/a
		4, 6, or 8	2	8, 8	2	4, 4	n/a	n/a	n/a	n/a	n/a	n/a
	30	2 or 3	2	10, 10	2	5, 5	n/a	n/a	2	2, 2	n/a	n/a
		4, 6, or 8	2	10, 10	2	5, 5	n/a	n/a	n/a	n/a	n/a	n/a

Face-Velocity Limits for Moisture Carryover

Cooling coils for the M-Series air handler are available with a wide variety of fin types and materials, including the following, to help optimize their performance:

- 1/2-inch: Delta-Flo™ E and Delta-Flo H aluminum fins
- 5/8-inch: Prima-Flo™ E and Prima-Flo H aluminum fins, and Sigma-Flo™ copper fins

All of these fins are available with variable fin spacing (that is, the spacing can increment by as little as one fin per foot). Also, Delta-Flo H and Prima-Flo H fins are specifically designed to help maximize heat transfer while minimizing moisture carryover.

Figure 77 through Figure 86 detail the moisture carryover limits for each of these fin types. Sigma Flo fin moisture carryover limits based on not exceeding coil row limit by module size. Refer to TOPSS selection program for availability.

Figure 77. Face-velocity limits for moisture carryover with uncoated coils in unit sizes 3 to 10

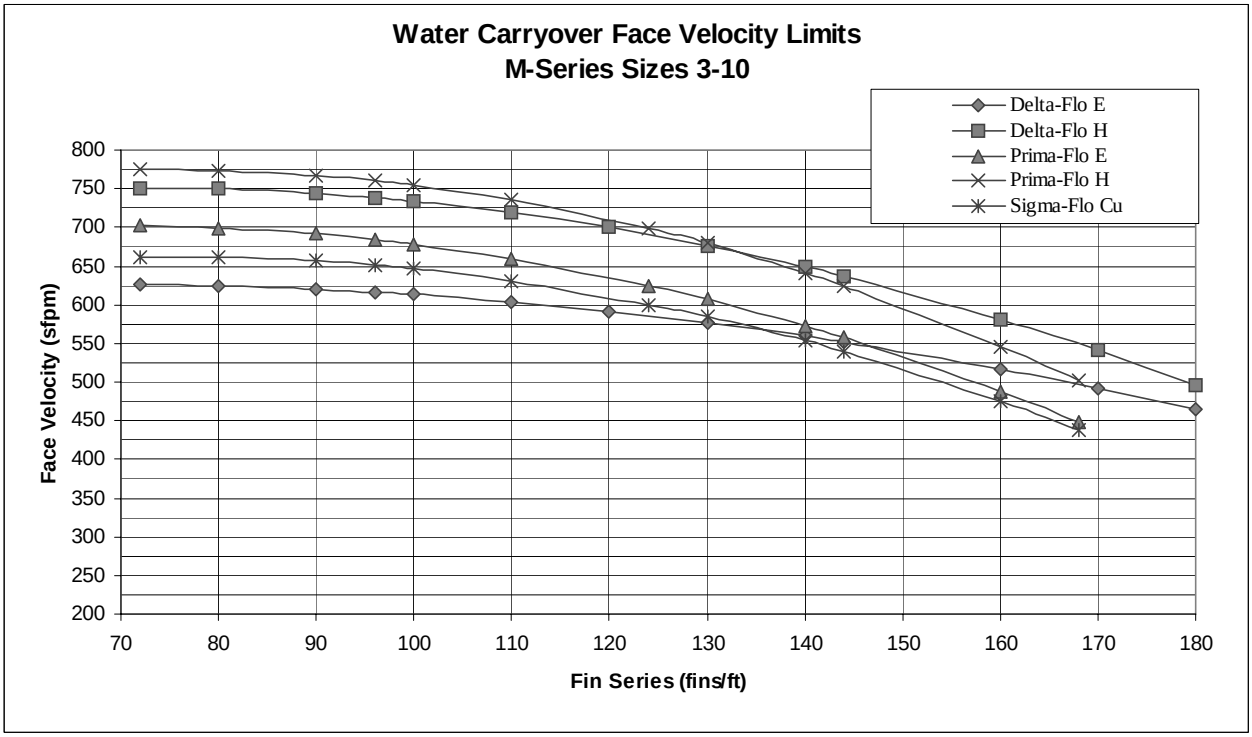


Figure 78. Face-velocity limits for moisture carryover with uncoated coils in unit size 12

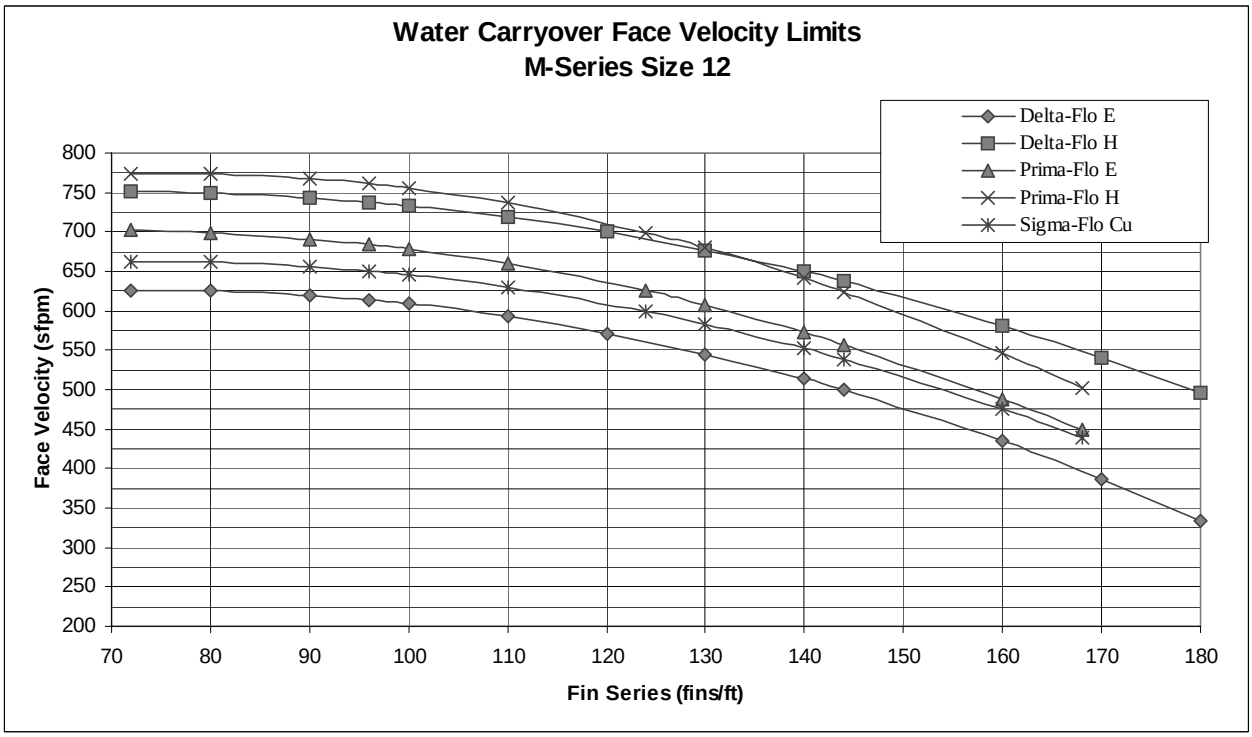


Figure 79. Face velocity limits for moisture carryover with uncoated coils in unit sizes 14 to 17

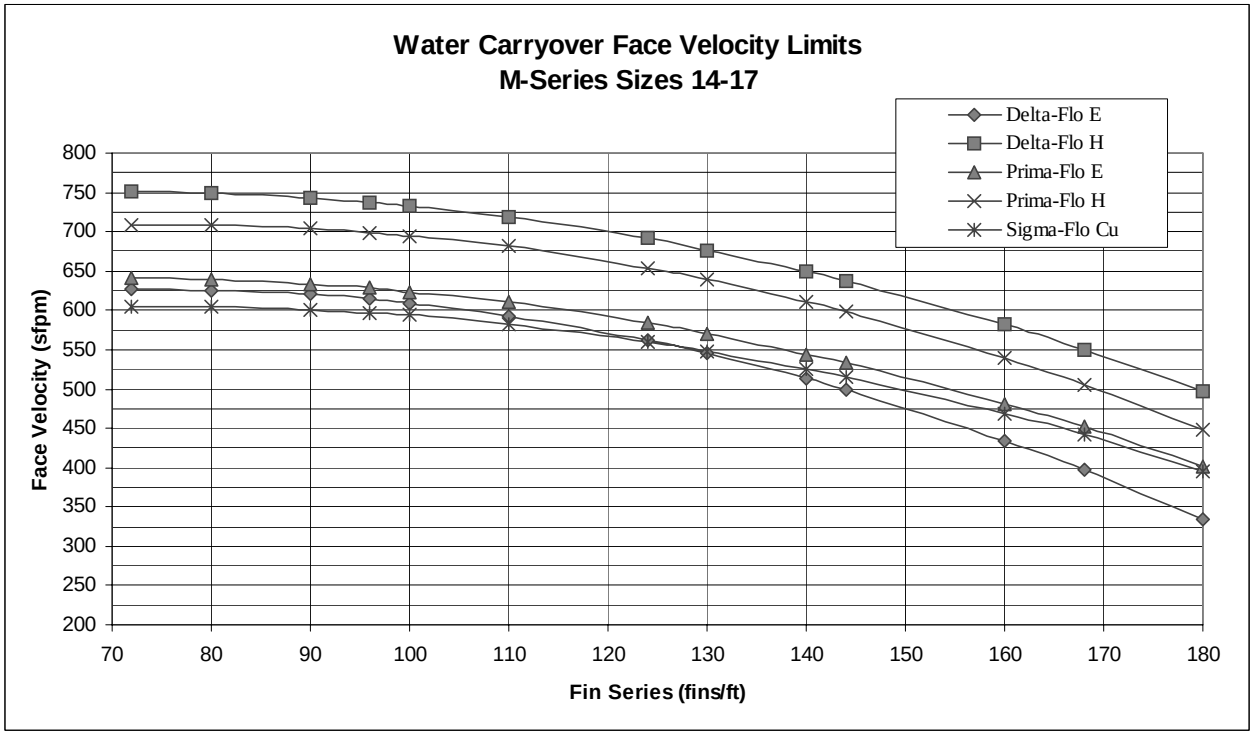


Figure 80. Face velocity limits for moisture carryover with uncoated coils in unit sizes 21 to 30

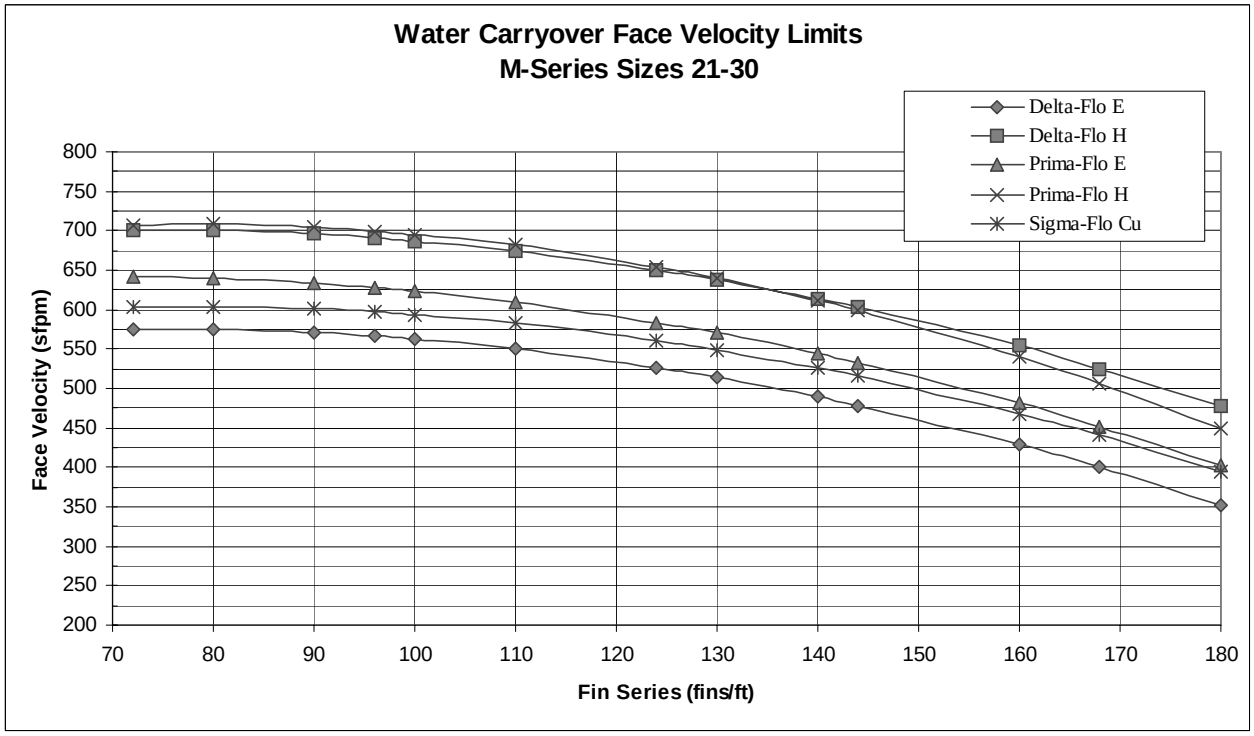


Figure 81. Face velocity limits for moisture carryover with uncoated coils in unit sizes 35 and 40

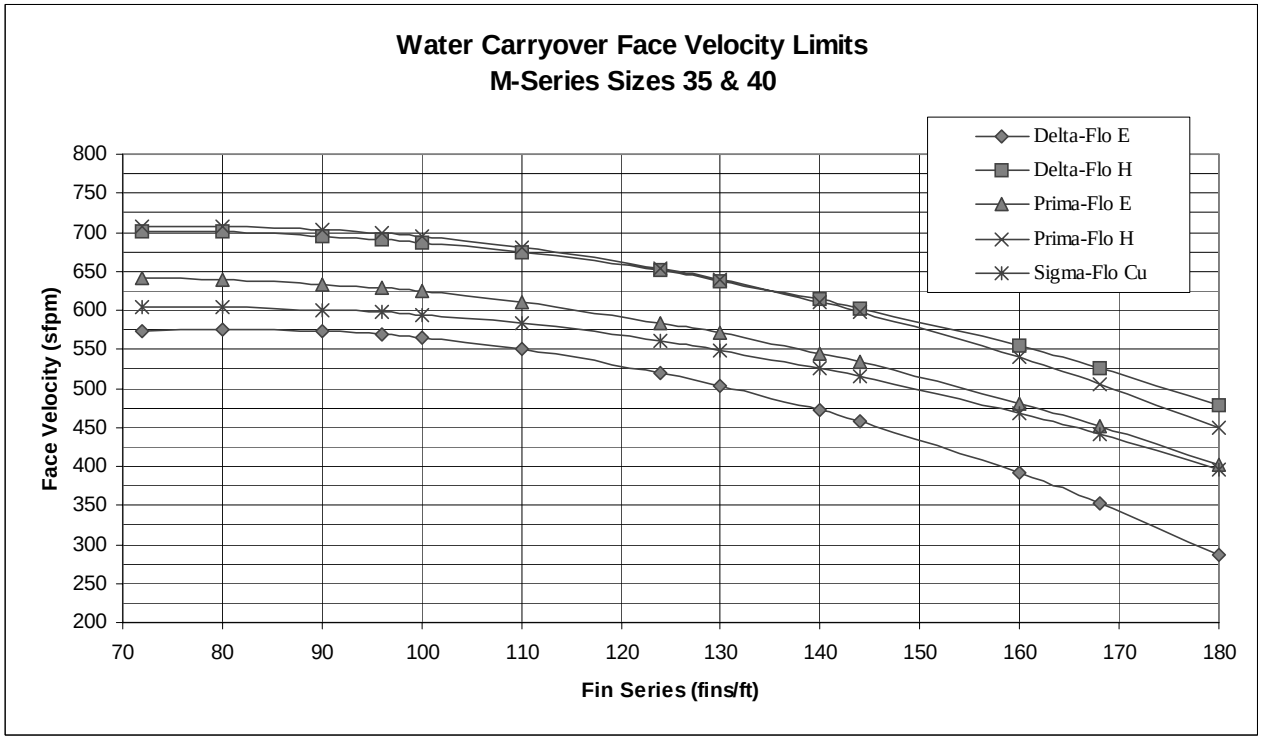


Figure 82. Face velocity limits for moisture carryover with uncoated coils in unit sizes 50 to 57

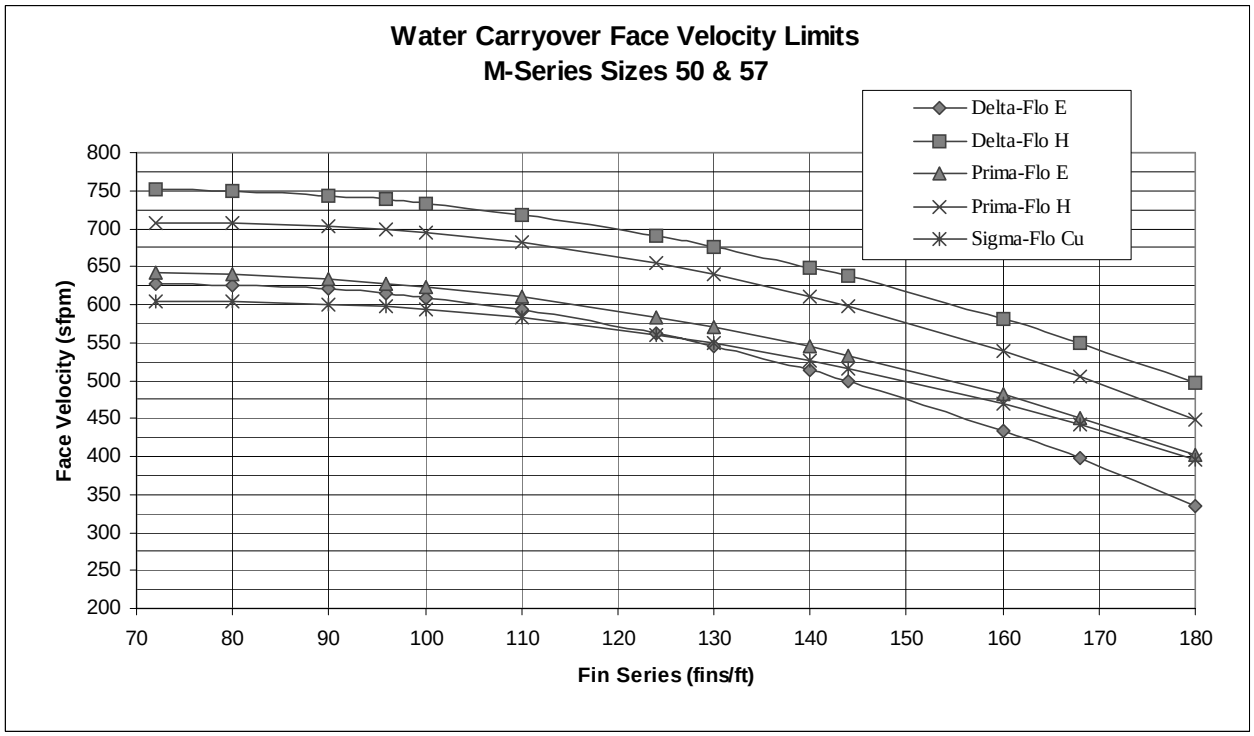


Figure 83. Face velocity limits for moisture carryover with uncoated coils in unit size 66

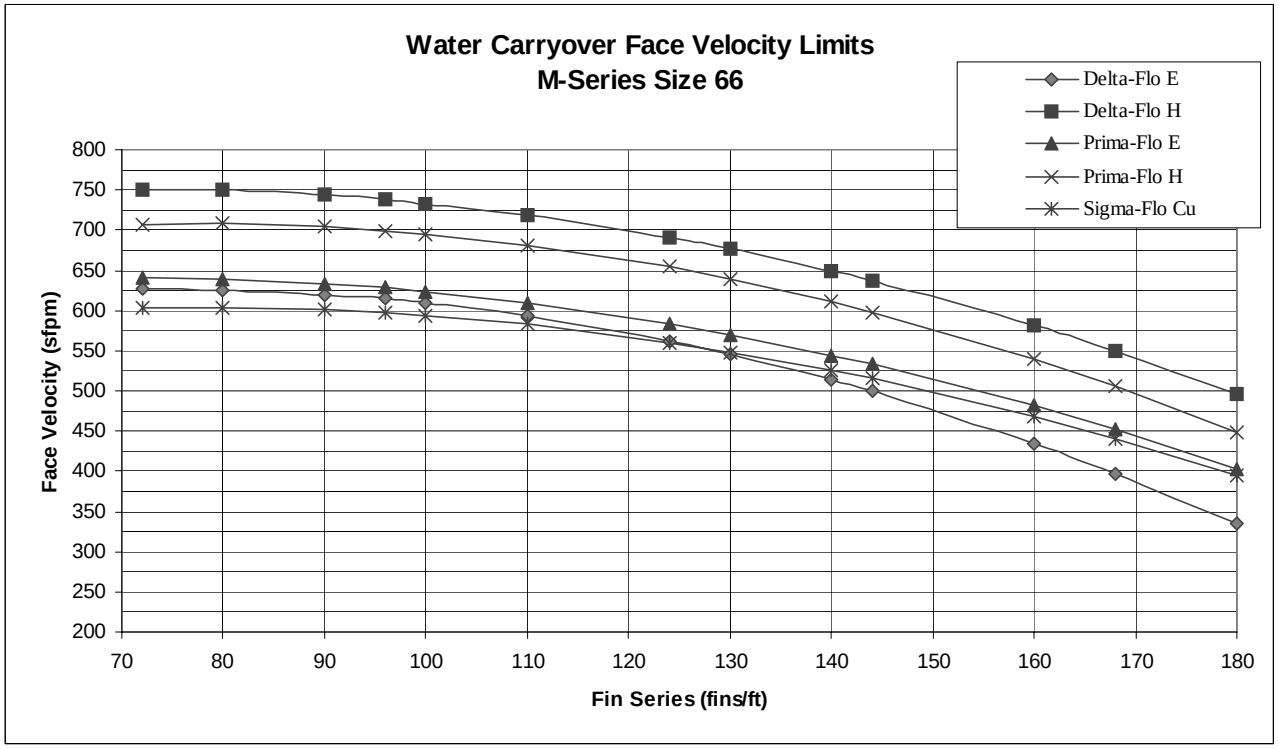


Figure 84. Face velocity limits for moisture carryover with uncoated coils in unit sizes 80 to 120

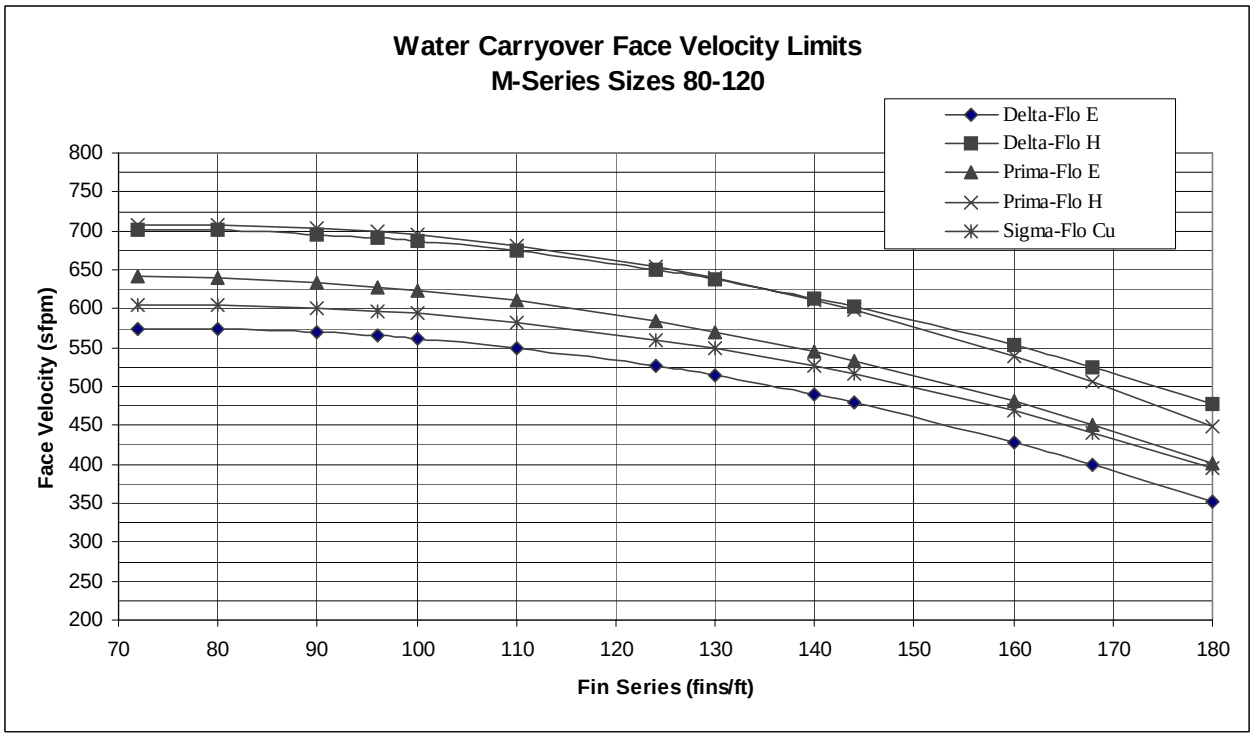


Figure 85. Face-velocity limits for moisture carryover with coated coils in unit sizes 3 to 17, and 50 to 66

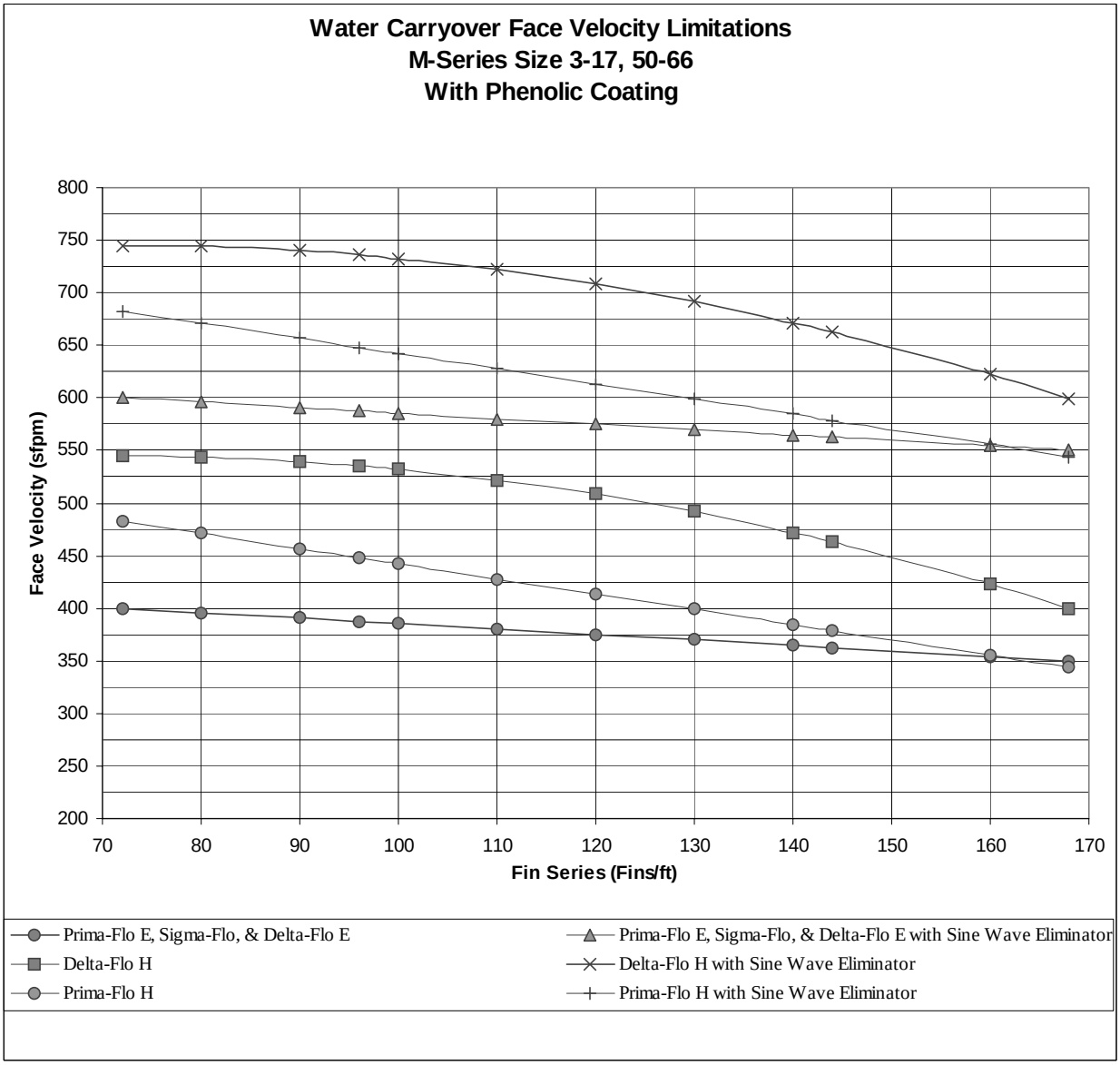
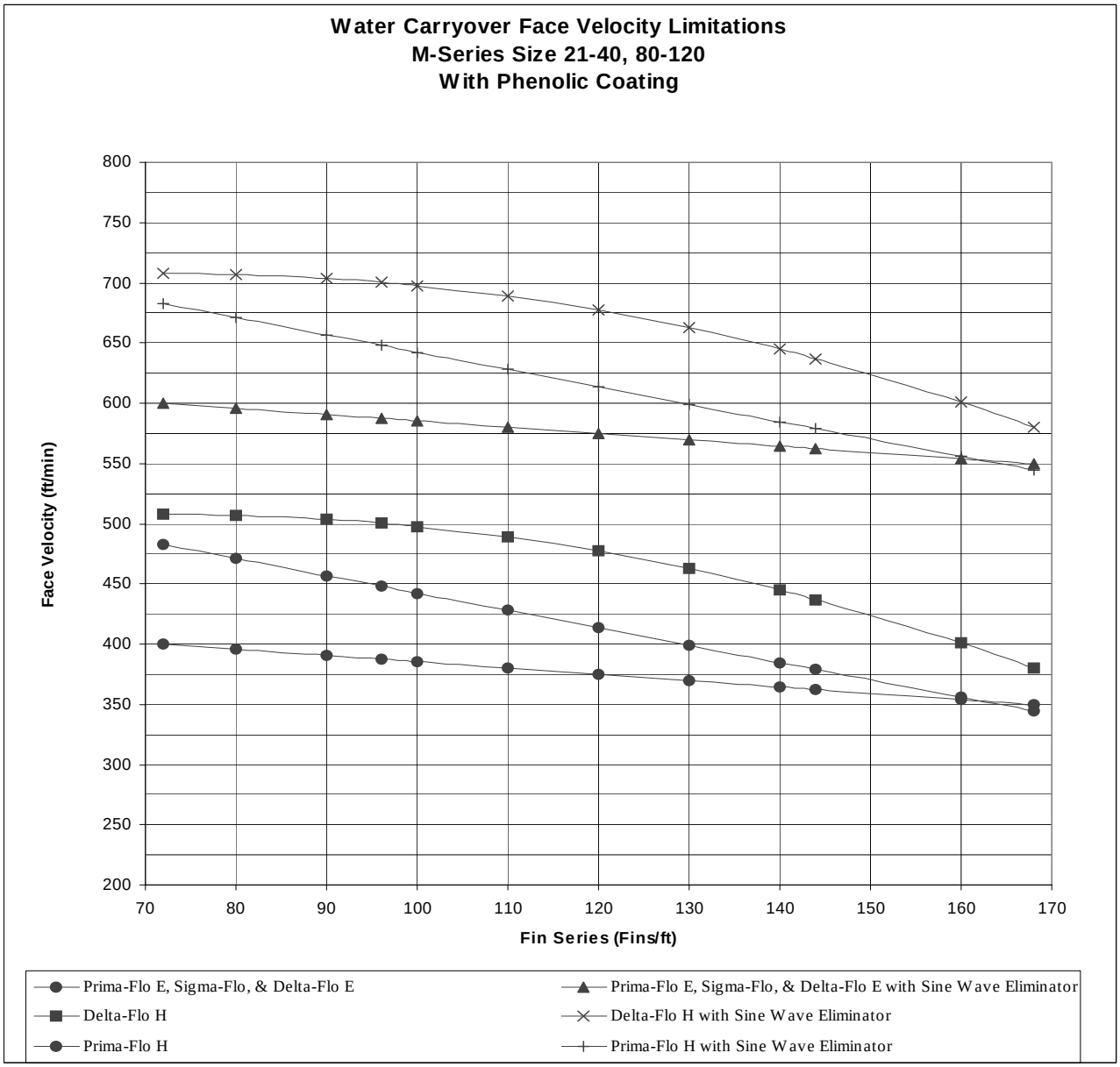


Figure 86. Face-velocity limits for moisture carryover with coated coils in unit sizes 21-40, 80-120



Notes

Module Performance Data

Accessories

Table 157. Accessories performance data

Accessory	Unit Size	Pressure Drop (inches wg.) by Unit Coil Face Velocity (fpm)								
		400	450	500	550	600	650	700	750	800
Moisture Eliminator	All	0.02	0.02	0.03	0.04	0.06	0.08	0.10	0.13	0.16
Humidifier	All	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07
Intake Module	All	0.05	0.06	0.09	0.11	0.12	0.13	0.16	0.18	0.21
Diffuser	3-8	0.13	0.17	0.21	0.26	0.32	0.38	0.44	0.52	0.60
	10-30	0.21	0.26	0.32	0.39	0.46	0.54	0.63	0.72	0.82
	35-120	0.53	0.67	0.83	1.00	1.19	1.40	1.62	1.86	2.12

Blender Module

Table 158. Blender module performance data

Unit Size	Area (sq.ft)	Pressure Drop (inches wg) by Blender Face Velocity (fpm)												
		1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200
3	1.50	0.15	0.18	0.21	0.25	0.29	0.30	0.38	0.43	0.48	0.53	0.59	0.65	0.71
6	2.80	0.14	0.16	0.19	0.23	0.26	0.30	0.35	0.39	0.44	0.49	0.54	0.60	0.65
8	3.30	0.15	0.18	0.12	0.25	0.28	0.33	0.37	0.42	0.47	0.52	0.58	0.64	0.70
10	4.50	0.14	0.17	0.20	0.24	0.27	0.31	0.36	0.40	0.45	0.50	0.56	0.61	0.67
12	5.20	0.15	0.18	0.21	0.25	0.29	0.33	0.38	0.42	0.48	0.53	0.59	0.65	0.71
14	5.90	0.13	0.16	0.19	0.22	0.26	0.29	0.34	0.38	0.42	0.47	0.52	0.58	0.63
17	6.60	0.13	0.16	0.19	0.22	0.26	0.29	0.33	0.38	0.42	0.47	0.52	0.57	0.63
21	9.00	0.13	0.16	0.19	0.22	0.26	0.29	0.33	0.38	0.42	0.47	0.52	0.57	0.63
25	10.40	0.14	0.17	0.21	0.24	0.28	0.32	0.37	0.41	0.47	0.52	0.57	0.63	0.69
30	11.80	0.13	0.16	0.19	0.22	0.26	0.29	0.34	0.38	0.42	0.47	0.52	0.58	0.63
35	13.40	0.13	0.16	0.19	0.22	0.25	0.29	0.33	0.38	0.42	0.47	0.52	0.57	0.63
40	17.70	0.13	0.16	0.19	0.22	0.26	0.29	0.33	0.38	0.42	0.47	0.52	0.57	0.63
50	20.10	0.14	0.16	0.19	0.23	0.26	0.30	0.35	0.39	0.44	0.49	0.54	0.60	0.65
57	22.50	0.15	0.18	0.22	0.25	0.29	0.34	0.38	0.43	0.49	0.54	0.60	0.66	0.73
66	27.60	0.12	0.15	0.18	0.21	0.24	0.28	0.32	0.36	0.40	0.44	0.49	0.54	0.60
80	33.30	0.14	0.17	0.20	0.23	0.27	0.31	0.35	0.40	0.45	0.50	0.55	0.61	0.67
100	39.75	0.14	0.17	0.21	0.24	0.28	0.32	0.37	0.41	0.46	0.52	0.57	0.63	0.69
120	46.80	0.14	0.18	0.21	0.24	0.28	0.33	0.37	0.42	0.47	0.52	0.58	0.64	0.70

Dampers

Energy Wheel Bypass Damper

Table 159. Energy wheel bypass damper

Unit Size	Wheel Size	Static Pressure Drop (inches wg) by Damper Face Velocity (fpm)										
		400	500	600	700	800	900	1000	1100	1200	1400	1600
3	900	0.04	0.07	0.09	0.13	0.17	0.21	0.26	0.32	0.38	0.51	0.67
3	1500	0.04	0.07	0.09	0.13	0.17	0.21	0.26	0.32	0.38	0.51	0.67
6	900	0.04	0.07	0.09	0.13	0.17	0.21	0.26	0.32	0.38	0.51	0.67
6	1500	0.04	0.07	0.09	0.13	0.17	0.21	0.26	0.32	0.38	0.51	0.67
6	3000	0.04	0.06	0.08	0.11	0.15	0.19	0.23	0.28	0.33	0.45	0.59
8	1500	0.04	0.07	0.09	0.13	0.17	0.21	0.26	0.32	0.38	0.51	0.67
8	3000	0.04	0.06	0.08	0.11	0.15	0.19	0.23	0.28	0.33	0.45	0.59
8	4000	0.04	0.06	0.08	0.11	0.14	0.18	0.22	0.27	0.32	0.43	0.57
10	1500	0.04	0.07	0.09	0.13	0.17	0.21	0.26	0.32	0.38	0.51	0.67
10	3000	0.04	0.06	0.08	0.11	0.15	0.19	0.23	0.28	0.33	0.45	0.59
10	4000	0.04	0.06	0.08	0.11	0.14	0.18	0.22	0.27	0.32	0.43	0.57
10	5000	0.03	0.05	0.08	0.11	0.14	0.17	0.22	0.26	0.31	0.42	0.55
12	1500	0.04	0.07	0.09	0.13	0.17	0.21	0.26	0.32	0.38	0.51	0.67
12	3000	0.04	0.06	0.08	0.11	0.15	0.19	0.23	0.28	0.33	0.45	0.59
12	4000	0.04	0.06	0.08	0.11	0.14	0.18	0.22	0.27	0.32	0.43	0.57
12	5000	0.03	0.05	0.08	0.11	0.14	0.17	0.22	0.26	0.31	0.42	0.55
12	6000	0.03	0.05	0.08	0.10	0.14	0.17	0.21	0.26	0.31	0.42	0.54
14	1500	0.04	0.07	0.09	0.13	0.17	0.21	0.26	0.32	0.38	0.51	0.67
14	3000	0.04	0.06	0.08	0.11	0.15	0.19	0.23	0.28	0.33	0.45	0.59
14	4000	0.04	0.06	0.08	0.11	0.14	0.18	0.22	0.27	0.32	0.43	0.57
14	5000	0.03	0.05	0.08	0.11	0.14	0.17	0.22	0.26	0.31	0.42	0.55
14	6000	0.03	0.05	0.08	0.10	0.14	0.17	0.21	0.26	0.31	0.42	0.54
14	7000	0.04	0.06	0.08	0.11	0.15	0.19	0.23	0.28	0.33	0.45	0.58
17	3000	0.04	0.06	0.08	0.11	0.15	0.19	0.23	0.28	0.33	0.45	0.59
17	4000	0.04	0.06	0.08	0.11	0.14	0.18	0.22	0.27	0.32	0.43	0.57
17	5000	0.03	0.05	0.08	0.11	0.14	0.17	0.22	0.26	0.31	0.42	0.55
17	6000	0.03	0.05	0.08	0.10	0.14	0.17	0.21	0.26	0.31	0.42	0.54
17	7000	0.04	0.06	0.08	0.11	0.15	0.19	0.23	0.28	0.33	0.45	0.58
17	8500	0.04	0.06	0.08	0.11	0.14	0.18	0.23	0.27	0.32	0.44	0.58
21	3000	0.04	0.06	0.08	0.11	0.15	0.19	0.23	0.28	0.33	0.45	0.59
21	4000	0.04	0.06	0.08	0.11	0.14	0.18	0.22	0.27	0.32	0.43	0.57
21	5000	0.03	0.05	0.08	0.11	0.14	0.17	0.22	0.26	0.31	0.42	0.55
21	6000	0.03	0.05	0.08	0.10	0.14	0.17	0.21	0.26	0.31	0.42	0.54
21	7000	0.04	0.06	0.08	0.11	0.15	0.19	0.23	0.28	0.33	0.45	0.58
21	8500	0.04	0.06	0.08	0.11	0.14	0.18	0.23	0.27	0.32	0.44	0.58
21	10500	0.02	0.04	0.05	0.07	0.10	0.12	0.15	0.18	0.21	0.29	0.38

Table 159. (continued) Energy wheel bypass damper

Unit Size	Wheel Size	Static Pressure Drop (inches wg) by Damper Face Velocity (fpm)										
		400	500	600	700	800	900	1000	1100	1200	1400	1600
25	4000	0.04	0.06	0.08	0.11	0.14	0.18	0.22	0.27	0.32	0.43	0.57
25	5000	0.03	0.05	0.08	0.11	0.14	0.17	0.22	0.26	0.31	0.42	0.55
25	6000	0.03	0.05	0.08	0.10	0.14	0.17	0.21	0.26	0.31	0.42	0.54
25	7000	0.04	0.06	0.08	0.11	0.15	0.19	0.23	0.28	0.33	0.45	0.58
25	8500	0.04	0.06	0.08	0.11	0.14	0.18	0.23	0.27	0.32	0.44	0.58
25	10500	0.02	0.04	0.05	0.07	0.10	0.12	0.15	0.18	0.21	0.29	0.38
25	12500	0.03	0.04	0.06	0.08	0.10	0.13	0.16	0.19	0.23	0.31	0.41
30	4000	0.04	0.06	0.08	0.11	0.14	0.18	0.22	0.27	0.32	0.43	0.57
30	5000	0.03	0.05	0.08	0.11	0.14	0.17	0.22	0.26	0.31	0.42	0.55
30	6000	0.03	0.05	0.08	0.10	0.14	0.17	0.21	0.26	0.31	0.42	0.54
30	7000	0.04	0.06	0.08	0.11	0.15	0.19	0.23	0.28	0.33	0.45	0.58
30	8500	0.04	0.06	0.08	0.11	0.14	0.18	0.23	0.27	0.32	0.44	0.58
30	10500	0.02	0.04	0.05	0.07	0.10	0.12	0.15	0.18	0.21	0.29	0.38
30	12500	0.03	0.04	0.06	0.08	0.10	0.13	0.16	0.19	0.23	0.31	0.41
30	15000	0.02	0.04	0.06	0.08	0.10	0.13	0.16	0.19	0.22	0.30	0.40
35	5000	0.03	0.05	0.08	0.11	0.14	0.17	0.22	0.26	0.31	0.42	0.55
35	6000	0.03	0.05	0.08	0.10	0.14	0.17	0.21	0.26	0.31	0.42	0.54
35	7000	0.04	0.06	0.08	0.11	0.15	0.19	0.23	0.28	0.33	0.45	0.58
35	8500	0.04	0.06	0.08	0.11	0.14	0.18	0.23	0.27	0.32	0.44	0.58
35	10500	0.02	0.04	0.05	0.07	0.10	0.12	0.15	0.18	0.21	0.29	0.38
35	12500	0.03	0.04	0.06	0.08	0.10	0.13	0.16	0.19	0.23	0.31	0.41
35	15000	0.02	0.04	0.06	0.08	0.10	0.13	0.16	0.19	0.22	0.30	0.40
35	17500	0.02	0.04	0.05	0.07	0.10	0.12	0.15	0.18	0.22	0.30	0.39
40	5000	0.03	0.05	0.08	0.11	0.14	0.17	0.22	0.26	0.31	0.42	0.55
40	6000	0.03	0.05	0.08	0.10	0.14	0.17	0.21	0.26	0.31	0.42	0.54
40	7000	0.04	0.06	0.08	0.11	0.15	0.19	0.23	0.28	0.33	0.45	0.58
40	8500	0.04	0.06	0.08	0.11	0.14	0.18	0.23	0.27	0.32	0.44	0.58
40	10500	0.02	0.04	0.05	0.07	0.10	0.12	0.15	0.18	0.21	0.29	0.38
40	12500	0.03	0.04	0.06	0.08	0.10	0.13	0.16	0.19	0.23	0.31	0.41
40	15000	0.02	0.04	0.06	0.08	0.10	0.13	0.16	0.19	0.22	0.30	0.40
40	17500	0.02	0.04	0.05	0.07	0.10	0.12	0.15	0.18	0.22	0.30	0.39
40	20000	0.02	0.04	0.05	0.07	0.10	0.12	0.15	0.18	0.22	0.29	0.38
50	7000	0.04	0.06	0.08	0.11	0.15	0.19	0.23	0.28	0.33	0.45	0.58
50	8500	0.04	0.06	0.08	0.11	0.14	0.18	0.23	0.27	0.32	0.44	0.58
50	10500	0.02	0.04	0.05	0.07	0.10	0.12	0.15	0.18	0.21	0.29	0.38
50	12500	0.03	0.04	0.06	0.08	0.10	0.13	0.16	0.19	0.23	0.31	0.41
50	15000	0.02	0.04	0.06	0.08	0.10	0.13	0.16	0.19	0.22	0.30	0.40
50	17500	0.02	0.04	0.05	0.07	0.10	0.12	0.15	0.18	0.22	0.30	0.39
50	20000	0.02	0.04	0.05	0.07	0.10	0.12	0.15	0.18	0.22	0.29	0.38
50	25000	0.02	0.04	0.05	0.07	0.09	0.12	0.15	0.18	0.21	0.29	0.38

Energy Wheel Return Damper

Table 160. Energy wheel return damper

Unit Size	Static Pressure Drop (inches wg) by Damper Face Velocity (fpm)										
	400	500	600	700	800	900	1000	1100	1200	1400	1600
3	0.04	0.06	0.09	0.12	0.16	0.20	0.25	0.30	0.36	0.48	0.63
6	0.04	0.06	0.08	0.11	0.15	0.18	0.23	0.27	0.33	0.45	0.58
8	0.04	0.06	0.08	0.11	0.14	0.18	0.22	0.27	0.32	0.44	0.57
10	0.03	0.05	0.08	0.11	0.14	0.18	0.22	0.26	0.31	0.43	0.56
12	0.03	0.05	0.08	0.11	0.14	0.17	0.22	0.26	0.31	0.42	0.55
14	0.03	0.05	0.08	0.11	0.14	0.17	0.21	0.26	0.31	0.42	0.55
17	0.04	0.06	0.08	0.11	0.15	0.19	0.23	0.28	0.33	0.45	0.59
21	0.04	0.06	0.08	0.11	0.15	0.19	0.23	0.28	0.33	0.45	0.59
25	0.04	0.06	0.08	0.11	0.15	0.18	0.23	0.28	0.33	0.45	0.58
30	0.04	0.06	0.08	0.11	0.14	0.18	0.22	0.27	0.32	0.44	0.57
35	0.04	0.06	0.08	0.11	0.14	0.18	0.22	0.27	0.32	0.43	0.57
40	0.03	0.05	0.08	0.11	0.14	0.18	0.22	0.26	0.31	0.43	0.56
50	0.03	0.05	0.08	0.11	0.14	0.17	0.22	0.26	0.31	0.42	0.55

External Face-and-Bypass

Table 161. External face-and-bypass damper - face section

Unit Size	Static Pressure Drop (inches wg) by Damper Face Velocity (fpm)										
	400	500	600	700	800	900	1000	1100	1200	1400	1600
3	0.03	0.05	0.08	0.10	0.13	0.17	0.21	0.25	0.30	0.41	0.53
6	0.03	0.05	0.07	0.10	0.13	0.16	0.20	0.24	0.28	0.38	0.50
8	0.03	0.04	0.06	0.09	0.12	0.15	0.18	0.22	0.26	0.35	0.46
10	0.03	0.04	0.06	0.09	0.11	0.14	0.18	0.21	0.25	0.34	0.45
12	0.03	0.04	0.06	0.08	0.11	0.14	0.17	0.20	0.24	0.33	0.43
14	0.03	0.04	0.06	0.09	0.12	0.15	0.18	0.22	0.26	0.35	0.46
17	0.03	0.04	0.06	0.08	0.11	0.14	0.17	0.21	0.25	0.34	0.44
21	0.03	0.04	0.06	0.08	0.11	0.14	0.17	0.20	0.24	0.33	0.43
25	0.03	0.04	0.06	0.08	0.11	0.13	0.16	0.20	0.24	0.32	0.42
30	0.03	0.04	0.06	0.08	0.10	0.13	0.16	0.20	0.23	0.32	0.41
35	0.03	0.04	0.06	0.08	0.10	0.13	0.16	0.19	0.23	0.31	0.41
40	0.03	0.04	0.06	0.08	0.11	0.13	0.17	0.20	0.24	0.32	0.42
50	0.03	0.04	0.06	0.08	0.10	0.13	0.16	0.19	0.23	0.31	0.41
57	0.03	0.04	0.06	0.08	0.11	0.14	0.17	0.20	0.24	0.33	0.43
66	0.03	0.04	0.06	0.08	0.11	0.13	0.16	0.20	0.24	0.32	0.42
80	0.03	0.04	0.06	0.08	0.10	0.13	0.16	0.19	0.23	0.31	0.41
100	0.02	0.04	0.06	0.08	0.10	0.13	0.16	0.19	0.22	0.31	0.40
120	0.02	0.04	0.06	0.08	0.10	0.12	0.15	0.19	0.22	0.30	0.39

Table 162. External face-and-bypass damper - bypass section

Unit Size	Static Pressure Drop (inches wg) by Damper Face Velocity (fpm)										
	400	500	600	700	800	900	1000	1100	1200	1400	1600
3	0.04	0.06	0.09	0.12	0.15	0.19	0.24	0.29	0.34	0.47	0.61
6	0.04	0.06	0.08	0.11	0.14	0.18	0.22	0.27	0.32	0.44	0.57
8	0.04	0.06	0.08	0.11	0.14	0.18	0.22	0.27	0.32	0.43	0.57
10	0.03	0.05	0.08	0.11	0.14	0.17	0.22	0.26	0.31	0.42	0.55
12	0.03	0.05	0.08	0.11	0.14	0.17	0.21	0.26	0.31	0.42	0.55
14	0.04	0.06	0.08	0.11	0.15	0.19	0.23	0.28	0.33	0.45	0.59
17	0.04	0.06	0.08	0.11	0.15	0.18	0.23	0.28	0.33	0.45	0.58
21	0.04	0.06	0.08	0.11	0.15	0.18	0.23	0.27	0.33	0.45	0.58
25	0.04	0.06	0.08	0.11	0.14	0.18	0.23	0.27	0.33	0.44	0.58
30	0.04	0.06	0.08	0.11	0.14	0.18	0.22	0.27	0.32	0.43	0.57
35	0.04	0.06	0.08	0.11	0.14	0.18	0.22	0.27	0.32	0.43	0.57
40	0.04	0.06	0.08	0.11	0.15	0.19	0.23	0.28	0.33	0.45	0.59
50	0.04	0.06	0.08	0.11	0.15	0.18	0.23	0.27	0.33	0.44	0.58
57	0.04	0.06	0.08	0.11	0.15	0.18	0.23	0.27	0.33	0.44	0.58
66	0.03	0.04	0.06	0.08	0.11	0.14	0.17	0.20	0.24	0.33	0.43
80	0.03	0.04	0.06	0.08	0.11	0.14	0.17	0.20	0.24	0.33	0.43
100	0.03	0.04	0.06	0.08	0.11	0.14	0.17	0.20	0.24	0.33	0.43
120	0.03	0.04	0.06	0.08	0.11	0.13	0.16	0.20	0.24	0.32	0.42

Internal Face-and-Bypass

Table 163. Internal face-and-bypass damper - face section

Unit Size	Static Pressure Drop (inches wg) by Damper Face Velocity (fpm)										
	400	500	600	700	800	900	1000	1100	1200	1400	1600
3	0.04	0.06	0.09	0.12	0.15	0.20	0.24	0.29	0.35	0.47	0.62
6	0.03	0.05	0.07	0.10	0.13	0.16	0.20	0.24	0.28	0.38	0.50
8	0.03	0.04	0.06	0.09	0.11	0.14	0.18	0.21	0.25	0.35	0.45
10	0.03	0.05	0.07	0.09	0.12	0.15	0.19	0.23	0.27	0.37	0.48
12	0.03	0.04	0.06	0.08	0.10	0.13	0.16	0.20	0.24	0.32	0.42
14	0.03	0.05	0.07	0.09	0.12	0.15	0.19	0.23	0.27	0.37	0.48
17	0.03	0.05	0.07	0.09	0.12	0.15	0.19	0.22	0.27	0.36	0.47
21	0.03	0.04	0.06	0.09	0.11	0.14	0.18	0.21	0.25	0.35	0.45
25	0.03	0.04	0.06	0.08	0.11	0.14	0.17	0.21	0.25	0.33	0.44
30	0.03	0.04	0.06	0.08	0.11	0.14	0.17	0.20	0.24	0.33	0.43
35	0.03	0.04	0.06	0.08	0.11	0.14	0.17	0.20	0.24	0.33	0.43
40	0.03	0.04	0.06	0.09	0.11	0.14	0.17	0.21	0.25	0.34	0.45
50	0.03	0.04	0.06	0.08	0.11	0.13	0.16	0.20	0.24	0.32	0.42
57	0.03	0.04	0.06	0.08	0.10	0.13	0.16	0.20	0.23	0.32	0.41
66	0.03	0.04	0.06	0.08	0.10	0.13	0.16	0.19	0.23	0.31	0.41
80	0.02	0.04	0.06	0.08	0.10	0.13	0.16	0.19	0.22	0.31	0.40
100	0.02	0.04	0.05	0.07	0.10	0.12	0.15	0.18	0.22	0.30	0.39
120	0.02	0.04	0.05	0.07	0.10	0.12	0.15	0.18	0.22	0.29	0.38

Table 164. Internal face-and-bypass damper - bypass section

Unit Size	Static Pressure Drop (inches wg) by Damper Face Velocity (fpm)										
	400	500	600	700	800	900	1000	1100	1200	1400	1600
3	0.06	0.09	0.12	0.17	0.22	0.28	0.35	0.42	0.50	0.68	0.88
6	0.05	0.08	0.12	0.16	0.21	0.26	0.32	0.39	0.47	0.64	0.83
8	0.05	0.08	0.12	0.16	0.20	0.26	0.32	0.39	0.46	0.63	0.82
10	0.05	0.08	0.11	0.15	0.20	0.25	0.31	0.38	0.45	0.61	0.80
12	0.05	0.08	0.11	0.15	0.20	0.25	0.31	0.38	0.45	0.61	0.80
14	0.05	0.08	0.12	0.16	0.21	0.27	0.33	0.40	0.48	0.66	0.86
17	0.05	0.08	0.12	0.16	0.21	0.27	0.33	0.40	0.47	0.65	0.84
21	0.04	0.06	0.08	0.11	0.15	0.18	0.23	0.27	0.33	0.45	0.58
25	0.04	0.06	0.08	0.11	0.14	0.18	0.23	0.27	0.33	0.44	0.58
30	0.04	0.06	0.08	0.11	0.14	0.18	0.22	0.27	0.32	0.43	0.57
35	0.03	0.05	0.07	0.09	0.12	0.16	0.19	0.23	0.28	0.38	0.49
40	0.03	0.05	0.07	0.10	0.13	0.16	0.20	0.24	0.29	0.39	0.51
50	0.03	0.05	0.07	0.10	0.13	0.16	0.20	0.24	0.28	0.39	0.51
57	0.03	0.05	0.07	0.10	0.13	0.16	0.20	0.24	0.28	0.39	0.51
66	0.03	0.05	0.07	0.10	0.12	0.16	0.19	0.23	0.28	0.38	0.50
80	0.03	0.05	0.07	0.10	0.12	0.16	0.19	0.23	0.28	0.38	0.50
100	0.03	0.05	0.07	0.09	0.12	0.16	0.19	0.23	0.28	0.38	0.49
120	0.03	0.05	0.07	0.09	0.12	0.15	0.19	0.23	0.27	0.37	0.48

Full-Face Damper

Table 165. Full-face damper

Unit Size	Static Pressure Drop (inches wg) by Damper Face Velocity (fpm)										
	400	500	600	700	800	900	1000	1100	1200	1400	1600
3	0.03	0.05	0.08	0.10	0.13	0.17	0.21	0.25	0.30	0.41	0.53
6	0.03	0.05	0.07	0.10	0.13	0.16	0.20	0.24	0.28	0.38	0.50
8	0.03	0.04	0.06	0.09	0.12	0.15	0.18	0.22	0.26	0.35	0.46
10	0.03	0.04	0.06	0.09	0.11	0.14	0.18	0.21	0.25	0.34	0.45
12	0.03	0.04	0.06	0.08	0.11	0.14	0.17	0.20	0.24	0.33	0.43
14	0.03	0.04	0.06	0.09	0.12	0.15	0.18	0.22	0.26	0.35	0.46
17	0.03	0.04	0.06	0.08	0.11	0.14	0.17	0.21	0.25	0.34	0.44
21	0.03	0.04	0.06	0.08	0.11	0.14	0.17	0.20	0.24	0.33	0.43
25	0.03	0.04	0.06	0.08	0.11	0.13	0.16	0.20	0.24	0.32	0.42
30	0.03	0.04	0.06	0.08	0.10	0.13	0.16	0.20	0.23	0.32	0.41
35	0.03	0.04	0.06	0.08	0.10	0.13	0.16	0.19	0.23	0.31	0.41
40	0.03	0.04	0.06	0.08	0.11	0.13	0.17	0.20	0.24	0.32	0.42
50	0.03	0.04	0.06	0.08	0.10	0.13	0.16	0.19	0.23	0.31	0.41
57	0.03	0.04	0.06	0.08	0.11	0.14	0.17	0.20	0.24	0.33	0.43
66	0.03	0.04	0.06	0.08	0.11	0.13	0.16	0.20	0.24	0.32	0.42
80	0.03	0.04	0.06	0.08	0.10	0.13	0.16	0.19	0.23	0.31	0.41
100	0.02	0.04	0.06	0.08	0.10	0.13	0.16	0.19	0.22	0.31	0.40
120	0.02	0.04	0.06	0.08	0.10	0.12	0.15	0.19	0.22	0.30	0.39

Multizone

Table 166. Multizone damper -2 deck with hot and cold coil

Unit Size	Static Pressure Drop (inches wg) by Damper Face Velocity (fpm)									
	400	500	600	700	800	900	1000	1100	1200	1400
6	0.03	0.05	0.08	0.11	0.14	0.17	0.22	0.26	0.31	0.42
8	0.03	0.05	0.08	0.11	0.14	0.17	0.22	0.26	0.31	0.42
10	0.03	0.05	0.07	0.09	0.12	0.16	0.19	0.23	0.28	0.38
12	0.03	0.05	0.07	0.09	0.12	0.15	0.19	0.23	0.27	0.37
14	0.03	0.05	0.07	0.09	0.12	0.15	0.19	0.23	0.27	0.37
17	0.03	0.05	0.07	0.09	0.12	0.15	0.19	0.23	0.27	0.37
21	0.03	0.04	0.06	0.09	0.11	0.14	0.18	0.21	0.25	0.35
25	0.03	0.04	0.06	0.09	0.11	0.14	0.18	0.22	0.26	0.35
30	0.03	0.04	0.06	0.09	0.11	0.14	0.18	0.21	0.25	0.34
35	0.03	0.04	0.06	0.08	0.11	0.14	0.17	0.20	0.24	0.33
40	0.03	0.04	0.06	0.08	0.11	0.13	0.17	0.20	0.24	0.32
50	0.03	0.04	0.06	0.08	0.11	0.13	0.16	0.20	0.24	0.32

Baffles

Selection Procedure

Use this procedure to balance hot-deck and cold-deck airflows:

1. Determine face velocity of hot-deck and cold-deck coils.
2. Determine air pressure drop (APD) for each coil.
3. Determine hot-deck casing loss using the formula below.

$$\text{Hot-deck APD} = K_t \bullet \left(\frac{Vcoil}{500}\right)^2$$

Note: Vcoil is cooling coil face velocity.

Sizes 6 - 10

$K_t = 0.24$

Sizes 12 - 17

$K_t = 0.36$

Sizes 21 - 50

$K_t = 0.62$

4. Determine total hot deck losses for 100 percent heating (total hot deck APD = casing + heating coil APD).
5. Determine the pressure differential between the decks. The deck with the lowest pressure drop may require baffles.
6. Use Table 167 below to choose a baffle or combination of baffles that will provide the static pressure drop necessary to compensate for the pressure differential determined in Step 5.

Table 167. Baffles

Baffle Selection	Static Pressure Drop (inches wg.) by Coil Face Velocity (fpm)														
	400	450	500	550	600	650	700	750	800	850	900	1000	1200	1300	1400
No. 22	.37	.47	.57	.69	.83	.97	1.12	1.28	1.47	n/a	n/a	n/a	n/a	n/a	n/a
No. 40	.10	.13	.17	.21	.25	.29	.34	.40	.45	.51	.57	.70	1.20	n/a	n/a
No. 60	.06	.08	.10	.12	.15	.18	.21	.24	.26	.29	.33	.41	.59	.69	.80
No. 70	.04	.05	.07	.08	.09	.10	.12	.14	.16	.18	.20	.25	.35	.42	.49

Mixing Box with Dampers

Table 168. Mixing box with front, back, top and bottom airfoil blade dampers (unducted)

Unit Size	Static Pressure Drop (inches wg) by Damper Face Velocity (fpm)										
	400	500	600	700	800	900	1000	1100	1200	1400	1600
3	0.04	0.07	0.09	0.13	0.17	0.21	0.26	0.32	0.38	0.51	0.67
6	0.04	0.06	0.08	0.11	0.15	0.19	0.23	0.28	0.33	0.45	0.59
8	0.04	0.06	0.08	0.11	0.15	0.18	0.23	0.28	0.33	0.45	0.58
10	0.04	0.06	0.08	0.11	0.14	0.18	0.22	0.27	0.32	0.44	0.57
12	0.03	0.05	0.08	0.11	0.14	0.18	0.22	0.26	0.31	0.43	0.56
14	0.03	0.05	0.07	0.09	0.12	0.16	0.19	0.23	0.28	0.38	0.50
17	0.03	0.05	0.07	0.09	0.12	0.15	0.19	0.23	0.27	0.37	0.49
21	0.03	0.05	0.07	0.09	0.12	0.15	0.19	0.23	0.27	0.37	0.48
25	0.03	0.04	0.06	0.09	0.11	0.14	0.17	0.21	0.25	0.34	0.45
30	0.03	0.04	0.06	0.08	0.11	0.14	0.17	0.21	0.25	0.34	0.44
35	0.03	0.04	0.06	0.08	0.11	0.13	0.17	0.20	0.24	0.32	0.42
40	0.03	0.04	0.06	0.09	0.11	0.14	0.18	0.21	0.25	0.34	0.45
50	0.03	0.04	0.06	0.08	0.11	0.14	0.17	0.21	0.25	0.33	0.44
57	0.03	0.04	0.06	0.08	0.10	0.13	0.16	0.20	0.24	0.32	0.42
66	0.03	0.04	0.06	0.08	0.10	0.13	0.16	0.20	0.24	0.32	0.42
80	0.03	0.04	0.06	0.08	0.10	0.13	0.16	0.19	0.23	0.31	0.41
100	0.02	0.04	0.06	0.08	0.10	0.13	0.16	0.19	0.22	0.31	0.40
120	0.03	0.04	0.06	0.08	0.10	0.13	0.16	0.19	0.23	0.31	0.41

Table 169. Mixing box with side airfoil blade dampers (unducted)

Unit Size	Static Pressure Drop (inches wg) by Damper Face Velocity (fpm)										
	400	500	600	700	800	900	1000	1100	1200	1400	1600
3	0.06	0.09	0.13	0.18	0.23	0.30	0.37	0.44	0.53	0.72	0.93
6	0.04	0.07	0.10	0.14	0.18	0.23	0.28	0.34	0.40	0.55	0.72
8	0.04	0.06	0.09	0.13	0.17	0.21	0.26	0.31	0.37	0.51	0.66
10	0.04	0.06	0.08	0.11	0.15	0.19	0.23	0.28	0.33	0.45	0.59
12	0.03	0.05	0.08	0.11	0.14	0.18	0.22	0.26	0.31	0.43	0.56
14	0.03	0.05	0.08	0.10	0.13	0.17	0.21	0.25	0.30	0.41	0.54
17	0.03	0.05	0.07	0.10	0.13	0.16	0.20	0.25	0.29	0.40	0.52
21	0.03	0.05	0.07	0.10	0.13	0.16	0.20	0.24	0.29	0.39	0.51
25	0.03	0.05	0.07	0.10	0.12	0.16	0.19	0.24	0.28	0.38	0.50
30	0.03	0.05	0.07	0.10	0.13	0.17	0.21	0.25	0.30	0.40	0.53
35	0.03	0.05	0.07	0.10	0.13	0.16	0.20	0.24	0.29	0.39	0.51
40	0.03	0.05	0.07	0.09	0.12	0.16	0.19	0.23	0.28	0.38	0.49
50	0.03	0.05	0.07	0.09	0.12	0.15	0.18	0.22	0.26	0.36	0.47
57	0.03	0.04	0.06	0.09	0.11	0.15	0.18	0.22	0.26	0.35	0.46
66	0.03	0.04	0.06	0.09	0.11	0.14	0.17	0.21	0.25	0.34	0.45
80	0.03	0.05	0.07	0.09	0.12	0.15	0.18	0.22	0.26	0.35	0.46
100	0.03	0.04	0.06	0.09	0.11	0.14	0.17	0.21	0.25	0.34	0.45
120	0.03	0.04	0.06	0.08	0.11	0.14	0.17	0.21	0.25	0.33	0.44

Table 170. Mixing box with Traq™ dampers

Unit Size	Static Pressure Drop (inches wg) by Damper Face Velocity (fpm)															
	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
3	0.04	0.05	0.07	0.08	0.09	0.11	0.13	0.15	0.17	0.19	0.21	0.24	0.26	0.29	0.31	0.35
6	0.04	0.05	0.06	0.07	0.08	0.10	0.11	0.13	0.15	0.17	0.19	0.21	0.23	0.26	0.28	0.31
8	0.04	0.05	0.07	0.08	0.10	0.11	0.13	0.15	0.17	0.20	0.22	0.24	0.27	0.30	0.33	0.36
10	0.04	0.05	0.07	0.08	0.09	0.11	0.13	0.15	0.17	0.19	0.21	0.24	0.26	0.29	0.32	0.35
12	0.04	0.05	0.06	0.07	0.08	0.10	0.11	0.13	0.15	0.16	0.18	0.21	0.23	0.25	0.28	0.30
14	0.04	0.05	0.06	0.07	0.09	0.10	0.12	0.14	0.16	0.18	0.20	0.22	0.25	0.27	0.30	0.32
17	0.04	0.06	0.07	0.08	0.10	0.12	0.13	0.15	0.18	0.20	0.22	0.25	0.28	0.30	0.33	0.35
21	0.04	0.05	0.06	0.07	0.08	0.10	0.12	0.13	0.15	0.17	0.19	0.21	0.24	0.26	0.29	0.32
25	0.04	0.05	0.06	0.08	0.09	0.11	0.13	0.15	0.17	0.19	0.21	0.23	0.26	0.29	0.32	0.35
30	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.14	0.16	0.18	0.20	0.22	0.24	0.26	0.29
35	0.04	0.05	0.06	0.07	0.09	0.10	0.12	0.14	0.16	0.18	0.20	0.22	0.25	0.27	0.29	0.32
40	0.04	0.05	0.07	0.08	0.10	0.11	0.13	0.15	0.17	0.19	0.22	0.24	0.27	0.29	0.31	0.34
50	0.04	0.05	0.07	0.08	0.10	0.11	0.13	0.15	0.17	0.19	0.21	0.24	0.26	0.29	0.32	0.35
57	0.04	0.05	0.07	0.08	0.10	0.11	0.13	0.15	0.17	0.19	0.21	0.24	0.26	0.29	0.32	0.35
66	0.04	0.06	0.07	0.08	0.10	0.12	0.14	0.16	0.18	0.20	0.22	0.25	0.28	0.30	0.33	0.36
80	0.04	0.05	0.07	0.08	0.10	0.11	0.13	0.15	0.17	0.19	0.22	0.24	0.27	0.29	0.32	0.35
100	0.04	0.06	0.07	0.08	0.10	0.12	0.13	0.15	0.17	0.20	0.22	0.25	0.27	0.30	0.33	0.36
120	0.04	0.06	0.07	0.08	0.10	0.12	0.13	0.15	0.17	0.20	0.22	0.24	0.27	0.29	0.33	0.36

Damper Torque Requirements

Table 171. Damper torque requirements (inch pound) at 1-inch w.g. air pressure drop

Unit Size	Face Damper	Internal Face-and-Bypass	External Face-and-Bypass	Integral Face-and-Bypass	Multizone[1]	
					Top Discharge	Front Discharge
3	16	17	27	10	N/A	N/A
6	24	29	40	17	5	7
8	33	39	52	26	5	7
10	43	50	66	31	6	8
12	56	62	81	36	6	8
14	60	69	87	41	6	8
17	78	83	107	62	6	8
21	92	99	122	62	7	10
25	108	115	139	86	7	10
30	127	136	163	86	7	10
35	143	154	180	103	17	24
40	160	172	201	103	17	24
50	215	228	261	161	17	24
57	253	267	299	161	n/a	n/a
66	307	308	404	201	n/a	n/a
80	364	364	460	221	n/a	n/a
100	460	460	569	314	n/a	n/a
120	549	549	678	314	n/a	n/a

Unit Size	Mixing Module Dampers (Top-Back-Bottom Locations)					Side Locations
	Traq damper only	Bladed damper only	Traq damper linked to bladed damper	Bladed damper linked to bladed damper	Traq damper linked to Traq damper	Bladed damper only
3	18	12	20	14	36	10
6	36	21	39	24	72	17
8	36	24	39	27	72	22
10	54	29	58	33	108	30
12	68	36	73	41	135	36
14	68	41	73	47	135	43
17	68	49	74	56	135	49
21	72	60	81	69	144	58
25	72	72	82	82	144	67
30	99	84	111	96	198	87
35	108	100	122	114	216	102
40	108	115	125	132	216	117
50	113	146	159	167	225	148
57	113	199	211	227	225	169
66	150	199	216	227	300	200
80	188	233	254	266	375	240
100	225	292	318	334	450	296
120	225	353	379	404	450	342

[1] Torque is per blade. Multiply blades required per zone by torque value to size actuator per zone.

Discharge Plenums

Front- or Top-Mounted Discharge Plenum with Factory Openings

Note: Top-mounted fan discharges indicate vertical airflow direction; front-mounted fan discharges indicate horizontal airflow direction.

Formulas

For all factory openings, except a full bottom opening in a horizontal plenum, use:

$$SP = K_t \bullet \left(\frac{OV_F}{4005}\right)^2 + 0.5 \bullet \left(\frac{OV_P}{4005}\right)^2$$

For a full bottom opening in a horizontal plenum, use:

$$SP = K_t \bullet \left(\frac{OV_F}{4005}\right)^2$$

Where:

SP = static pressure drop

K_t = value from Table 173, p. 120

$OV_F = FM/OA_F$

$OV_P = CFM/OA_P$

OV_F = fan outlet velocity

OA_F = fan outlet area

OV_P = plenum opening outlet velocity

OA_P = plenum opening area (see Table 173)

Figure 87. Horizontal plenum

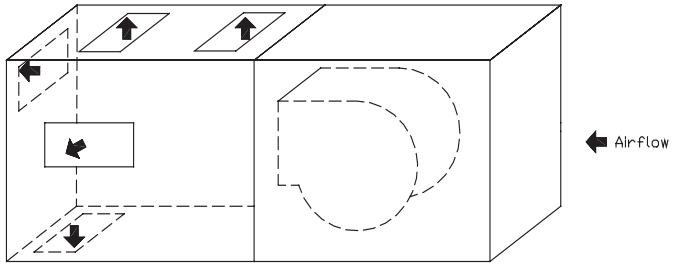


Figure 88. Vertical plenum

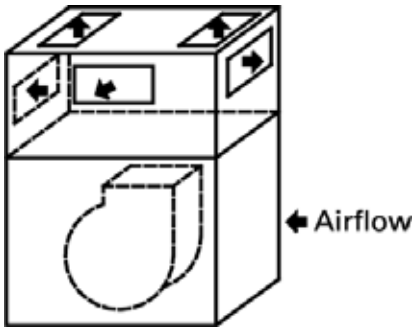


Table 172. Discharge plenums—factory outlet areas (ft²)

Unit Size	Top-mounted discharge		Front-mounted discharge			Down discharge plenum
	Front, top, back, bottom openings	Side openings	Top, bottom openings	Front openings	Side openings	
3	1.13	0.99	1.13	1.13	0.99	4.17
6	1.94	1.60	1.94	1.94	1.60	6.88
8	2.35	2.01	2.35	2.35	2.01	9.17
10	3.07	2.66	3.07	3.07	2.66	11.67
12	3.48	3.23	3.48	3.48	3.23	12.50
14	3.55	3.80	3.55	3.55	3.80	13.33
17	4.19	4.37	4.19	4.19	4.37	14.58
21	5.19	5.08	5.19	5.19	5.08	15.00
25	6.10	5.97	6.10	6.10	5.97	18.50
30	7.24	7.65	7.24	7.24	7.65	21.75
35	8.56	8.75	8.56	8.56	8.75	27.17
40	9.84	8.75	9.84	9.84	10.02	31.06
50	12.35	12.67	12.35	12.36	12.67	34.34
57	12.35	12.67	14.26	14.65	14.43	34.34
66	n/a	n/a	22.00	17.25	16.42	40.33
80	n/a	n/a	26.20	20.58	19.74	44.92
100	n/a	n/a	33.61	25.30	25.49	56.15
120	n/a	n/a	39.72	28.58	30.17	66.46

Refer to the General Data section on page 53 for fan outlet areas.

Table 173. Discharge Plenums - factory openings, K_t values

Fan Size	Plenum Discharge Location	Plenum Location - Top Mounted		Plenum Location - Horizontally Mounted	
		Supply Fan Discharge Top-front	Supply Fan Discharge Top-back	Supply Fan Discharge Front-top	Supply Fan Discharge Back-top
3-8 FC	Front-top	1.67	0.98	0.98	N/A
	Back-top	0.98	1.67	N/A	0.98
	Top-front/back	0.98	0.98	1.67	1.67
	Side-top	1.50	1.50	1.50	1.50
	Bottom-front/back or full bottom	N/A	N/A	0.98	0.98
3-8 BC or AF	Front-top	1.14	0.68	0.68	N/A
	Back-top	0.68	1.14	N/A	0.68
	Top-front/back	0.68	0.68	1.33	1.33
	Side-top	1.29	1.29	1.34	1.34
	Bottom-front/back or full bottom	N/A	N/A	0.78	0.78
10-17 FC	Front-top	2.59	1.68	1.68	N/A
	Back-top	1.68	2.59	N/A	1.68
	Top-front/back	1.68	1.68	2.59	2.59
	Side-top	2.37	2.37	2.37	2.37
	Bottom-front/back	N/A	N/A	1.68	1.68
	Full bottom	N/A	N/A	1.28	1.28
10-17 AF	Front-top	1.67	1.15	1.15	N/A
	Back-top	1.15	1.67	N/A	1.15
	Top-front/back	1.15	1.15	1.83	1.83
	Side-top	1.85	1.85	1.85	1.85
	Bottom-front/back or full bottom	N/A	N/A	1.23	1.23
21-30 FC	Front-top	1.68	0.96	0.96	N/A
	Back-top	0.96	1.68	N/A	0.96
	Top-front/back	0.96	0.96	1.68	1.68
	Side-top	1.50	1.50	1.50	1.50
	Bottom-front/back or full bottom	N/A	N/A	0.96	0.96
21-57 AF	Front-top	1.45	0.93	0.93	N/A
	Back-top	0.93	1.45	N/A	0.93
	Top-front/back	0.93	0.93	1.81	1.81
	Side-top	1.68	1.68	1.68	1.68
	Bottom-front/back or full bottom	N/A	N/A	1.13	1.13
35-57 FC	Front-top	1.44	0.83	0.83	N/A
	Back-top	0.83	1.44	N/A	0.83
	Top-front/back	0.83	0.83	1.44	1.44
	Side-top	1.25	1.25	1.25	1.25
	Bottom-front/back	N/A	N/A	0.83	0.83
	Full bottom	N/A	N/A	0.73	0.73

Table 173. (continued) Discharge plenums - factory openings, K_t values

Fan Size	Plenum Discharge Location	Plenum Location - Top Mounted		Plenum Location - Horizontally Mounted	
		Supply Fan Discharge	Supply Fan Discharge	Supply Fan Discharge	Supply Fan Discharge
		Top-front	Top-back	Front-top	Back-top
66-120 FC	Front-top	N/A	N/A	0.83	N/A
	Back-top	N/A	N/A	N/A	0.83
	Top-front/back	N/A	N/A	1.44	1.44
	Side-top	N/A	N/A	1.25	1.25
	Bottom-front/back	N/A	N/A	0.83	0.83
	Full bottom	N/A	N/A	0.73	0.73
66-120 AF	Front-top	N/A	N/A	1.34	N/A
	Back-top	N/A	N/A	N/A	1.34
	Top-front/back	N/A	N/A	2.14	2.14
	Side-top	N/A	N/A	2.11	2.11
	Bottom-front/back or full bottom	N/A	N/A	1.34	1.34
12-17Q, 12-14R	Front-top	n/a	n/a	1.40	n/a
	Back-top	n/a	n/a	n/a	1.40
	Top-front/back	n/a	n/a	2.90	2.90
	Side-top	n/a	n/a	2.90	2.90
	Bottom-front/back	n/a	n/a	2.90	2.90
	Full bottom	n/a	n/a	2.10	2.10
21-30Q, 17-25R	Front-top	n/a	n/a	1.40	n/a
	Back-top	n/a	n/a	n/a	1.40
	Top-front/back	n/a	n/a	2.90	2.90
	Side-top	n/a	n/a	2.90	2.90
	Bottom-front/back	n/a	n/a	2.90	2.90
	Full bottom	n/a	n/a	2.00	2.00
35-80Q, 30-66R	Front-top	n/a	n/a	1.40	n/a
	Back-top	n/a	n/a	n/a	1.40
	Top-front/back	n/a	n/a	2.90	2.90
	Side-top	n/a	n/a	2.90	2.90
	Bottom-front/back	n/a	n/a	2.90	2.90
	Full bottom	n/a	n/a	1.70	1.70
6 - 80 V, W	Front-top	2.20	2.20	n/a	n/a
	Back-top	2.20	2.20	n/a	n/a
	Top-front/back	1.40	1.40	n/a	n/a
	Side-top	2.20	2.20	n/a	n/a
3 - 120 P	Front-top	2.50	2.50	2.50	n/a
	Back-top	2.50	2.50	n/a	2.50
	Top-front/back	2.00	2.00	2.00	2.00
	Side-top	2.00	2.00	2.00	2.00
	Bottom-front/back or full bottom	n/a	n/a	2.00	2.00

AF = airfoil, FC = forward-curved, Q, R = vaneaxial

Filters

Table 174. Filters - clean

Filter type	Static Pressure Drop (inches wg) by Damper Face Velocity (fpm)								
	200	250	300	350	400	450	500	550	600
Disposable	0.04	0.06	0.08	0.10	0.13	0.15	0.18	n/a	n/a
2-inch Pleated media	0.08	0.11	0.14	0.18	0.21	0.26	0.30	0.35	0.40
4-inch Pleated media	0.04	0.06	0.09	0.12	0.16	0.20	0.25	0.30	0.36
Permanent	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.09	0.11
4-inch high efficiency-65% efficient	0.13	0.17	0.22	0.28	0.34	0.40	0.48	0.55	0.64
4-inch high efficiency - 85% efficient	0.21	0.28	0.36	0.45	0.55	0.66	0.77	0.90	1.03
4-inch high efficiency - 95% efficient	0.24	0.32	0.41	0.51	0.62	0.74	0.87	1.01	1.15
6-inch cartridge - 65% efficient	0.13	0.16	0.19	n/a	n/a	n/a	n/a	n/a	n/a
6-inch cartridge - 85% efficient	0.22	0.27	0.32	n/a	n/a	n/a	n/a	n/a	n/a
6-inch cartridge - 95% efficient	0.25	0.30	0.34	n/a	n/a	n/a	n/a	n/a	n/a
12-inch cartridge - 65% efficient	0.10	0.14	0.18	0.23	0.28	0.33	0.39	0.45	0.52
12-inch cartridge - 85% efficient	0.17	0.23	0.29	0.36	0.43	0.51	0.59	0.68	0.77
12-inch cartridge - 95% efficient	0.20	0.27	0.34	0.42	0.51	0.60	0.70	0.80	0.91
18-inch bag - 65% efficient	0.18	0.22	0.27	0.31	0.35	0.39	0.44	0.48	0.52
18-inch bag - 85% efficient	0.20	0.25	0.30	0.35	0.41	0.46	0.51	0.56	0.61
18-inch bag - 95% efficient	0.23	0.28	0.34	0.39	0.45	0.50	0.56	0.61	0.66
30-inch bag - 65% efficient	0.07	0.10	0.13	0.17	0.21	0.26	0.31	0.36	0.42
30-inch bag - 85% efficient	0.09	0.11	0.15	0.18	0.22	0.26	0.31	0.35	0.40
30-inch bag - 95% efficient	0.17	0.22	0.27	0.32	0.37	0.42	0.47	0.52	0.58
HEPA 99.97 DOP	0.47	0.60	0.74	0.89	1.04	1.20	1.37	1.54	1.72

Table 175. Filters - dirty

Face Velocity (fpm)	Static Pressure Drop (inches wg) by Damper Face Velocity (fpm)								
	200	250	300	350	400	450	500	550	600
Disposable	1.00	1.00	1.00	1.00	1.00	1.00	1.00	n/a	n/a
2-inch Pleated media	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4-inch Pleated media	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Permanent	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4-inch high efficiency-65% efficient	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
4-inch high efficiency - 85% efficient	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
4-inch high efficiency - 95% efficient	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
6-inch cartridge - 65% efficient	1.20	1.20	1.20	n/a	n/a	n/a	n/a	n/a	n/a
6-inch cartridge - 85% efficient	1.20	1.20	1.20	n/a	n/a	n/a	n/a	n/a	n/a
6-inch cartridge - 95% efficient	1.20	1.20	1.20	n/a	n/a	n/a	n/a	n/a	n/a
12-inch cartridge - 65% efficient	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
12-inch cartridge - 85% efficient	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
12-inch cartridge - 95% efficient	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
18-inch bag - 65% efficient	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
18-inch bag - 85% efficient	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
18-inch bag - 95% efficient	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
30-inch bag - 65% efficient	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
30-inch bag - 85% efficient	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
30-inch bag - 95% efficient	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
HEPA 99.97 DOP	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

Fans

Table 176. Vertical Q fan pressure drop

Size	Inlet Screen
6-80	0.10

Table 177. Q fan pressure drop

Size	Turning Module Downstream	Inlet Screen	Diffuser
12Q, 14Q, 17Q, 12R, 14R	2.10	0.10	1.80
21Q, 25Q, 30Q, 17R, 21R, 25R	2.00	0.10	1.80
35Q, 40Q, 50Q, 57Q, 66Q, 80Q, 30R, 35R, 40R, 50R, 57R, 66R	1.70	0.10	1.80

Gas Heat

Table 178. Gas heat

Discharge	Static Pressure Drop (inches wg) by Face Velocity (fpm)										
	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000
Front/Bottom Discharge	0.51	0.52	0.53	0.55	0.57	0.60	0.62	0.66	0.69	0.74	0.78
Full Face Front Discharge	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50

Silencers

Table 179. Silencers

Length	Model	Unit Sizes	Supplier Data Pressure Drop (inches wg)						
			250	500	750	1000	1250	1500	1750
3 Feet	RD-ULV-F2	10	0.03	0.11	0.26	0.45	0.71	1.02	1.39
	RD-ULV-F3	03, 40, 66, 80	0.03	0.11	0.25	0.45	0.70	1.01	1.37
	RD-ULV-F4	17, 21, 25, 100, 120	0.03	0.11	0.25	0.44	0.69	0.99	1.35
	RD-ULV-F5	08, 14, 30, 35, 50, 57	0.03	0.12	0.26	0.47	0.73	1.06	1.44
	RD-ULV-F6	06, 12	0.03	0.13	0.28	0.50	0.78	1.13	1.53
5 Feet	RD-ULV-F2	10	0.04	0.15	0.34	0.61	0.95	1.37	1.86
	RD-ULV-F3	03, 40, 66, 80	0.04	0.15	0.33	0.59	0.92	1.33	1.80
	RD-ULV-F4	17, 21, 25, 100, 120	0.04	0.14	0.32	0.57	0.89	1.28	1.75
	RD-ULV-F5	08, 14, 30, 35, 50, 57	0.04	0.15	0.34	0.60	0.94	1.36	1.85
	RD-ULV-F6	06, 12	0.04	0.16	0.36	0.64	0.99	1.43	1.95

Dimensional Data by Module

Access Module

Figure 89. Access module

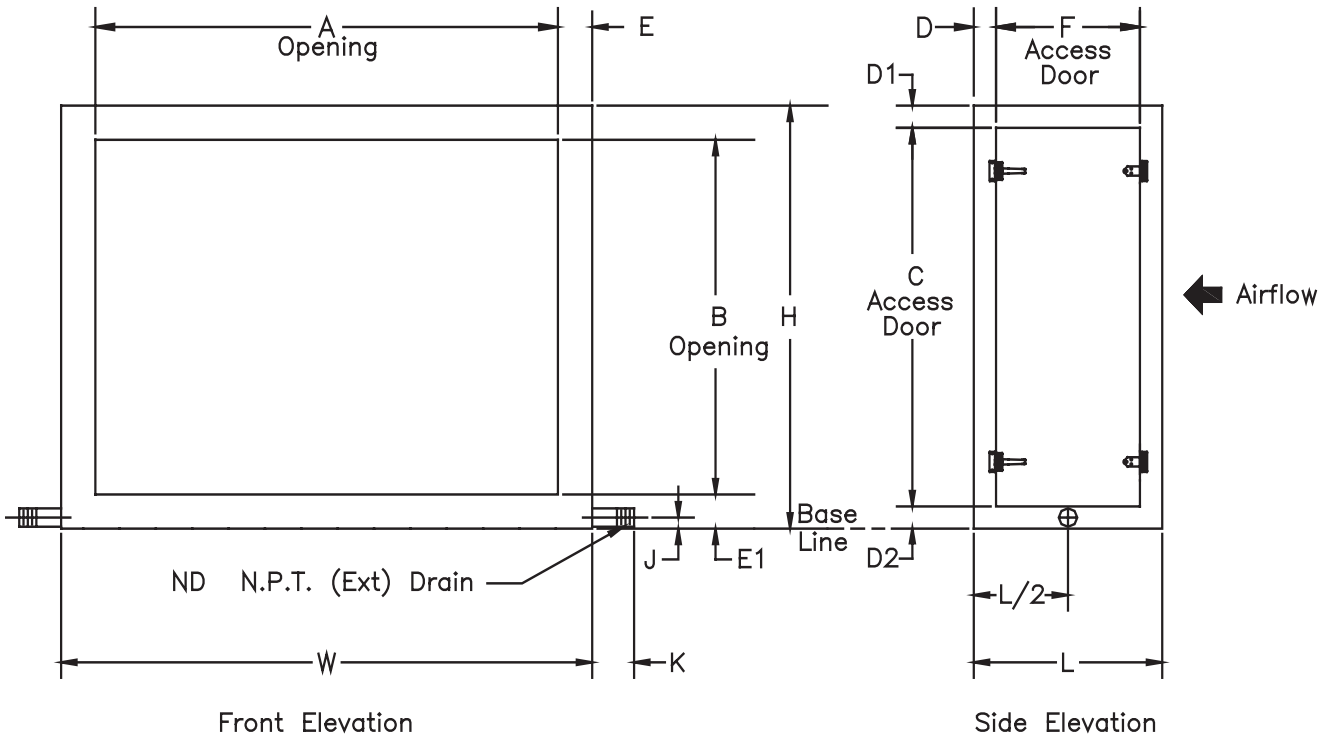


Table 180. Access module dimensions (inches)

Unit Size	W	H	A	B	Outward C	Inward C	Outward D1	Inward D1	Outward D2	Inward D2	E	E1	J	K	ND (NPT)
3	31	26.25	27.00	22.25	21.71	19.49	2.27	3.38	2.27	3.38	2.00	2.00	0.80	2.60	1.00
6	44	28.75	40.00	24.75	24.21	21.99	2.27	3.38	2.27	3.38	2.00	2.00	0.80	2.60	1.00
8	48	34.00	44.00	30.00	29.46	27.24	2.27	3.38	2.27	3.38	2.00	2.00	0.80	2.60	1.00
10	60	34.00	56.00	30.00	29.46	27.24	2.27	3.38	2.27	3.38	2.00	2.00	0.80	2.60	1.00
12	64	39.00	60.00	35.00	34.46	32.24	2.27	3.38	2.27	3.38	2.00	2.00	0.80	2.60	1.00
14	68	40.50	64.00	36.50	35.96	33.74	2.27	3.38	2.27	3.38	2.00	2.00	0.80	2.60	1.00
17	74	44.00	70.00	40.00	39.46	37.24	2.27	3.38	2.27	3.38	2.00	2.00	0.80	2.60	1.00
21	76	50.25	72.00	46.25	45.71	43.49	2.27	3.38	2.27	3.38	2.00	2.00	0.80	2.60	1.00
25	78	56.50	74.00	52.50	51.96	49.74	2.27	3.38	2.27	3.38	2.00	2.00	0.80	2.60	1.00
30	91	56.50	87.00	52.50	51.96	49.74	2.27	3.38	2.27	3.38	2.00	2.00	0.80	2.60	1.00
35	96	63.75	91.00	58.75	58.21	55.99	2.77	3.88	2.77	3.88	2.50	2.50	1.20	3.60	1.25
40	109	63.75	104.00	58.75	58.21	55.99	2.77	3.88	2.77	3.88	2.50	2.50	1.20	3.60	1.25
50	120	75.00	115.00	70.00	69.46	67.24	2.77	3.88	2.77	3.88	2.50	2.50	1.20	3.60	1.25
57	120	86.50	115.00	81.50	71.58	70.12	12.15	12.50	2.77	3.88	2.50	2.50	1.20	3.60	1.25
66	137	92.08	132.00	81.58	71.58	70.12	12.15	12.50	8.35	9.47	2.50	8.00	5.80	2.50	1.50
80	137	107.08	132.00	96.58	71.58	70.12	27.15	27.50	8.35	9.47	2.50	8.00	5.80	2.50	1.50
100	152	119.58	147.00	109.08	71.58	70.12	39.65	40.00	8.35	9.47	2.50	8.00	5.80	2.50	1.50
120	179	119.58	174.00	109.08	71.58	70.12	39.65	40.00	8.35	9.47	2.50	8.00	5.80	2.50	1.50

Table 180. (continued) Access module dimensions (inches)

Unit Size	Small			Medium			Extended-Medium				
	L	Outward		L	Outward		L	Outward	Inward	Outward	Inward
		D	F		D	F		D	D	F	F
3	11.00	2.15	6.70	15.50	2.15	11.20	19.00	2.15	2.50	14.70	14
6	11.00	2.15	6.70	15.50	2.15	11.20	19.00	2.15	2.50	14.70	14
8	11.00	2.15	6.70	15.50	2.15	11.20	19.00	2.15	2.50	14.70	14
10	11.00	2.15	6.70	15.50	2.15	11.20	19.00	2.15	2.50	14.70	14
12	11.00	2.15	6.70	15.50	2.15	11.20	19.00	2.15	2.50	14.70	14
14	11.00	2.15	6.70	15.50	2.15	11.20	19.00	2.15	2.50	14.70	14
17	11.00	2.15	6.70	15.50	2.15	11.20	19.00	2.15	2.50	14.70	14
21	11.00	2.15	6.70	15.50	2.15	11.20	19.00	2.15	2.50	14.70	14
25	11.00	2.15	6.70	15.50	2.15	11.20	19.00	2.15	2.50	14.70	14
30	11.00	2.15	6.70	15.50	2.15	11.20	19.00	2.15	2.50	14.70	14
35	11.50	2.65	6.20	16.00	2.65	10.70	20.00	2.65	3.00	14.70	14
40	11.50	2.65	6.20	16.00	2.65	10.70	20.00	2.65	3.00	14.70	14
50	14.50	2.65	9.20	n/a	n/a	n/a	20.00	2.65	3.00	14.70	14
57	14.50	2.65	9.20	n/a	n/a	n/a	20.00	2.65	3.00	14.70	14
66	14.50	2.65	9.20	n/a	n/a	n/a	20.00	2.65	3.00	14.70	14
80	14.50	2.65	9.20	n/a	n/a	n/a	20.00	2.65	3.00	14.70	14
100	14.50	2.65	9.20	n/a	n/a	n/a	20.00	2.65	3.00	14.70	14
120	14.50	2.65	9.20	n/a	n/a	n/a	20.00	2.65	3.00	14.70	14

Unit Size	Medium-Large					Large					Extra-Large		
		Outward	Inward	Outward	Inward		Outward	Inward	Outward	Inward		Outward	
	L	D	D	F	F	L	D	D	F	F	L	D	F
3	n/a	n/a	n/a	n/a	n/a	26.25	2.15	2.50	21.95	21.25	36.00	11.90	21.95
6	n/a	n/a	n/a	n/a	n/a	28.75	2.15	2.50	24.45	23.75	41.00	21.65	17.20
8	24.50	2.15	2.50	20.20	19.5	34.00	2.15	12.00	20.20	19.5	44.00	23.15	18.70
10	24.50	2.15	2.50	20.20	19.5	39.00	2.15	17.00	20.20	19.5	34.00	11.65	20.20
12	24.50	2.15	2.50	20.20	19.5	34.00	2.15	12.00	20.20	19.5	39.00	22.15	14.70
14	24.50	2.15	2.50	20.20	19.5	34.00	2.15	12.00	20.20	19.5	40.50	23.65	14.70
17	24.50	2.15	2.50	20.20	19.5	34.00	2.15	12.00	20.20	19.5	44.00	23.15	18.70
21	24.50	2.15	2.50	20.20	19.5	34.00	2.15	12.00	20.20	19.5	50.25	26.27	21.83
25	24.50	2.15	2.50	20.20	19.5	40.00	2.15	18.00	20.20	19.5	56.50	29.40	24.95
30	24.50	2.15	2.50	20.20	19.5	40.00	2.15	18.00	20.20	19.5	56.50	29.40	24.95
35	29.50	2.65	3.00	24.20	23.5	48.00	2.65	21.50	24.20	23.5	63.75	33.27	27.83
40	29.50	2.65	3.00	24.20	23.5	48.00	2.65	21.50	24.20	23.5	63.75	33.27	27.83
50	29.50	2.65	3.00	24.20	23.5	48.00	2.65	21.50	24.20	23.5	68.50	35.65	30.20
57	29.50	2.65	3.00	24.20	23.5	48.00	2.65	21.50	24.20	23.5	68.50	41.65	24.20
66	29.50	2.65	3.00	24.20	23.5	49.00	2.65	22.50	24.20	23.5	84.00	57.15	24.20
80	29.50	2.65	3.00	24.20	23.5	54.00	2.65	27.50	24.20	23.5	92.00	65.15	24.20
100	29.50	2.65	3.00	24.20	23.5	60.00	2.65	33.50	24.20	23.5	96.00	69.15	24.20
120	29.50	2.65	3.00	24.20	23.5	60.00	2.65	33.50	24.20	23.5	96.00	69.15	24.20

Notes: (1) The drain pan connection dimension is nominal pipe size. Indoor air quality drain pan connections can be either LH or RH but not both.
(2) Outward swing doors are dimensioned to door and inward swing doors are to door opening.
(3) Base line does not include the height for mounting legs or base rail except for unit sizes 66 thru 120 where the base rail is integral to the module.

Blender Module

Figure 90. Blender module

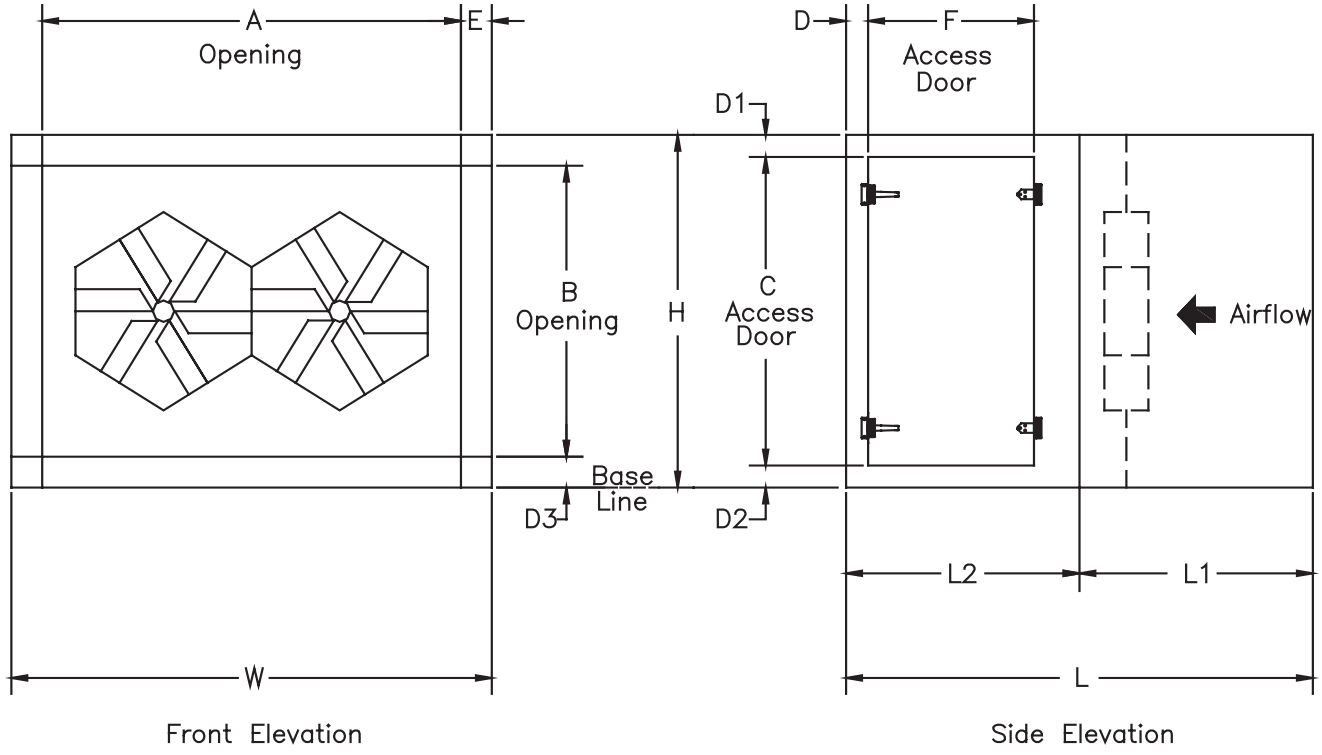


Table 181. Blender module dimensions (inches)

Unit Size	W	L	H	A	B	C	D	D1	D2	D3	E	F	L1	L2
3	31	26.57*	26.25	27.00	22.25	21.71	2.15	2.27	2.27	2.00	2.00	11.20	11.00	15.50
6	44	30.07*	28.75	40.00	24.75	24.21	2.15	2.27	2.27	2.00	2.00	14.70	11.00	19.00
8	48	34.00	34.00	44.00	30.00	29.46	2.15	2.27	2.27	2.00	2.00	20.20	n/a	n/a
10	60	34.00	34.00	56.00	30.00	29.46	2.15	2.27	2.27	2.00	2.00	20.20	n/a	n/a
12	64	39.00	39.00	60.00	35.00	34.46	2.15	2.27	2.27	2.00	2.00	14.70	n/a	n/a
14	68	40.50	40.50	64.00	36.50	35.96	2.15	2.27	2.27	2.00	2.00	14.70	n/a	n/a
17	74	34.00	44.00	70.00	40.00	39.46	2.15	2.27	2.27	2.00	2.00	20.20	n/a	n/a
21	76	34.00	50.25	72.00	46.25	45.71	2.15	2.27	2.27	2.00	2.00	20.20	n/a	n/a
25	78	40.00	56.50	74.00	52.50	51.96	2.15	2.27	2.27	2.00	2.00	20.20	n/a	n/a
30	91	40.00	56.50	87.00	52.50	51.96	2.15	2.27	2.27	2.00	2.00	20.20	n/a	n/a
35	96	48.00	63.75	91.00	58.75	58.21	2.65	2.77	2.77	2.50	2.50	24.20	n/a	n/a
40	109	48.00	63.75	104.00	58.75	58.21	2.65	2.77	2.77	2.50	2.50	24.20	n/a	n/a
50	120	48.00	75.00	115.00	70.00	69.46	2.65	2.77	2.77	2.50	2.50	24.20	n/a	n/a
57	120	48.00	86.50	115.00	81.50	71.58	2.65	12.15	2.77	2.50	2.50	24.20	n/a	n/a
66	137	49.00	92.09	132.00	81.59	71.58	2.65	12.15	8.36	8.00	2.50	24.20	n/a	n/a
80	137	54.00	107.09	132.00	96.59	71.58	2.65	27.15	8.36	8.00	2.50	24.20	n/a	n/a
100	152	60.00	119.59	147.00	109.09	71.58	2.65	39.65	8.36	8.00	2.50	24.20	n/a	n/a
120	179	60.00	119.59	174.00	109.09	71.58	2.65	39.65	8.36	8.00	2.50	24.20	n/a	n/a

Notes: (*) For sizes 3 and 6, the combined module length includes the module length plus gasket thickness.
The base line does not include the height for mounting legs or base rail except for unit sizes 66 through 120 where the base rail is integral to the unit.

Unit Mounting

Figure 91. External support kit

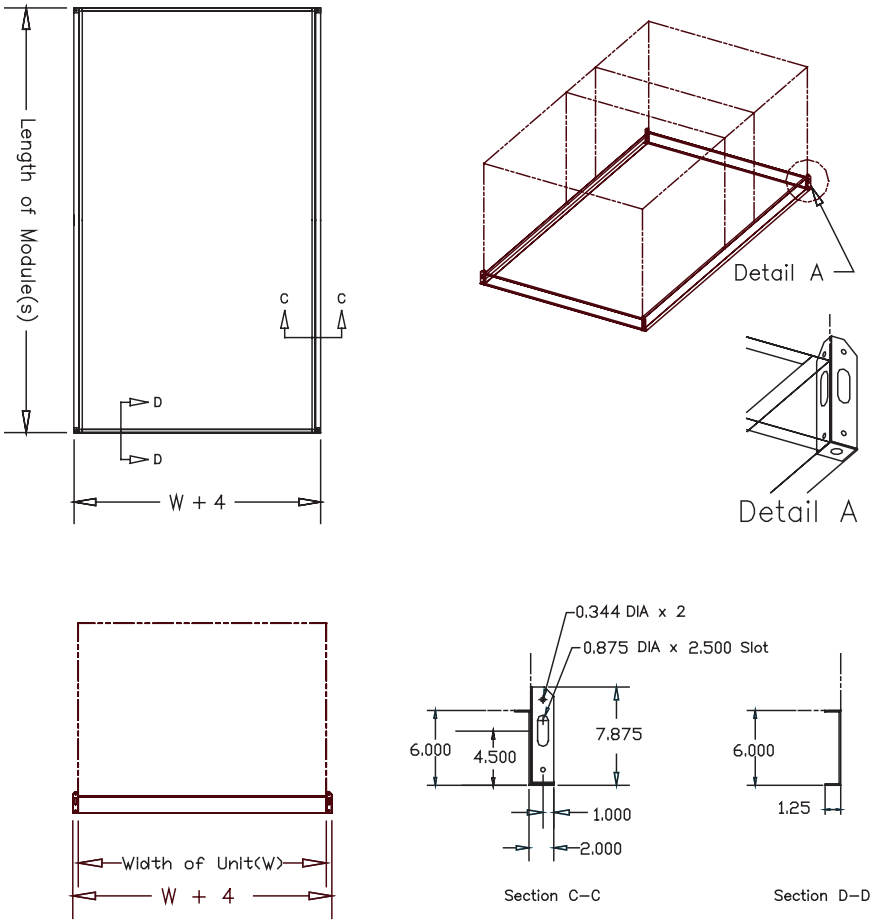


Figure 92. Mounting legs

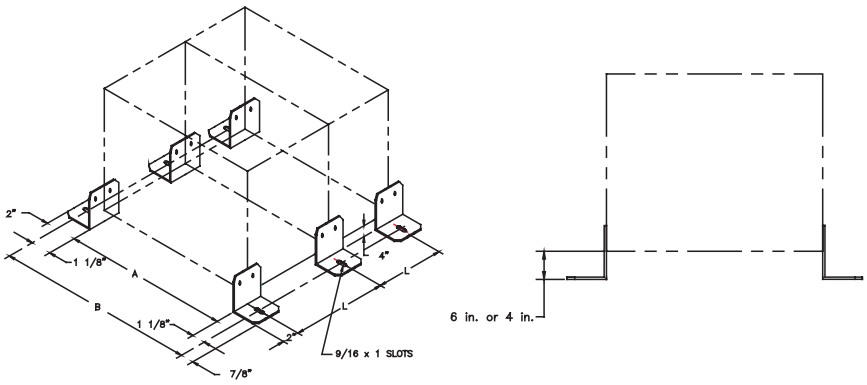


Table 182. Mounting leg dimensions (inches)

Unit Size	A	B
3	31	33.25
6	44	46.25
8	48	50.25
10	60	62.25
12	64	66.25
14	68	70.25
17	74	76.25
21	76	78.25
25	78	80.25
30	91	93.25
35	96	98.25
40	109	111.25
50	120	122.25
57	120	122.25

Coils

Figure 93. Coil location

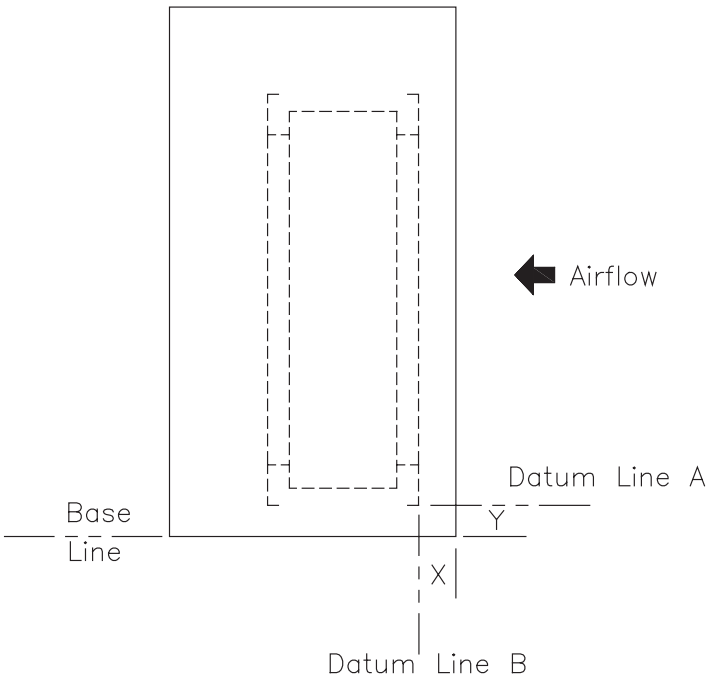


Table 183. Coil location dimensions

Unit Size	1/2-inch, 5/8-inch Coils and 1-inch Pitched Coils		8 Row 1/2-inch Coil in Medium Module	
	X	Y	X	Y
3 - 12	2.05	2.19	1.05	2.19
14 - 17	2.05	2.19	1.56	2.19
21 - 30	2.05	2.40	1.56	2.40
35 - 40	2.55	3.16	1.88	3.16
50 - 57	2.55	3.16	n/a	n/a
66 - 120	2.55	9.71	n/a	n/a

(1) The base line does not include the height for mounting legs or base rail except for unit sizes 66 through 120 where the base rail is integral to the unit.

(2) For coil connection information for refrigerant coils, refer to the submittal information provided from the Trane Official Product Selection Software (TOPSS™)

Figure 94. Coil module

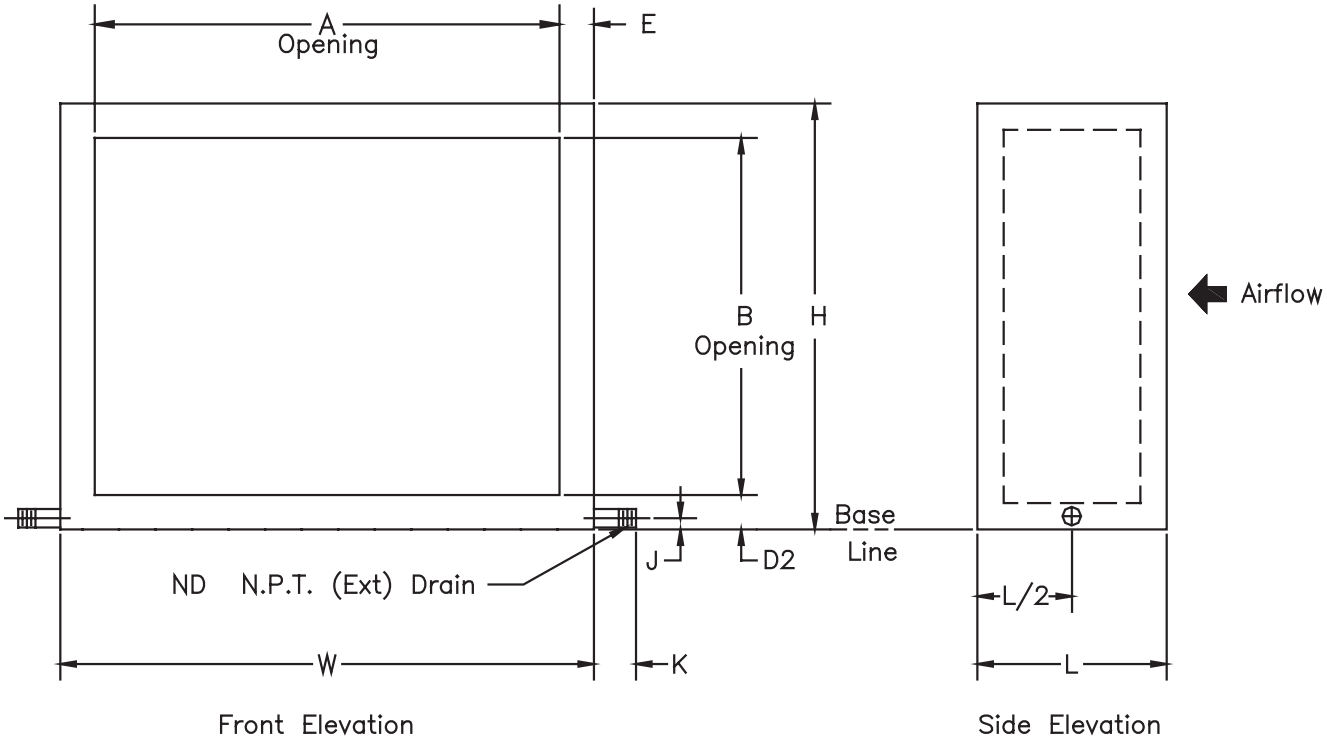


Table 184. Coil module dimensions (inches)

Unit Size	W	H	A	B	D2	E	J	K	ND (NPT)	Small L	Medium L	Extended Medium L	Medium Large L	Large L
3	31	26.25	27.00	22.25	2.00	2.00	0.80	2.60	1.00	11.00	15.50	19.00	n/a	26.25
6	44	28.75	40.00	24.75	2.00	2.00	0.80	2.60	1.00	11.00	15.50	19.00	n/a	28.75
8	48	34.00	44.00	30.00	2.00	2.00	0.80	2.60	1.00	11.00	15.50	19.00	24.50	34.00
10	60	34.00	56.00	30.00	2.00	2.00	0.80	2.60	1.00	11.00	15.50	19.00	24.50	34.00
12	64	39.00	60.00	35.00	2.00	2.00	0.80	2.60	1.00	11.00	15.50	19.00	24.50	34.00
14	68	40.50	64.00	36.50	2.00	2.00	0.80	2.60	1.00	11.00	15.50	19.00	24.50	34.00
17	74	44.00	70.00	40.00	2.00	2.00	0.80	2.60	1.00	11.00	15.50	19.00	24.50	34.00
21	76	50.25	72.00	46.25	2.00	2.00	0.80	2.60	1.00	11.00	15.50	19.00	24.50	34.00
25	78	56.50	74.00	52.50	2.00	2.00	0.80	2.60	1.00	11.00	15.50	19.00	24.50	40.00
30	91	56.50	87.00	52.50	2.00	2.00	0.80	2.60	1.00	11.00	15.50	19.00	24.50	40.00
35	96	63.75	91.00	58.75	2.50	2.50	1.20	3.60	1.25	11.50	16.00	20.00	29.50	48.00
40	109	63.75	104.00	58.75	2.50	2.50	1.20	3.60	1.25	11.50	16.00	20.00	29.50	48.00
50	120	75.00	115.00	70.00	2.50	2.50	1.20	3.60	1.25	14.50	n/a	20.00	29.50	48.00
57	120	86.50	115.00	81.50	2.50	2.50	1.20	3.60	1.25	14.50	n/a	20.00	29.50	48.00
66	137	92.08	132.00	81.58	8.00	2.50	5.80	2.50	1.50	14.50	n/a	20.00	29.50	n/a
80	137	107.08	132.00	96.58	8.00	2.50	5.80	2.50	1.50	14.50	n/a	20.00	29.50	n/a
100	152	119.58	147.00	109.08	8.00	2.50	5.80	2.50	1.50	14.50	n/a	20.00	29.50	n/a
120	179	119.58	174.00	109.08	8.00	2.50	5.80	2.50	1.50	14.50	n/a	20.00	29.50	n/a

(1) The drain pan connection dimension is nominal pipe size. Indoor air quality drain pan connections can be either left-hand or right-hand but not both.
(2) The base line does not include the height for mounting legs or base rail except for unit sizes 66 through 120 where the base rail is integral to the unit.

Figure 95. Horizontal or vertical coil module with inspection door

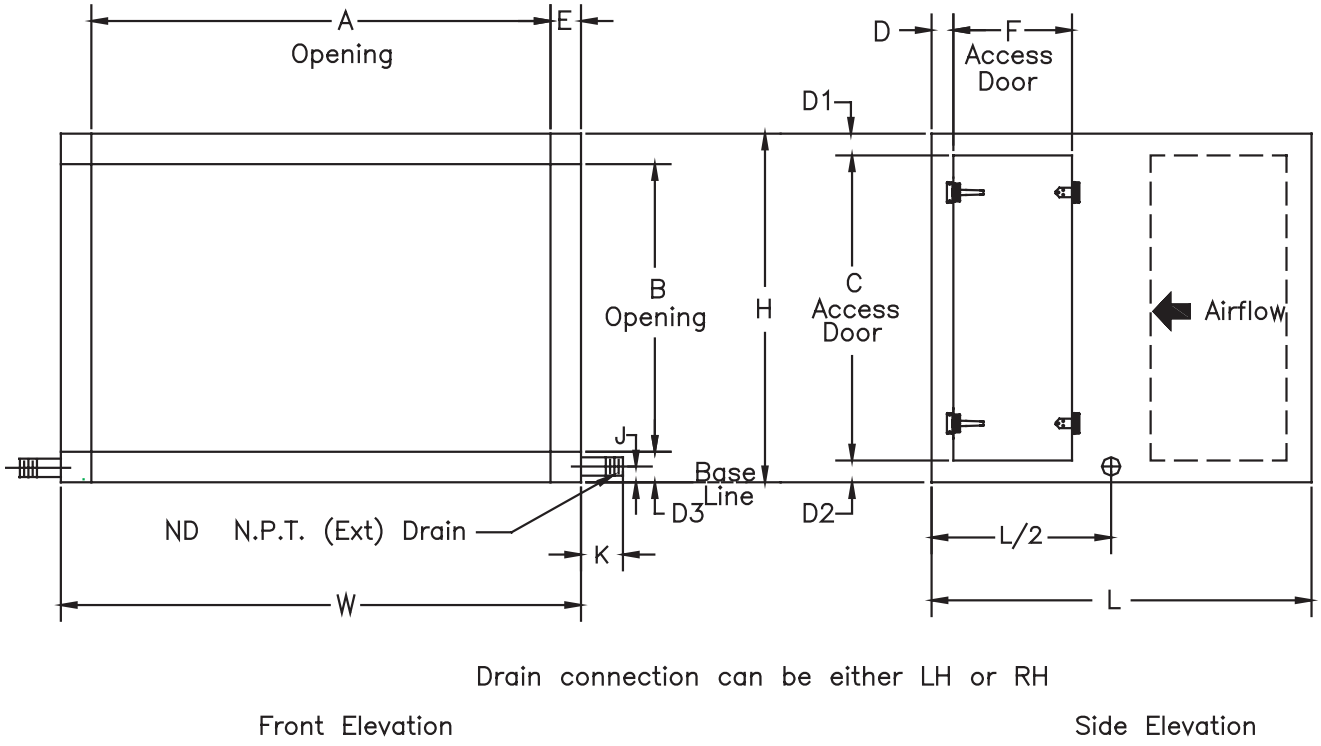


Table 185. Horizontal coil module with inspection door dimensions (inches)

Unit Size	W	H	A	B	C	D	D1	D2	D3	E	J	K	ND	Medium-Large		Large	
													(NPT)	L	F	L	F
8	48	34.00	44.00	30.00	29.46	2.15	2.27	2.27	2.00	2.00	0.80	2.60	1.00	24.50	6.70	34.00	11.20
10	60	34.00	56.00	30.00	29.46	2.15	2.27	2.27	2.00	2.00	0.80	2.60	1.00	24.50	6.70	34.00	11.20
12	64	39.00	60.00	35.00	34.46	2.15	2.27	2.27	2.00	2.00	0.80	2.60	1.00	24.50	6.70	34.00	11.20
14	68	40.50	64.00	36.50	35.96	2.15	2.27	2.27	2.00	2.00	0.80	2.60	1.00	24.50	6.70	34.00	11.20
17	74	44.00	70.00	40.00	39.46	2.15	2.27	2.27	2.00	2.00	0.80	2.60	1.00	24.50	6.70	34.00	11.20
21	76	50.25	72.00	46.25	45.71	2.15	2.27	2.27	2.00	2.00	0.80	2.60	1.00	24.50	6.70	34.00	11.20
25	78	56.50	74.00	52.50	51.96	2.15	2.27	2.27	2.00	2.00	0.80	2.60	1.00	24.50	6.70	40.00	11.20
30	91	56.50	87.00	52.50	51.96	2.15	2.27	2.27	2.00	2.00	0.80	2.60	1.00	24.50	6.70	40.00	11.20
35	96	63.75	91.00	58.75	58.21	2.65	2.77	2.77	2.50	2.50	1.20	3.60	1.25	29.50	6.20	48.00	10.70
40	109	63.75	104.00	58.75	58.21	2.65	2.77	2.77	2.50	2.50	1.20	3.60	1.25	29.50	6.20	48.00	10.70
50	120	75.00	115.00	70.00	69.46	2.65	2.77	2.77	2.50	2.50	1.20	3.60	1.25	29.50	9.20	48.00	14.70
57	120	86.50	115.00	81.50	71.58	2.65	12.15	2.77	2.50	2.50	1.20	3.60	1.25	29.50	9.20	48.00	14.70
66	137	92.08	132.00	81.58	71.57	2.65	12.15	8.36	8.00	2.50	5.80	2.50	1.50	29.50	9.20	n/a	n/a
80	137	107.08	132.00	96.58	71.57	2.65	27.15	8.36	8.00	2.50	5.80	2.50	1.50	29.50	9.20	n/a	n/a
100	152	119.58	147.00	109.08	71.57	2.65	39.65	8.36	8.00	2.50	5.80	2.50	1.50	29.50	9.20	n/a	n/a
120	179	119.58	174.00	109.08	71.57	2.65	39.65	8.36	8.00	2.50	5.80	2.50	1.50	29.50	9.20	n/a	n/a

Note: The base line does not include the height for mounting legs or base rail except for unit sizes 66 through 120 where the base rail is integral to the unit.

Table 186. Vertical coil module with inspection door dimensions (inches)

Unit Size	W	H	A	B	C	D	D1	D2	D3	E	J	K	ND (NPT)	L	L/2	F
3	31.00	26.25	27.00	22.25	21.71	2.15	2.27	2.27	2.00	2.00	0.80	2.60	1.00	26.25	13.13	11.20
6	44.00	28.75	40.00	24.75	24.21	2.15	2.27	2.27	2.00	2.00	0.80	2.60	1.00	28.75	14.38	11.20
8	48.00	34.00	44.00	30.00	29.46	2.15	2.27	2.27	2.00	2.00	0.80	2.60	1.00	34.00	17.00	11.20
10	60.00	34.00	56.00	30.00	29.46	2.15	2.27	2.27	2.00	2.00	0.80	2.60	1.00	34.00	17.00	11.20
12	64.00	39.00	60.00	35.00	34.46	2.15	2.27	2.27	2.00	2.00	0.80	2.60	1.00	34.00	17.00	11.20
14	68.00	40.50	64.00	36.50	35.96	2.15	2.27	2.27	2.00	2.00	0.80	2.60	1.00	34.00	17.00	11.20
17	74.00	44.00	70.00	40.00	39.46	2.15	2.27	2.27	2.00	2.00	0.80	2.60	1.00	34.00	17.00	11.20
21	76.00	50.25	72.00	46.25	45.71	2.15	2.27	2.27	2.00	2.00	0.80	2.60	1.00	34.00	17.00	11.20
25	78.00	56.50	74.00	52.50	51.96	2.15	2.27	2.27	2.00	2.00	0.80	2.60	1.00	40.00	20.00	11.20
30	91.00	56.50	87.00	52.50	51.96	2.15	2.27	2.27	2.00	2.00	0.80	2.60	1.00	40.00	20.00	11.20
35	96.00	63.75	91.00	58.75	58.21	2.65	2.77	2.77	2.50	2.50	1.20	3.60	1.25	48.00	24.00	10.70
40	109.00	63.75	104.00	58.75	58.21	2.65	2.77	2.77	2.50	2.50	1.20	3.60	1.25	48.00	24.00	10.70
50	120.00	75.00	115.00	70.00	69.46	2.65	2.77	2.77	2.50	2.50	1.20	3.60	1.25	48.00	24.00	14.70
57	120.00	86.50	115.00	81.50	71.58	2.65	12.15	2.77	2.50	2.50	1.20	3.60	1.25	48.00	24.00	14.70

(1) The drain pan connection dimension is nominal pipe size. Indoor air quality drain pan connections can be either left-hand or right-hand but not both.
(2) The base line does not include the height for mounting legs or base rail.

Figure 96. Coil connection locations for UW and UU coils sizes 3 - 40

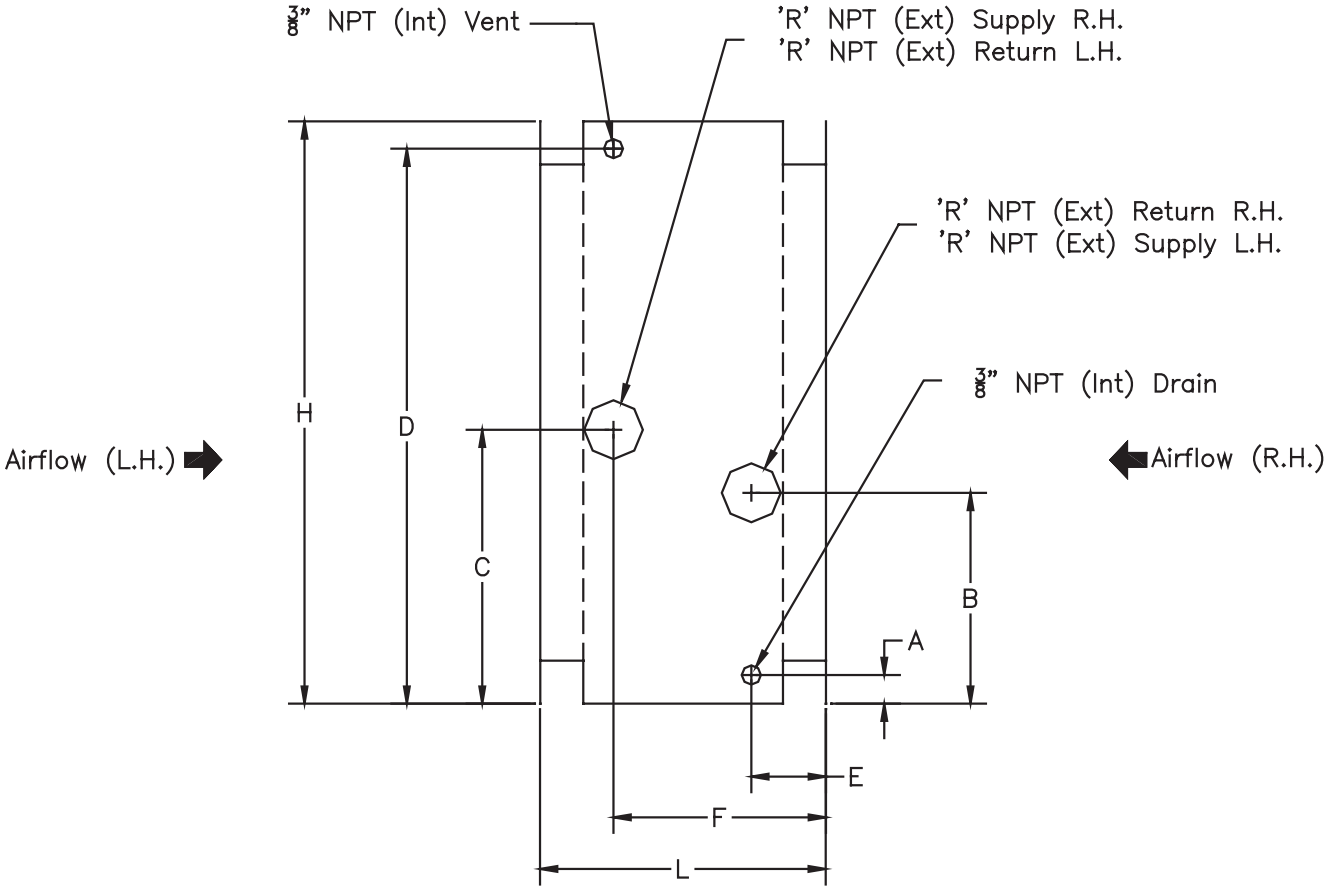


Figure 97. Coil connection locations for UW and UU coils sizes 50-120

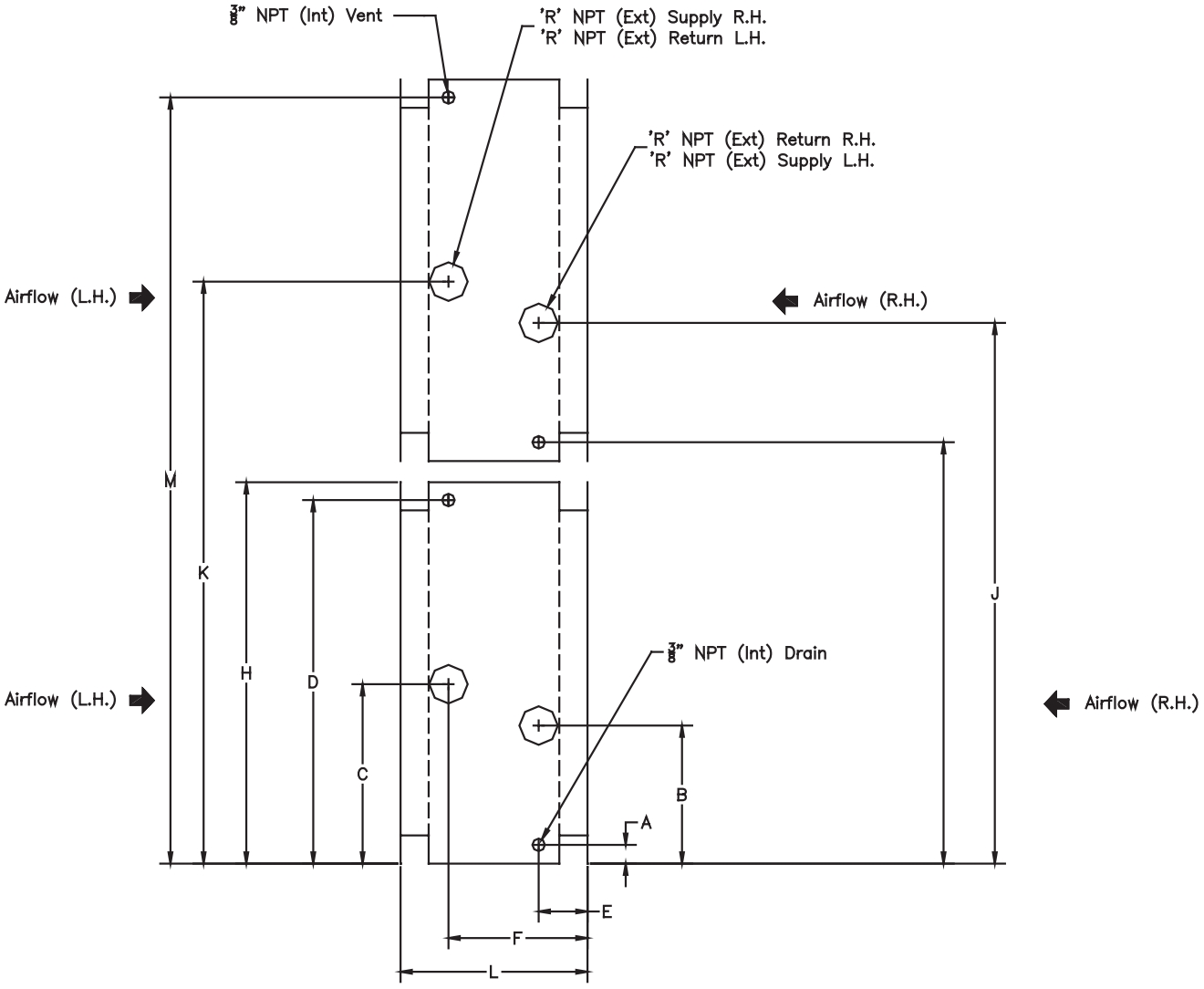


Table 187. UW coil connection location dimensions (inches)

Unit Size	2 - 8 Row										2-row	4 - 8 row	2-row	4-row	6-row	8-row	2-row	4-row	6-row	8-row
	A	B	C	D	H	I	J	K	M	R	E		F				L			
3	1.19	9.31	12.44	20.56	21.75	n/a	n/a	n/a	n/a	1.50	1.98	2.32	3.74	5.56	7.73	9.90	5.72	7.88	10.05	12.21
6	1.19	10.56	13.69	23.06	24.25	n/a	n/a	n/a	n/a	1.50	1.98	2.32	3.74	5.56	7.73	9.90	5.72	7.88	10.05	12.21
8	1.19	12.44	15.56	26.81	28.00	n/a	n/a	n/a	n/a	1.50	1.98	2.32	3.74	5.56	7.73	9.90	5.72	7.88	10.05	12.21
10	1.19	12.44	15.56	26.81	28.00	n/a	n/a	n/a	n/a	1.50	1.98	2.32	3.74	5.56	7.73	9.90	5.72	7.88	10.05	12.21
12	1.19	14.94	18.06	31.81	33.00	n/a	n/a	n/a	n/a	2.00	1.73	2.32	4.00	5.56	7.73	9.90	5.72	7.88	10.05	12.21
14	1.19	16.19	19.31	34.31	35.50	n/a	n/a	n/a	n/a	2.00	1.73	2.32	4.00	5.56	7.73	9.90	5.72	7.88	10.05	12.21
17	1.19	17.44	20.56	36.81	38.00	n/a	n/a	n/a	n/a	2.00	1.73	2.32	4.00	5.56	7.73	9.90	5.72	7.88	10.05	12.21
21	1.19	21.19	24.31	44.31	45.50	n/a	n/a	n/a	n/a	2.50	1.48	2.32	4.25	5.56	7.73	9.90	5.72	7.88	10.05	12.21
25	1.19	24.31	27.44	50.56	51.75	n/a	n/a	n/a	n/a	2.50	1.48	2.32	4.25	5.56	7.73	9.90	5.72	7.88	10.05	12.21
30	1.19	24.31	27.44	50.56	51.75	n/a	n/a	n/a	n/a	2.50	1.48	2.32	4.25	5.56	7.73	9.90	5.72	7.88	10.05	12.21
35	1.19	27.44	30.56	56.81	58.00	n/a	n/a	n/a	n/a	2.50	1.48	2.32	4.25	5.56	7.73	9.90	5.72	7.88	10.05	12.21
40	1.19	27.44	30.56	56.81	58.00	n/a	n/a	n/a	n/a	2.50	1.48	2.32	4.25	5.56	7.73	9.90	5.72	7.88	10.05	12.21
50	1.69	15.44	18.56	32.31	34.00	36.50	50.25	53.36	67.11	2.00	1.73	2.32	4.00	5.56	7.73	9.90	5.72	7.88	10.05	12.21
57	1.69	17.94	21.06	37.31	39.00	41.50	57.75	60.86	77.11	2.00	1.73	2.32	4.00	5.56	7.73	9.90	5.72	7.88	10.05	12.21
66	1.69	17.94	21.06	37.31	39.00	41.50	57.75	60.86	77.11	2.00	1.73	2.32	4.00	5.56	7.73	9.90	5.72	7.88	10.05	12.21
80	1.69	21.69	24.81	44.81	46.50	49.00	69.00	72.11	92.11	2.50	1.48	2.32	4.25	5.56	7.73	9.90	5.72	7.88	10.05	12.21
100	1.69	24.81	27.94	51.06	52.75	55.25	78.36	81.50	104.61	2.50	1.48	2.32	4.25	5.56	7.73	9.90	5.72	7.88	10.05	12.21
120	1.69	24.81	27.94	51.06	52.75	55.25	78.36	81.50	104.61	2.50	1.48	2.32	4.25	5.56	7.73	9.90	5.72	7.88	10.05	12.21

Table 188. UU coil connection location dimensions (inches)

Unit Size	4, 8 Row										4-row Supply	4-row Return	8-row	4-row	8-row	4-row	8-row
	A	B	C	D	H	I	J	K	M	R	E			F		L	
12	0.94	14.94	18.07	32.06	33.00	n/a	n/a	n/a	n/a	2.50	0.85	2.86	2.86	5.02	9.35	7.88	12.21
14	0.94	16.19	19.32	34.56	35.50	n/a	n/a	n/a	n/a	2.50	0.85	2.86	2.86	5.02	9.35	7.88	12.21
17	0.94	17.44	20.57	37.06	38.00	n/a	n/a	n/a	n/a	2.50	0.85	2.86	2.86	5.02	9.35	7.88	12.21
21	0.94	21.19	24.32	44.56	45.50	n/a	n/a	n/a	n/a	2.50	0.85	2.86	2.86	5.02	9.35	7.88	12.21
25	0.94	24.31	27.44	50.81	51.75	n/a	n/a	n/a	n/a	2.50	0.85	2.86	2.86	5.02	9.35	7.88	12.21
30	0.94	24.31	27.44	50.81	51.75	n/a	n/a	n/a	n/a	2.50	0.85	2.86	2.86	5.02	9.35	7.88	12.21
35	0.94	27.44	30.57	57.06	58.00	n/a	n/a	n/a	n/a	2.50	0.85	2.86	2.86	5.02	9.35	7.88	12.21
40	0.94	27.44	30.57	57.06	58.00	n/a	n/a	n/a	n/a	2.50	0.85	2.86	2.86	5.02	9.35	7.88	12.21
50	1.69	15.44	18.56	32.31	34.00	36.50	50.25	53.36	67.11	2.50	2.86	2.86	2.86	5.02	9.35	7.88	12.21
57	1.69	17.94	21.06	37.31	39.00	41.50	57.75	60.86	77.11	2.50	2.86	2.86	2.86	5.02	9.35	7.88	12.21
66	1.69	17.94	21.06	37.31	39.00	41.50	57.75	60.86	77.11	2.50	2.86	2.86	2.86	5.02	9.35	7.88	12.21
80	1.69	21.69	24.81	44.81	46.50	49.00	69.00	72.11	92.11	2.50	2.86	2.86	2.86	5.02	9.35	7.88	12.21
100	1.69	24.81	27.94	51.06	52.75	55.25	78.36	81.50	104.61	2.50	2.86	2.86	2.86	5.02	9.35	7.88	12.21
120	1.69	24.81	27.94	51.06	52.75	55.25	78.36	81.50	104.61	2.50	2.86	2.86	2.86	5.02	9.35	7.88	12.21

Note: Refer to Figure 93 and Table 183 on page 128 for location of coil in the module.

Figure 98. Integral face-and-bypass coil

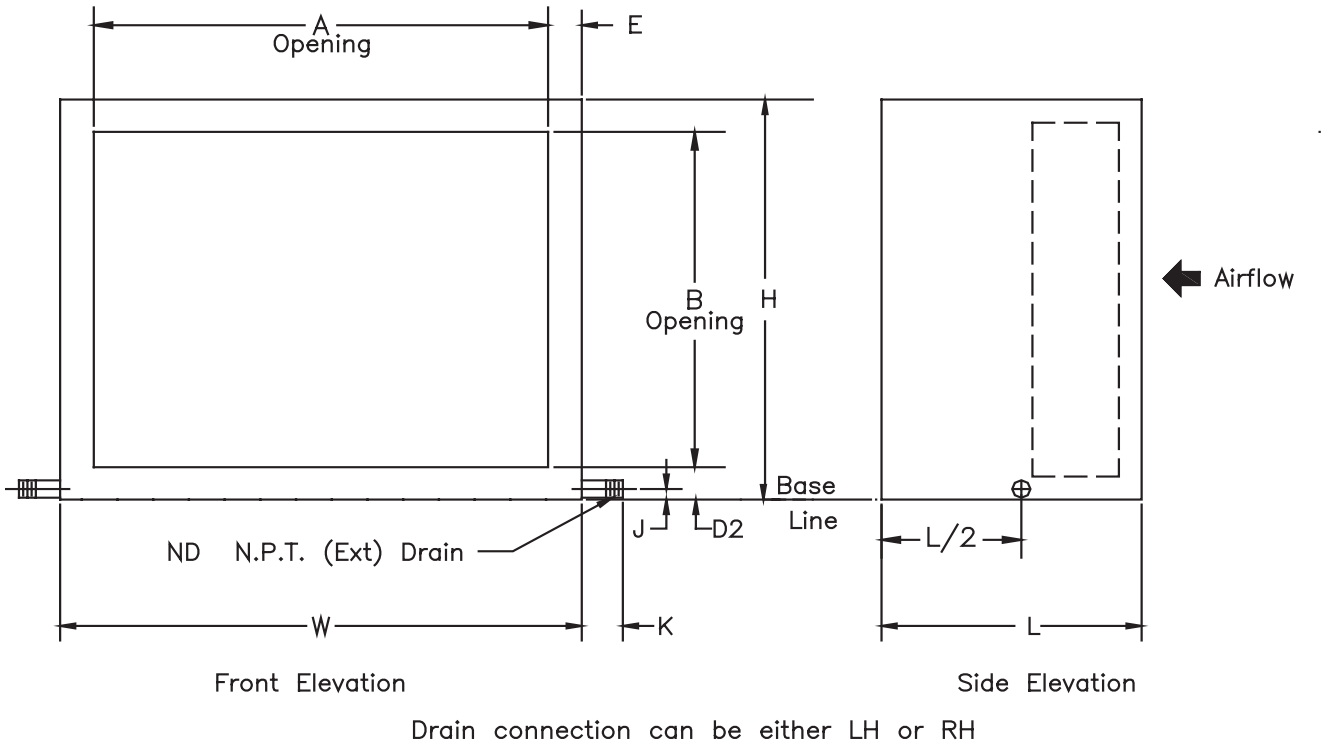


Table 189. Integral face-and-bypass coil dimensions (inches)

Unit Size	W	L	H	A	B	D2	E	J	K	ND (NPT)
3	31	26.25	26.25	27.00	22.25	2.00	2.00	0.80	2.60	1.00
6	44	28.75	28.75	40.00	24.75	2.00	2.00	0.80	2.60	1.00
8	48	34.00	34.00	44.00	30.00	2.00	2.00	0.80	2.60	1.00
10	60	34.00	34.00	56.00	30.00	2.00	2.00	0.80	2.60	1.00
12	64	34.00	39.00	60.00	35.00	2.00	2.00	0.80	2.60	1.00
14	68	34.00	40.50	64.00	36.50	2.00	2.00	0.80	2.60	1.00
17	74	34.00	44.00	70.00	40.00	2.00	2.00	0.80	2.60	1.00
21	76	34.00	50.25	72.00	46.25	2.00	2.00	0.80	2.60	1.00
25	78	40.00	56.50	74.00	52.50	2.00	2.00	0.80	2.60	1.00
30	91	40.00	56.50	87.00	52.50	2.00	2.00	0.80	2.60	1.00
35	96	29.50	63.75	91.00	58.75	2.50	2.50	1.20	3.60	1.25
40	109	29.50	63.75	104.00	58.75	2.50	2.50	1.20	3.60	1.25
50	120	29.50	75.00	115.00	70.00	2.50	2.50	1.20	3.60	1.25
57	120	29.50	86.50	115.00	81.50	2.50	2.50	1.20	3.60	1.25
66	137	29.50	92.08	132.00	81.58	8.00	2.50	5.80	2.50	1.50
80	137	29.50	107.08	132.00	96.58	8.00	2.50	5.80	2.50	1.50
100	152	29.50	119.58	147.00	109.08	8.00	2.50	5.80	2.50	1.50
120	179	29.50	119.58	174.00	109.08	8.00	2.50	5.80	2.50	1.50

(1) The drain pan connection dimension is nominal pipe size. Indoor air quality drain pan connections can be either LH or RH but not both.
(2) The base line does not include the height for mounting legs or base rail except for unit sizes 66 through 120 where the base rail is integral to the unit.
(3) For coil connection information, refer to the submittal information provided from the Trane Official Product Selection Software (TOPSS ™)

Bypass Dampers

Figure 99. External face-and-bypass damper module

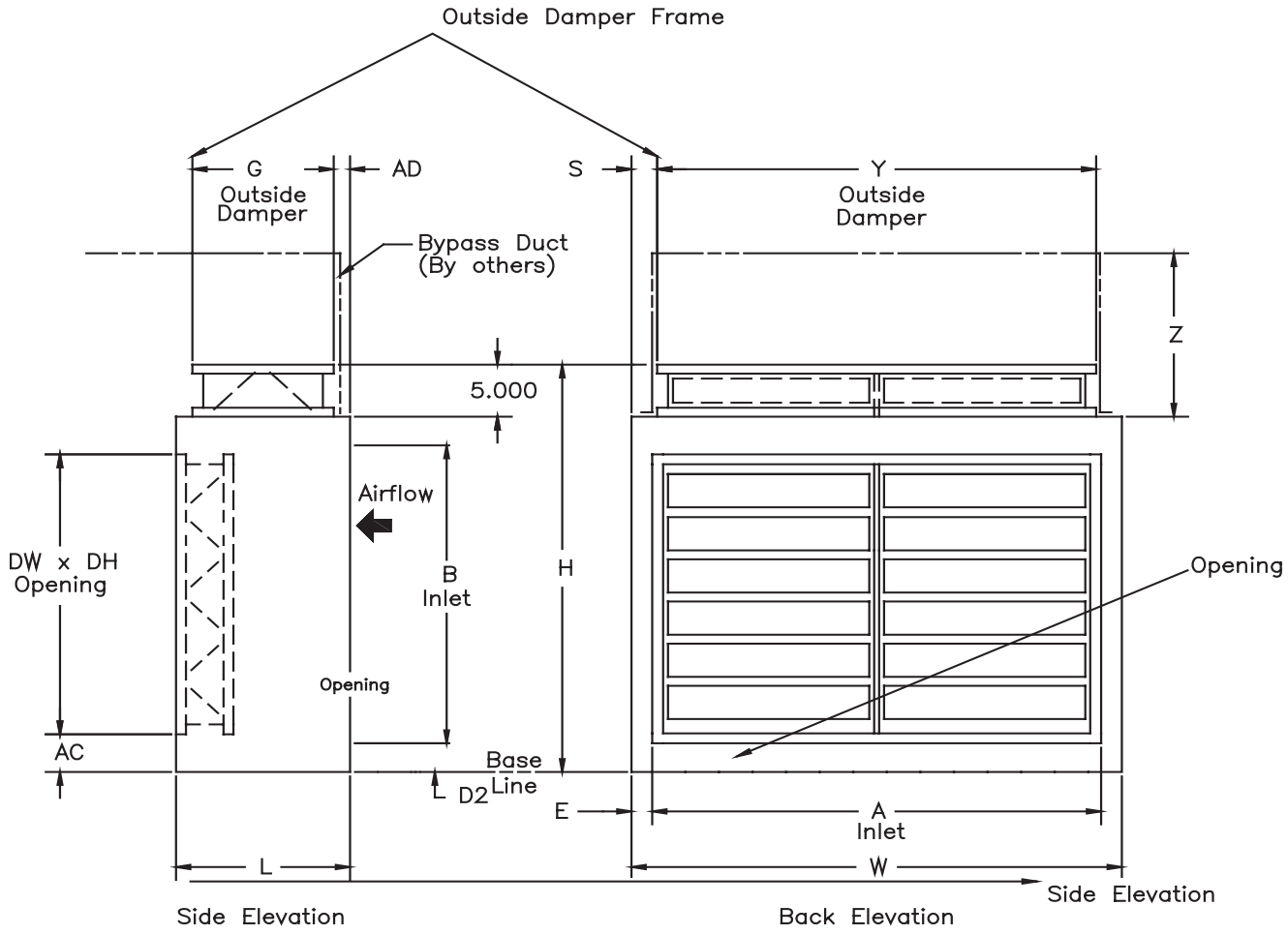


Table 190. External face-and-bypass dampers dimensions (inches)

Unit Size	W	L	H	A	B	D2	E	G	S	Y	Z	AC	AD	DH	DW
3	31	15.50	31.25	27.00	22.25	2.00	2.00	14.00	2.25	26.50	12.00	0.63	0.75	22.75	29.50
6	44	15.50	33.75	40.00	24.75	2.00	2.00	14.00	2.25	39.50	14.00	0.63	0.75	22.75	42.50
8	48	15.50	39.00	44.00	30.00	2.00	2.00	14.00	2.25	43.50	14.00	0.63	0.75	28.50	46.50
10	60	15.50	39.00	56.00	30.00	2.00	2.00	14.00	2.25	55.50	14.00	0.63	0.75	28.50	58.50
12	64	15.50	44.00	60.00	35.00	2.00	2.00	14.00	2.25	59.50	18.00	0.63	0.75	34.25	62.50
14	68	15.50	45.50	64.00	36.50	2.00	2.00	14.00	2.25	63.50	18.00	0.63	0.75	34.25	66.50
17	74	15.50	49.00	70.00	40.00	2.00	2.00	14.00	2.25	69.50	18.00	0.63	0.75	40.00	72.50
21	76	15.50	55.25	72.00	46.25	2.00	2.00	14.00	2.25	71.50	24.00	0.63	0.75	45.75	74.50
25	78	15.50	61.50	74.00	52.50	2.00	2.00	14.00	2.25	73.50	24.00	0.63	0.75	51.50	76.50
30	91	15.50	61.50	87.00	52.50	2.00	2.00	14.00	2.25	86.50	24.00	0.63	0.75	51.50	89.50
35	96	16.00	68.75	91.00	58.75	2.50	2.50	14.00	2.75	90.50	28.00	1.13	1.00	57.25	93.50
40	109	16.00	68.75	104.00	58.75	2.50	2.50	14.00	2.75	103.50	28.00	1.13	1.00	57.25	106.50
50	120	20.00	80.00	115.00	70.00	2.50	2.50	14.00	2.75	114.50	28.00	1.13	3.00	68.75	117.50
57	120	20.00	91.50	115.00	81.50	2.50	2.50	14.00	2.75	114.50	32.00	1.13	3.00	80.25	117.50
66	137	29.50	97.08	132.00	81.50	8.00	2.50	25.50	2.75	131.50	40.00	6.57	2.00	84.00	134.50
80	137	29.50	112.08	132.00	96.50	8.00	2.50	25.50	2.75	131.50	40.00	6.57	2.00	99.00	134.50
100	152	29.50	124.58	147.00	109.00	8.00	2.50	25.50	2.75	146.50	40.00	6.57	2.00	111.50	149.50
120	179	29.50	124.58	174.00	109.00	8.00	2.50	25.50	2.75	173.50	40.00	6.57	2.00	111.50	176.50

(1) Z represents the minimum duct height dimension for the bypass ductwork that is provided by others.

(2) The damper opening dimensions are the dimensions to the outer edge of the damper flanges.

Figure 100. Face damper module

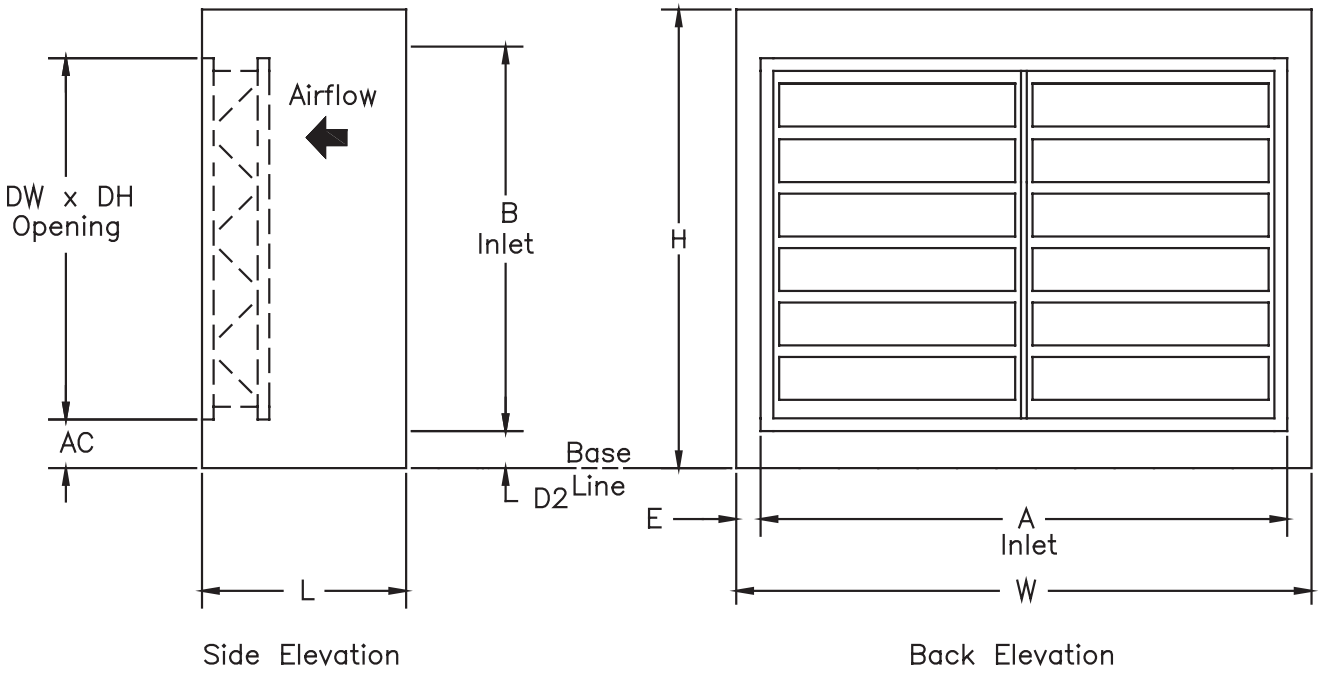


Table 191. Face damper dimensions (inches)

Unit Size	W	L	H	A	B	D2	E	AC	DH	DW
3	31	15.50	26.25	27.00	22.25	2.00	2.00	0.63	22.75	29.50
6	44	15.50	28.75	40.00	24.75	2.00	2.00	0.63	22.75	42.50
8	48	15.50	34.00	44.00	30.00	2.00	2.00	0.63	28.50	46.50
10	60	15.50	34.00	56.00	30.00	2.00	2.00	0.63	28.50	58.50
12	64	15.50	39.00	60.00	35.00	2.00	2.00	0.63	34.25	62.50
14	68	15.50	40.50	64.00	36.50	2.00	2.00	0.63	34.25	66.50
17	74	15.50	44.00	70.00	40.00	2.00	2.00	0.63	40.00	72.50
21	76	15.50	50.25	72.00	46.25	2.00	2.00	0.63	45.75	74.50
25	78	15.50	56.50	74.00	52.50	2.00	2.00	0.63	51.50	76.50
30	91	15.50	56.50	87.00	52.50	2.00	2.00	0.63	51.50	89.50
35	96	16.00	63.75	91.00	58.75	2.50	2.50	1.13	57.25	93.50
40	109	16.00	63.75	104.00	58.75	2.50	2.50	1.13	57.25	106.50
50	120	20.00	75.00	115.00	70.00	2.50	2.50	1.13	68.75	117.50
57	120	20.00	86.50	115.00	81.50	2.50	2.50	1.13	80.25	117.50
66	137	20.00	92.09	132.00	81.50	8.00	2.50	6.50	84.00	134.50
80	137	20.00	107.09	132.00	96.50	8.00	2.50	6.50	99.00	134.50
100	152	20.00	119.59	147.00	109.00	8.00	2.50	6.50	111.50	149.50
120	179	20.00	119.59	174.00	109.00	8.00	2.50	6.50	111.50	176.50

(1) The damper opening dimensions are the dimensions to the outer edge of the damper flanges.

(2) The base line does not include the height for mounting legs or base rail except for unit sizes 66 through 120 where the base rail is integral to the unit.

Figure 101. Internal face-and-bypass damper module

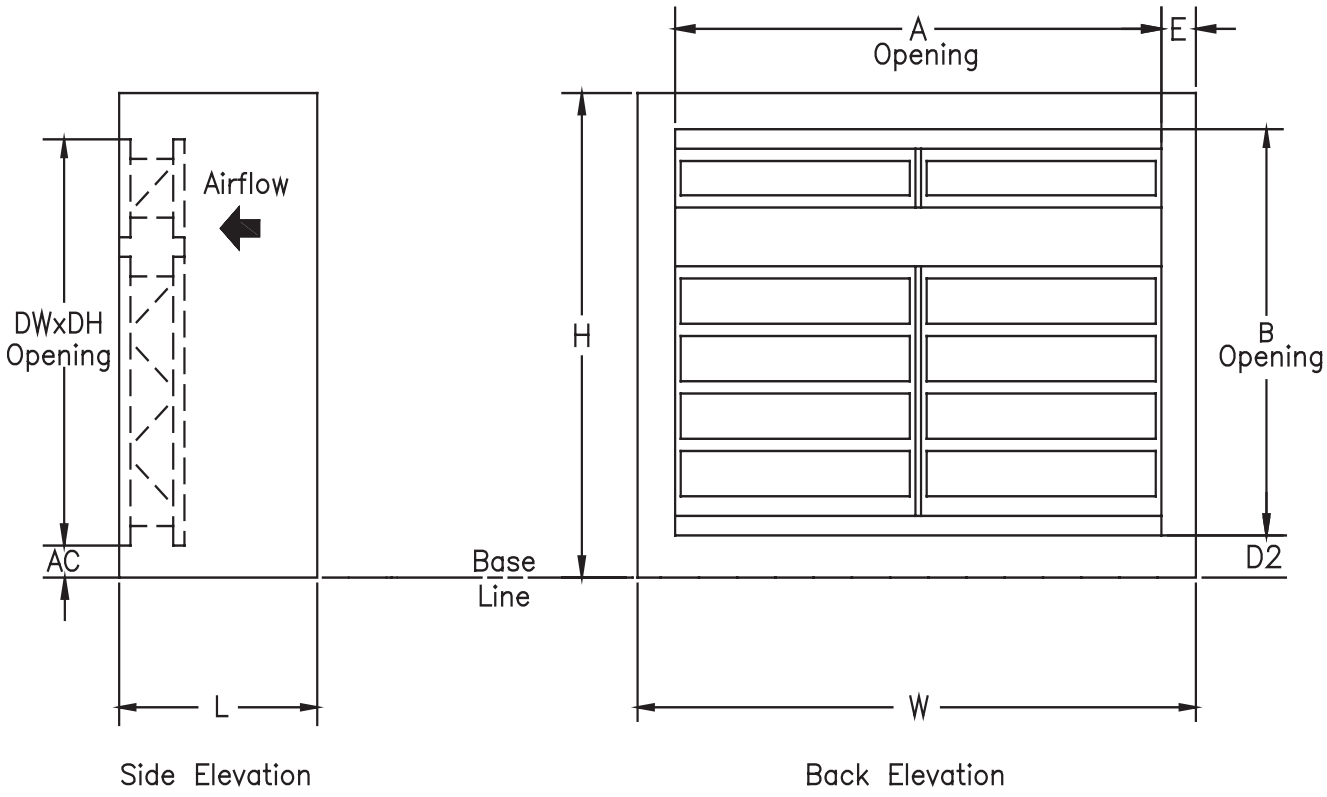


Table 192. Internal face-and-bypass damper dimensions (inches)

Unit Size	W	L	H	A	B	D2	E	AC	DH	DW
3	31	15.50	26.25	27.00	22.25	2.00	2.00	2.19	24.75	29.50
6	44	15.50	28.75	40.00	24.75	2.00	2.00	2.25	27.25	42.50
8	48	15.50	34.00	44.00	30.00	2.00	2.00	2.25	32.50	46.50
10	60	15.50	34.00	56.00	30.00	2.00	2.00	2.25	32.50	58.50
12	64	15.50	39.00	60.00	35.00	2.00	2.00	2.25	37.50	62.50
14	68	15.50	40.50	64.00	36.50	2.00	2.00	2.25	39.00	66.50
17	74	15.50	44.00	70.00	40.00	2.00	2.00	2.25	42.50	72.50
21	76	15.50	50.25	72.00	46.25	2.00	2.00	2.24	48.75	74.50
25	78	15.50	56.50	74.00	52.50	2.00	2.00	2.25	55.00	76.50
30	91	15.50	56.50	87.00	52.50	2.00	2.00	2.25	55.00	89.50
35	96	16.00	63.75	91.00	58.75	2.50	2.50	2.75	61.25	93.50
40	109	16.00	63.75	104.00	58.75	2.50	2.50	2.75	61.25	106.50
50	120	20.00	75.00	115.00	70.00	2.50	2.50	2.75	72.50	117.50
57	120	20.00	86.50	115.00	81.50	2.50	2.50	2.59	84.32	117.50
66	137	20.00	92.09	132.00	81.59	8.00	2.50	8.09	84.32	134.50
80	137	20.00	107.09	132.00	96.59	8.00	2.50	8.09	99.00	134.50
100	152	20.00	119.59	147.00	109.09	8.00	2.50	8.09	111.50	149.50
120	179	20.00	119.59	174.00	109.09	8.00	2.50	8.09	111.50	176.50

(1) The base line does not include the height for mounting legs or base rail except for unit sizes 66 through 120 where the base rail is integral to the unit.

Diffuser

Figure 102. Diffuser module

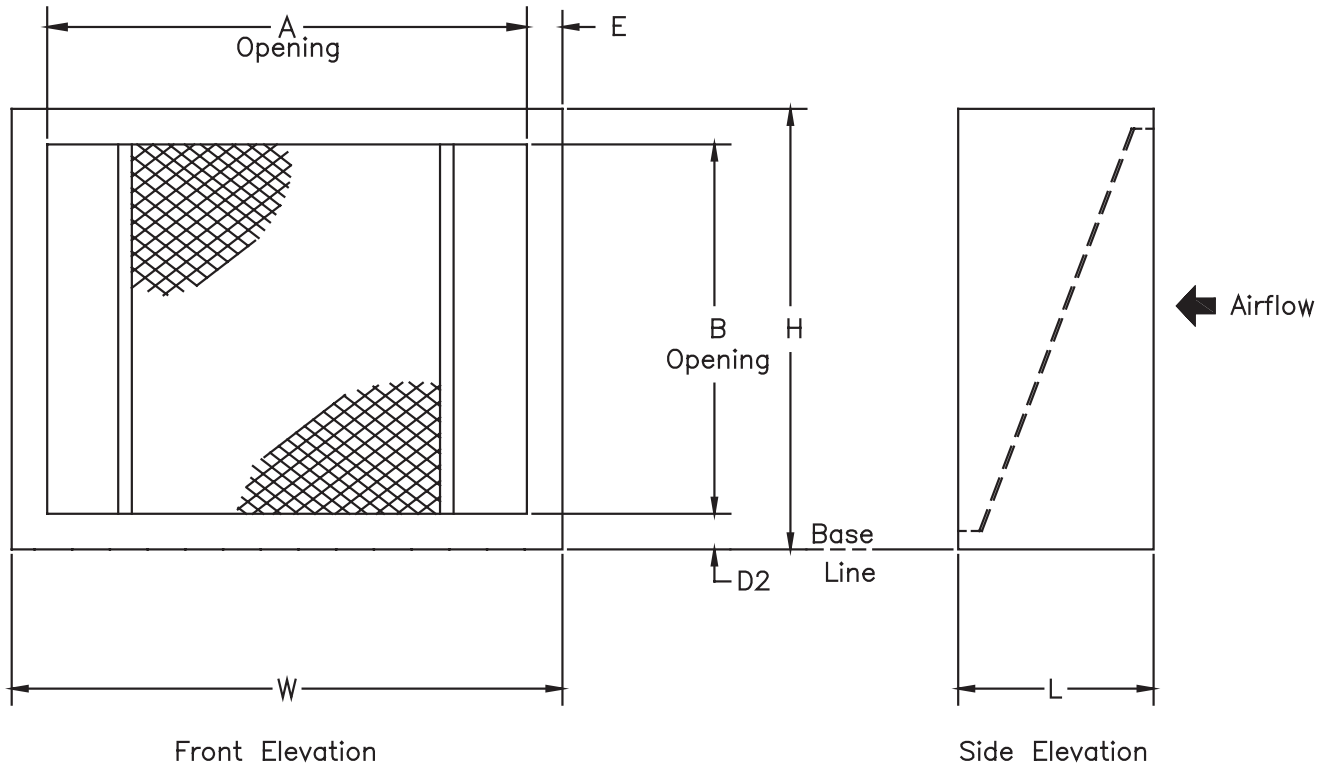


Table 193. Diffuser module dimensions (inches)

Unit Size	W	L	H	A	B	D2	E
3	31	15.50	26.25	27.00	22.25	2.00	2.00
6	44	15.50	28.75	40.00	24.75	2.00	2.00
8	48	15.50	34.00	44.00	30.00	2.00	2.00
10	60	15.50	34.00	56.00	30.00	2.00	2.00
12	64	15.50	39.00	60.00	35.00	2.00	2.00
14	68	15.50	40.50	64.00	36.50	2.00	2.00
17	74	15.50	44.00	70.00	40.00	2.00	2.00
21	76	15.50	50.25	72.00	46.25	2.00	2.00
25	78	15.50	56.50	74.00	52.50	2.00	2.00
30	91	15.50	56.50	87.00	52.50	2.00	2.00
35	96	16.00	63.75	91.00	58.75	2.50	2.50
40	109	16.00	63.75	104.00	58.75	2.50	2.50
50	120	20.00	75.00	115.00	70.00	2.50	2.50
57	120	20.00	86.50	115.00	81.50	2.50	2.50
66	137	49.00	92.09	132.00	81.50	8.00	2.50
80	137	54.00	107.09	132.00	96.50	8.00	2.50
100	152	60.00	119.59	147.00	109.00	8.00	2.50
120	179	60.00	119.59	174.00	109.00	8.00	2.50

Note: The base line does not include the height for mounting legs or base rail except for unit sizes 66 through 120 where the base rail is integral to the unit.

Discharge Plenum

Figure 103. Horizontal discharge plenum module

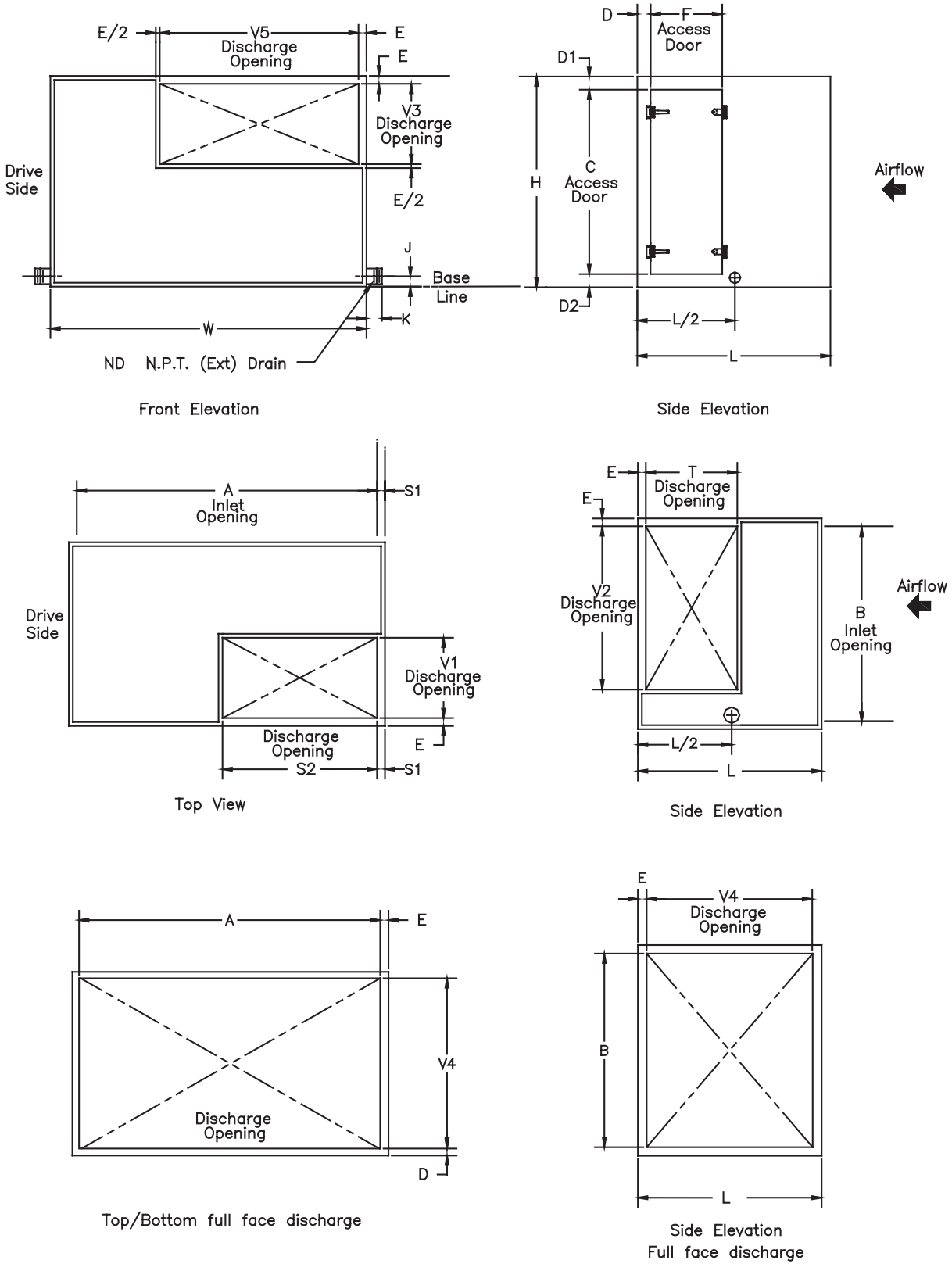


Table 194. Horizontal plenum dimensions (inches)

Unit Size	W	L	H	A	B	C	D	D1	D2	E	F
3	31	26.25	26.25	27.00	22.25	19.49	9.75	3.38	3.38	2.00	14.00
6	44	28.75	28.75	40.00	24.75	21.99	12.25	3.38	3.38	2.00	14.00
8	48	34.00	34.00	44.00	30.00	27.24	12.00	3.38	3.38	2.00	19.50
10	60	34.00	34.00	56.00	30.00	27.24	12.00	3.38	3.38	2.00	19.50
12	64	34.00	39.00	60.00	35.00	32.24	12.00	3.38	3.38	2.00	19.50
14	68	34.00	40.50	64.00	36.50	33.74	12.00	3.38	3.38	2.00	19.50
17	74	34.00	44.00	70.00	40.00	37.24	12.00	3.38	3.38	2.00	19.50
21	76	34.00	50.25	72.00	46.25	43.49	12.00	3.38	3.38	2.00	19.50
25	78	40.00	56.50	74.00	52.50	49.74	18.00	3.38	3.38	2.00	19.50
30	91	40.00	56.50	87.00	52.50	49.74	18.00	3.38	3.38	2.00	19.50
35	96	48.00	63.75	91.00	58.75	55.99	21.50	3.88	3.88	2.50	23.50
40	109	48.00	63.75	104.00	58.75	55.99	21.50	3.88	3.88	2.50	23.50
50	120	48.00	75.00	115.00	70.00	67.24	21.50	3.88	3.88	2.50	23.50
57	120	48.00	86.50	115.00	81.50	70.12	21.50	12.50	3.88	2.50	23.50
66	137	49.00	92.09	132.00	81.50	70.12	22.50	12.50	9.46	2.50	23.50
80	137	54.00	107.09	132.00	96.50	70.12	27.50	27.50	9.46	2.50	23.50
100	152	60.00	119.59	147.00	109.00	70.12	33.50	40.00	9.46	2.50	23.50
120	179	60.00	119.59	174.00	109.00	70.12	33.50	40.00	9.46	2.50	23.50
Unit Size	**J**	**K**	**ND (NPT)**	**S1**	**S2**	**T**	**V1**	**V2**	**V3**	**V4**	**V5**
3	0.80	2.60	1.00	2.00	18.00	14.72	9.00	9.69	9.00	22.25	18.00
6	0.80	2.60	1.00	2.00	19.00	14.72	14.72	15.69	14.72	24.75	19.00
8	0.80	2.60	1.00	2.00	23.00	14.72	14.72	19.69	14.72	30.00	23.00
10	0.80	2.60	1.00	2.00	30.00	20.50	14.72	18.69	14.72	30.00	30.00
12	0.80	2.60	1.00	2.00	34.00	20.50	14.72	22.69	14.72	30.00	34.00
14	0.80	2.60	1.00	2.00	25.00	20.50	20.47	26.69	20.47	30.00	25.00
17	0.80	2.60	1.00	2.00	29.50	20.50	20.47	30.69	20.47	30.00	29.50
21	0.80	2.60	1.00	2.00	36.50	20.50	20.47	35.69	20.47	30.00	36.50
25	0.80	2.60	1.25	2.00	33.50	20.50	26.22	41.94	26.22	36.00	33.50
30	0.80	2.60	1.25	2.00	39.75	26.25	26.22	41.94	26.22	36.00	39.75
35	1.20	3.60	1.25	2.50	56.00	25.97	22.00	48.50	22.00	43.00	56.00
40	1.20	3.60	1.25	2.50	64.38	31.72	22.00	45.50	22.00	43.00	64.38
50	1.20	3.60	1.25	2.50	69.75	31.72	25.50	57.50	32.00	43.00	55.63
57	1.20	3.60	1.25	2.50	80.50	31.72	25.50	65.50	37.50	43.00	56.25
66	5.80	2.50	1.50	32.50	72.00	44.00	44.00	53.75	28.50	44.00	87.17
80	5.80	2.50	1.50	30.00	77.00	49.00	49.00	58.00	34.00	49.00	87.17
100	5.80	2.50	1.50	32.00	88.00	55.00	55.00	66.75	37.50	55.00	97.17
120	5.80	2.50	1.50	37.50	104.00	55.00	55.00	79.00	48.00	55.00	85.75

(1) Drain pan connect dimension is nominal pipe size.

(2) Inward swing doors are dimensioned to door opening.

Figure 104. Vertical plenum module

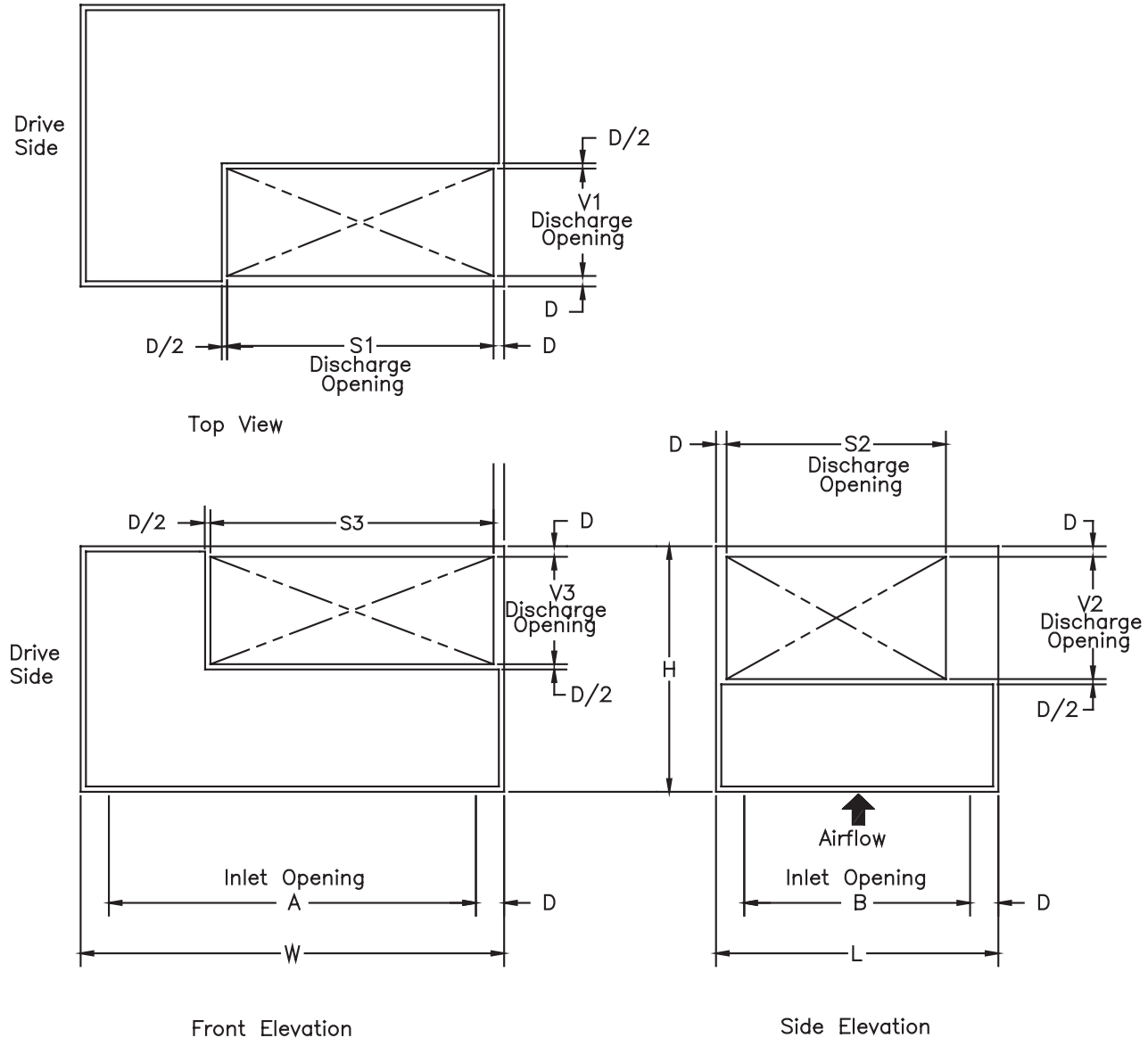


Table 195. Vertical plenum dimensions (inches)

Unit Size	W	L	H	A	B	D	S1	S2	S3	V1	V2	V3
3	31	36.00	26.25	27.00	32.00	2.00	18.00	14.72	18.00	9.00	9.69	9.00
6	44	41.00	28.75	40.00	37.00	2.00	19.00	14.72	19.00	14.72	15.69	14.72
8	48	44.00	34.00	44.00	40.00	2.00	23.00	14.72	23.00	14.72	19.69	14.72
10	60	39.00	34.00	56.00	35.00	2.00	30.00	20.50	30.00	14.72	18.69	14.72
12	64	39.00	34.00	60.00	35.00	2.00	34.00	22.69	34.00	14.72	20.50	14.72
14	68	40.50	34.00	64.00	36.50	2.00	25.00	26.69	25.00	20.47	20.50	20.47
17	74	44.00	34.00	70.00	40.00	2.00	29.50	30.69	29.50	20.47	20.50	20.47
21	76	50.25	34.00	72.00	46.25	2.00	36.50	35.69	36.50	20.47	20.50	20.47
25	78	56.50	40.00	74.00	52.50	2.00	33.50	41.94	33.50	26.22	20.50	26.22
30	91	56.50	40.00	87.00	52.50	2.00	39.75	41.94	39.75	26.22	26.25	26.22
35	96	63.75	48.00	91.00	58.75	2.50	56.00	48.50	56.00	22.00	25.97	22.00
40	109	63.75	48.00	104.00	58.75	2.50	64.38	48.50	64.38	22.00	25.97	22.00
50	120	75.00	48.00	115.00	70.00	2.50	55.63	57.50	69.75	32.00	31.72	25.50
57	120	75.00	48.00	115.00	70.00	2.50	55.63	57.50	69.75	32.00	31.72	25.50

Electric Heat

Figure 105. Electric heat module

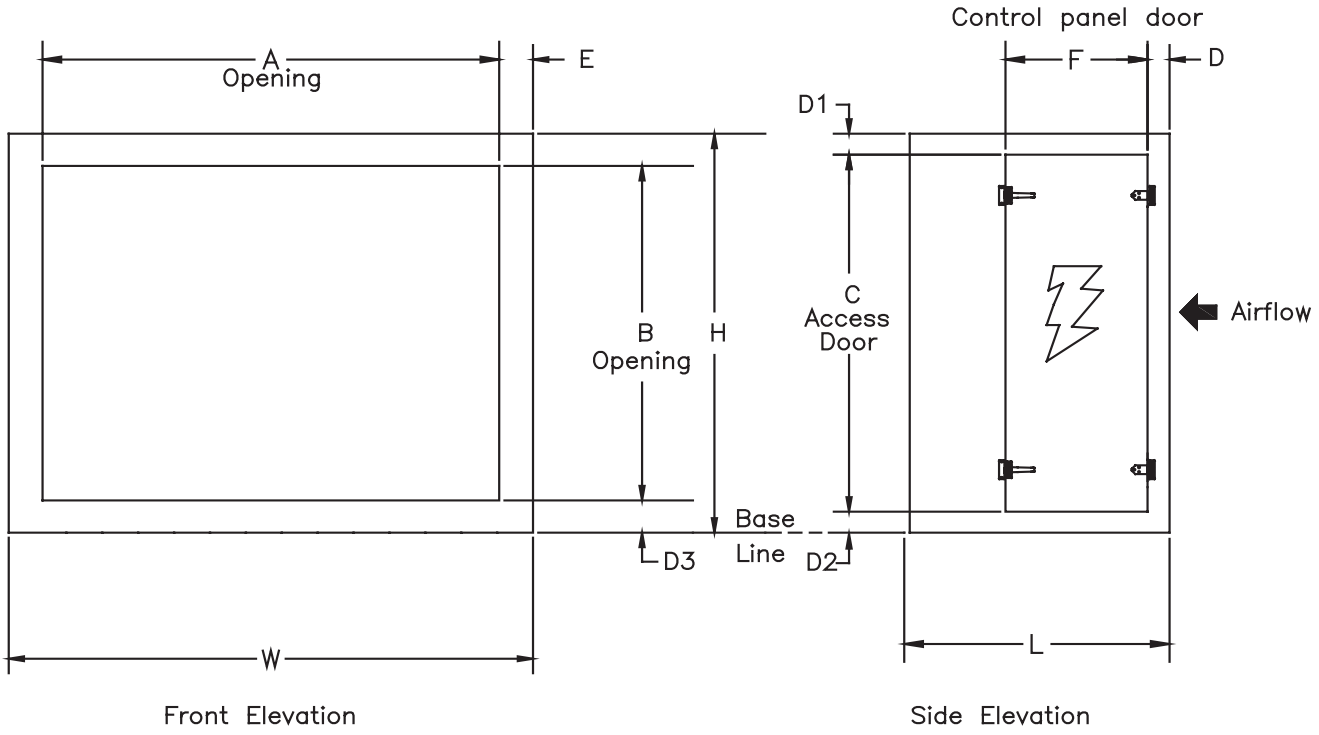


Table 196. Electric heat dimensions (inches)

Unit Size	W	L	H	A	B	C	D	D1	D2	D3	E	F
3	31	26.25	26.25	27.00	22.25	21.71	2.15	2.27	2.27	2.00	2.00	21.95
6	44	28.75	28.75	40.00	24.75	24.21	2.15	2.27	2.27	2.00	2.00	24.45
8	48	34.00	34.00	44.00	30.00	29.46	2.15	2.27	2.27	2.00	2.00	20.20
10	60	34.00	34.00	56.00	30.00	29.46	2.15	2.27	2.27	2.00	2.00	20.20
12	64	34.00	39.00	60.00	35.00	34.46	2.15	2.27	2.27	2.00	2.00	20.20
14	68	34.00	40.50	64.00	36.50	35.96	2.15	2.27	2.27	2.00	2.00	20.20
17	74	34.00	44.00	70.00	40.00	39.46	11.65	2.27	2.27	2.00	2.00	20.20
21	76	34.00	50.25	72.00	46.25	45.71	11.65	2.27	2.27	2.00	2.00	20.20
25	78	40.00	56.50	74.00	52.50	51.96	17.65	2.27	2.27	2.00	2.00	20.20
30	91	40.00	56.50	87.00	52.50	51.96	17.65	2.27	2.27	2.00	2.00	20.20
35	96	48.00	63.75	91.00	58.75	58.21	21.15	2.77	2.77	2.50	2.50	24.20
40	109	48.00	63.75	104.00	58.75	58.21	21.15	2.77	2.77	2.50	2.50	24.20
50	120	48.00	75.00	115.00	70.00	69.46	21.15	2.77	2.77	2.50	2.50	24.20
57	120	48.00	86.50	115.00	81.50	71.58	21.15	12.15	2.77	2.50	2.50	24.20
66	137	49.00	92.09	132.00	81.50	71.58	22.15	12.15	8.36	8.00	2.50	24.20

Note: The base line does not include the height for mounting legs or base rail except for unit size 66 where the base rail is integral to the unit.

Energy Wheel

Figure 106. Energy wheel cassette

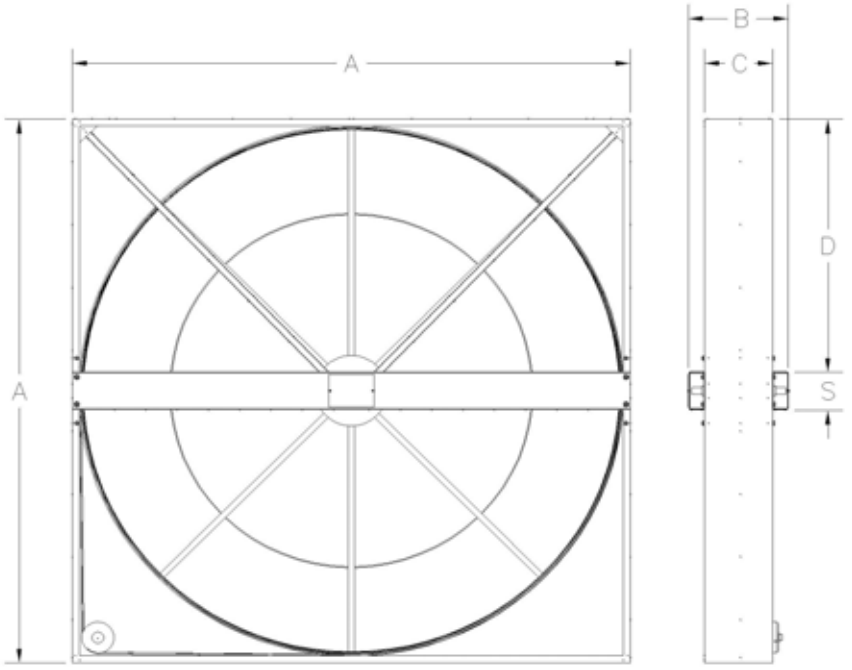


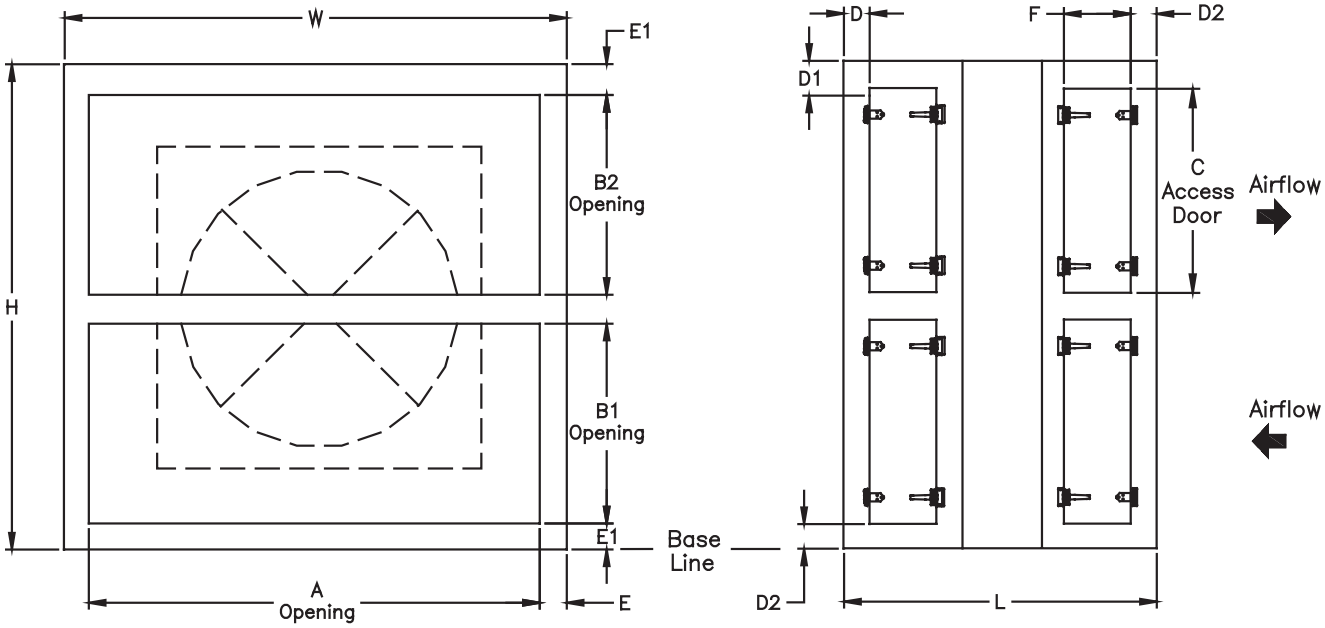
Table 198. Energy wheel cassette dimensions (inches)

CFM	A	B	C	D	S
900	29.00	5.415	2.488	13.480	2.040
1500	34.00	5.415	2.488	15.980	2.040
3000	44.00	7.520	4.360	19.860	4.268
4000	48.00	7.520	4.360	21.866	4.268
5000	56.19	7.520	4.360	25.961	4.268
6000	62.42	10.165	6.065	28.710	5.000
7000	68.00	10.065	6.065	31.500	5.000
8500	72.00	11.065	7.065	33.000	6.000
10500	76.00	11.065	7.064	35.003	6.000
12500	85.00	13.065	7.065	39.000	7.000
15000	91.00	16.000	10.000	42.000	7.000
17500	96.00	16.000	10.000	44.500	7.000
20000	108.00	20.500	14.000	50.001	8.000
25000	115.00	20.499	14.000	53.500	8.000

Table 197. Energy wheel module dimensions (inches)

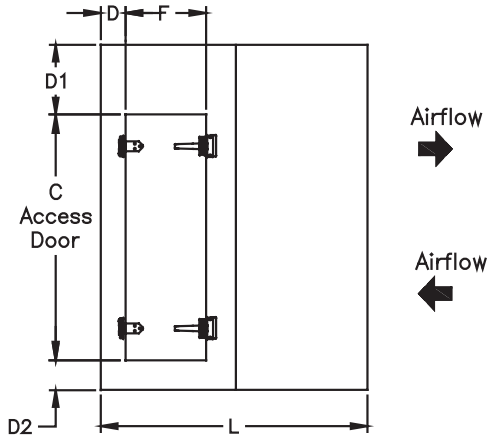
Unit Size	W	L	H	A	C	D	D1	D2	E	E1	F
3	38	29.00	52.75	34.00	45.71	2.15	4.77	2.27	2.00	2.00	11.20
6	48	29.00	57.75	40.00	51.96	2.15	3.52	2.27	4.00	2.00	11.20
8	52	29.00	68.25	44.00	51.96	2.15	2.27	14.02	4.00	2.00	11.20
10	60	45.00	68.25	56.00	29.46	2.15	2.27	2.27	2.00	2.00	11.20
12	68	48.00	78.25	60.00	34.46	2.15	2.27	2.27	4.00	2.00	11.20
14	72	48.00	81.25	64.00	35.96	2.15	2.27	2.27	4.00	2.00	11.20
17	78	50.00	88.25	70.00	39.46	2.15	2.27	2.27	4.00	2.00	11.20
21	80	50.00	100.75	72.00	45.71	2.15	2.27	2.27	4.00	2.00	11.20
25	89	52.00	113.25	74.00	51.96	2.15	2.27	2.27	7.50	2.00	11.20
25P (Partial wheel)	82	52.00	113.25	74.00	51.96	2.15	2.27	2.27	4.00	2.00	11.20
30	95	57.50	113.25	87.00	51.96	2.15	2.27	2.27	4.00	2.00	11.20
35	101	58.00	127.75	91.00	58.21	2.65	2.77	2.77	5.00	2.50	10.70
40	114	59.00	127.75	104.00	58.21	2.65	2.77	2.77	5.00	2.50	10.70
50	120	67.00	150.25	115.00	69.46	2.65	2.77	2.77	2.50	2.50	14.70

Figure 107. Energy wheel module



Front/Back View

Sizes 10–50
Side Elevation



Sizes 3–8
Side Elevation

Table 199. Partial energy wheel dimensions (inches)

Unit Size	Wheel Size	Bottom Supply		Top Supply	
		B1	B2	B1	B2
3	900	23.33	25.24	23.33	25.24
6	900	25.95	25.92	25.95	25.92
	1500	25.90	25.85	25.90	25.85
8	1500	31.15	31.15	31.15	31.15
	3000	32.25	30.00	32.25	30.00
10	1500	33.19	29.06	29.06	33.19
	3000	32.69	29.56	26.32	35.93
	4000	34.69	27.56	28.32	33.93
12	1500	38.19	34.06	34.06	38.19
	3000	39.31	32.94	32.94	39.31
	4000	39.31	32.94	32.94	39.31
	5000	38.78	33.47	32.42	39.83
14	1500	39.69	35.56	35.56	39.69
	3000	40.81	34.44	34.44	40.81
	4000	40.81	34.44	34.44	40.81
	5000	40.81	34.44	34.44	40.81
	6000	42.26	32.99	35.17	40.08
17	3000	44.31	37.94	37.94	44.31
	4000	44.31	37.94	37.94	44.31
	5000	44.31	37.94	37.94	44.31
	6000	44.67	37.58	37.61	44.64
	7000	45.12	37.13	37.99	44.26
21	3000	50.56	44.19	44.19	50.56
	4000	50.56	44.19	44.19	50.56
	5000	50.56	44.19	44.19	50.56
	6000	50.92	43.83	43.83	50.92
	7000	50.92	43.83	43.83	50.92
	8500	51.42	43.33	43.33	51.42
25	4000	56.81	50.44	50.44	56.81
	5000	56.81	50.44	50.44	56.81
	6000	57.17	50.08	50.08	57.17
	7000	57.17	50.08	50.08	57.17
	8500	57.67	49.58	49.58	57.67
	10500	57.31	49.94	49.26	57.99
30	4000	56.81	50.44	50.44	56.81
	5000	56.81	50.44	50.44	56.81
	6000	57.17	50.08	50.08	57.17
	7000	57.17	50.08	50.08	57.17
	8500	57.67	49.58	49.58	57.67
	10500	57.67	49.58	49.58	57.67
	12500	60.3	46.95	51.26	55.99
35	5000	63.56	56.69	56.69	63.56
	6000	63.92	56.33	56.33	63.92
	7000	63.92	56.33	56.33	63.92
	8500	64.42	55.83	55.8	64.45
	10500	64.42	55.83	55.83	64.42
	12500	64.92	55.33	55.33	64.92
	15000	64.92	55.33	55.33	64.92
40	5000	63.56	56.69	56.64	63.61
	6000	63.92	56.33	56.33	63.92
	7000	63.92	56.33	56.33	63.92
	8500	64.42	55.83	55.83	64.42
	10500	64.42	55.83	55.83	64.42
	12500	64.92	55.33	55.33	64.92
	15000	64.92	55.33	55.33	64.92
	17500	65.8	54.45	56.21	64.04
50	7000	75.17	67.58	67.58	75.17
	8500	75.67	67.08	67.08	75.67
	10500	75.67	67.08	67.08	75.67
	12500	76.17	66.58	66.58	76.17
	15000	76.17	66.58	66.58	76.17
	17500	76.17	66.58	66.58	76.17
	20000	76.67	66.08	66.08	76.67

Table 200. 100% Energy wheel dimensions (inches)

Unit Size	Wheel Size	Bypass Damper	Supply Air	B1	B2
3	1500	top	n/a	22.21	24.54
		bottom	n/a	24.58	22.17
		none	top	22.21	24.54
		none	bottom	22.21	24.54
6	3000	top	n/a	22.25	29.5
		bottom	top	31.75	20
		bottom	bottom	29.50	22.25
		none	top	29.50	22.25
		none	bottom	22.25	29.5
8	4000	top	n/a	31.80	30.45
		bottom	n/a	32.70	29.55
		none	top	30.45	31.8
		none	bottom	31.80	30.45
10	5000	top	n/a	30.4	31.85
		bottom	n/a	31.85	30.4
		none	top	31.85	30.4
		none	bottom	30.4	31.85
12	6000	top	n/a	37.08	35.17
		bottom	n/a	35.17	37.08
		none	top	35.17	37.08
		none	bottom	37.08	35.17
14	7000	top	n/a	36.83	38.42
		bottom	n/a	38.42	36.83
		none	top	38.42	36.83
		none	bottom	36.83	38.42
17	8500	top	n/a	42.76	39.49
		bottom	n/a	39.49	42.76
		none	top	39.49	42.76
		none	bottom	42.76	39.49
21	10,500	top	n/a	47.54	47.21
		bottom	n/a	47.21	47.54
		none	top	47.21	47.54
		none	bottom	47.54	47.21
25	12,500	top	n/a	56.00	51.25
		bottom	n/a	51.25	56.00
		none	top	51.25	56.00
		none	bottom	56.00	51.25
30	15,000	top	n/a	53.00	54.25
		bottom	n/a	54.21	53.04
		none	top	54.21	53.04
		none	bottom	53.00	54.25
35	17,500	top	n/a	64.04	56.21
		bottom	n/a	56.21	64.04
		none	top	56.21	64.04
		none	bottom	64.04	56.21
40	20,000	top	n/a	58.21	62.04
		bottom	n/a	62.04	58.21
		none	top	62.04	58.21
		none	bottom	58.21	62.04
50	25,000	top	n/a	77.54	65.21
		bottom	n/a	65.21	77.54
		none	top	65.21	77.54
		none	bottom	77.54	65.21

Fans

Figure 108. Fan modules

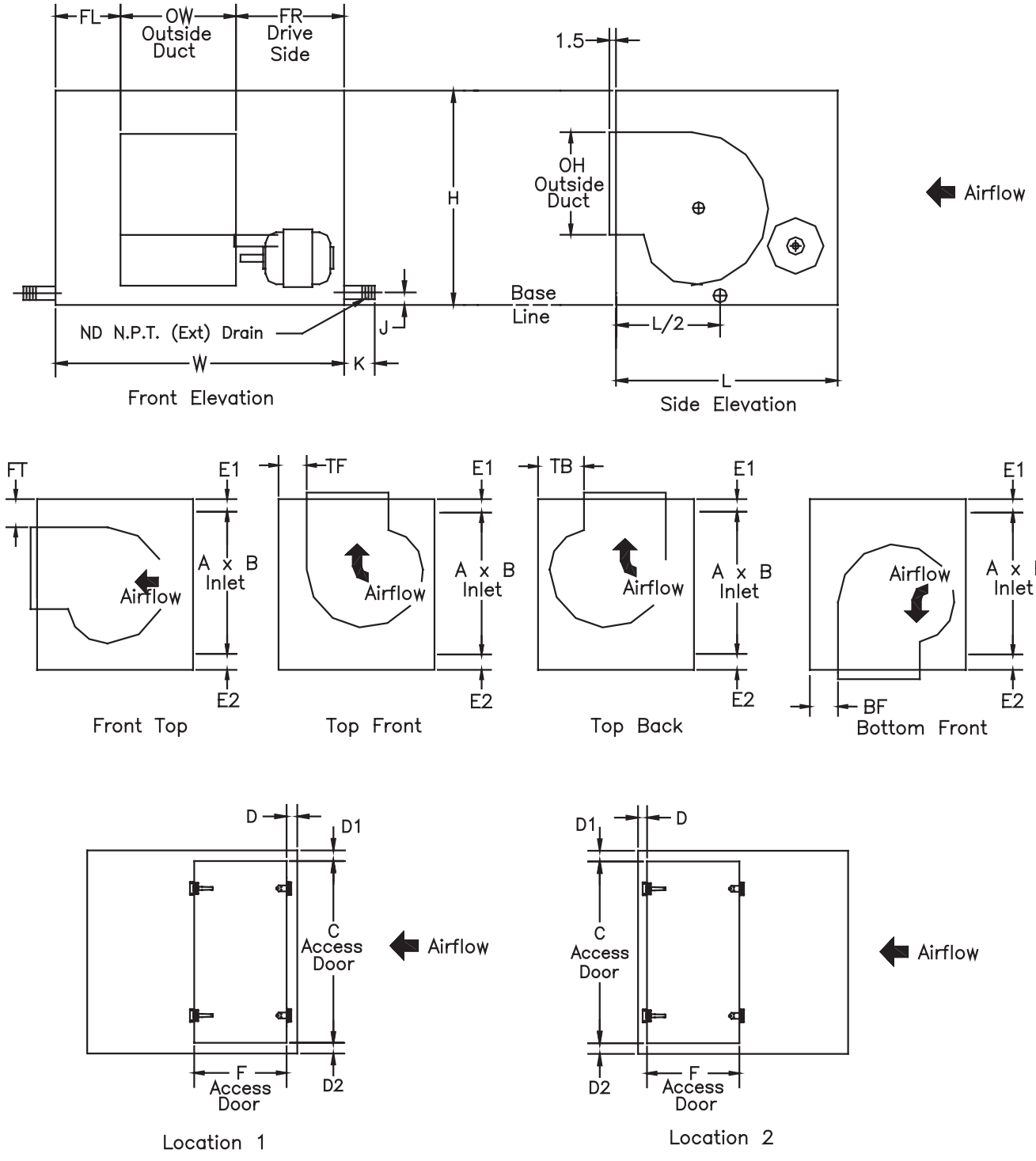


Table 201. Fan type, orientation and access door location

Fan Size and Type	Fan Orientation[1]	Access Door Location
3-8 ABDE	FT BT BF TB TF	Location 1
10 ABDFG	FT TF	Location 1
	BF TB	Location 2
10 E	FT TB	Location 1
	BF TF	Location 2
12 ABDEFG	FT TF	Location 1
	BF TB	Location 2
14 ABDEFG	FT TF	Location 1
	BF TB	Location 2
17 ABFG	FT TF	Location 1
	BF TB	Location 2
17 DE	FT TB	Location 1
	BF TF	Location 2
21 ABFG	FT TF	Location 1
	BF TB	Location 2
21 DE	FT TB	Location 1
	BF TF	Location 2
25 ABDEFG	FT TF	Location 1
	BF TB	Location 2
30 ABFG	FT TF	Location 1
	BF TB	Location 2
30 DE	FT TB	Location 1
	BF TF	Location 2
35-120 ABDEFG	FT TB	Location 1
	BF TF	Location 2

Note: The door offset, D, dimension can be located towards the air entering or air leaving side of the module.

[1] FT = Front top (FTTP) or back top (BKTP);
BF = Bottom front (BT FT);
TB = Top back (TP BK);
TF = Top front (TP FT)

Table 202. Fan dimensions (inches)

Unit Size	Fan Size	W	L	H	A	B	C	D	D1	D2	E1	E2	F	J	K	ND
3A	9.5 FC															
3B	9.5 FC	31	36.00	26.25	27.00	22.25	21.71	2.15	2.27	2.27	2.00	2.00	14.70	0.80	2.60	1.00
3DE	9 BC															
6A	12.25 FC															
6B	10.5 FC	44	41.00	28.75	40.00	24.75	24.21	2.15	2.27	2.27	2.00	2.00	17.20	0.80	2.60	1.00
6DE	12 AF															
8A	13.5 FC															
8B	12.25 FC	48	44.00	34.00	44.00	30.00	29.46	2.15	2.27	2.27	2.00	2.00	18.70	0.80	2.60	1.00
8DE	12 AF															
10A	15 FC															
10B	13.5 FC	60	39.00	34.00	56.00	30.00	29.46	2.15	2.27	2.27	2.00	2.00	11.20	0.80	2.60	1.00
10DE	15 AF															
10FG	12 AF															
12A	16.5 FC															
12B	15 FC	64	39.00	39.00	60.00	35.00	34.46	2.15	2.27	2.27	2.00	2.00	14.70	0.80	2.60	1.00
12DE	18 AF															
12FG	15 AF															
14A	18.25 FC															
14B	16.5 FC	68	40.50	40.50	64.00	36.50	35.96	2.15	2.27	2.27	2.00	2.00	14.70	0.80	2.60	1.00
14DE	18 AF															
14FG	15 AF															
17A	20 FC															
17B	18.25 FC	74	44.00	44.00	70.00	40.00	39.46	2.15	2.27	2.27	2.00	2.00	18.70	0.80	2.60	1.00
17DE	20 AF															
17FG	18 AF															
21A	22.38 FC															
21B	20 FC	76	50.25	50.25	72.00	46.25	45.71	2.15	2.27	2.27	2.00	2.00	21.83	0.80	2.60	1.00
21DE	22 AF															
21FG	20 AF															
25A	25 FC															
25B	22.38 FC	78	56.50	56.50	74.00	52.50	51.96	2.15	2.27	2.27	2.00	2.00	24.95	0.80	2.60	1.00
25DE	22 AF															
25FG	20 AF															
30A	25 FC															
30B	22.38 FC	91	56.50	56.50	87.00	52.50	51.96	2.15	2.27	2.27	2.00	2.00	24.95	0.80	2.60	1.00
30DE	25 AF															
30FG	22 AF															
35A	27.63 FC															
35B	25 FC	96	63.75	63.75	91.00	58.75	58.21	2.65	2.77	2.77	2.50	2.50	27.83	1.20	3.60	1.25
35DE	25 AF															
35FG	22 AF															
40A	30.25 FC															
40B	27.63 FC	109	63.75	63.75	104.00	58.75	58.21	2.65	2.77	2.77	2.50	2.50	27.83	1.20	3.60	1.25
40DE	28 AF															
40FG	25 AF															
50A	33 FC															
50B	30.25 FC	120	68.50	75.00	115.00	70.00	69.46	2.65	2.77	2.77	2.50	2.50	30.20	1.20	3.60	1.25
50DE	32 AF															
50FG	28 AF															
57A	33 FC															
57B	30.25 FC	120	68.50	86.50	115.00	81.50	71.58	2.65	12.15	2.77	2.50	2.50	24.20	1.20	3.60	1.25
57DE	32 AF															
57FG	28 AF															
66A	33 FC															
66B	36 FC	137	84.00	92.00	132.00	81.50	71.58	2.65	12.15	8.27	2.5	8.00	24.20	8.00	2.50	1.50
66DE	36 AF															
66FG	32 AF															
80AB	36 FC															
80DE	40 AF	137	92.00	107.00	132.00	96.50	71.58	2.65	27.15	8.27	2.5	8.00	24.20	8.00	2.50	1.50
80FG	36 AF															
100AB	40 FC															
100DE	44 AF	152	96.00	119.50	147.00	109.00	71.58	2.65	39.65	8.27	2.5	8.00	24.20	8.00	2.50	1.50
100FG	40 AF															
120AB	40 FC															
120DE	49 AF	179	96.00	119.50	174.00	109.00	71.58	2.65	39.65	8.27	2.5	8.00	24.20	8.00	2.50	1.50
120FG	44 AF															

(1) The drain pan connection dimension is nominal pipe size. Drain pan connections are LH and RH.

(2) The base line does not include the height for mounting legs or base rail except for unit size 66 where the base rail is integral to the unit.

Table 202. (continued) Fan dimensions (inches)

Unit Size	Fan Size	FT	TF	TB	BF	FR	FL	OH	OW
3A	9.5 FC	7.81	3.36	9.10	5.03	9.55	9.55	10.34	11.90
3B	9.5 FC	7.57	4.35	6.87	5.11	10.86	10.86	10.34	9.28
3DE	9 BC	6.22	3.45	7.84	5.88	9.59	9.59	10.39	11.82
6A	12.25 FC	5.05	2.92	7.89	5.37	13.78	13.78	16.72	16.44
6B	10.5 FC	6.28	3.83	9.77	5.38	14.91	14.91	14.41	14.19
6DE	12 AF	3.68	3.33	9.73	5.88	14.18	14.18	13.54	15.64
8A	13.5 FC	7.16	3.85	9.39	6.00	14.90	14.90	18.34	18.21
8B	12.25 FC	8.60	3.42	8.38	4.91	15.78	15.78	16.72	16.44
8DE	12 AF	8.93	5.83	12.23	5.88	16.18	16.18	13.54	15.64
10A	15 FC	4.28	3.95	15.20	7.16	26.74	12.93	19.84	20.34
10B	13.5 FC	4.28	3.95	16.70	8.04	29.30	12.49	18.34	18.21
10DE	15 AF	3.69	5.20	17.84	7.97	25.85	15.52	15.96	18.64
10FG	12 AF	6.10	5.08	20.38	7.97	25.87	18.49	13.54	15.64
12A	16.5 FC	5.18	3.96	12.95	8.27	28.43	13.36	22.09	22.21
12B	15 FC	5.18	3.96	15.20	8.54	30.67	13.00	19.84	20.34
12DE	18 AF	3.75	5.22	14.91	7.72	30.51	11.47	18.87	22.02
12FG	15 AF	7.32	5.45	17.58	7.72	30.21	15.15	15.96	18.63
14A	18.25 FC	4.83	3.96	12.08	7.91	29.55	13.99	24.47	24.46
14B	16.5 FC	4.83	3.96	14.45	10.09	32.34	13.45	22.09	22.21
14DE	18 AF	3.88	4.95	16.67	7.97	31.15	14.83	18.87	22.02
14FG	15 AF	8.82	4.95	19.58	7.97	31.15	18.22	15.96	18.63
17A	20 FC	4.32	3.96	12.83	8.08	32.68	14.49	27.28	26.84
17B	18.25 FC	4.33	3.96	15.58	8.44	35.55	13.99	24.47	24.46
17DE	20 AF	3.98	4.04	14.74	7.97	31.89	16.90	25.21	25.21
17FG	18 AF	7.38	5.43	19.69	7.97	31.09	20.89	18.87	22.02
21A	22.38 FC	6.03	3.95	18.96	9.90	35.16	13.51	27.34	27.34
21B	20 FC	6.04	5.85	17.33	10.25	34.70	14.46	27.22	26.84
21DE	22 AF	4.12	5.02	16.98	7.97	35.18	12.58	28.24	28.24
21FG	20 AF	7.10	4.61	20.42	7.97	34.23	16.56	25.21	25.21
25A	25 FC	6.11	3.99	21.17	9.83	32.12	14.57	31.34	31.31
25B	22.38 FC	6.13	3.89	25.26	10.46	37.05	13.61	27.34	27.34
25DE	22 AF	9.00	8.15	20.11	8.00	34.83	14.92	28.24	28.24
25FG	20 AF	13.35	7.92	23.37	8.00	34.63	18.15	25.21	25.21
30A	25 FC	6.11	3.99	21.17	9.64	39.54	20.15	31.34	31.31
30B	22.38 FC	6.13	3.89	25.26	10.46	39.59	24.07	27.34	27.34
30DE	25 AF	4.00	5.67	19.20	7.97	35.14	24.23	31.63	31.63
30FG	22 AF	9.00	8.15	20.11	7.97	35.14	27.62	28.24	28.24
35A	27.63 FC	7.30	5.48	24.14	9.31	44.64	16.87	34.22	34.49
35B	25 FC	10.95	9.14	23.36	9.14	46.27	18.51	31.34	31.22
35DE	25 AF	7.24	6.64	25.58	10.72	42.07	22.30	31.63	31.63
35FG	22 AF	12.24	6.60	29.01	10.72	42.08	25.68	28.24	28.24
40A	30.25 FC	6.11	4.38	21.74	8.34	51.66	19.53	37.72	37.81
40B	27.63 FC	7.30	5.48	24.14	9.31	53.32	21.19	34.22	34.49
40DE	28 AF	4.47	6.62	21.79	10.72	42.28	31.28	35.44	35.44
40FG	25 AF	7.24	6.63	25.58	10.72	42.07	35.29	31.63	31.63
50A	33 FC	10.27	5.77	21.56	8.27	55.19	23.57	41.27	41.24
50B	30.25 FC	13.22	11.22	19.66	11.22	56.91	25.28	37.72	37.81
50DE	32 AF	6.28	5.61	23.24	10.72	42.27	37.98	39.74	39.74
50FG	28 AF	12.72	6.61	26.54	10.72	42.28	42.28	35.44	35.44
57A	33 FC	21.77	5.77	21.56	8.27	55.19	23.57	41.27	41.24
57B	30.25 FC	24.72	11.22	19.66	11.22	56.91	25.28	37.72	37.81
57DE	32 AF	17.78	5.61	23.24	10.72	42.27	37.98	39.74	39.74
57FG	28 AF	24.22	6.61	26.54	10.72	42.28	42.28	35.44	35.44
66A	33 FC	16.63	20.13	22.69	20.27	57.93	37.93	41.18	41.15
66B	36 FC	10.12	12.90	26.45	12.90	49.54	42.81	44.65	44.65
66DE	36 AF	10.12	12.90	26.45	12.90	49.54	42.81	44.65	44.65
66FG	32 AF	17.39	13.72	30.63	13.09	49.54	47.81	39.65	39.65
80AB	36 FC	25.20	13.72	33.63	13.72	49.62	42.89	44.49	44.49
80DE	40 AF	18.76	14.27	27.69	14.35	49.54	37.42	50.04	50.04
80FG	36 AF	25.20	13.72	33.63	13.80	49.62	42.89	44.49	44.49
100AB	40 FC	31.33	16.27	29.69	16.28	50.98	50.98	50.04	50.04
100DE	44 AF	21.83	10.25	41.43	12.59	57.53	38.52	44.34	55.95
100FG	40 AF	31.26	16.27	29.69	16.35	50.98	50.98	50.04	50.04
120AB	40 FC	31.26	16.27	29.69	16.28	64.48	64.48	50.04	50.04
120DE	49 AF	12.54	5.58	43.93	12.59	58.16	58.16	49.45	62.68
120FG	44 AF	21.83	10.25	41.43	12.59	61.53	61.46	44.33	56.02

Figure 109. Plenum fan module

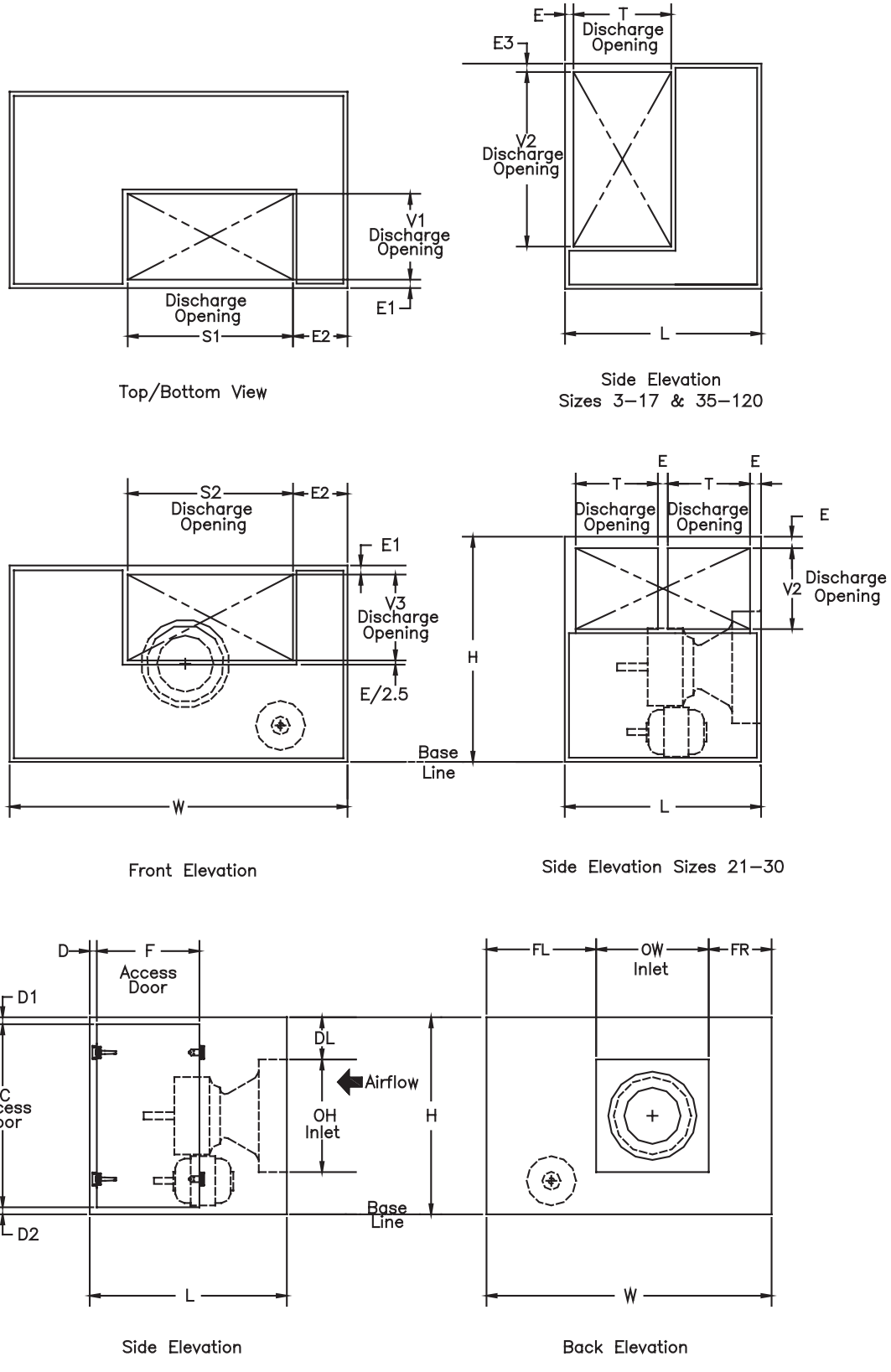


Table 203. Plenum fan dimensions (inches)

Unit Size	Fan Size	W	L	H	C	D	D1	D2	E	E1	E2	E3	F
3	12.25 AF	31	36.00	26.25	21.71	2.15	2.27	2.27	2.00	2.94	7.06	4.69	14.70
6	13.50 AF	44	41.00	28.75	24.21	2.15	2.27	2.27	2.00	2.94	10.06	2.94	17.20
8	15.00 AF	48	44.00	34.00	29.46	2.15	2.27	2.27	2.00	2.94	10.19	3.19	18.70
10	16.50 AF	60	39.00	34.00	29.46	2.15	2.27	2.27	2.00	2.94	14.56	2.94	14.70
12	18.25 AF	64	39.00	39.00	34.46	2.15	2.27	2.27	2.00	2.94	15.06	2.94	14.70
14	20.00 AF	68	40.50	40.50	35.96	2.15	2.27	2.27	2.00	2.94	15.69	2.94	14.70
17	22.25 AF	74	44.00	44.00	39.46	2.15	2.27	2.27	2.00	2.94	16.81	2.94	18.70
21	29.13 AF	76	50.25	50.25	45.71	2.15	2.27	2.27	2.00	2.00	2.00	2.00	21.83
25	32.38 AF	78	56.50	56.50	51.96	2.15	2.27	2.27	2.00	2.00	2.00	2.00	24.95
30	35.56 AF	91	56.50	56.50	51.96	2.15	2.27	2.27	2.00	2.00	2.00	2.00	24.95
35	35.56 AF	96	63.75	63.75	58.21	2.65	2.77	2.77	2.50	2.50	2.50	2.50	27.83
40	39.38 AF	109	63.75	63.75	58.21	2.65	2.77	2.77	2.50	2.50	2.50	2.50	27.83
50	43.44 AF	120	68.50	75.00	69.46	2.65	2.77	2.77	2.50	2.50	2.50	2.50	30.20
57	43.44 AF	120	68.50	86.50	71.58	2.65	12.15	2.77	2.50	2.50	2.50	2.50	24.20
66	52.88 AF	137	84.00	92.09	71.58	2.65	12.15	8.27	2.50	2.50	2.50	2.50	24.20
80	58.5 AF	137	92.00	107.09	71.58	2.65	27.15	8.27	2.50	2.50	2.50	2.50	24.20
100	64.75 AF	152	96.00	119.59	71.58	2.65	39.65	8.27	2.50	2.50	2.50	2.50	24.20
120	64.75 AF	179	96.00	119.59	71.58	2.65	39.65	8.27	2.50	2.50	2.50	2.50	24.20

Unit Size	Fan Size	DL	OH	OW	FR	FL	S1	S2	T	V1	V2	V3
3	12.25 AF	3.24	16.39	20.38	5.31	5.31	16.88	16.88	8.38	8.38	16.88	8.38
6	13.50 AF	3.25	18.88	21.75	11.13	11.13	23.88	23.88	12.38	11.88	22.88	11.88
8	15.00 AF	5.00	22.38	23.38	12.31	12.31	27.63	27.63	13.76	13.76	27.63	13.76
10	16.50 AF	3.26	22.38	25.38	9.72	24.90	30.88	30.88	16.88	15.38	28.13	15.38
12	18.25 AF	4.38	26.25	27.25	11.85	24.90	33.88	33.88	17.26	16.88	33.13	16.88
14	20.00 AF	3.88	28.25	29.25	13.85	24.90	36.63	36.63	19.26	18.26	34.63	18.26
17	22.25 AF	5.13	30.50	31.50	17.60	24.90	40.38	40.38	21.26	20.13	38.13	20.13
21	29.13 AF	10.61	31.15	35.50	12.00	28.50	36.50	36.50	22.13	20.47	16.75	20.47
25	32.38 AF	10.61	37.40	37.50	12.00	28.50	33.50	33.50	25.25	26.22	17.25	26.22
30	35.56 AF	10.61	37.40	46.16	13.78	31.06	39.75	39.75	25.25	26.22	20.25	26.22
35	35.56 AF	11.21	43.41	46.41	17.71	31.88	56.00	56.00	25.97	22.00	48.50	22.00
40	39.38 AF	11.21	43.41	51.43	25.70	31.88	64.38	64.38	31.72	22.00	45.50	22.00
50	43.44 AF	10.46	55.41	59.00	28.50	32.50	69.75	55.63	31.72	25.50	57.50	32.00
57	43.44 AF	21.96	55.41	59.00	28.50	32.50	80.50	56.25	31.72	25.50	65.50	37.47
66	52.88 AF	11.50	63.50	68.75	21.75	46.50	64.75	42.33	52.00	36.00	45.50	28.49
80	58.5 AF	11.50	78.50	72.75	17.75	46.50	82.00	42.33	60.00	32.00	47.38	34.00
100	64.75 AF	11.50	91.00	84.25	21.25	46.50	97.17	47.33	64.00	37.50	57.38	37.50
120	64.75 AF	11.50	91.00	84.25	34.75	60.00	85.75	41.63	64.00	55.00	70.75	48.00

Figure 110. Q fan module

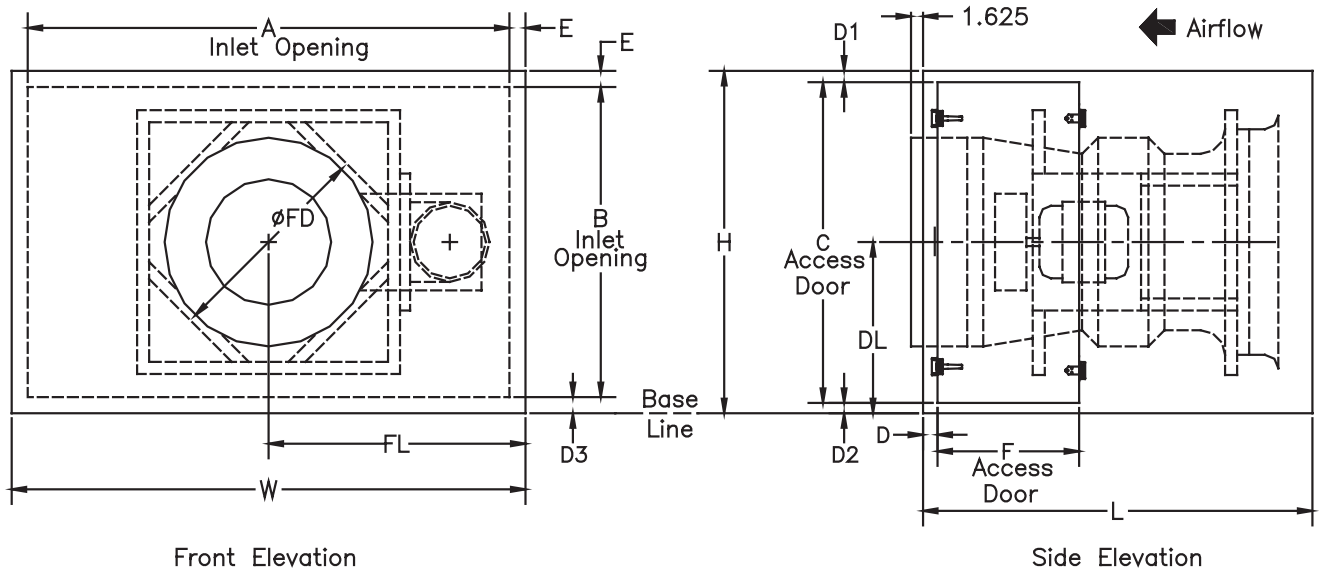


Table 204. Q fan dimensions (inches)

Unit Size	Fan Size	W	L	H	A	B	C	D	D1	D2	D3	E	F	DL	FD	FL
12Q	19.00	64	39.00	39.00	60.00	35.00	34.46	22.15	2.27	2.27	2.00	2.00	14.70	19.50	20.49	32.00
12R	21.50														23.15	32.59
14Q	19.00	68	40.50	40.50	64.00	36.50	35.96	23.65	2.27	2.27	2.00	2.00	14.70	20.25	20.49	34.00
14R	21.50														23.15	
17Q	21.50	74	44.00	44.00	70.00	40.00	39.46	23.15	2.27	2.27	2.00	2.00	18.70	22.00	23.15	37.00
17R	24.50														26.37	
21Q	24.50	76	50.25	50.25	72.00	46.25	45.71	26.28	2.27	2.27	2.00	2.00	21.83	25.13	26.37	38.00
21R	27.00														28.99	39.91
25Q	27.00	78	56.50	56.50	74.00	52.50	51.96	26.28	2.27	2.27	2.00	2.00	24.95	28.25	28.99	39.00
25R	30.00														32.20	40.75
30Q	30.00	91	56.50	56.50	87.00	52.50	51.96	29.40	2.27	2.27	2.00	2.00	24.95	28.25	32.20	45.50
30R	33.00														36.00	
35Q	33.00	96	63.75	63.75	91.00	58.75	58.21	29.40	2.77	2.77	2.50	2.50	27.83	30.40	36.00	48.00
35R	36.50													32.90	40.00	
40Q	33.00	109	63.75	63.75	104.00	58.75	58.21	33.27	2.77	2.77	2.50	2.50	27.83	30.40	36.00	54.50
40R	36.50														40.00	
50Q	36.50	120	68.50	75.00	115.00	70.00	69.46	35.65	2.77	2.77	2.50	2.50	30.20	37.50	40.00	60.00
50R	40.25														44.00	
57Q	36.50	120	68.50	86.50	115.00	81.50	71.58	41.65	12.15	2.77	2.50	2.50	24.20	43.25	44.00	60.00
57R	40.25													43.42	48.00	
66Q	40.25	137	84.00	92.09	132.00	81.59	71.58	2.65	12.15	8.36	8.00	2.50	24.20	48.84	44.00	68.50
66R	44.50														48.00	
80Q	44.50	137	92.00	107.09	132.00	96.59	71.58	2.65	27.15	8.36	8.00	2.50	24.20	56.34	48.00	68.50

Figure 111. Vertical Q fan

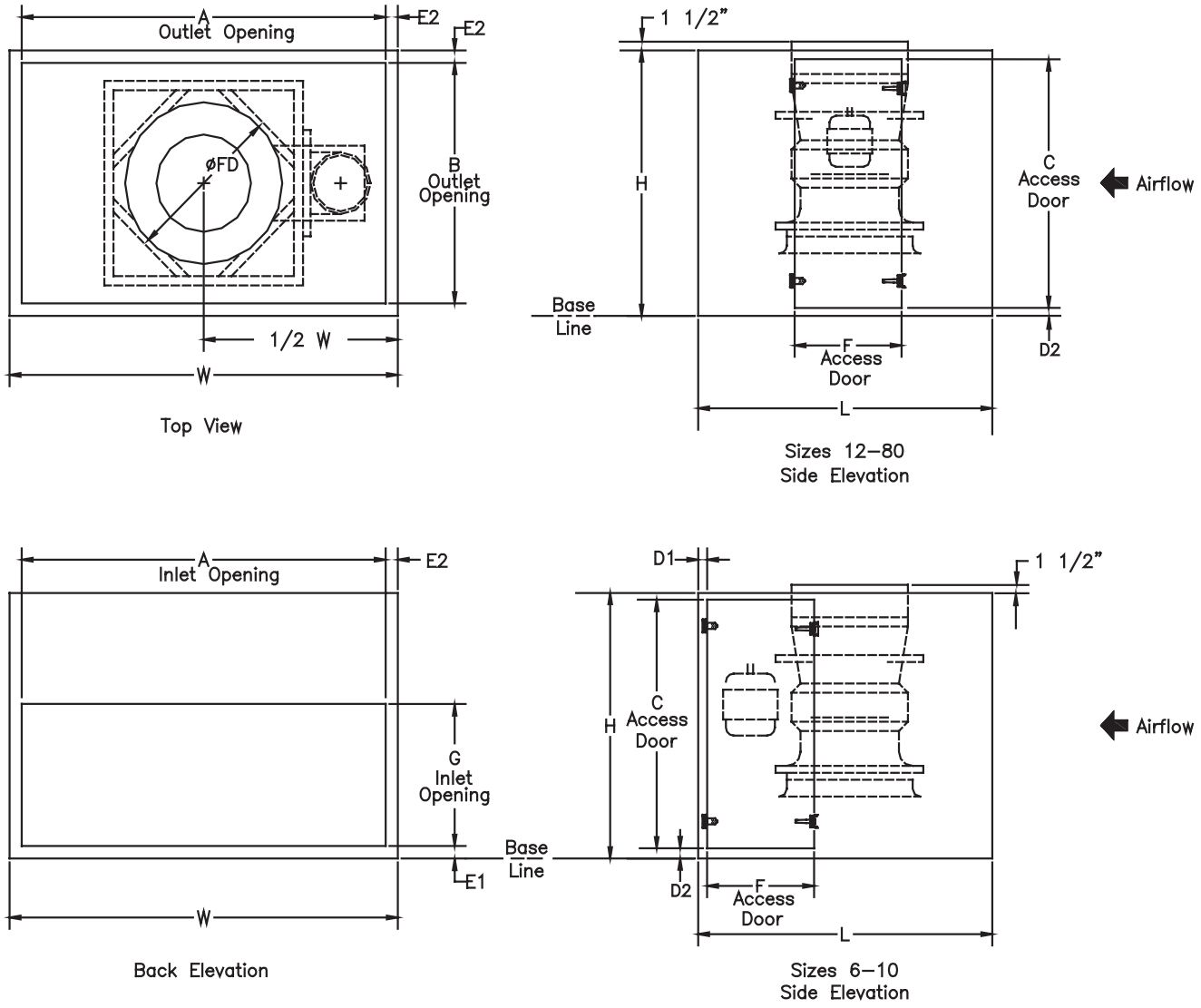


Table 205. Vertical Q fan dimensions

Unit Size	Fan Type	Fan Size	W	L	H	A	G	C	D1	D2	E1	E2	F	FD
6V		16.5	44.00	64.00	61.00	40.00	24.75	56.50	2.15					18.00
6W		19												21.00
8V		16.5	48.00	64.00	61.00	44.00	30.00	56.50	2.15					18.00
8W		19												21.00
10V		16.5	60.00	64.00	61.00	56.00	30.00	56.50	2.15					18.00
10W		19												21.00
12V		19	64.00	57.00	66.00	60.00	35.00	61.50	17.25					20.00
12W		21.5												23.00
14V		19	68.00	57.00	66.00	64.00	36.50	61.50	17.25	2.25	2.00	2.00		21.00
14W		21.5												23.00
17V		21.5	74.00	65.00	70.00	70.00	40.00	65.50	21.25					23.00
17W		24.5												26.00
21V		24.5	76.00	73.00	75.00	72.00	46.25	70.50	25.25					26.00
21W		27												29.00
25V		27	78.00	81.00	81.00	74.00	52.50		29.25				22.50	29.00
25W		30												32.00
30V		30	91.00	83.00	90.00	87.00	52.50		30.25					32.00
30W		33												36.00
35V		33	96.00	83.00	90.00	91.00	58.75		30.25					36.00
35W		36.5												40.00
40V		33	109.00	83.00	90.00	104.00	58.75	72.00	30.25					36.00
40W		36.5								2.75	2.50			40.00
50V		36.5	120.00	92.00	97.00	115.00	70.00		34.75			2.50		40.00
50W		40.25												44.00
57V		40.25	120.00	101.00	107.00	115.00	81.50		39.25					44.00
57W		44.5												48.00
66V		40.25	137.00	101.00	112.00	132.00	81.50		39.25	8.25	8.00			44.00
66W		44.5												48.00
80V		44.5	137.00	101.00	112.00	132.00	96.50		39.25					48.00

Figure 112. Vertical Q fan plenum

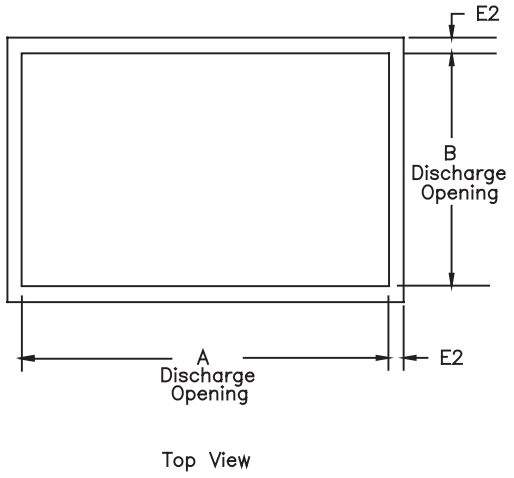


Table 206. Vertical Q fan plenum dimensions

Unit Size	W	L	H	A	B	G	E2
6	44.00	64.00	23.00	40.00	60.00	19.00	
8	48.00	64.00	23.00	44.00	60.00	19.00	
10	60.00	64.00	23.00	56.00	60.00	19.00	
12	64.00	57.00	25.00	60.00	53.00	21.00	
14	68.00	57.00	25.00	64.00	53.00	21.00	2.00
17	74.00	65.00	28.00	70.00	61.00	24.00	
21	76.00	73.00	31.00	72.00	69.00	27.00	
25	78.00	81.00	34.00	74.00	77.00	30.00	
30	91.00	83.00	37.00	87.00	79.00	33.00	
35	96.00	83.00	41.00	91.00	78.00	36.00	
40	109.00	83.00	41.00	104.00	78.00	36.00	
50	120.00	92.00	45.00	115.00	87.00	40.00	2.50
57	120.00	101.00	49.00	115.00	96.00	44.00	
66	137.00	101.00	49.00	132.00	96.00	44.00	
80	137.00	101.00	49.00	132.00	96.00	44.00	

Filters

Figure 113. Angled filter module for sizes 3-50

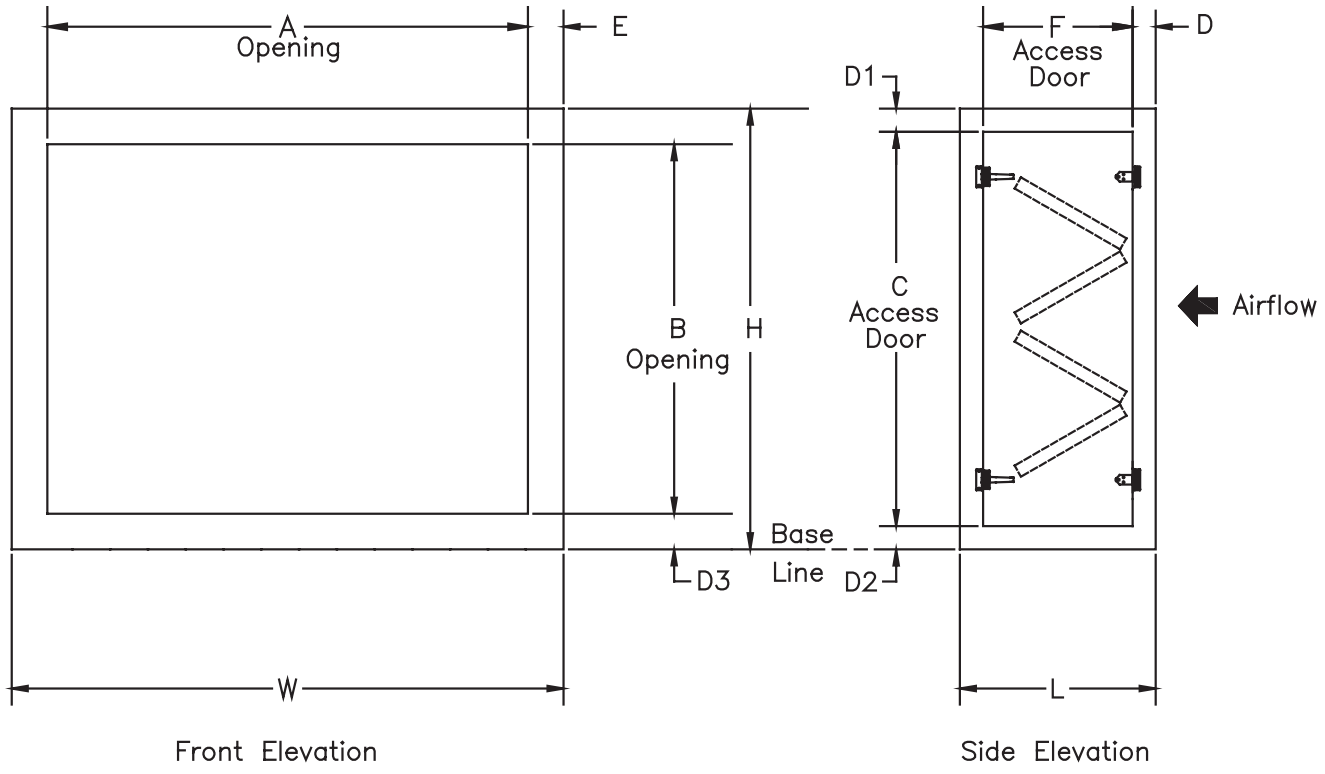


Figure 114. Angled filter module for sizes 57 -120

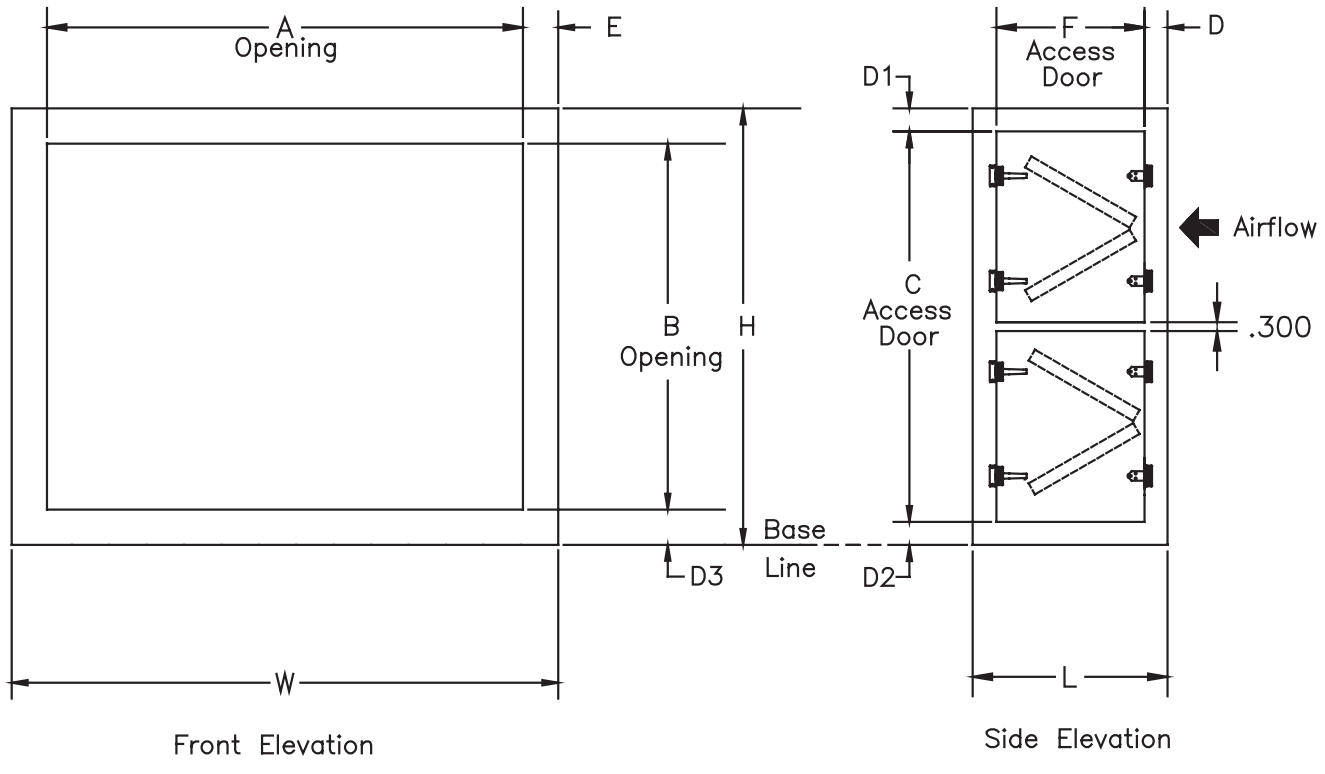


Table 207. Angled filter dimensions

Unit Size	W	L	H	A	B	C	D	D1	D2	D3	E	F
3	31	26.25	26.25	27.00	22.25	21.71	2.15	2.27	2.27	2.00	2.00	21.95
6	44	28.75	28.75	40.00	24.75	24.21	2.15	2.27	2.27	2.00	2.00	24.45
8	48	24.50	34.00	44.00	30.00	29.46	2.15	2.27	2.27	2.00	2.00	20.20
10	60	24.50	34.00	56.00	30.00	29.46	2.15	2.27	2.27	2.00	2.00	20.20
12	64	24.50	39.00	60.00	35.00	34.46	2.15	2.27	2.27	2.00	2.00	20.20
14	68	24.50	40.50	64.00	36.50	35.96	2.15	2.27	2.27	2.00	2.00	20.20
17	74	24.50	44.00	70.00	40.00	39.46	2.15	2.27	2.27	2.00	2.00	20.20
21	76	24.50	50.25	72.00	46.25	45.71	2.15	2.27	2.27	2.00	2.00	20.20
25	78	24.50	56.50	74.00	52.50	51.96	2.15	2.27	2.27	2.00	2.00	20.20
30	91	24.50	56.50	87.00	52.50	51.96	2.15	2.27	2.27	2.00	2.00	20.20
35	96	29.50	63.75	91.00	58.75	58.21	2.65	2.77	2.77	2.50	2.50	24.20
40	109	29.50	63.75	104.00	58.75	58.21	2.65	2.77	2.77	2.50	2.50	24.20
50	120	29.50	75.00	115.00	70.00	69.46	2.65	2.77	2.77	2.50	2.50	24.20
57	120	29.50	86.50	115.00	81.50	80.96	2.65	2.77	2.77	2.50	2.50	24.20
66	137	29.50	92.09	132.00	81.50	80.96	2.65	2.77	8.36	8.00	2.50	24.20
80	137	29.50	107.09	132.00	96.50	95.96	2.65	2.77	8.36	8.00	2.50	24.20
100	152	29.50	119.59	147.00	109.00	108.46	2.65	2.77	8.36	8.00	2.50	24.20
120	179	29.50	119.59	174.00	109.00	108.46	2.65	2.77	8.36	8.00	2.50	24.20

NOTE: All dimensions shown are expressed in inches unless otherwise noted. The base line does not include the height for mounting legs or base rail except for unit sizes 66 through 120 where the base rail is integral to the unit.

Figure 115. Bag filter module for size 3-50

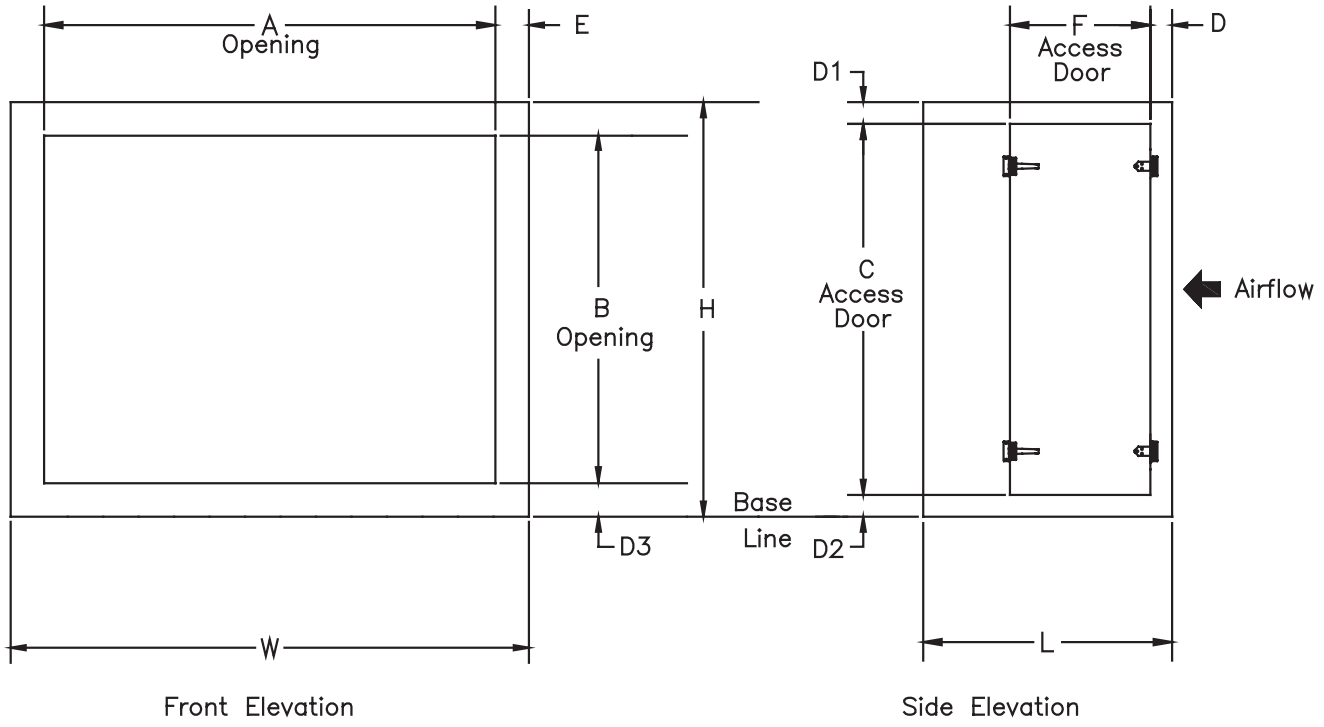


Figure 116. Bag filter module for size 57-120

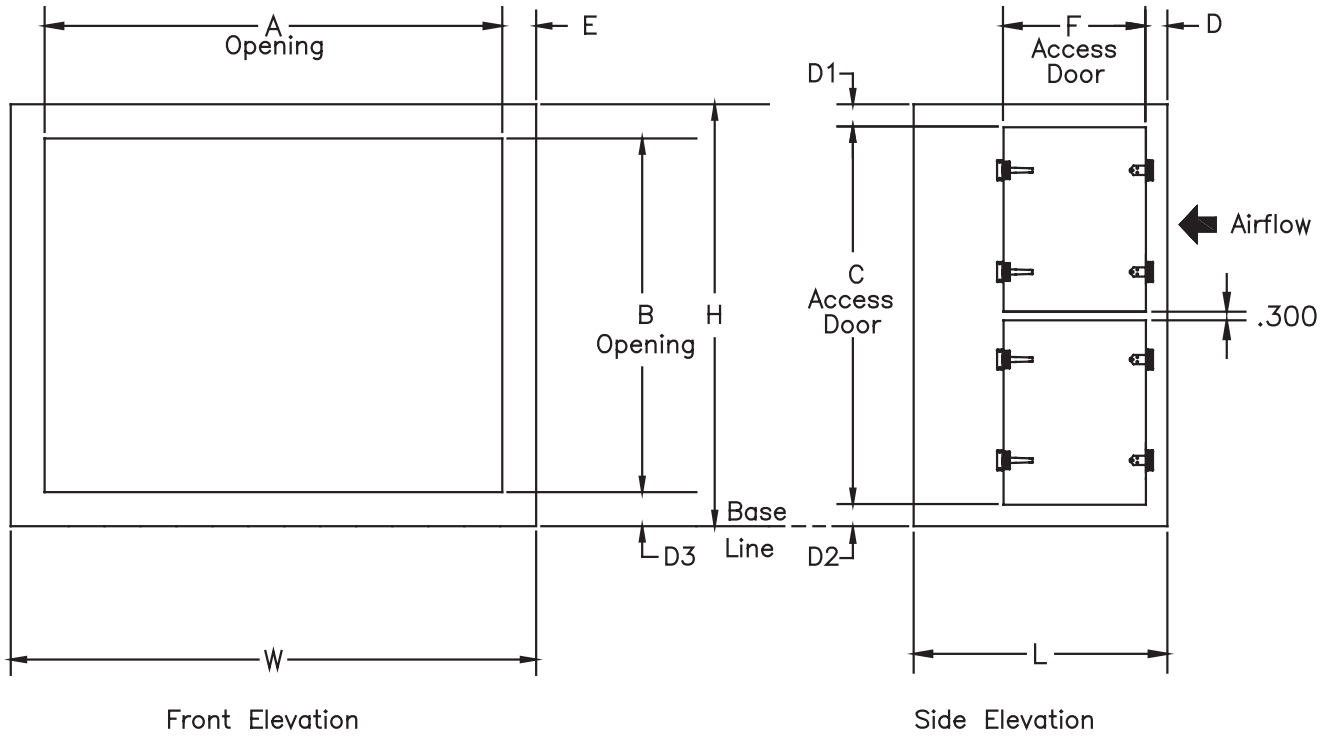


Table 208. Bag filter dimensions

Unit Size	W	L	H	A	B	C	D	D1	D2	D3	E	F
3	31	36.00	26.25	27.00	22.25	21.71	2.15	2.27	2.27	2.00	2.00	21.95
6	44	41.00	28.75	40.00	24.75	24.21	2.15	2.27	2.27	2.00	2.00	17.20
8	48	44.00	34.00	44.00	30.00	29.46	2.15	2.27	2.27	2.00	2.00	18.70
10	60	34.00	34.00	56.00	30.00	29.46	2.15	2.27	2.27	2.00	2.00	20.20
12	64	39.00	39.00	60.00	35.00	34.46	2.15	2.27	2.27	2.00	2.00	14.70
14	68	40.50	40.50	64.00	36.50	35.96	2.15	2.27	2.27	2.00	2.00	14.70
17	74	44.00	44.00	70.00	40.00	39.46	2.15	2.27	2.27	2.00	2.00	18.70
21	76	50.25	50.25	72.00	46.25	45.71	2.15	2.27	2.27	2.00	2.00	21.83
25	78	56.50	56.50	74.00	52.50	51.96	2.15	2.27	2.27	2.00	2.00	24.95
30	91	56.50	56.50	87.00	52.50	51.96	2.15	2.27	2.27	2.00	2.00	24.95
35	96	48.00	63.75	91.00	58.75	58.21	2.65	2.77	2.77	2.50	2.50	24.20
40	109	48.00	63.75	104.00	58.75	58.21	2.65	2.77	2.77	2.50	2.50	24.20
50	120	48.00	75.00	115.00	70.00	69.46	2.65	2.77	2.77	2.50	2.50	24.20
57	120	48.00	86.50	115.00	81.50	80.96	2.65	2.77	2.77	2.50	2.50	24.20
66	137	49.00	92.09	132.00	81.50	80.96	2.65	2.77	8.36	8.00	2.50	24.20
80	137	54.00	107.09	132.00	96.50	95.96	2.65	2.77	8.36	8.00	2.50	24.20
100	152	60.00	119.59	147.00	109.00	108.46	2.65	2.77	8.36	8.00	2.50	24.20
120	179	60.00	119.59	174.00	109.00	108.46	2.65	2.77	8.36	8.00	2.50	24.20

The base line does not include the height for mounting legs or base rail except for unit sizes 66 through 120 where the base rail is integral to the unit.

Figure 117. Cartridge filter module for size 3-50

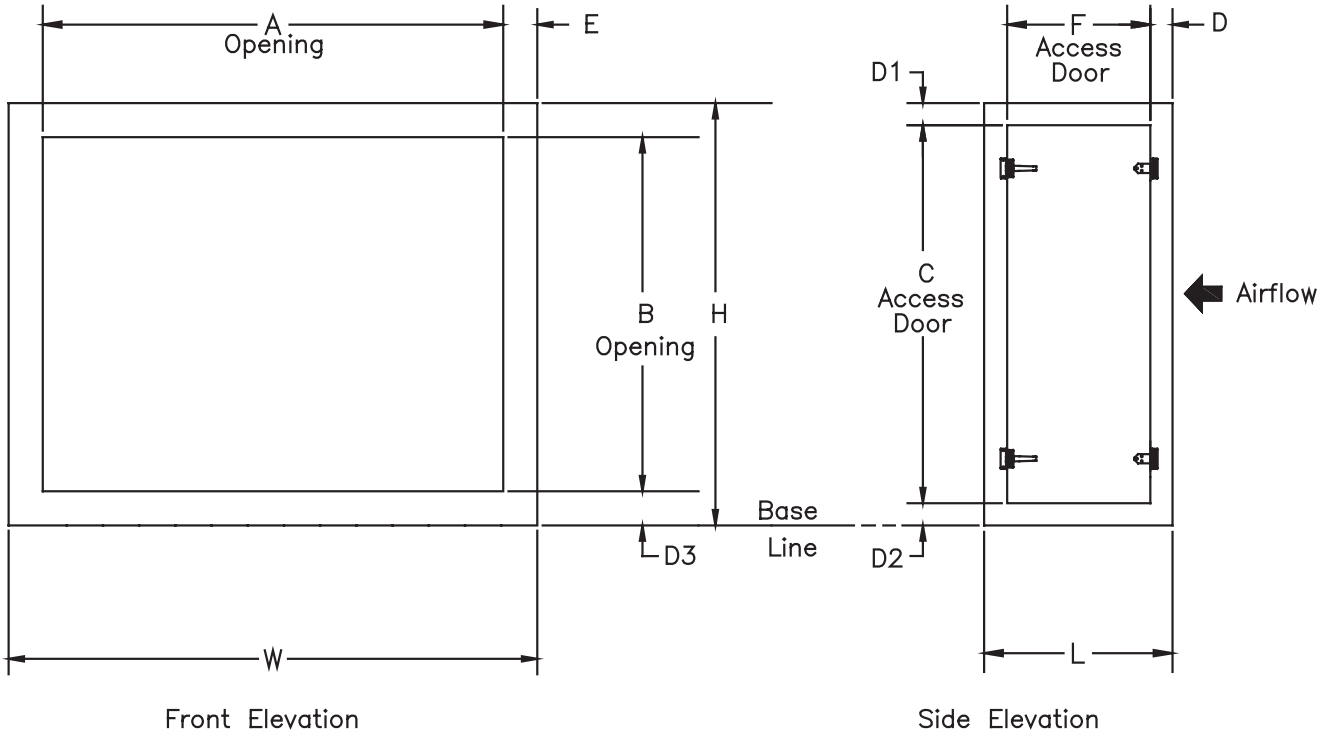


Figure 118. Cartridge filter module for size 57-120

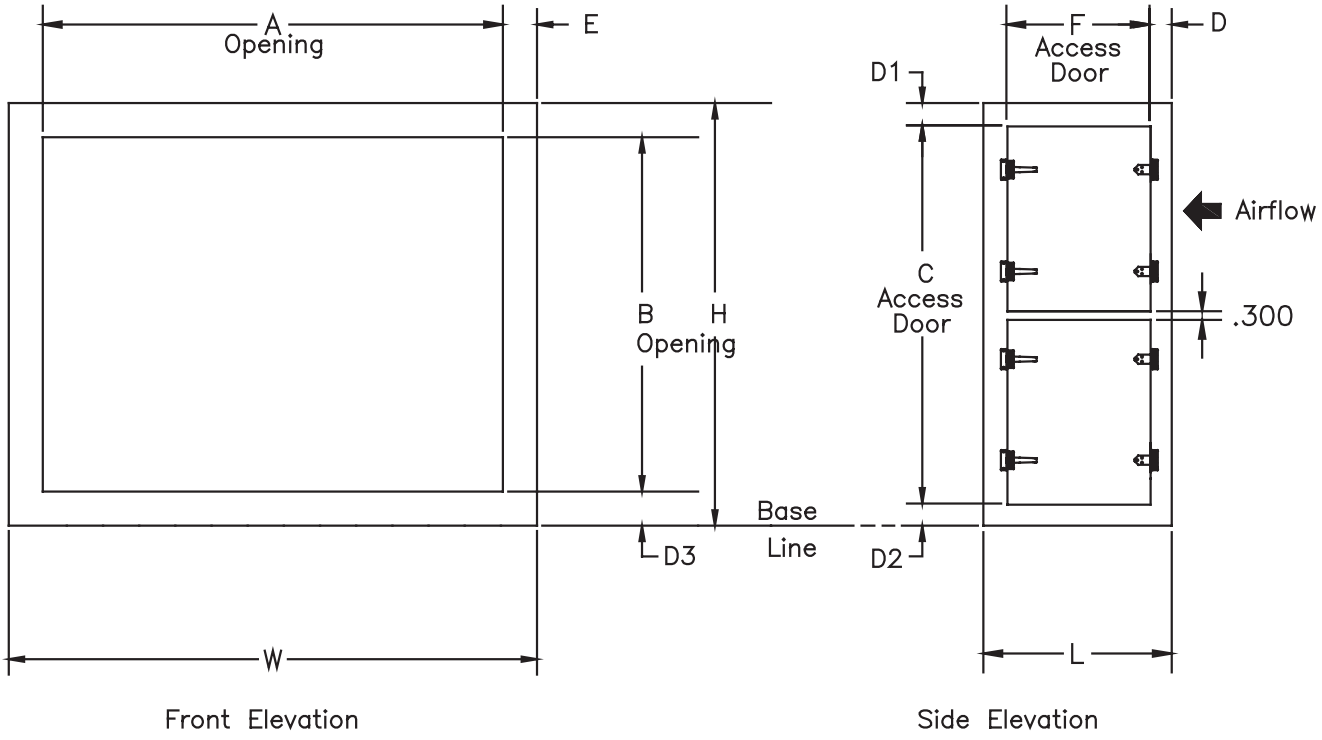


Table 209. Cartridge filter dimensions (inches)

Unit Size	W	L	H	A	B	C	D	D1	D2	D3	E	F
3	31	26.25	26.25	27.00	22.25	21.71	2.15	2.27	2.27	2.00	2.00	21.95
6	44	28.75	28.75	40.00	24.75	24.21	2.15	2.27	2.27	2.00	2.00	24.45
8	48	24.50	34.00	44.00	30.00	29.46	2.15	2.27	2.27	2.00	2.00	20.20
10	60	24.50	34.00	56.00	30.00	29.46	2.15	2.27	2.27	2.00	2.00	20.20
12	64	24.50	39.00	60.00	35.00	34.46	2.15	2.27	2.27	2.00	2.00	20.20
14	68	24.50	40.50	64.00	36.50	35.96	2.15	2.27	2.27	2.00	2.00	20.20
17	74	24.50	44.00	70.00	40.00	39.46	2.15	2.27	2.27	2.00	2.00	20.20
21	76	24.50	50.25	72.00	46.25	45.71	2.15	2.27	2.27	2.00	2.00	20.20
25	78	24.50	56.50	74.00	52.50	51.96	2.15	2.27	2.27	2.00	2.00	20.20
30	91	24.50	56.50	87.00	52.50	51.96	2.15	2.27	2.27	2.00	2.00	20.20
35	96	29.50	63.75	91.00	58.75	58.21	2.65	2.77	2.77	2.50	2.50	24.20
40	109	29.50	63.75	104.00	58.75	58.21	2.65	2.77	2.77	2.50	2.50	24.20
50	120	29.50	75.00	115.00	70.00	69.46	2.65	2.77	2.77	2.50	2.50	24.20
57	120	29.50	86.50	115.00	81.50	80.96	2.65	2.77	2.77	2.50	2.50	24.20
66	137	29.50	92.09	132.00	81.50	80.96	2.65	2.77	8.36	8.00	2.50	24.20
80	137	29.50	107.09	132.00	96.50	95.96	2.65	2.77	8.36	8.00	2.50	24.20
100	152	29.50	119.59	147.00	109.00	108.46	2.65	2.77	8.36	8.00	2.50	24.20
120	179	29.50	119.59	174.00	109.00	108.46	2.65	2.77	8.36	8.00	2.50	24.20

The base line does not include the height for mounting legs or base rail except for unit sizes 66 through 120 where the base rail is integral to the unit.

Figure 119. Combination filter module for size 3-50

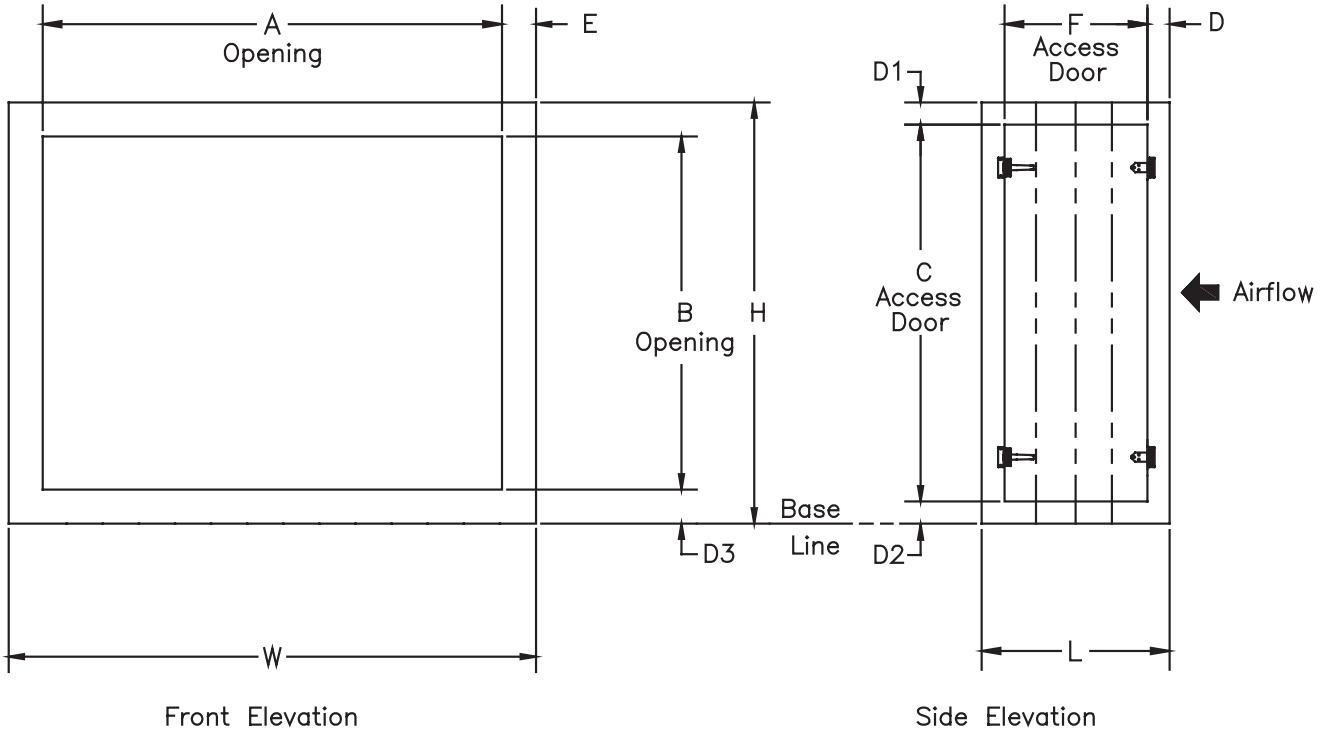


Figure 120. Combinations filter module for size 57-120

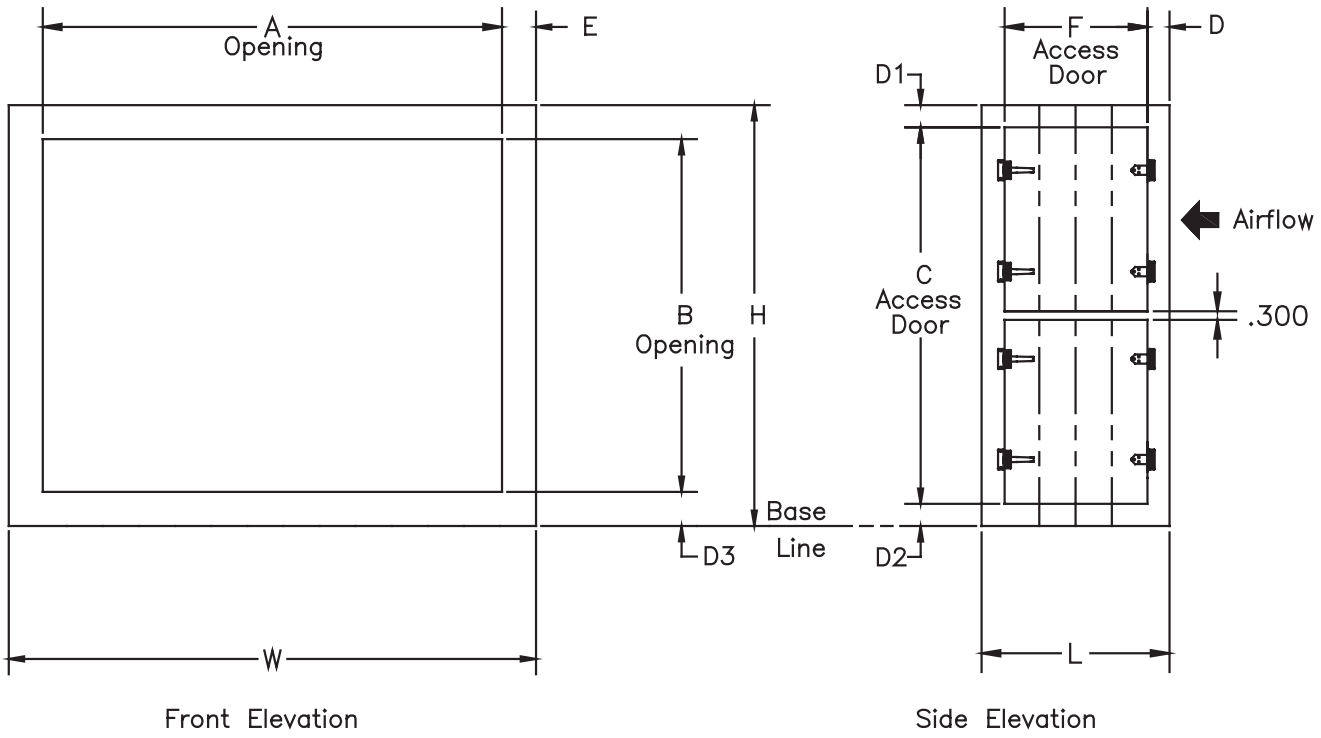


Table 210. Combination filter dimensions (inches)

Unit Size	W	L	H	A	B	C	D	D1	D2	D3	E	F
3	31	15.50	26.25	27.00	22.25	21.71	2.15	2.27	2.27	2.00	2.00	11.20
6	44	15.50	28.75	40.00	24.75	24.21	2.15	2.27	2.27	2.00	2.00	11.20
8	48	15.50	34.00	44.00	30.00	29.46	2.15	2.27	2.27	2.00	2.00	11.20
10	60	15.50	34.00	56.00	30.00	29.46	2.15	2.27	2.27	2.00	2.00	11.20
12	64	15.50	39.00	60.00	35.00	34.46	2.15	2.27	2.27	2.00	2.00	11.20
14	68	15.50	40.50	64.00	36.50	35.96	2.15	2.27	2.27	2.00	2.00	11.20
17	74	15.50	44.00	70.00	40.00	39.46	2.15	2.27	2.27	2.00	2.00	11.20
21	76	15.50	50.25	72.00	46.25	45.71	2.15	2.27	2.27	2.00	2.00	11.20
25	78	15.50	56.50	74.00	52.50	51.96	2.15	2.27	2.27	2.00	2.00	11.20
30	91	15.50	56.50	87.00	52.50	51.96	2.15	2.27	2.27	2.00	2.00	11.20
35	96	16.00	63.75	91.00	58.75	58.21	2.65	2.77	2.77	2.50	2.50	10.70
40	109	16.00	63.75	104.00	58.75	58.21	2.65	2.77	2.77	2.50	2.50	10.70
50	120	14.50	75.00	115.00	70.00	69.46	2.65	2.77	2.77	2.50	2.50	9.20
57	120	14.50	86.50	115.00	81.50	80.96	2.65	2.77	2.77	2.50	2.50	9.20
66	137	14.50	92.09	132.00	81.50	80.96	2.65	2.77	8.36	8.00	2.50	9.20
80	137	14.50	107.09	132.00	96.50	95.96	2.65	2.77	8.36	8.00	2.50	9.20
100	152	14.50	119.59	147.00	109.00	108.46	2.65	2.77	8.36	8.00	2.50	9.20
120	179	14.50	119.59	174.00	109.00	108.46	2.65	2.77	8.36	8.00	2.50	9.20

NOTE: All dimensions shown are expressed in inches unless otherwise noted. The base line does not include the height for mounting legs or base rail except for unit sizes 66 through 120 where the base rail is integral to the unit.

Figure 121. Flat filter module for size 3-50

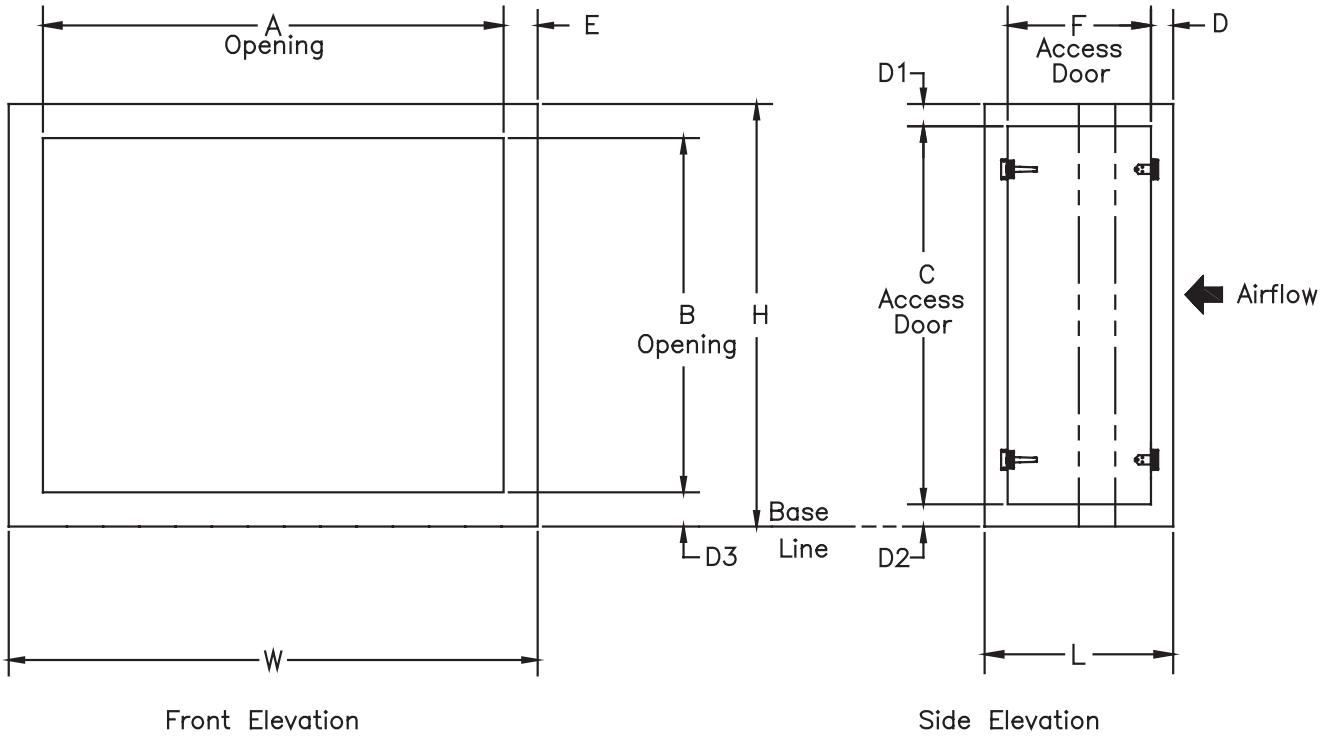


Figure 122. Flat filter module for size 57-120

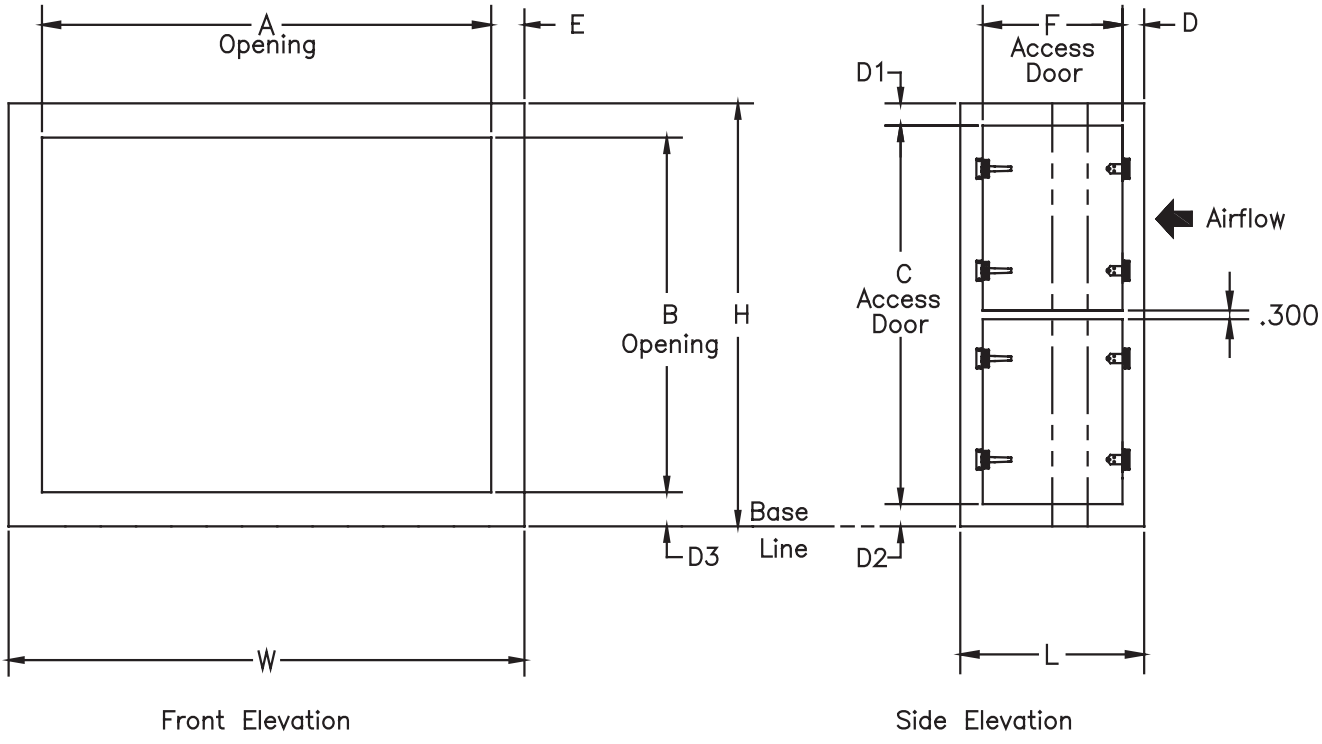


Table 211. Flat filter dimensions (inches)

Unit Size	W	L	H	A	B	C	D	D1	D2	D3	E	F
3	31	11.00	26.25	27.00	22.25	21.71	2.15	2.27	2.27	2.00	2.00	6.70
6	44	11.00	28.75	40.00	24.75	24.21	2.15	2.27	2.27	2.00	2.00	6.70
8	48	11.00	34.00	44.00	30.00	29.46	2.15	2.27	2.27	2.00	2.00	6.70
10	60	11.00	34.00	56.00	30.00	29.46	2.15	2.27	2.27	2.00	2.00	6.70
12	64	11.00	39.00	60.00	35.00	34.46	2.15	2.27	2.27	2.00	2.00	6.70
14	68	11.00	40.50	64.00	36.50	35.96	2.15	2.27	2.27	2.00	2.00	6.70
17	74	11.00	44.00	70.00	40.00	39.46	2.15	2.27	2.27	2.00	2.00	6.70
21	76	11.00	50.25	72.00	46.25	45.71	2.15	2.27	2.27	2.00	2.00	6.70
25	78	11.00	56.50	74.00	52.50	51.96	2.15	2.27	2.27	2.00	2.00	6.70
30	91	11.00	56.50	87.00	52.50	51.96	2.15	2.27	2.27	2.00	2.00	6.70
35	96	11.50	63.75	91.00	58.75	58.21	2.65	2.77	2.77	2.50	2.50	6.20
40	109	11.50	63.75	104.00	58.75	58.21	2.65	2.77	2.77	2.50	2.50	6.20
50	120	14.50	75.00	115.00	70.00	69.46	2.65	2.77	2.77	2.50	2.50	9.20
57	120	14.50	86.50	115.00	81.50	80.96	2.65	2.77	2.77	2.50	2.50	9.20
66	137	14.50	92.09	132.00	81.50	80.96	2.65	2.77	8.36	8.00	2.50	9.20
80	137	14.50	107.09	132.00	96.50	95.96	2.65	2.77	8.36	8.00	2.50	9.20
100	152	14.50	119.59	147.00	109.00	108.46	2.65	2.77	8.36	8.00	2.50	9.20
120	179	14.50	119.59	174.00	109.00	108.46	2.65	2.77	8.36	8.00	2.50	9.20

The base line does not include the height for mounting legs or base rail except for unit sizes 66 through 120 where the base rail is integral to the unit.

Figure 123. HEPA filter module

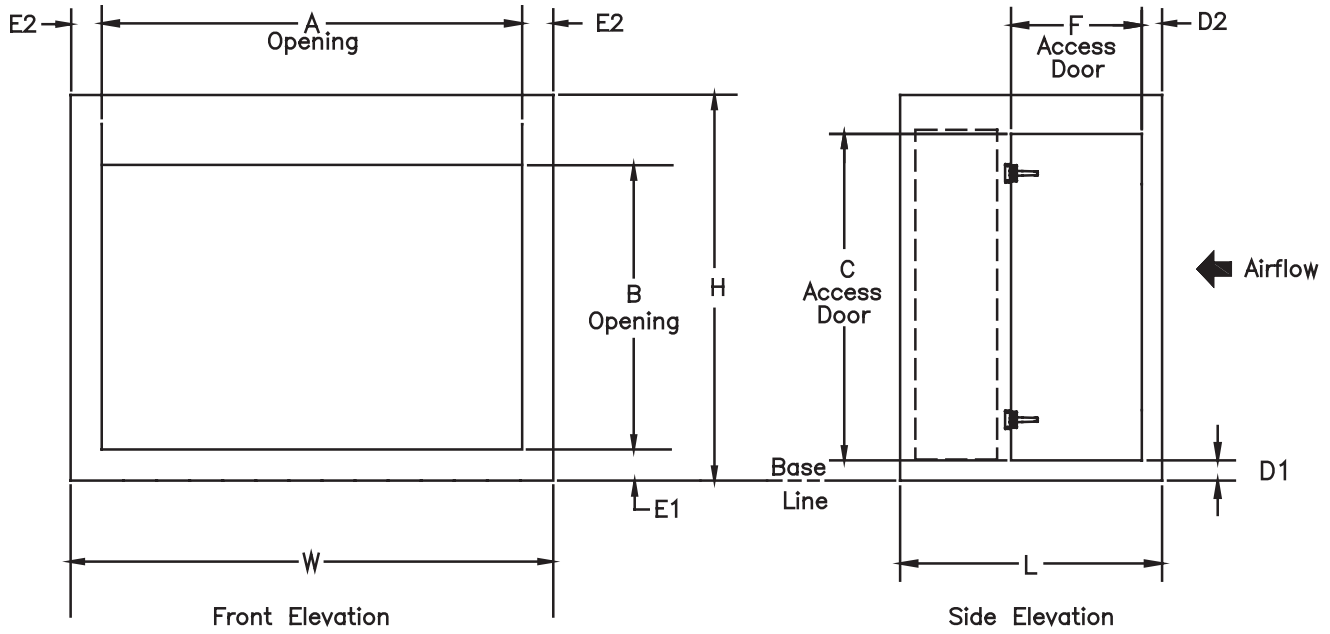


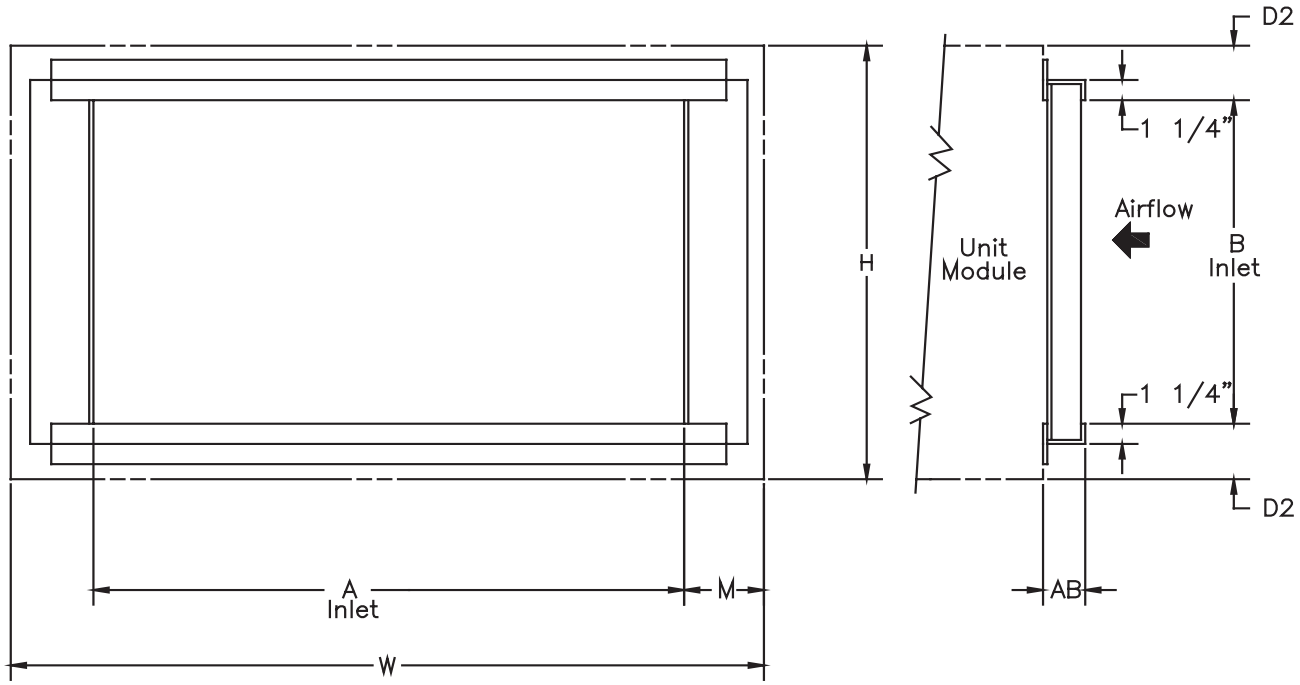
Table 212. HEPA filter dimensions (inches)

Unit Size	W	L	H	A	B*	C	D1	D2	E1	E2	F
3	31.00	36.00	30.75	27.00	22.25	23.99	3.38	2.50	2.00	2.00	14.00
6	44.00	41.00	30.75	40.00	24.75	21.99	3.38	2.50	2.00	2.00	14.00
8	48.00	44.00	41.00	44.00	30.00	34.24	3.38	2.50	2.00	2.00	19.50
10	60.00	39.00	41.00	56.00	30.00	34.24	3.38	2.50	2.00	2.00	19.50
12	64.00	39.00	41.00	60.00	35.00	32.24	3.38	2.50	2.00	2.00	19.50
14	68.00	40.50	42.50	64.00	36.50	33.74	3.38	2.50	2.00	2.00	19.50
17	74.00	44.00	53.00	70.00	40.00	46.24	3.38	2.50	2.00	2.00	19.50
21	76.00	50.25	54.50	72.00	46.25	47.74	3.38	2.50	2.00	2.00	19.50
25	78.00	56.50	65.50	74.00	52.50	58.74	3.38	2.50	2.00	2.00	19.50
30	91.00	56.50	65.50	87.00	52.50	58.74	3.38	2.50	2.00	2.00	19.50
35	96.00	48.00	68.00	91.00	58.75	60.24	3.88	3.00	2.50	2.50	23.50
40	109.00	48.00	68.00	104.00	58.75	60.24	3.88	3.00	2.50	2.50	23.50
50	120.00	48.00	78.50	115.00	70.00	70.74	3.88	3.00	2.50	2.50	23.50
57	120.00	48.00	86.50	115.00	81.50	70.12	3.88	3.00	2.50	2.50	23.50
66	137.00	49.00	92.00	132.00	81.50	70.12	9.46	3.00	8.00	2.50	23.50
80	137.00	54.00	107.00	132.00	96.50	70.12	9.46	3.00	8.00	2.50	23.50
100	152.00	60.00	119.50	147.00	109.00	70.12	9.46	3.00	8.00	2.50	23.50
120	179.00	60.00	119.50	174.00	109.00	70.12	9.46	3.00	8.00	2.50	23.50

* Opening size is dependent on whether there is an adjacent module. Listed B dimension applies if there is an adjacent module. If HEPA filter is the last module in the unit, there is a full face opening.

The base line does not include the height for mounting legs or base rail except for unit sizes 66 through 120 where the base rail is integral to the unit.

Figure 124. Open return filter module



Note: Dimensions A, C & W are approximate b/c different types of fliters vary up to 1" overall

Table 213. Open return filter dimensions (inches)

Unit Size	W	H	A	B	M	D2	2-inch AB	4-inch AB
3	31	26.25	24.75	17.60	3.13	4.25	2.25	4.25
6	44	28.75	39.25	17.60	2.38	5.50	2.25	4.25
8	48	34.00	39.25	22.60	4.38	5.70	2.25	4.25
10	60	34.00	55.00	22.60	2.50	5.70	2.25	4.25
12	64	39.00	59.00	29.70	2.50	4.65	2.25	4.25
14	68	40.50	63.75	29.70	2.13	5.40	2.25	4.25
17	74	44.00	68.76	33.70	2.62	5.15	2.25	4.25
21	76	50.25	70.75	37.69	2.63	6.28	2.25	4.25
25	78	56.50	71.75	45.70	3.13	5.40	2.25	4.25
30	91	56.50	84.75	45.70	3.13	5.40	2.25	4.25
35	96	63.75	91.14	47.70	2.43	8.03	2.25	4.25
40	109	63.75	103.00	47.70	3.00	8.03	2.25	4.25
50	120	75.00	115.14	57.75	2.43	8.63	2.25	4.25
57	120	86.50	115.14	69.88	2.43	8.31	2.25	4.25
66	137	92.09	129.75	69.88	3.63	13.84	2.25	4.25
80	137	107.09	129.75	85.88	3.63	13.34	2.25	4.25
100	152	119.59	144.75	97.88	3.63	13.60	2.25	4.25
120	179	119.59	171.75	97.88	3.63	13.60	2.25	4.25

The base line does not include the height for mounting legs or base rail except for unit sizes 66 through 120 where the base rail is integral to the unit.

Filter Placement

Table 214. 2-inch and 4-inch Angled filter layout

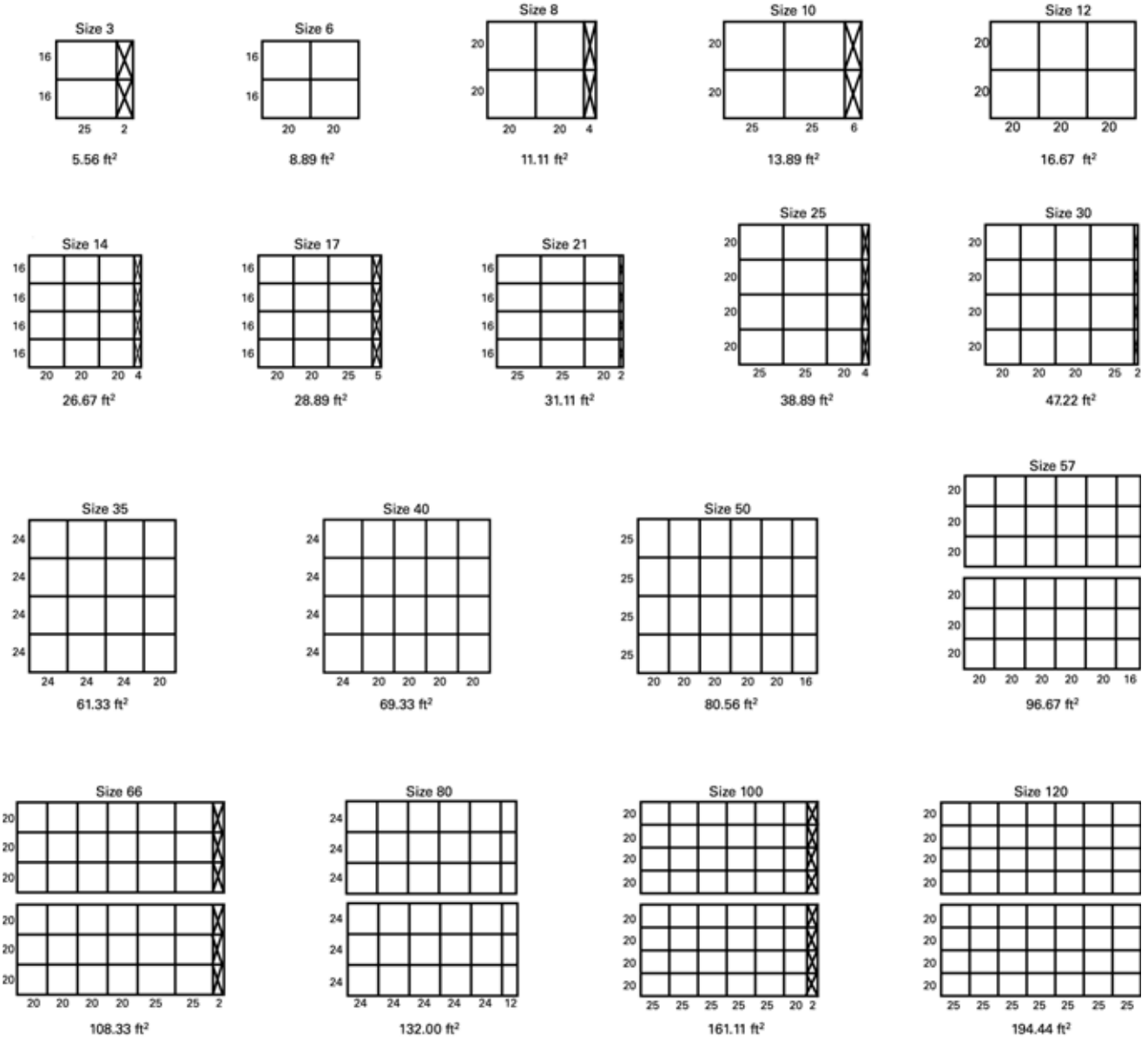


Table 215. Bag and cartridge filter layout

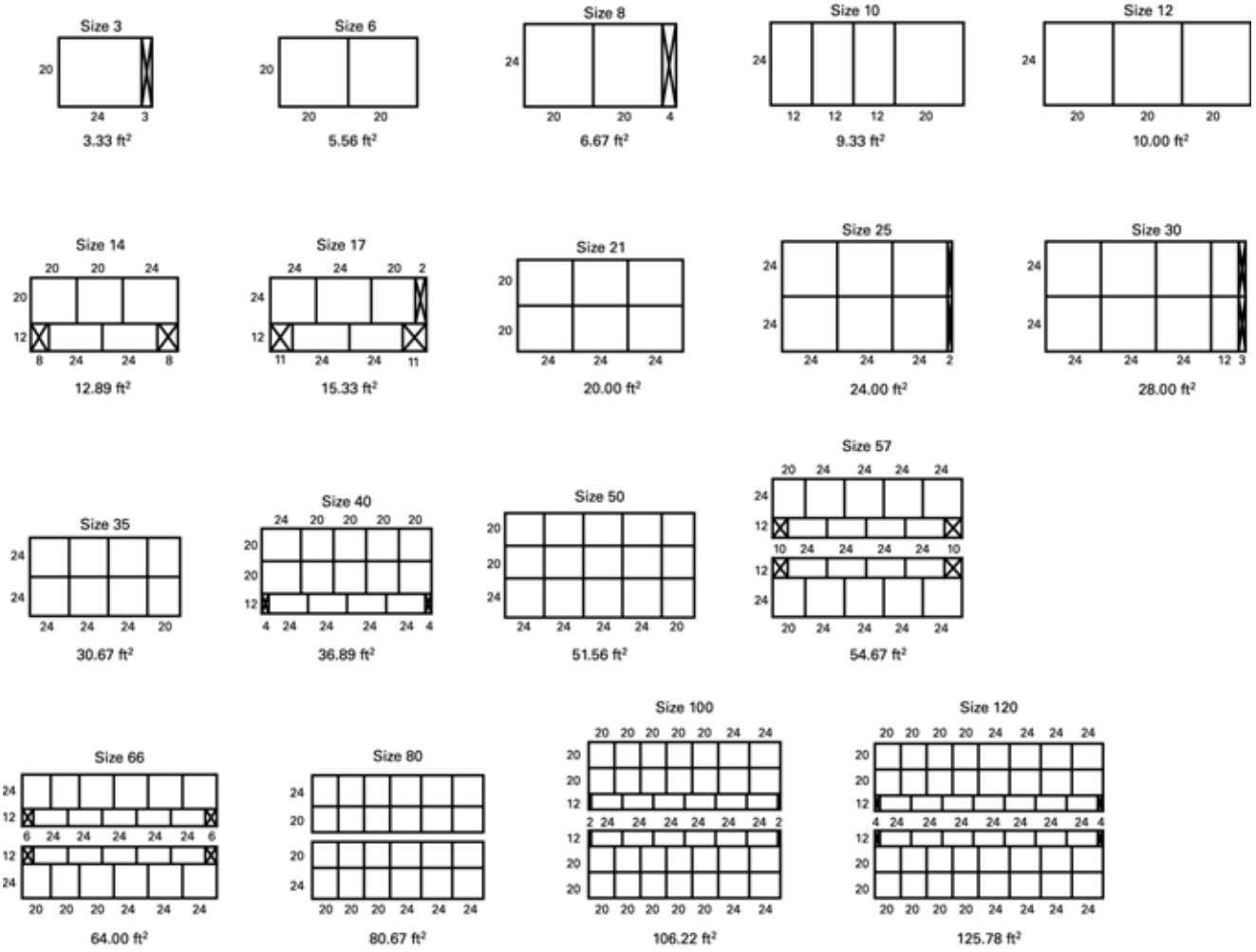


Table 216. 2-inch and 4-inch Open or Flat filter and 2-inch / 4-inch high-efficiency filter layout

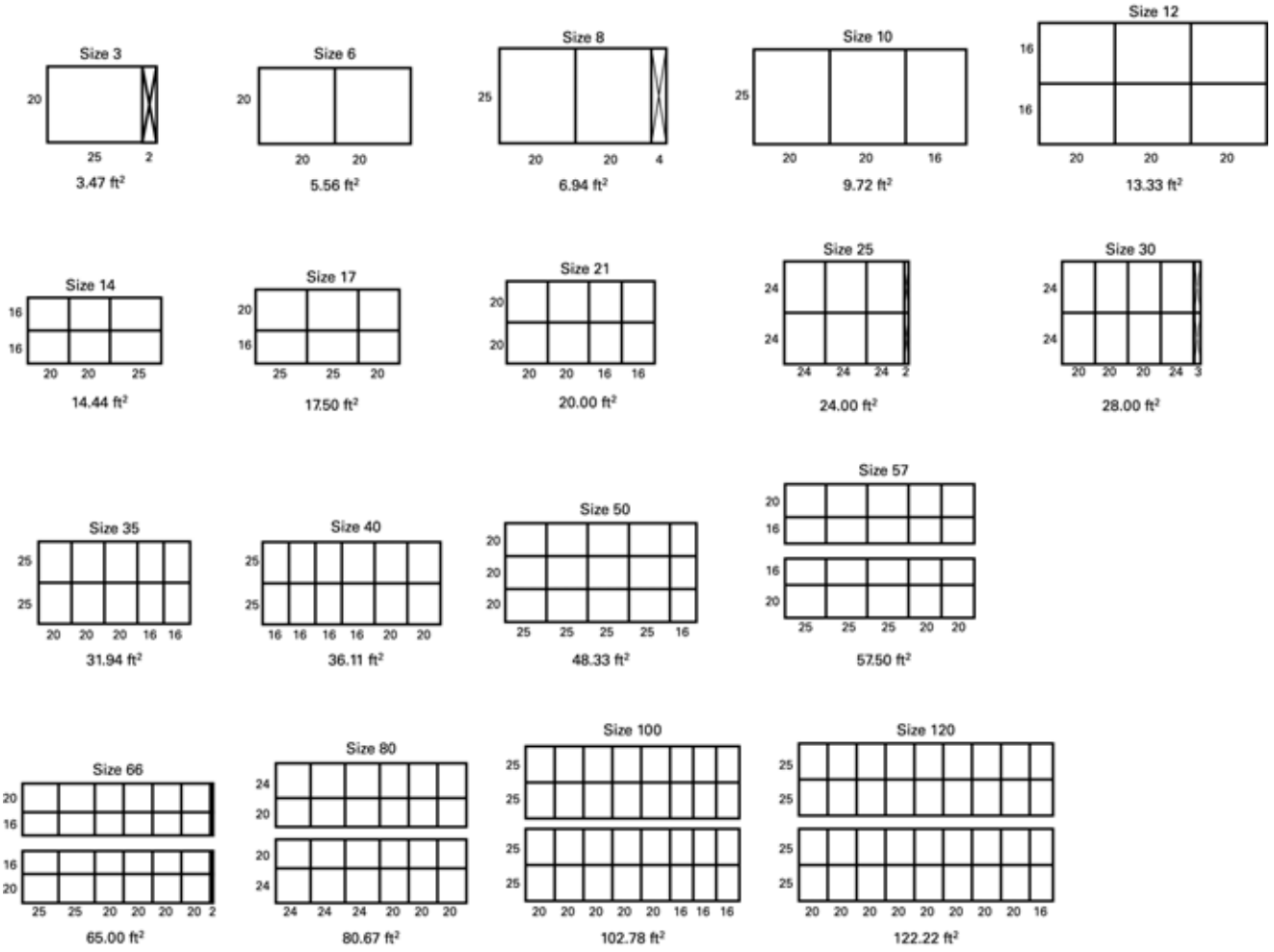
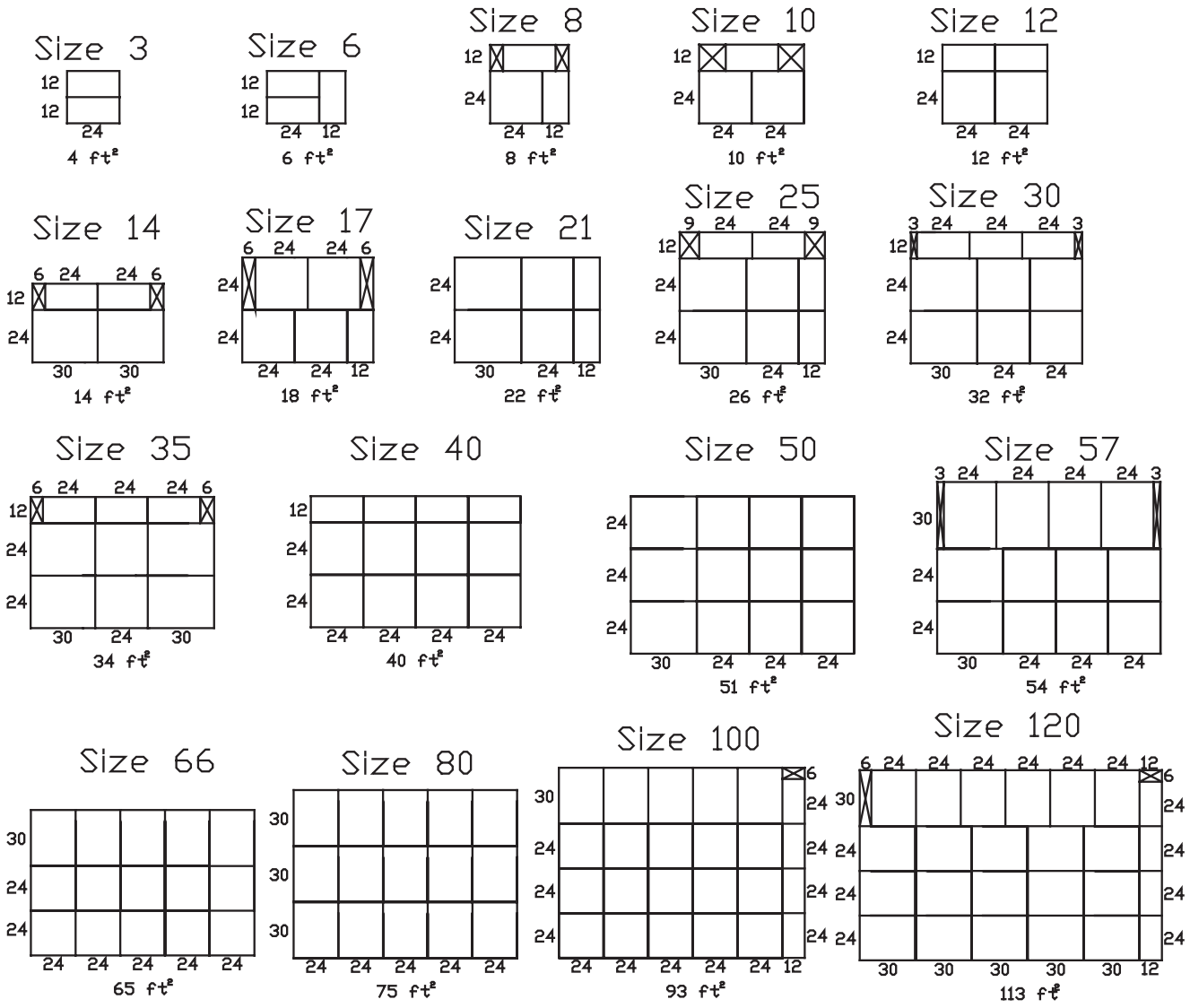


Table 217. HEPA filter layout



Humidifier

Figure 125. Humidifier module

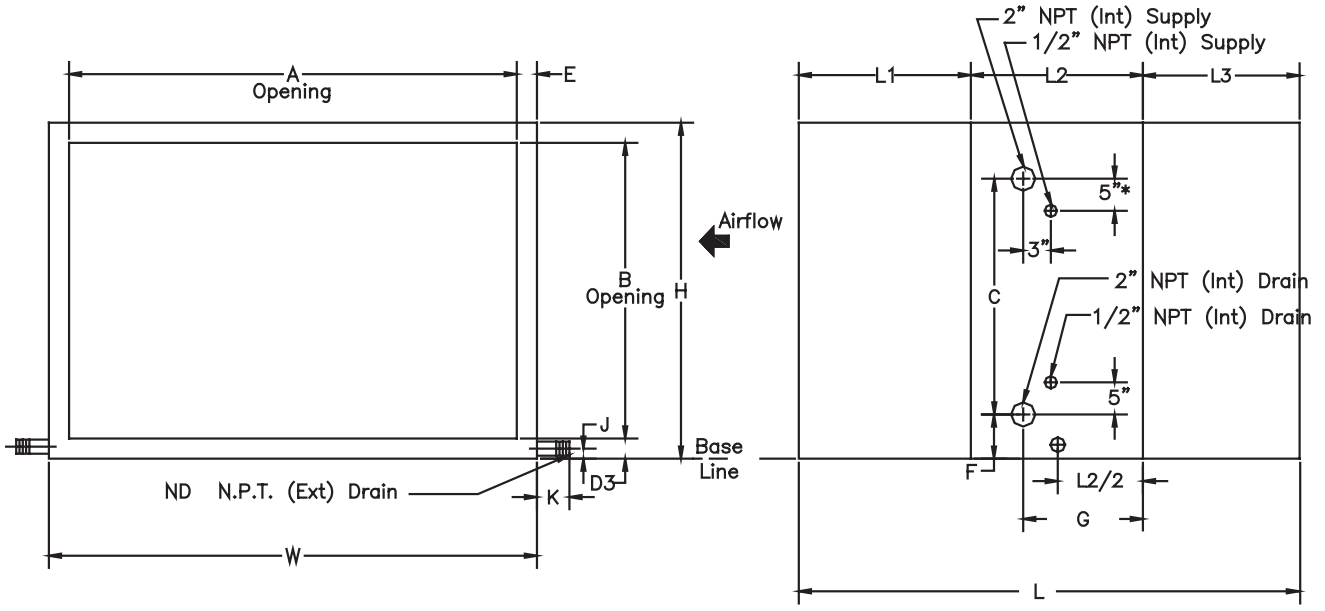


Table 218. Humidifier dimensions (inches)

Unit Size	W	L	H	A	B	C	D3	E	F	G	J	K	L1	L2	L3	ND (NPT)
3	31	31.00	26.25	27.00	22.25	15.75	2.00	2.00	4.00	9.00	0.80	2.60	15.50	15.50	n/a	1.00
6	44	31.00	28.75	40.00	24.75	18.00	2.00	2.00	4.00	9.00	0.80	2.60	15.50	15.50	n/a	1.00
8	48	31.00	34.00	44.00	30.00	21.00	2.00	2.00	7.38	9.00	0.80	2.60	15.50	15.50	n/a	1.00
10	60	31.00	34.00	56.00	30.00	21.00	2.00	2.00	5.88	9.00	0.80	2.60	15.50	15.50	n/a	1.00
12	64	31.00	39.00	60.00	35.00	27.13	2.00	2.00	4.88	9.00	0.80	2.60	15.50	15.50	n/a	1.00
14	68	31.00	40.50	64.00	36.50	27.13	2.00	2.00	5.88	9.00	0.80	2.60	15.50	15.50	n/a	1.00
17	74	31.00	44.00	70.00	40.00	33.00	2.00	2.00	4.88	9.00	0.80	2.60	15.50	15.50	n/a	1.00
21	76	31.00	50.25	72.00	46.25	39.00	2.00	2.00	4.13	9.00	0.80	2.60	15.50	15.50	n/a	1.00
25	78	31.00	56.50	74.00	52.50	45.00	2.00	2.00	4.38	9.00	0.80	2.60	15.50	15.50	n/a	1.00
30	91	31.00	56.50	87.00	52.50	45.00	2.00	2.00	4.38	9.00	0.80	2.60	15.50	15.50	n/a	1.00
35	96	32.00	63.75	91.00	58.75	50.88	2.50	2.50	2.63	9.25	1.20	3.60	16.00	16.00	n/a	1.25
40	109	32.00	63.75	104.00	58.75	50.88	2.50	2.50	2.63	9.25	1.20	3.60	16.00	16.00	n/a	1.25
50	120	29.00	75.00	115.00	70.00	56.88	2.50	2.50	4.63	8.50	1.20	3.60	14.50	14.50	n/a	1.25
57	120	29.00	86.50	115.00	81.50	68.75	2.50	2.50	4.63	8.50	1.20	3.60	14.50	14.50	n/a	1.25
66	137	29.00	92.00	132.00	81.50	68.75	8.00	2.50	10.75	8.50	5.80	2.50	14.50	14.50	n/a	1.50
80	137	43.50	107.00	132.00	96.50	74.75	8.00	2.50	11.25	8.50	5.80	2.50	14.50	14.50	14.50	1.50
100	152	43.50	119.50	147.00	109.00	74.75	8.00	2.50	11.25	8.50	5.80	2.50	14.50	14.50	14.50	1.50
120	179	43.50	119.50	174.00	109.00	74.75	8.00	2.50	11.25	8.50	5.80	2.50	14.50	14.50	14.50	1.50

Note: The drain pan connection dimension is nominal pipe size. Indoor air quality drain pan connections can be either left-hand or right-hand but not both.

Intake Module

Figure 126. Intake module

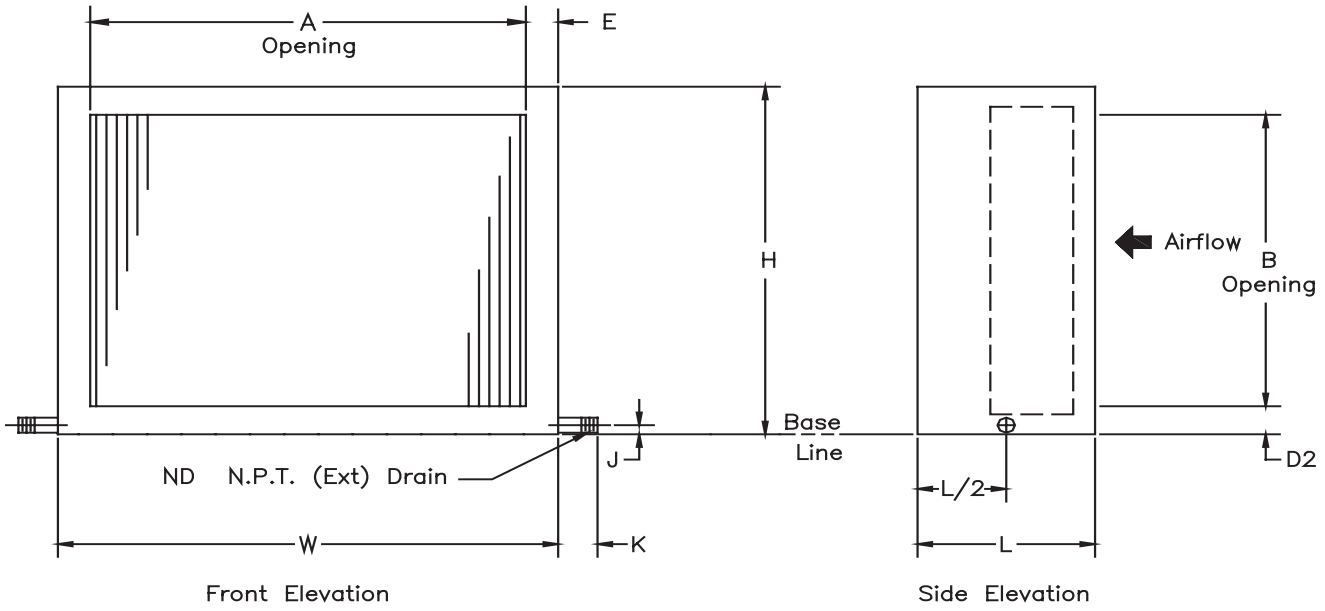


Table 219. Intake module dimensions (inches)

Unit Size	W	L	H	A	B	D2	E	J	K	ND (NPT)
3	31	15.50	26.25	27.00	22.25	2.00	2.00	0.80	2.60	1.00
6	44	15.50	28.75	40.00	24.75	2.00	2.00	0.80	2.60	1.00
8	48	15.50	34.00	44.00	30.00	2.00	2.00	0.80	2.60	1.00
10	60	15.50	34.00	56.00	30.00	2.00	2.00	0.80	2.60	1.00
12	64	15.50	39.00	60.00	35.00	2.00	2.00	0.80	2.60	1.00
14	68	15.50	40.50	64.00	36.50	2.00	2.00	0.80	2.60	1.00
17	74	15.50	44.00	70.00	40.00	2.00	2.00	0.80	2.60	1.00
21	76	15.50	50.25	72.00	46.25	2.00	2.00	0.80	2.60	1.00
25	78	15.50	56.50	74.00	52.50	2.00	2.00	0.80	2.60	1.00
30	91	15.50	56.50	87.00	52.50	2.00	2.00	0.80	2.60	1.00
35	96	16.00	63.75	91.00	58.75	2.50	2.50	1.20	3.60	1.25
40	109	16.00	63.75	104.00	58.75	2.50	2.50	1.20	3.60	1.25
50	120	20.00	75.00	115.00	70.00	2.50	2.50	1.20	3.60	1.25
57	120	20.00	86.50	115.00	81.50	2.50	2.50	1.20	3.60	1.25
66	137	29.50	92.08	132.00	81.50	8.00	2.50	5.80	2.50	1.50
80	137	29.50	107.08	132.00	96.50	8.00	2.50	5.80	2.50	1.50
100	152	29.50	119.58	147.00	109.00	8.00	2.50	5.80	2.50	1.50
120	179	29.50	119.58	174.00	109.00	8.00	2.50	5.80	2.50	1.50

(1) The drain pan connection dimension is nominal pipe size. Indoor air quality drain pan connections can be either left-hand or right-hand but not both.
(2) The base line does not include the height for mounting legs or base rail except for unit sizes 66 through 120 where the base rail is integral to the unit.

Mixing Box

Figure 127. Mixing box module

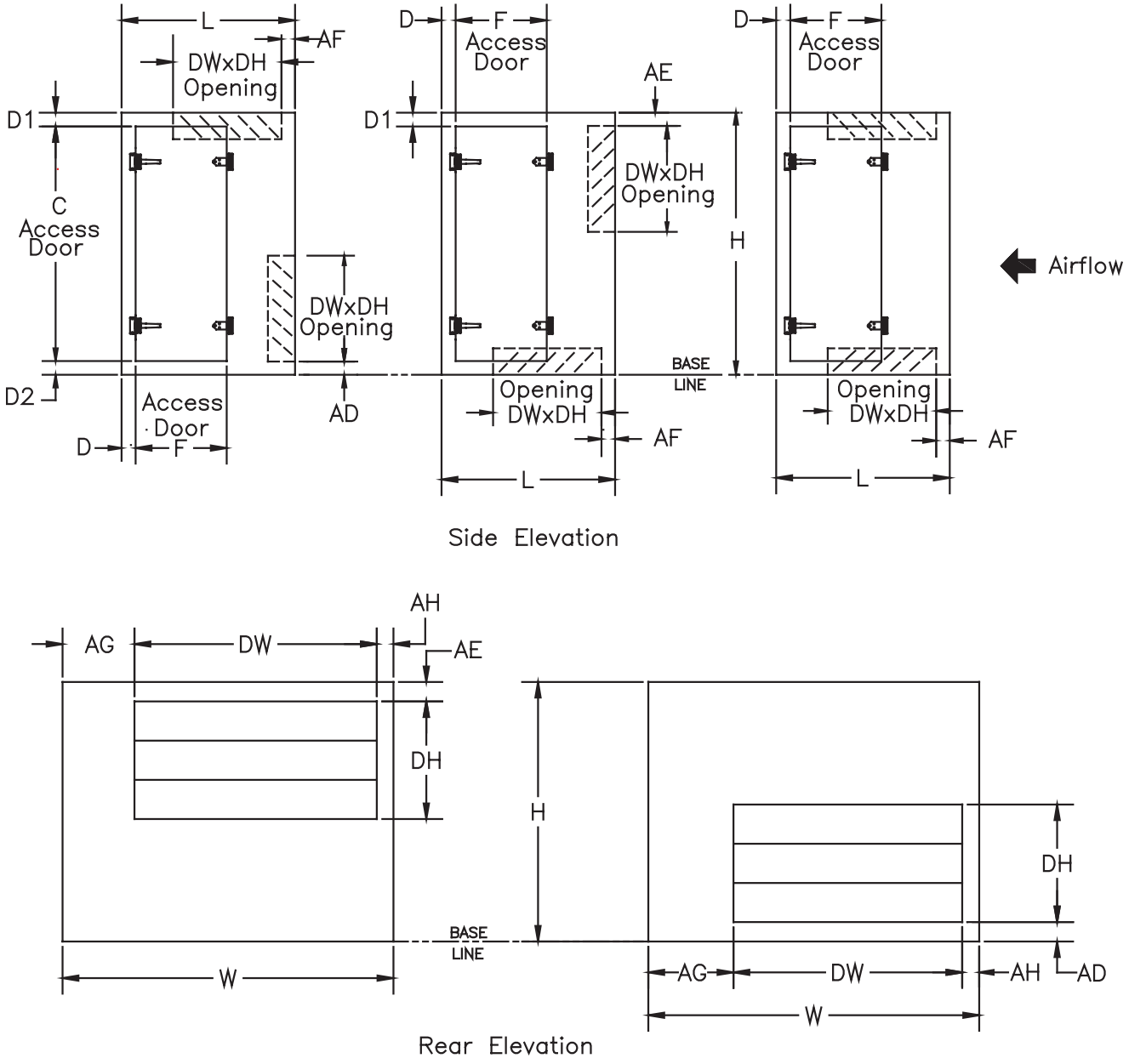


Table 220. Mixing box dimensions (inches)

Unit Size	W	L	H	C without filters	C with filters	F	D	D1 without filters	D1 with filters	D2
3	31	26.25[1]	26.25	21.71	21.71	21.95	2.15	2.27	2.27	2.27
6	44.	28.75	28.75	24.21	24.21	24.45	2.15	2.27	2.27	2.27
8	48	34.00	34.00	29.46	29.46	20.20	2.15	2.27	2.27	2.27
10	60	34.00	34.00	29.46	29.46	20.20	2.15	2.27	2.27	2.27
12	64	34.00	39.00	34.46	34.46	20.20	2.15	2.27	2.27	2.27
14	68	34.00	40.50	35.96	35.96	20.20	2.15	2.27	2.27	2.27
17	74	34.00	44.00	39.46	39.46	20.20	2.15	2.27	2.27	2.27
21	76	34.00	50.25	45.71	45.71	20.20	2.15	2.27	2.27	2.27
25	78	40.00	56.50	51.96	51.96	20.20	2.15	2.27	2.27	2.27
30	91	40.00	56.50	51.96	51.96	20.20	2.15	2.27	2.27	2.27
35	96	48.00	63.75	58.21	58.21	24.20	2.65	2.77	2.77	2.77
40	109	48.00	63.75	58.21	58.21	24.20	2.65	2.77	2.77	2.77
50	120	48.00	75.00	69.46	69.46	24.20	2.65	2.77	2.77	2.77
57	120	48.00	86.50	71.58	80.96	24.20	2.65	12.15	2.77	2.77
66	137	49.00	92.09	71.58	80.96	24.20	2.65	12.15	2.77	8.27
80	137	54.00	107.09	71.58	95.96	24.20	2.65	27.15	2.77	8.27
100	152	60.00	119.59	71.58	108.46	24.20	2.65	39.65	2.77	8.27
120	179	60.00	119.59	71.58	108.46	24.20	2.65	39.65	2.77	8.27

Unit Size	With Dampers[2]							Without Dampers[3-4]						
	DH	DW	AD	AE	AF	AG	AH	DH	DW	AD	AE	AF	AG	AH
3	17.00	21.00	0.75	0.75	0.75	9.25	0.75	14.75	18.50	2.00	2.00	2.00	10.50[6]	2.00
6	17.00	34.00	0.75	0.75	0.75	9.25	0.75	14.75	31.50	2.00	2.00	2.00	10.50[6]	2.00
8	17.00	38.00	0.75	0.75	0.75	9.25	0.75	14.75	35.50	2.00	2.00	2.00	10.50[6]	2.00
10	17.00	45.00	0.75	0.75	0.75	7.50	7.50	14.75	42.50	2.00	2.00	2.00	8.75	8.75
12	17.00	56.00	0.75	0.75	0.75	4.00	4.00	14.75	53.50	2.00	2.00	2.00	5.25	5.25
14	22.75	46.00	0.75	0.75	0.75	11.00	11.00	20.50	43.50	2.00	2.00	2.00	12.25	12.25
17	22.75	54.00	0.75	0.75	0.75	10.00	10.00	20.50	51.50	2.00	2.00	2.00	11.25	11.25
21	22.75	66.00	0.75	0.75	0.75	5.00	5.00	20.50	63.50	2.00	2.00	2.00	6.25	6.25
25	28.50	61.00	0.75	0.75	0.75	8.50	8.50	26.25	58.50	2.00	2.00	2.00	9.75	9.75
30	28.50	71.00	0.75	0.75	0.75	10.00	10.00	26.25	68.50	2.00	2.00	2.00	11.25	11.25
35	34.25	69.00	1.25	1.25	1.25	13.50	13.50	32.00	66.50	2.50	2.50	2.50	14.75	14.75
40	34.25	82.00	1.25	1.25	1.25	13.50	13.50	32.00	79.50	2.50	2.50	2.50	14.75	14.75
50	34.25	102.00	1.25	1.25	1.25	9.00	9.00	32.00	99.50	2.50	2.50	2.50	10.25	10.25
57	40.00	117.00	1.25	1.25	1.25	1.50	1.50	37.50	115.00	2.50	2.50	2.50	2.50	2.50
66	40.00	116.50	28.71	23.30	1.25	10.25	10.25	37.75	114.00	29.85	24.40	2.50	11.50	11.50
80	45.75	118.00	33.34	28.00	1.25	9.50	9.50	43.50	115.50	34.50	29.00	2.50	10.75	10.75
100	51.50	130.00	36.71	31.40	1.25	11.00	11.00	49.25	127.50	38.00	32.38	2.50	12.25	12.25
120	51.50	159.00	36.71	31.40	1.25	10.00	10.00	49.25	156.50	38.00	32.38	2.50	11.25	11.25

(1) Size 3 mixing box with filters L dimension is 36.00.

(2) With Dampers dimensions are to the outer edge of the damper flanges.

(3) Without Dampers dimensions for sizes 3-30 represent the panel openings when only a damper opening is provided.

(4) Without Dampers dimensions for sizes 35-120 represent a channel frame opening when only a damper opening is provided.

(5) The base line does not include the height for mounting legs or base rail except for unit sizes 66 through 120 where the base rail is integral to the unit.

(6) For unit sizes 3, 6 and 8, the dampers are not centered in the module. The AG dimension refers to the drive side of the unit.

Figure 128. Mixing box with side dampers

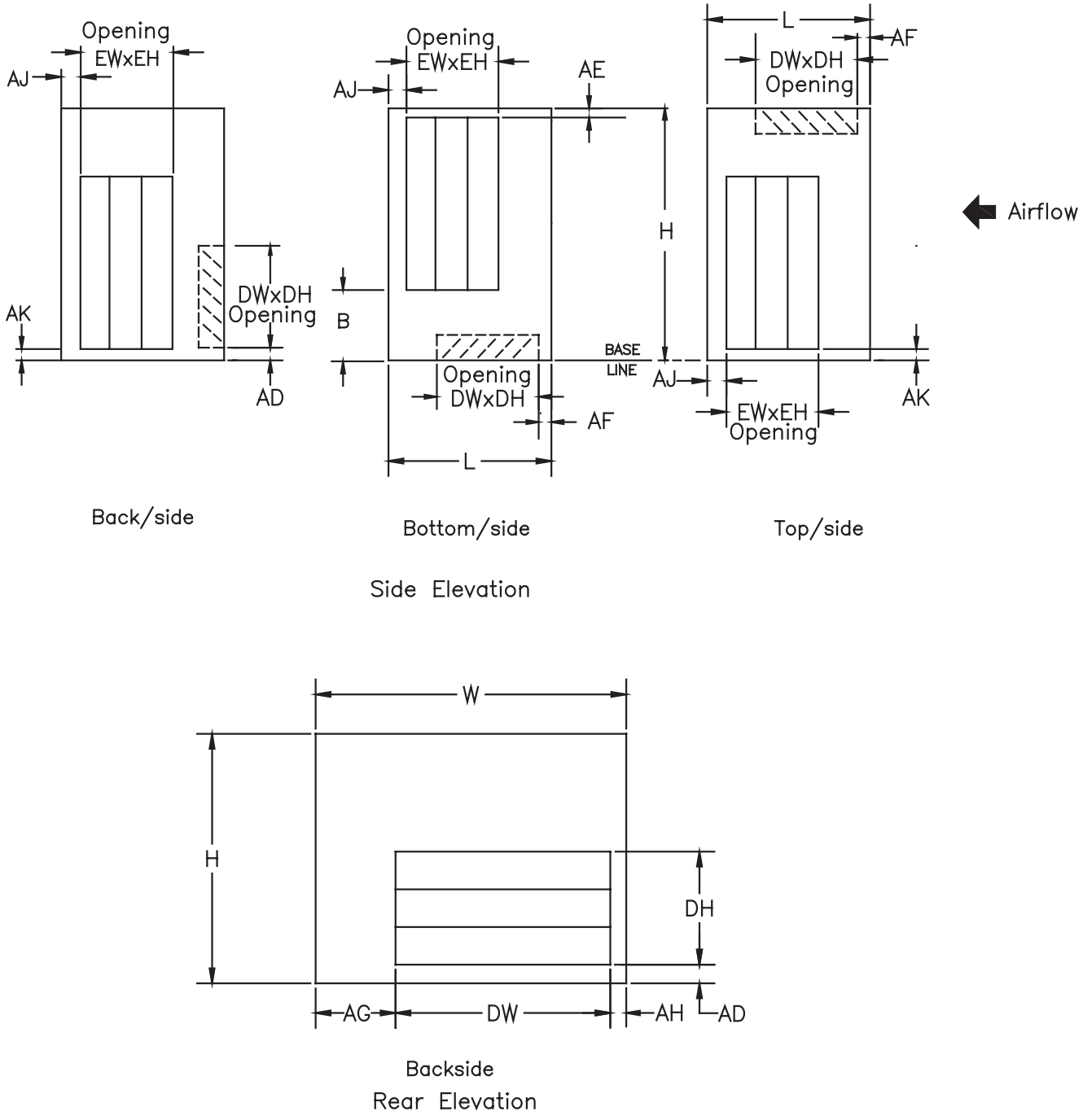


Table 221. Mixing box with side openings with dampers

Unit Size	W	L	H	With Dampers										
				EH	EW	DH	DW	AD	AE	AF	AG	AH	AJ	AK
3	31.00	26.25	26.25	12.00	17.00	17.00	21.00	0.75	0.75	0.75	9.25	0.75	0.75	0.75
6	44.00	28.75	28.75	18.00	17.00	17.00	34.00	0.75	0.75	0.75	9.25	0.75	0.75	0.75
8	48.00	34.00	34.00	22.00	17.00	17.00	38.00	0.75	0.75	0.75	9.25	0.75	0.75	0.75
10	60.00	34.00	34.00	21.00	22.75	17.00	45.00	0.75	0.75	0.75	7.50	7.50	0.75	0.75
12	64.00	34.00	39.00	25.00	22.75	17.00	56.00	0.75	0.75	0.75	4.00	4.00	0.75	0.75
14	68.00	34.00	40.50	29.00	22.75	22.75	46.00	0.75	0.75	0.75	11.00	11.00	0.75	0.75
17	74.00	34.00	44.00	33.00	22.75	22.75	54.00	0.75	0.75	0.75	10.00	10.00	0.75	0.75
21	76.00	34.00	50.25	38.00	22.75	22.75	66.00	0.75	0.75	0.75	5.00	5.00	0.75	0.75
25	78.00	40.00	56.50	44.00	22.75	28.50	61.00	0.75	0.75	0.75	8.50	8.50	0.75	0.75
30	91.00	40.00	56.50	44.00	28.50	28.50	71.00	0.75	0.75	0.75	10.00	10.00	0.75	0.75
35	96.00	48.00	63.75	51.00	28.50	34.25	69.00	1.25	1.25	1.25	13.50	13.50	1.25	1.25
40	109.00	48.00	63.75	48.00	34.25	34.25	82.00	1.25	1.25	1.25	13.50	13.50	1.25	1.25
50	120.00	48.00	75.00	60.00	34.25	34.25	102.00	1.25	1.25	1.25	9.00	9.00	1.25	1.25
57	120.00	48.00	86.50	68.00	34.25	40.00	117.00	1.25	1.25	1.25	1.50	1.50	1.25	1.25
66	137.00	49.00	92.09	68.00	40.00	40.00	116.50	28.71	17.20	1.25	10.25	10.25	1.25	6.89
80	137.00	54.00	107.09	81.00	40.00	45.75	118.00	33.34	19.25	1.25	9.50	9.50	1.25	6.84
100	152.00	60.00	119.59	99.00	40.00	51.50	130.00	36.85	13.75	1.25	11.00	11.00	1.25	6.84
120	179.00	60.00	119.59	99.00	45.75	51.50	159.00	36.85	13.75	1.25	10.00	10.00	1.25	6.84

Table 222. Mixing box with side openings without dampers

Unit Size	W	L	H	Without Dampers											B
				EH	EW	AJ	DH	DW	AD	AE	AF	AG	AH	AK	
3	31.00	26.25	26.25	9.69	14.75	2.00	14.75	18.50	2.00	2.00	2.00	10.50	2.00	2.00	14.56
6	44.00	28.75	28.75	15.69	14.75	2.00	14.75	31.50	2.00	2.00	2.00	10.50	2.00	2.00	11.06
8	48.00	34.00	34.00	19.69	14.75	2.00	14.75	35.50	2.00	2.00	2.00	10.50	2.00	2.00	12.31
10	60.00	34.00	34.00	18.69	20.50	2.00	14.75	42.50	2.00	2.00	2.00	8.75	8.75	2.00	13.31
12	64.00	34.00	39.00	22.69	20.50	2.00	14.75	53.50	2.00	2.00	2.00	5.25	5.25	2.00	14.31
14	68.00	34.00	40.50	26.69	20.50	2.00	20.50	43.50	2.00	2.00	2.00	12.25	12.25	2.00	11.31
17	74.00	34.00	44.00	30.69	20.50	2.00	20.50	51.50	2.00	2.00	2.00	11.25	11.25	2.00	11.31
21	76.00	34.00	50.25	35.69	20.50	2.00	20.50	63.50	2.00	2.00	2.00	6.25	6.25	2.00	12.56
25	78.00	40.00	56.50	41.94	20.50	2.00	26.25	58.50	2.00	2.00	2.00	9.75	9.75	2.00	12.56
30	91.00	40.00	56.50	41.94	26.25	2.00	26.25	68.60	2.00	2.00	2.00	11.20	11.20	2.00	12.56
35	96.00	48.00	63.75	48.50	26.00	2.50	32.00	66.50	2.50	2.50	2.50	14.75	14.75	2.50	12.75
40	109.00	48.00	63.75	45.50	31.75	2.50	32.00	79.50	2.50	2.50	2.50	14.75	14.75	2.50	15.75
50	120.00	48.00	75.00	57.50	31.75	2.50	32.00	99.50	2.50	2.50	2.50	10.25	10.25	2.50	15.00
57	120.00	48.00	86.50	65.50	31.75	2.50	37.75	115.00	2.50	2.50	2.50	2.50	2.50	2.50	18.50
66	137.00	49.00	92.00	65.69	37.50	2.50	37.75	114.00	29.96	18.40	2.50	11.50	11.50	8.00	18.40
80	137.00	54.00	107.00	78.59	37.50	2.50	43.50	115.50	34.59	20.50	2.50	10.75	10.75	8.00	20.50
100	152.00	60.00	119.50	96.59	37.50	2.50	49.25	127.50	37.96	15.00	2.50	12.25	12.25	8.00	15.00
120	179.00	60.00	119.50	96.59	43.25	2.50	49.25	156.50	37.96	15.00	2.50	11.25	11.25	8.00	15.00

(1) With Dampers are the dimensions to the outer edge of the damper flanges.

(2) Without Dampers are the dimensions that represent the panel openings sizes 3-30 when only a damper opening is provided.

(3) Without Dampers for sizes 35-120 the dimensions represent a channel frame openings when only a damper opening is provided.

(4) The base line does not include the height for mounting legs or base rail except for unit sizes 66 through 120 where the base rail is integral to the unit.

(5) For unit sizes 3, 6 and 8, the dampers are not centered in the module. The AG dimension refers to the drive side of the unit.

(6) For access door locations, refer to the Mixing Module.

(7) Side dampers and access doors can not be located on the same side of mixing module.

Figure 129. Traq mixing box

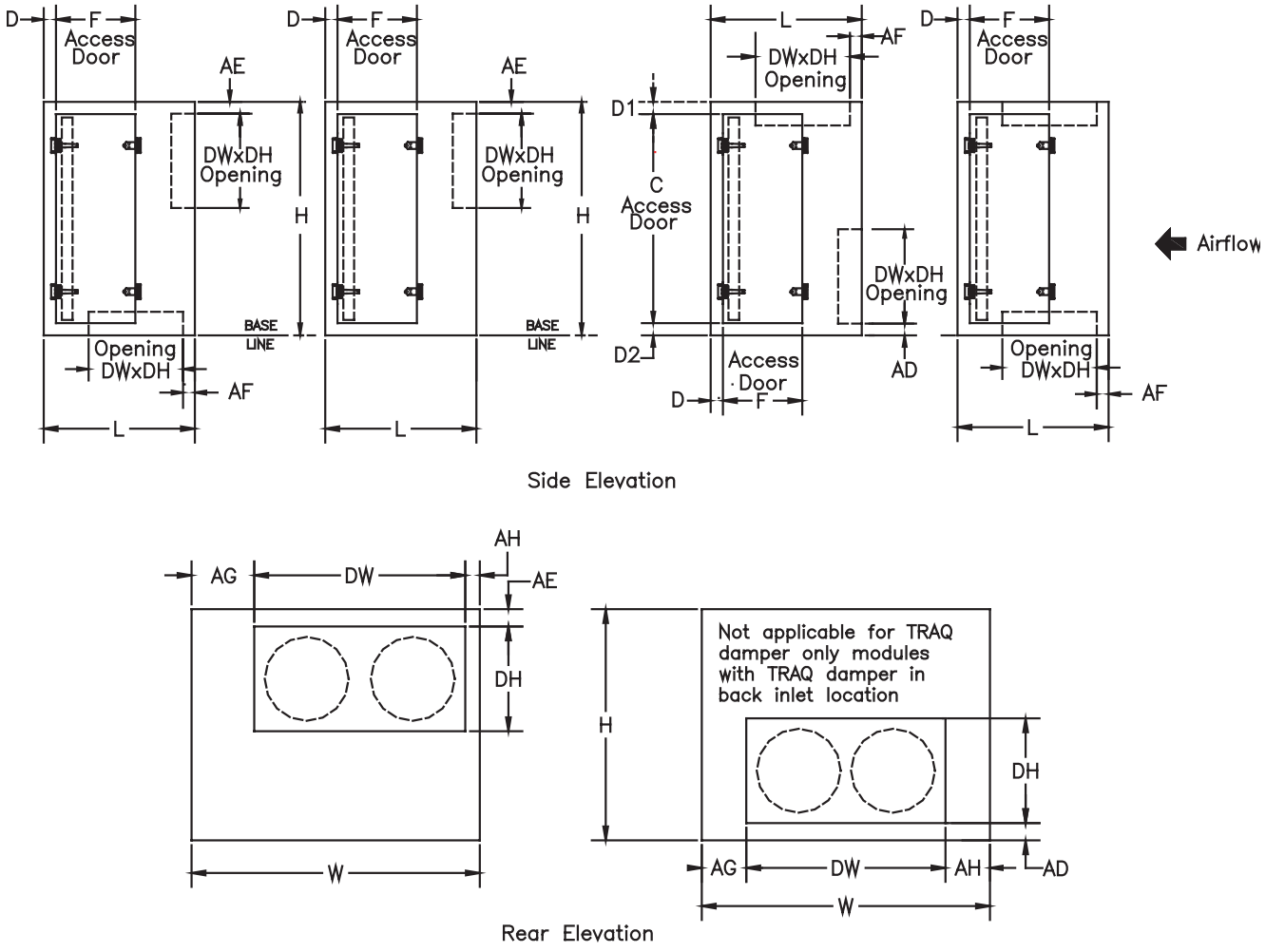


Table 223. Traq mixing box dimensions

Unit Size	W	L	H	C w/out filters	C with filters	F	D	D1 w/out filters	D1 with filters	D2	Without Airfoil Blade Dampers						
											DH	DW	AD	AE	AF	AG	AH
3	31.00	36.00	26.25	21.71	21.71	21.95	2.15	2.27	2.27	2.27	14.75	18.50	2.00	2.00	2.00	10.50	2.00
6	44.00	28.75	28.75	24.21	24.21	24.45	2.15	2.27	2.27	2.27	14.75	31.50	2.00	2.00	2.00	10.50	2.00
8	48.00	34.00	34.00	29.46	29.46	20.20	2.15	2.27	2.27	2.27	14.75	35.50	2.00	2.00	2.00	10.50	2.00
10	60.00	34.00	34.00	29.46	29.46	20.20	2.15	2.27	2.27	2.27	14.75	42.50	2.00	2.00	2.00	8.75	8.75
12	64.00	34.00	39.00	34.46	34.46	20.20	2.15	2.27	2.27	2.27	14.75	53.50	2.00	2.00	2.00	5.25	5.25
14	68.00	34.00	40.50	35.96	35.96	20.20	2.15	2.27	2.27	2.27	20.50	43.50	2.00	2.00	2.00	12.25	12.25
17	74.00	34.00	44.00	39.46	39.46	20.20	2.15	2.27	2.27	2.27	20.50	51.50	2.00	2.00	2.00	11.25	11.25
21	76.00	50.25	50.25	45.71	45.71	21.83	2.15	2.27	2.27	2.27	20.50	63.50	2.00	2.00	2.00	6.25	6.25
25	78.00	40.00	56.50	51.96	51.96	20.20	2.15	2.27	2.27	2.27	26.25	58.50	2.00	2.00	2.00	9.75	9.75
30	91.00	56.50	56.50	51.96	51.96	24.95	2.15	2.27	2.27	2.27	26.25	68.50	2.00	2.00	2.00	11.25	11.25
35	96.00	48.00	63.75	58.21	58.21	24.20	2.65	2.77	2.77	2.77	32.00	66.50	2.50	2.50	2.50	14.75	14.75
40	109.00	48.00	63.75	58.21	58.21	24.20	2.65	2.77	2.77	2.77	32.00	79.50	2.50	2.50	2.50	14.75	14.75
50	120.00	48.00	75.00	69.46	69.46	24.20	2.65	2.77	2.77	2.77	32.00	99.50	2.50	2.50	2.50	10.25	10.25
57	120.00	48.00	86.50	71.58	80.96	24.20	2.65	12.15	2.77	2.77	37.75	115.00	2.50	2.50	2.50	2.50	2.50
66	137.00	84.00	92.09	71.58	80.96	24.20	2.65	12.15	2.77	8.36	37.75	114.00	29.96	24.38	2.50	11.50	11.50
80	137.00	92.00	107.09	71.58	95.96	24.20	2.65	27.15	2.77	8.36	43.50	115.50	34.58	29.01	2.50	10.75	10.75
100	152.00	96.00	119.59	71.58	108.46	24.20	2.65	39.65	2.77	8.36	49.25	127.50	37.95	32.38	2.50	12.25	12.25
120	179.00	96.00	119.59	71.58	108.46	24.20	2.65	39.65	2.77	8.36	49.25	156.50	37.95	32.38	2.50	11.25	11.25

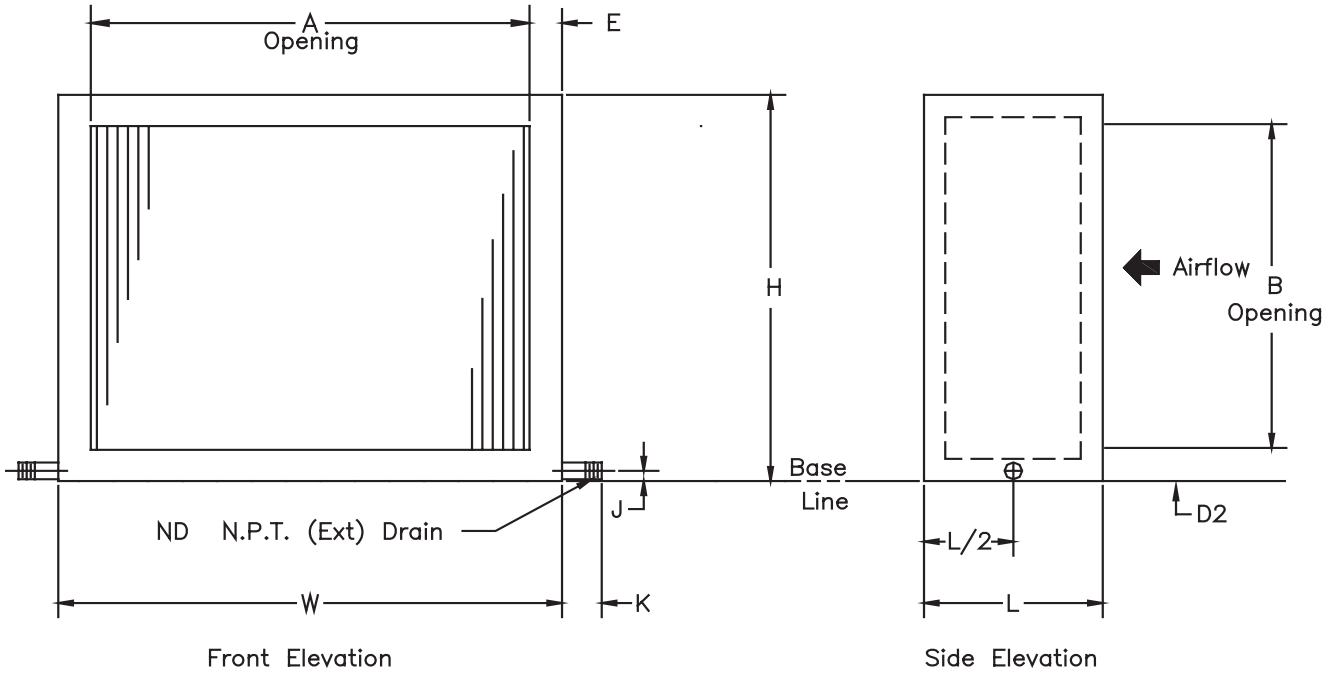
Table 224. Traq mixing box dimensions with dampers

Unit Size	With Airfoil Blade Dampers							With Traq Dampers						
	DH	DW	AD	AE	AF	AG	AH	DH	DW	AD	AE	AF	AG	AH
3	17.00	21.00	0.75	0.75	0.75	9.25	0.75	16.06	16.06	2.47	2.47	9.97	7.47	7.47
6	17.00	34.00	0.75	0.75	0.75	9.25	0.75	16.06	33.21	2.47	2.47	6.34	5.40	5.40
8	17.00	38.00	0.75	0.75	0.75	9.25	0.75	16.06	33.21	2.47	2.47	2.47	7.40	7.40
10	17.00	45.00	0.75	0.75	0.75	7.50	7.50	16.06	52.86	4.22	4.22	4.22	3.57	3.57
12	17.00	56.00	0.75	0.75	0.75	4.00	4.00	27.25	58.55	3.38	3.38	3.38	2.73	2.73
14	22.75	46.00	0.75	0.75	0.75	11.00	11.00	19.75	62.06	2.36	2.36	2.36	2.97	2.97
17	22.75	54.00	0.75	0.75	0.75	10.00	10.00	19.75	62.06	2.36	2.36	2.36	5.97	5.97
21	22.75	66.00	0.75	0.75	0.75	5.00	5.00	29.65	63.65	2.18	2.18	2.18	6.18	6.18
25	28.50	61.00	0.75	0.75	0.75	8.50	8.50	29.65	67.65	3.18	3.18	3.18	5.18	5.18
30	28.50	71.00	0.75	0.75	0.75	10.00	10.00	24.75	80.44	7.63	7.63	7.63	5.28	5.28
35	34.25	69.00	1.25	1.25	1.25	13.50	13.50	29.65	91.98	5.76	5.76	5.75	2.01	2.01
40	34.25	82.00	1.25	1.25	1.25	13.50	13.50	29.65	100.65	6.55	6.55	6.55	4.18	4.18
50	34.25	102.00	1.25	1.25	1.25	9.00	9.00	34.50	112.83	4.13	4.13	4.13	3.59	3.59
57	40.00	117.00	1.25	1.25	1.25	1.50	1.50	34.50	112.83	4.13	4.13	4.13	3.59	3.59
66	40.00	116.50	28.71	23.27	1.39	10.25	10.25	74.28	124.17	9.65	4.13	4.38	6.42	6.42
80	45.75	118.00	33.47	27.90	1.39	9.50	9.50	74.50	124.17	9.59	4.13	6.38	6.42	6.42
100	51.50	130.00	36.85	31.27	1.39	11.00	11.00	74.50	134.17	9.59	4.13	7.38	8.92	8.92
120	51.50	159.00	36.85	31.27	1.39	10.00	10.00	74.50	152.17	9.59	4.13	7.38	13.42	13.42

(1) With Airfoil Blade Dampers are the dimensions to the outer edge of the damper flanges.
(2) Without Airfoil Blade Dampers are the dimensions that represent the panel openings size 3-30 when only a damper opening is provided.
(3) Without Airfoil Blade Dampers for size 35-120 the dimensions represent a channel frame openings when only a damper opening is provided.
(4) With Traq Dampers, the DW and DH dimensions represent the outer most edges of the Traq Damper flange.
(5) The base line does not include the height for mounting legs or base rail except for unit sizes 66 through 120 where the base rail is integral to the unit.
(6) For unit sizes 3, 6 and 8, the dampers are not centered in the module. The AG dimension refers to the drive side of the unit.

Moisture Eliminator

Figure 130. Moisture eliminator



Drain connection can be LH or RH

Table 225. Moisture eliminator dimensions

Unit Size	W	L	H	A	B	D2	E	L/2	J	K	ND (NPT)
3	31	11.00	26.25	27.00	22.25	2.00	2.00	5.50	0.80	2.60	1.00
6	44	11.00	28.75	40.00	24.75	2.00	2.00	5.50	0.80	2.60	1.00
8	48	11.00	34.00	44.00	30.00	2.00	2.00	5.50	0.80	2.60	1.00
10	60	11.00	34.00	56.00	30.00	2.00	2.00	5.50	0.80	2.60	1.00
12	64	11.00	39.00	60.00	35.00	2.00	2.00	5.50	0.80	2.60	1.00
14	68	11.00	40.50	64.00	36.50	2.00	2.00	5.50	0.80	2.60	1.00
17	74	11.00	44.00	70.00	40.00	2.00	2.00	5.50	0.80	2.60	1.00
21	76	11.00	50.25	72.00	46.25	2.00	2.00	5.50	0.80	2.60	1.00
25	78	11.00	56.50	74.00	52.50	2.00	2.00	5.50	0.80	2.60	1.00
30	91	11.00	56.50	87.00	52.50	2.00	2.00	5.50	0.80	2.60	1.00
35	96	11.50	63.75	91.00	58.75	2.50	2.50	5.75	1.20	3.60	1.25
40	109	11.50	63.75	104.00	58.75	2.50	2.50	5.75	1.20	3.60	1.25
50	120	14.50	75.00	115.00	70.00	2.50	2.50	7.25	1.20	3.60	1.25
57	120	14.50	86.50	115.00	81.50	2.50	2.50	7.25	1.20	3.60	1.25
66	137	14.50	92.08	132.00	81.50	8.00	2.50	7.25	5.80	2.50	1.50
80	137	14.50	107.08	132.00	96.50	8.00	2.50	7.25	5.80	2.50	1.50
100	152	14.50	119.58	147.00	109.00	8.00	2.50	7.25	5.80	2.50	1.50
120	179	14.50	119.58	174.00	109.00	8.00	2.50	7.25	5.80	2.50	1.50

(1) Drain pan connection dimension is nominal pipe size. Indoor air quality drain pan connections can be either LH or RH but not both.

(2) The base line does not include the height for mounting legs or base rail except for unit sizes 66 through 120 where the base rail is integral to the unit.

Multizone

Figure 131. Multizone module

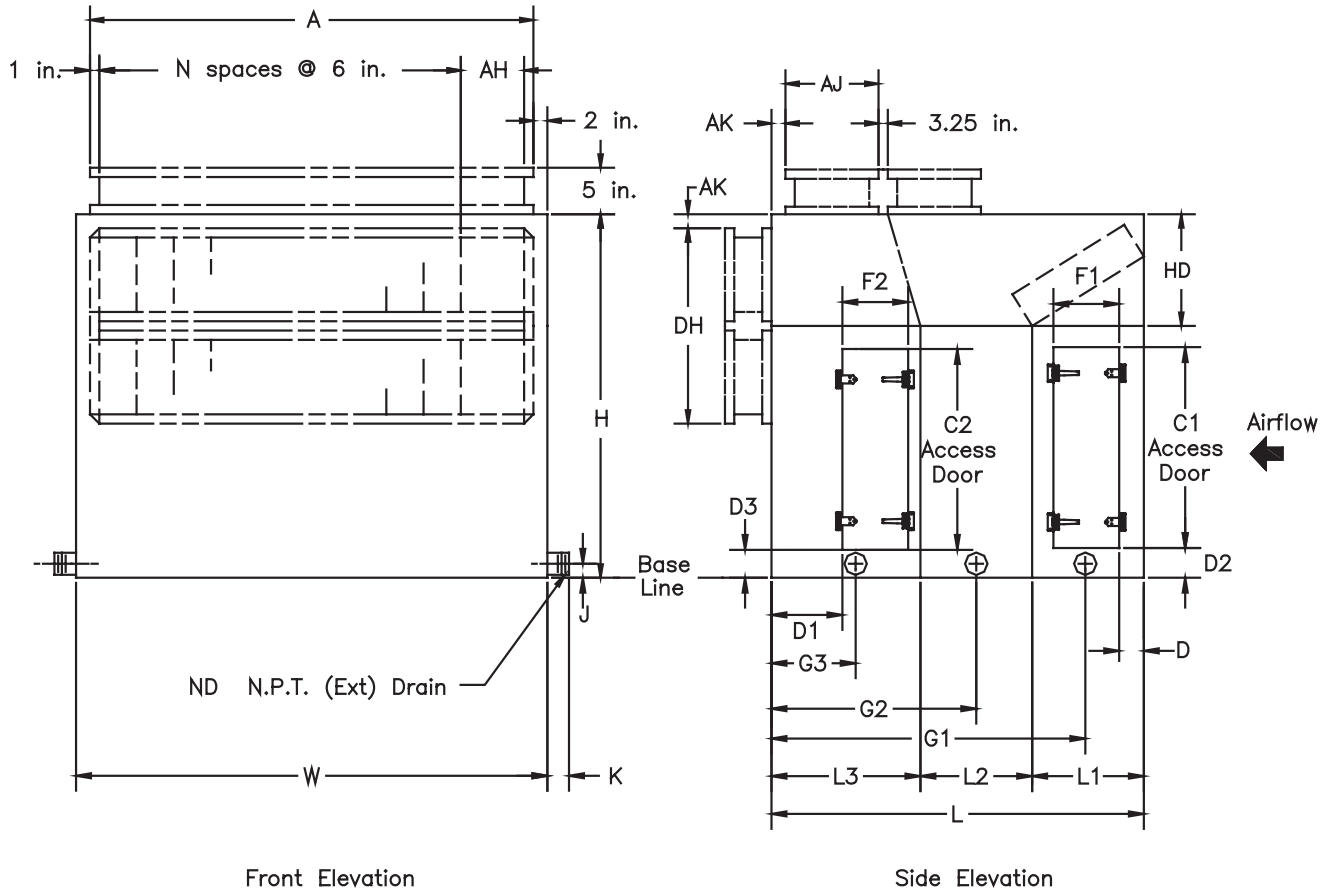


Table 226. Multizone dimensions (inches)

Unit Size	W	L*	H	C1	C2	F1	F2	HD	D	D1	D2	D3	AH	AJ	AK	DH	N
6	44	46.80	45.75	24.21	24.21	11.20	11.20	17.00	2.15	2.15	2.27	2.27	8.00	13.13	2.00	29.50	5.00
8	48	46.80	51.00	29.46	29.46	11.20	11.20	17.00	2.15	2.15	2.27	2.27	6.00	13.13	2.00	29.50	6.00
10	60	46.80	54.00	29.46	29.46	11.20	11.20	20.00	2.15	2.15	2.27	2.27	6.00	16.13	2.00	35.50	8.00
12	64	65.30	59.00	34.46	32.24	11.20	19.5	20.00	2.15	12.00	2.27	3.38	10.00	16.13	2.00	35.50	8.00
14	68	65.30	60.50	35.96	33.74	11.20	19.5	20.00	2.15	12.00	2.27	3.38	8.00	16.13	2.00	35.50	9.00
17	74	65.30	64.00	39.46	37.24	11.20	19.5	20.00	2.15	12.00	2.27	3.38	8.00	16.13	2.00	35.50	10.00
21	76	65.30	73.25	45.71	43.49	11.20	19.5	23.00	2.15	12.00	2.27	3.38	10.00	19.13	2.00	41.50	10.00
25	78	71.30	79.50	51.96	49.74	11.20	19.5	23.00	2.15	18.00	2.27	3.38	6.00	19.13	2.00	41.50	11.00
30	91	71.30	79.50	51.96	49.74	11.20	19.5	23.00	2.15	18.00	2.27	3.38	7.00	19.13	2.00	41.50	13.00
35	96	80.30	91.75	58.21	55.99	10.70	23.5	28.00	2.65	21.50	2.77	3.88	6.00	23.63	2.75	50.50	14.00
40	109	80.30	91.75	58.21	55.99	10.70	23.5	28.00	2.65	21.50	2.77	3.88	7.00	23.63	2.75	50.50	16.00
50	120	88.30	103.0	69.46	67.24	14.70	23.5	28.00	2.65	21.50	2.77	3.88	6.00	23.63	2.75	50.50	18.00

Unit Size	A	L1	L2	L3	G1	G2	G3	J	K	ND (NPT)
6	40.00	15.50	15.50	15.50	39.05	23.40	7.75	0.80	2.60	1.00
8	44.00	15.50	15.50	15.50	39.05	23.40	7.75	0.80	2.60	1.00
10	56.00	15.50	15.50	15.50	39.05	23.40	7.75	0.80	2.60	1.00
12	60.00	15.50	15.50	34.00	57.55	41.90	17.00	0.80	2.60	1.00
14	64.00	15.50	15.50	34.00	57.55	41.90	17.00	0.80	2.60	1.00
17	70.00	15.50	15.50	34.00	57.55	41.90	17.00	0.80	2.60	1.00
21	72.00	15.50	15.50	34.00	57.55	41.90	17.00	0.80	2.60	1.00
25	74.00	15.50	15.50	40.00	63.55	47.90	20.00	0.80	2.60	1.00
30	87.00	15.50	15.50	40.00	63.55	47.90	20.00	0.80	2.60	1.00
35	92.00	16.00	16.00	48.00	72.30	56.15	24.00	1.20	3.60	1.25
40	105.00	16.00	16.00	48.00	72.30	56.15	24.00	1.20	3.60	1.25
50	116.00	20.00	20.00	48.00	78.30	58.15	24.00	1.20	3.60	1.25

(1) The drain pan connection dimension is nominal pipe size. Indoor air quality drain pan connections can be either left-hand or right-hand but not both.

(2) Damper opening dimensions are to the outer edge of the damper frames.

(3) Outward swing doors are dimensioned to door and inward swing doors (leaving module, sizes 12-50) are to door opening.

(4) L* Combined module length includes module length plus gasket thickness.

(5) Optional doors shown.

(6) Optional drain pan show in air entering section.

Figure 132. Multizone double duct

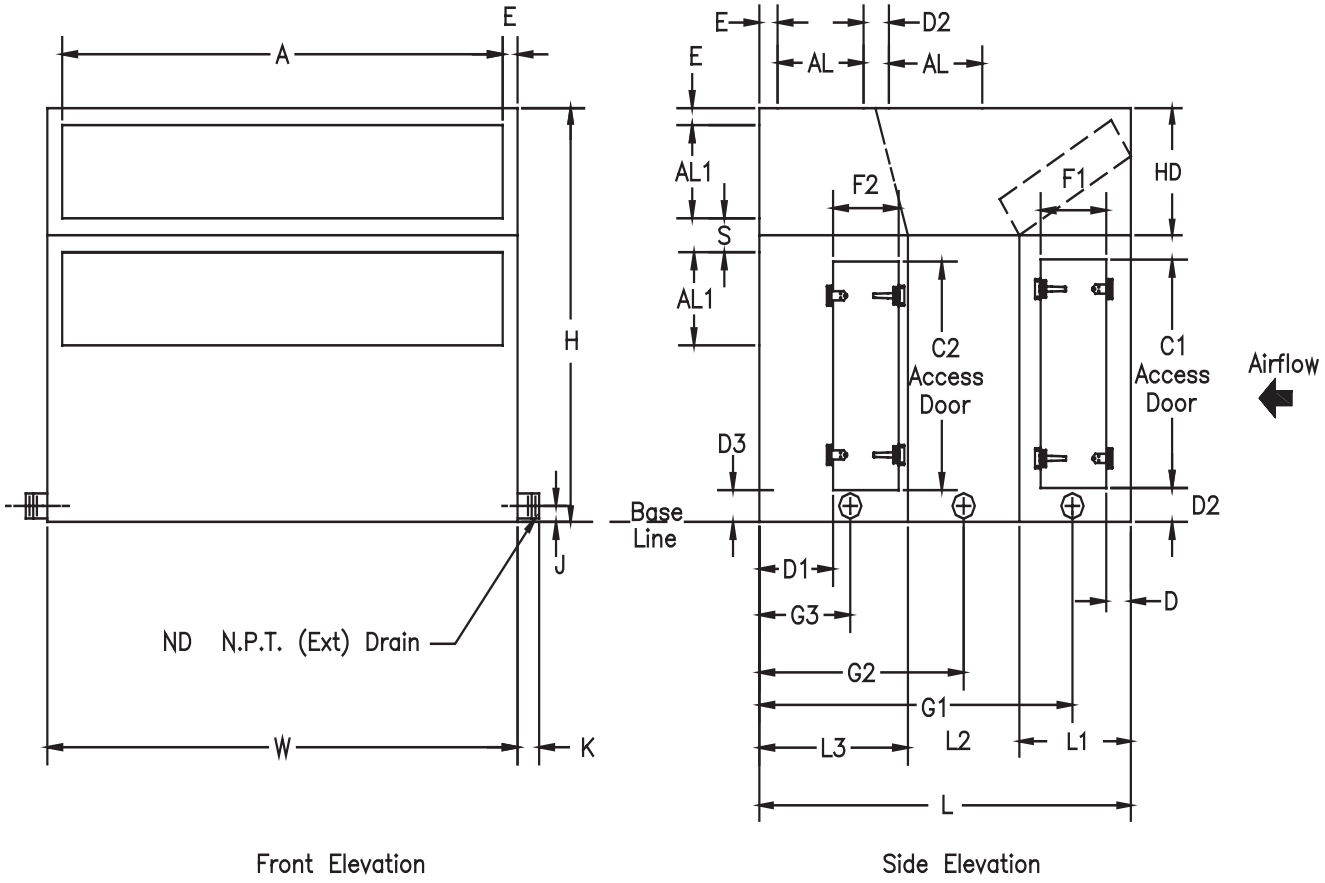


Table 227. Multizone double duct dimensions (inches)

Unit Size	W	L*	H	C1	C2	F1	F2	HD	D	D1	D2	D3	E	Duct Opening		S
														AL	AL1	
6	44.00	46.50	45.75	24.21	24.21	11.20	11.20	17.00	2.15	2.15	2.27	2.27	2.00	13.00	13.00	4.00
8	48.00	46.50	51.00	29.46	29.46	11.20	11.20	17.00	2.15	2.15	2.27	2.27	2.00	13.00	13.00	4.00
10	60.00	46.50	54.00	29.46	29.46	11.20	11.20	20.00	2.15	2.15	2.27	2.27	2.00	16.00	16.00	4.00
12	64.00	65.00	59.00	34.46	32.24	11.20	19.5	20.00	2.15	12.00	2.27	3.38	2.00	16.00	16.00	4.00
14	68.00	65.00	60.50	35.96	33.74	11.20	19.5	20.00	2.15	12.00	2.27	3.38	2.00	16.00	16.00	4.00
17	74.00	65.00	64.00	39.46	37.24	11.20	19.5	20.00	2.15	12.00	2.27	3.38	2.00	16.00	16.00	4.00
21	76.00	65.00	73.25	45.71	43.49	11.20	19.5	23.00	2.15	12.00	2.27	3.38	2.00	19.00	19.00	4.00
25	78.00	71.00	79.50	51.96	49.74	11.20	19.5	23.00	2.15	18.00	2.27	3.38	2.00	19.00	19.00	4.00
30	91.00	71.00	79.50	51.96	49.74	11.20	19.5	23.00	2.15	18.00	2.27	3.38	2.00	19.00	19.00	4.00
35	96.00	80.00	91.75	58.21	55.99	10.70	23.5	28.00	2.65	22.00	2.77	3.88	2.50	23.00	23.00	5.00
40	109.00	80.00	91.75	58.21	55.99	10.70	23.5	28.00	2.65	22.00	2.77	3.88	2.50	23.00	23.00	5.00
50	120.00	88.00	103.00	69.46	67.24	14.70	23.5	28.00	2.65	22.00	2.77	3.88	2.50	23.00	23.00	5.00

Unit Size	A	L1	L2	L3	G1	G2	G3	J	K	ND (NPT)
6	40.00	15.50	15.50	15.50	38.95	23.35	7.75	0.80	2.60	1.00
8	44.00	15.50	15.50	15.50	38.95	23.35	7.75	0.80	2.60	1.00
10	56.00	15.50	15.50	15.50	38.95	23.35	7.75	0.80	2.60	1.00
12	60.00	15.50	15.50	34.00	57.45	41.85	17.00	0.80	2.60	1.00
14	64.00	15.50	15.50	34.00	57.45	41.85	17.00	0.80	2.60	1.00
17	70.00	15.50	15.50	34.00	57.45	41.85	17.00	0.80	2.60	1.00
21	72.00	15.50	15.50	34.00	57.45	41.85	17.00	0.80	2.60	1.00
25	74.00	15.50	15.50	40.00	63.45	47.85	20.00	0.80	2.60	1.00
30	87.00	15.50	15.50	40.00	63.45	47.85	20.00	0.80	2.60	1.00
35	92.00	16.00	16.00	48.00	72.20	56.10	24.00	1.20	3.60	1.25
40	105.00	16.00	16.00	48.00	72.20	56.10	24.00	1.20	3.60	1.25
50	116.00	20.00	20.00	48.00	78.20	58.10	24.00	1.20	3.60	1.25

(1) The drain pan connection dimension is nominal pipe size. Indoor air quality drain pan connections can be either left-hand or right-hand but not both.
(2) Outward swing doors are dimensioned to door and inward swing doors are to door opening.
(3) L* Combined module length includes module length plus gasket thickness
(4) Optional doors shown
(5) Optional drain pan shown in air entering section

Silencer

Figure 133. Rectangular silencer

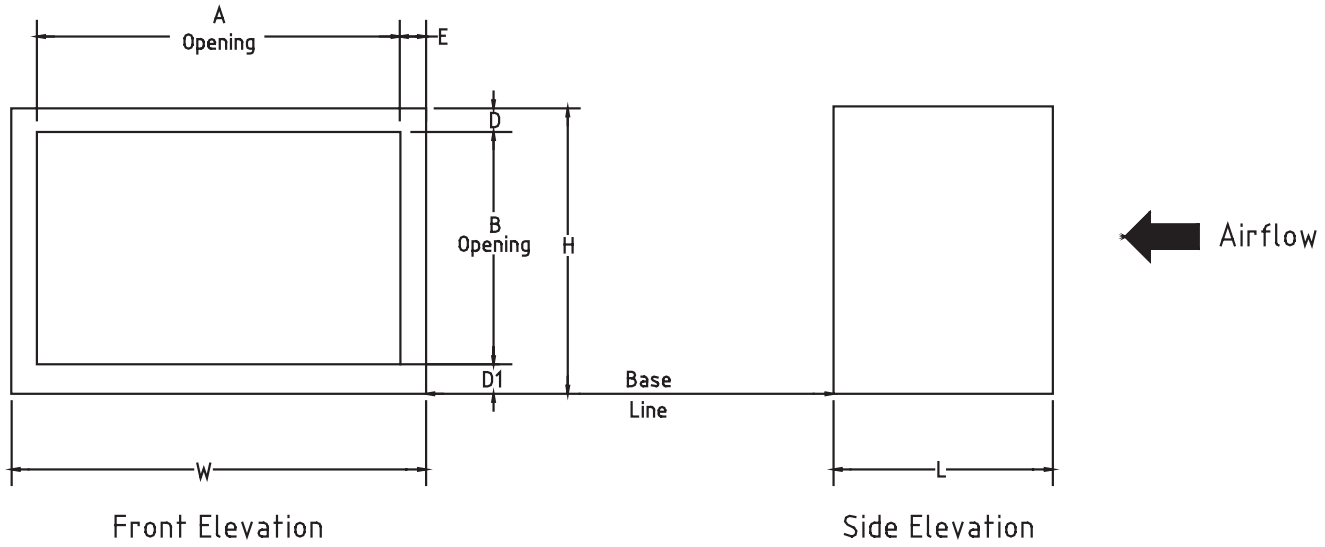


Table 228. Silencer dimensions

Unit Size	W	H	A	B	D	D1	E	3 feet L	5 feet L
3	31	26.25	27	22.25	2.0	2.0	2.0	36	60
6	44	28.75	40	24.75	2.0	2.0	2.0	36	60
8	48	34.00	44	30.00	2.0	2.0	2.0	36	60
10	60	34.00	56	30.00	2.0	2.0	2.0	36	60
12	64	39.00	60	35.00	2.0	2.0	2.0	36	60
14	68	40.50	64	36.50	2.0	2.0	2.0	36	60
17	74	44.00	70	40.00	2.0	2.0	2.0	36	60
21	76	50.25	72	46.25	2.0	2.0	2.0	36	60
25	78	56.50	74	52.50	2.0	2.0	2.0	36	60
30	91	56.50	87	52.50	2.0	2.0	2.0	36	60
35	96	63.75	91	58.75	2.5	2.5	2.5	36	60
40	109	63.75	104	58.75	2.5	2.5	2.5	36	60
50	120	75.00	115	70.00	2.5	2.5	2.5	36	60
57	120	86.50	115	81.50	2.5	2.5	2.5	36	60
66	137	92.09	132	81.50	2.5	8.0	2.5	36	60
80	137	107.09	132	96.50	2.5	8.0	2.5	36	60
100	152	119.59	147	109.00	2.5	8.0	2.5	36	60
120	179	119.59	174	109.00	2.5	8.0	2.5	36	60

Electrical Data

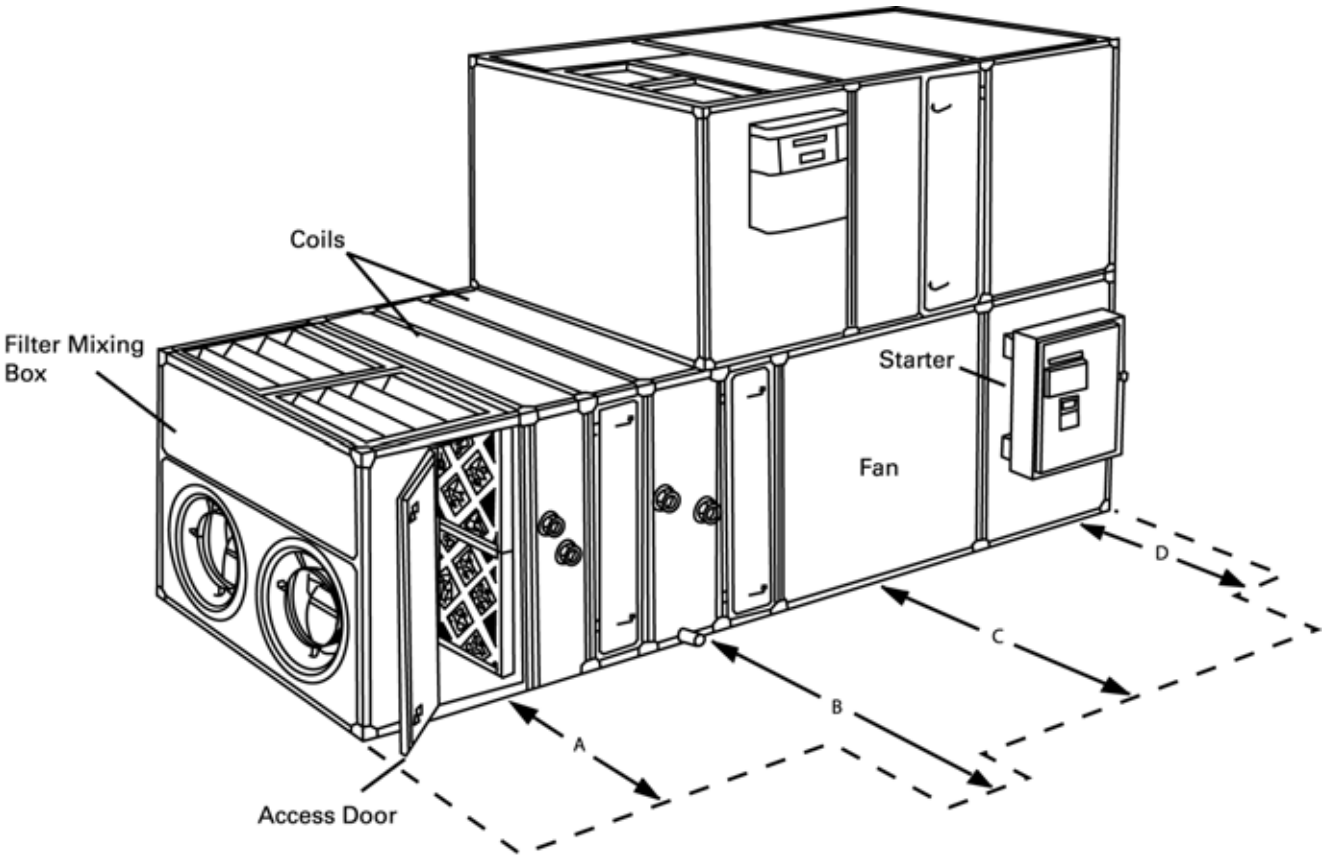
Table 229. Input line current requirements

Horsepower (hp)	Variable Frequency Drive Input Line Current (amps)				National Electric Code Motor Starter Current (amps)			
	200	230	460	575	200	230	460	575
1.0	6.3	6.3	2.5	2.3	4.8	4.2	2.1	1.7
1.5	6.3	6.3	2.5	2.3	6.9	6.0	3.0	2.4
2.0	7.3	7.3	3.4	2.6	7.8	6.8	3.4	2.7
3.0	10.4	10.4	4.8	3.8	11.0	9.6	4.8	3.9
5.0	16.8	16.8	8.3	5.9	17.5	15.2	7.6	6.1
7.5	23.8	23.8	10.6	9.2	25.3	22.0	11.0	9.0
10.0	32.2	32.2	14.2	11.1	32.2	28.0	14.0	11.0
15.0	48.3	48.3	21.0	16.6	48.3	42.0	21.0	17.0
20.0	61.9	61.9	27.6	21.4	62.1	54.0	27.0	22.0
25.0	78.2	78.2	34.0	26.3	78.2	68.0	34.0	27.0
30.0	92.0	92.0	41.0	31.2	92.0	80.0	40.0	32.0
40.0	117.0	101.3	53.0	39.9	120.0	104.0	52.0	41.0
50.0	n/a	126.6	64.0	50.6	n/a	130.0	65.0	52.0
60.0	n/a	n/a	77.0	60.4	n/a	n/a	77.0	62.0
75.0	n/a	n/a	104.0	75.0	n/a	n/a	96.0	77.0
100.0	n/a	n/a	128.0	92.4	n/a	n/a	124.0	99.0
125.0	n/a	n/a	157.0	n/a	n/a	n/a	156.0	n/a

Notes

Installation Considerations

Figure 134. Service Clearances



Preparing the Unit Site

When selecting and preparing the unit site, follow these guidelines:

- Ensure that the site can support the total weight of the unit. Add the module weights for each unit using the data in the section. If a factory external support kit (base rail) is provided, refer to Table 231 for weights for the external support kit option.
- Allow sufficient space for service access. Figure 134 and Table 230 give the recommended space allowances for filter, coil, and fan shaft removal, as well as motor starter maintenance. Because unit configurations vary, refer to the unit submittals for specific location of access doors, accessories, motor starter, and other components.
- Ensure there is adequate height for condensate drain requirements.
- Confirm that the foundation of the mounting platform is large enough to accommodate the unit footprint plus service access. Refer to the unit submittals for specific dimensions.

Table 230. Service Clearance Dimensions

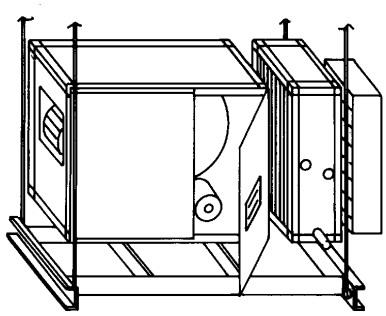
Unit Size	A Filter	B Coil	C Fan	D Starter or VFD
3	48	48	48	60
6	48	60	48	60
8	48	64	48	60
10	48	75	51	60
12	48	79	54	60
14	48	83	58	60
17	48	89	61	60
21	48	91	60	60
25	48	93	66	60
30	48	106	66	60
35	48	110	65	60
40	48	123	70	60
50	48	134	77	60
57	48	134	77	60
66	52	150	93	60
80	56	150	91	60
100	58	165	101	60
120	58	180	101	60

Certain units may be suspended from the ceiling (see Figure 135). To suspend an M-Series air handler from the ceiling, use structural channels that run the full length of the unit. The support may be obtained from the factory as an external support kit or fabricated in the field as a support frame.

- Ensure that the floor or foundation is level for proper coil drainage and condensate flow.
- Allow the proper height for coil piping and condensate drain requirements. It may be necessary to elevate the unit when piping the condensate drain. Insufficient trap height could inhibit condensate drainage and flood the unit or equipment room.
- Provide permanent power outlets near the unit for power requirements during installation and maintenance.
- Temper the air in the equipment room, and verify that it is free from standing water.

Note: Refer to the M-Series air handler installation, operation, and maintenance manual, CLCH-SVX03C-EN, for detailed installation information.

Figure 135. Ceiling Suspended Unit



⚠ WARNING
Structural Failure!

Do not or suspend M-Series air handlers from the top of the unit. To suspend an M-Series air handler from above, a factory-supplied external support base kit of fabricated support base frame must be used. Failure to adequately support the unit could result in death or serious injury. See Figure 135 for recommended mounting configurations.

External Support Kit Weight

To determine the weight of the external support kit, use the following equation with the factors A and B in Table 231:

Weight (lb.) = A × unit lgth (in.) + B

If the actual weight or length of the unit exceeds the maximum limit for single-piece shipment, the unit will ship in multiple pieces. Each piece will have its own base rail, so the base rail weight must be calculated for each piece. See Table 232 for shipping length and weight limits. Table 233 shows damper torque requirements.

Table 231. Weight Factors (lb.) for External Support Kit

Unit Size	3	6	8	10	12	14	17	21	25	30	35	40	50	57
A	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
B[1]	23	29	30	36	37	39	42	43	43	49	51	57	62	62

[1] B is the weight (lb.) for crossbars, lugs, and hardware on each shipping section.

Table 232. Shipping Length / Weight Limits for Single Piece Shipment

Unit Size	Maximum Unit Weight (lb)	Baserail Unit Maximum Unit Length (in)	Non-Baserail Unit Maximum Unit Length (in)
3–30	< 2,500	98	96
35	< 3,900	98	96
40	< 4,300	98	96
50–57	< 5,100	98	96
66-120	n/a	n/a	n/a

The unit will not ship as a single piece if either weight or length is exceeded. These limits are based on a four-point lift.

Table 233. Damper torque requirements (inch pound) at 1-inch w.g. air pressure drop

Unit Size	Face Damper	Internal Face-and-Bypass	External Face-and-Bypass	Integral Face-and-Bypass	Multizone[1]	
					Top Discharge	Front Discharge
3	16	17	27	10	N/A	N/A
6	24	29	40	17	5	7
8	33	39	52	26	5	7
10	43	50	66	31	6	8
12	56	62	81	36	6	8
14	60	69	87	41	6	8
17	78	83	107	62	6	8
21	92	99	122	62	7	10
25	108	115	139	86	7	10
30	127	136	163	86	7	10
35	143	154	180	103	17	24
40	160	172	201	103	17	24
50	215	228	261	161	17	24
57	253	267	299	161	n/a	n/a
66	307	308	404	201	n/a	n/a
80	364	364	460	221	n/a	n/a
100	460	460	569	314	n/a	n/a
120	549	549	678	314	n/a	n/a

Unit Size	Mixing Module Dampers (Top-Back-Bottom Locations)					Side Locations
	Traq damper only	Bladed damper only	Traq damper linked to bladed damper	Bladed damper linked to bladed damper	Traq damper linked to Traq damper	Bladed damper only
3	18	12	20	14	36	10
6	36	21	39	24	72	17
8	36	24	39	27	72	22
10	54	29	58	33	108	30
12	68	36	73	41	135	36
14	68	41	73	47	135	43
17	68	49	74	56	135	49
21	72	60	81	69	144	58
25	72	72	82	82	144	67
30	99	84	111	96	198	87
35	108	100	122	114	216	102
40	108	115	125	132	216	117
50	113	146	159	167	225	148
57	113	199	211	227	225	169
66	150	199	216	227	300	200
80	188	233	254	266	375	240
100	225	292	318	334	450	296
120	225	353	379	404	450	342

[1] Torque is per blade. Multiply blades required per zone by torque value to size actuator per zone.

Mechanical Specifications

M-Series air handlers must be rigged, lifted, and installed in strict accordance with the Installation, Operation, and Maintenance manual (CLCH-SVX03C-EN) for M-Series air handlers. The units are also to be installed in strict accordance with the specifications.

Units may be shipped fully assembled or disassembled to the minimum module size in accordance with shipping and job site requirements. Sizes 3 to 57 may be shipped on an integral shipping skid with 4-inch legs to mount the units on the housekeeping pad and to provide additional height to properly trap the condensate line.

Air-handling performance data shall be certified in accordance with ARI Standard 430. Air handlers with vaneaxial fans, air handlers with plenum fans, and vertical draw-thru air handlers in which the coil is mounted immediately below the fan module are outside the scope of ARI Standard 430 and, therefore, cannot receive ARI 430 certification.

Unit sound performance data shall be rated per ARI Standard 260 and reported as sound power. Sound power derived from ASHRAE algorithms is not acceptable because it does not represent tested acoustical performance.

Unit Construction

The unit shall be constructed as a complete frame with removable panels. Removal of side panels shall not affect the structural integrity of the unit. The casing shall be able to withstand up to 6 in. wg positive or 4 in. wg negative static pressure. All exterior wall panels shall be made of galvanized steel. Closed-cell foam gasketing shall be provided where modules join to prevent air leakage.

Insulation

Modules shall be factory-insulated. Insulation and insulation adhesive shall comply with NFPA-90A requirements for flame spread and smoke generation. Insulation adhesive shall be UL-listed.

1-Inch Single-Wall Panels

Panels shall be insulated with 1-inch, 1 1/2-lb/ft³ or 3-lb/ft³ density insulation. Thermal resistance (R) shall be 4.17 ft²•h•ºF/Btu.

Double-Wall Solid Panels

Panels shall be of double-wall construction to facilitate cleaning of the unit interior. The interior wall shall be constructed of solid, galvanized steel. Insulation shall be 1 1/2-lb/ft³ or 3-lb/ft³ density. Thermal resistance (R) shall be 8.33 ft²•h•ºF/Btu.

Double-Wall Perforated Panels

Panels shall be of double wall construction, fabricated from perforated material over fiberglass insulation. The perforation spacing and hole size shall be such as to prevent insulation breakaway, flake off, or delamination when tested at 9,000 fpm, in accordance with UL specification 181. The interior wall shall be perforated to enhance acoustical performance. Thermal resistance (R) shall be 8.33 ft²•h•ºF/Btu.

Drain Pans

All coil, moisture eliminator, and intake modules shall be provided with an insulated, double-wall, galvanized or stainless-steel drain pan. To address indoor air quality (IAQ), the drain pan shall be sloped in two planes to eliminate stagnant water conditions and to promote positive drainage. Access modules may be provided with an “IAQ” drain pan.

Access Doors

Access doors shall be constructed with a double-wall, solid, galvanized-steel interior panel and a solid, galvanized-steel exterior panel. Gasketing shall be provided around the full perimeter of the doors to prevent air leakage. Surface-mounted handles shall be provided to allow quick access to the interior of the module and to prevent through-cabinet penetrations that could cause air leakage. Access doors shall be hinged and removable for quick, easy access.

View Windows

A glass window for viewing, capable of withstanding unit operating pressures, shall be provided in the door.

Marine Lights

A factory-mounted, weather-resistant (enclosed and gasketed), vapor-tight, incandescent light fixture shall be provided for access and/or fan modules. The fixture shall be complete with junction box, globe, aluminum globe guard, receptacle, and bulb (field wiring required).

External Support Kit (Optional)

An external support kit constructed of galvanized steel shall be provided on the base of the unit. The external support kit may be used for ceiling suspension or external isolation, or as a housekeeping pad.

Fans

The fan type shall be provided as required for stable operation and optimum energy efficiency. The fan shall be statically and dynamically balanced at the factory as a complete fan assembly (fan wheel, motor, drive, and belts). The fan shaft shall not exceed 75 percent of its first critical speed at any cataloged speed. Fan wheels shall be keyed to the fan shaft to prevent slipping. The fan shafts shall be solid. The fan module shall be provided with an access door on the drive side of the fan.

FC Fan

The fan shall be a double-width, double-inlet, multiblade-type, forward-curved (FC) fan. The fan shall be equipped with self-aligning, antifriction bearings with an L-50 life of 200,000 hours as calculated per ANSI/AFBMA Standard 9. Fan performance shall be certified as complying with ARI Standard 430.

BC Fan

The fan shall be a double-width, double-inlet, multiblade-type backward-curved (BC) fan. The fan shall be equipped with self-aligning, antifriction bearings with an L-50 life of 200,000 hours as calculated per ANSI/AFBMA Standard 9. Fan performance shall be certified as complying with ARI Standard 430.

AF Fan

The fan shall be a double-width, double-inlet, multiblade-type, airfoil (AF) fan. The fan shall be equipped with self-aligning, antifriction bearings with an L-50 life of 200,000 hours, as calculated per ANSI/AFBMA Standard 9. Fan performance shall be certified as complying with ARI Standard 430.

Plenum (Plug) Fan

The fan shall be a single-width, single-inlet, multiblade-type, plenum fan. The fan blades shall be backward-inclined airfoil. Plenum fans shall be equipped with self-aligning, antifriction, pillow-block bearings with an L-50 life of 200,000 hours as calculated per ANSI/AFBMA Standard 9.

Airfoil Vaneaxial Fan

The fan shall be an airfoil vaneaxial type. The fan shall have tapered inlet and outlet shells over fan hub assemblies to uniformly accelerate air through the blade area. The fan shall include a cast aluminum diffuser with radially projected straightening vanes and airfoil cross sections to straighten air as it leaves the blades. The edge of the vanes shall be curved to reduce tonal noise generation. Airfoil vaneaxial fans shall be equipped with self-aligning, antifriction bearings with an L-50 life of 200,000 hours as calculated per ANSI/AFBMA Standard 9. Bearing grease lines shall extend through the fan shell for easy servicing. The fan shall be AMCA 210 performance certified.

Fan Modulation

Variable-Frequency Drives

For variable-air-volume applications, airflow shall be modulated by a variable-frequency drive that controls fan speed.

Fan Isolation

The fan shall be isolated from the unit casing by a flexible connection.

1-Inch, Seismic Spring Isolators

The fan and motor assembly (on sizes 3 to 8) shall be internally isolated from the unit casing with 1-inch (25.3-mm) deflection spring isolators, furnished and installed by the unit manufacturer. The isolation system shall be designed to resist loads produced by external forces, such as earthquakes, and conform to the current requirements for Seismic Zone IV.

2-Inch, Seismic Spring Isolators

The fan and motor assembly (on sizes 10 to 120) shall be internally isolated from the unit casing with 2-inch (50.8-mm) deflection spring isolators, furnished and installed by the unit manufacturer. The isolation system shall be designed to resist loads produced by external forces, such as earthquakes, and conform to the current requirements for Seismic Zone IV.

Fan Drives

- *Variable Pitch.* The drives shall be variable pitch, suitable for adjustment within five percent of the specified speed.
- *Fixed Pitch.* The drives shall be constant speed with fixed-pitch sheaves.
- *1.2 Service Factor.* The drives shall be selected at a minimum 20 percent larger than the motor horsepower.
- *1.5 Service Factor.* The drives shall be selected at a minimum 50 percent larger than the motor horsepower.

Fan Motors

The motor shall be integrally mounted to an isolated fan assembly furnished by the unit manufacturer. The motor shall be mounted inside the unit casing on an adjustable base to permit adjustment of drive-belt tension. The motor shall be a high-efficiency, T-frame, squirrel cage with size, type, and electrical characteristics as shown on the equipment schedule.

- *Open Drip-Proof.* The motor shall be open and drip-proof.
- *Totally Enclosed Fan-Cooled (TEFC).* The motor shall be totally enclosed and fan-cooled.

Motor Options

- 208–230 V, 3 ph, 60 Hz
- 460 V, 3 ph, 60 Hz
- 575 V, 3 ph, 60 Hz
- 220 V, 1 ph, 60 Hz
- NEMA Premium-efficiency motors

Fan Module Options

Grease Lines

Bearings are selectable with life-time lubrication or with relubrication required. For any bearing requiring relubrication, the grease line shall be extended to the fan-support bracket on the drive side.

Belt Guard

Unit sizes 35 to 120 shall be provided with a galvanized, expanded-metal belt guard that totally encloses the drive. The belt guard shall be rigidly attached to the bearing support structure and have a two-piece removable front panel. A tachometer hole shall be provided opposite the fan shaft. The belt guard shall be OSHA-approved and of a universal size to accommodate any applicable drive configuration.

Guard Screen

The plenum (plug) fan module shall be provided with an expanded-metal guard screen for the access door.

Coils

Horizontal and Vertical Coil Modules

The coil module shall be provided complete with coil and coil holding frame. If two or more cooling coils are stacked in the unit, an intermediate drain pan shall be installed between each coil to drain condensate to the main drain pan without passing condensate through the air stream of the lower coil. The coils shall be manufactured by the supplier of the air-handling unit. The coils shall be installed such that headers and return bends are enclosed by unit casings.

Inspection Section

The coil module shall include an inspection section complete with a double-wall, removable door downstream of the coil for inspection, cleaning, and maintenance.

Water Coils (UW, UU, W, 5W, 5A, WD, 5D, D, DD, K, P, or TT)

The coils shall have aluminum fins and seamless copper tubes. Copper fins may be applied to coils with 5/8-inch tubes. Fins shall have collars drawn, belled, and firmly bonded to tubes by mechanical expansion of the tubes. The coil casing may be galvanized or stainless steel. The coils shall be proof-tested to 300 psig and leak-tested under water to 200 psig. Coil performance data and coils containing water or ethylene glycol shall be certified in accordance with ARI Standard 410. Propylene glycol and calcium chloride, or mixtures thereof, are outside the scope of ARI Standard 410 and, therefore, do not require ARI 410 rating or certification.

Headers are to be constructed of round copper pipe or cast iron.

- Tubes shall be 1/2-inch OD, 0.016-inch copper.
- Tubes shall be 1/2-inch OD, 0.025-inch copper.
- Tubes shall be 5/8-inch OD, 0.020-inch copper.
- Tubes shall be 5/8-inch OD, 0.024-inch copper.
- Tubes shall be5/8-inch OD, 0.035-inch copper.

Refrigerant Cooling Coils (UF or F)

The coils shall have aluminum fins and seamless copper tubes. Copper fins may be applied to coils with 5/8-inch tubes. The fins shall have collars drawn, belled, and firmly bonded to tubes by mechanical expansion of the tubes. The coil casing may be galvanized or stainless steel.

The coils shall be proof-tested to 450 psig and leak-tested to 300 psig air pressure under water. After testing, the inside of the coils shall be dried, all connections shall be sealed, and the coil shall be shipped with a charge of dry nitrogen.

Suction headers shall be constructed of copper tubing. Suction connections shall penetrate unit casings to permit sweat connections to refrigerant lines. The coils shall have equalizing vertical distributors sized according to the capacities of the coils. Coil performance data shall be certified in accordance with ARI Standard 410.

Steam Heating Coils (N or NS)

The coils shall have aluminum fins and seamless copper tubes. Copper fins may be applied to coils with 1-inch tubes. The fins shall have collars drawn, belled, and firmly bonded to tubes by mechanical expansion of the tubes. The coil casing may be galvanized or stainless steel. Non-freeze, steam-distributing-type coils shall be provided. Steam coils shall be pitched in the unit for proper drainage of steam condensate from coils. The coils shall be proof-tested to 300 psig and leak-tested to 200 psig air pressure under water. Headers are to be constructed of round copper pipe or cast iron. Inner tubes shall have orifices that ensure even steam distribution throughout the full length of the outer tube. Orifices shall be directed toward the return connections to ensure that the steam condensate is adequately removed from the coil. Coil performance data shall be certified in accordance with ARI Standard 410.

- Tube construction shall be 11/16-inch OD, 0.031-inch copper inner tube, and 1-inch OD copper outer tube.
- Tube construction shall be 11/16-inch OD, 0.031-inch copper inner tube and 1-inch OD, 0.049-inch, red-brass outer tube.

Integral Face-and-Bypass Coil Modules

A module consisting of a horizontal- or vertical-tube, integral face-and-bypass coil shall be provided. The coils shall be installed such that the headers and return bends are enclosed by the unit casings. The coils shall be sized as required to meet the scheduled capacity using steam or hot water, as specified. The integral face-and-bypass coils shall consist of a built-in series of finned heating elements and bypasses with interlocked dampers. Coil performance shall be certified in accordance with ARI Standard 410.

Integral Face-and-Bypass Coil Option. Integral face-and-bypass coils shall be provided with a factory-mounted damper actuator.

Electric Heating Coil Modules

An electric heater shall be factory-installed in the air handler. The heater shall be an open-coil configuration with Type A wire derated to a maximum watt density of 45 watts per square inch. Safeties shall include three-pole, disconnecting-type contactors, airflow switches, automatic-reset functional limits, automatic-reset high-temperature limits, and manual-reset high-temperature limits. Electric heaters above 48 amps shall be fused into circuits not to exceed 48 amps as required by UL and NEC. Kilowatt output shall be selected to the nearest 0.1 kW of scheduled kilowatt up to a maximum 28ºF rise at nominal airflow. Basic controls (external thermostat or relay control) shall be installed with the proper staging for the voltage and kilowatt specified.

Power Options

- 208 V, 3 ph
- 240 V, 3 ph
- 480 V, 3 ph
- 600 V, 3 ph

Contactor Options

Magnetic Contactors The contactors for energizing the electric heater shall be magnetic contactors.

Filters

Filter modules shall have filter racks, at least one access door for filter removal, and filter block-offs to prevent air bypass around filters. The modules shall be supplied with 2-inch or 4-inch flat, or 2-inch or 4-inch angled, bag, cartridge, or HEPA filters.

Permanent Filters

The filters shall be 2-inch, all-metal, capable of operating up to 625-fpm face velocity without loss of filter efficiency and holding capacity. The filter media shall be layers of cleanable wire mesh. The filter frame shall be constructed of galvanized steel. The filters shall have a rated average dust-spot efficiency of less than 20 percent (MERV 2 rating) when tested in accordance with the ASHRAE Standard 52 atmospheric-dust-spot method.

Throwaway Filters

The filters shall be throwaway-type and shall have 2-inch fiberglass media contained in a rigid frame. Filters shall be capable of operating up to 500-fpm face velocity without loss of filter efficiency and holding capacity. Filters shall have a rigid supporting mesh across the leaving face of the media. (MERV 5 rating)

Pleated Media Filters

The filters shall be 2-inch or 4-inch-thick, nonwoven fabric, treated with adhesive and continuously laminated to a supported steel-wire grid. Filters shall be capable of operating up to 625-fpm face velocity without loss of filter efficiency and holding capacity. The filters shall have a rated average dust-spot efficiency of 25- to 35-percent (MERV 6 to 7 rating) when tested in accordance with the ASHRAE Standard 52.2 atmospheric-dust-spot method.

Bag Filters

The filters shall be fine-fiber, all-glass media with spun backing to keep glass fibers from eroding downstream. The stitching method shall permit the bag to retain its pleated shape without the use of a wire-basket support. The filters shall be capable of operating up to 625-fpm face velocity without loss of filter efficiency and holding capacity.

The filters shall be sealed into a metal header. The gasket material shall be installed on the metal header of the filter to prevent filter bypass where the metal headers meet the side-access racks. All bag filters shall be furnished with a 2-inch prefilter to extend bag filter life.

The manufacturer shall supply a side-access filter rack capable of holding bag filters and prefilters.

Bag filters shall have a 65- to 95-percent dust-spot efficiency (MERV 12 to 14 rating) based on ASHRAE Standard 52.2.

Cartridge Filters

The filters shall be constructed with a continuous sheet of fine-fiber media made into closely spaced pleats with safe-edged aluminum separators. The filters shall be capable of operating up to 625-fpm face velocity for 12-inch-deep filters and up to 312-fpm face velocity for 6-inch deep filters without loss of filter efficiency and holding capacity.

The filters shall be sealed into a metal frame assembled in a rigid manner. The gasket material shall be installed on the metal header of the filter to prevent filter bypass where the metal headers meet on the side-access racks.

All cartridge filters shall be furnished with a 2-inch prefilter to provide extended cartridge life. The manufacturer shall supply a side-access filter rack capable of holding cartridge filters and prefilters. Cartridge filters shall have a 65- to 95-percent dust-spot efficiency (MERV 11 to 14 rating) based on ASHRAE Standard 52.2.

4-Inch High-Efficiency Filters

The filters shall be constructed with a fine fiber media made into closely spaced pleats. The filters shall be capable of operating up to 625-fpm face velocity without loss of filter efficiency and holding capacity. The filter media shall be sealed into a frame assembled in a rigid manner. All 4-inch high-efficiency filters shall be furnished with a 2-inch prefilter to provide extended filter life. The manufacturer shall supply a side-access filter rack capable of holding 4-inch high-efficiency filters and prefilters. Filters are available in 65-, 85-, and 95-percent efficiencies (MERV 11 to 14 rating) based on ASHRAE Standard 52.2.

HEPA Filters

The HEPA filter section shall have enclosed, front-loading-type, HEPA filters with an efficiency of not less than 99.97 percent. Holding frames shall be mounted in the casing and shall be leak free. Neoprene rubber gasketing shall be applied on the leaving-air side of the filter to reduce leakage. A fold design shall be used to increase the media surface area and reduce media damage during handling and installation. The filters shall be capable of operating up to 500-fpm face velocity without loss of filter efficiency and holding capacity.

HEPA filtration shall have 99.97-percent dust-spot efficiency (MERV rating not applicable)

Mixing and Bypass

Mixing Box, Filter Mixing Box, Airflow Measurement Station (Traq Dampers), and Economizer Modules

A module shall be provided to support the damper assembly for outdoor, return, and/or exhaust air.

Dampers

Dampers shall modulate the volume of outdoor, return, or exhaust air. The dampers shall be of double-skin airfoil design with metal, compressible jamb seals and extruded-vinyl blade-edge seals on all blades. The blades shall rotate on stainless-steel sleeve bearings. The dampers shall be rated for a maximum leakage rate of 3 cfm/ft² at 1 in. wg and 8 cfm/ft² at 4 in. wg. Dampers may be arranged in a parallel or opposed-blade configuration.

Airflow Measurement Station (Traq Dampers)

A factory-mounted airflow measurement station shall be provided in the outdoor- and/or return-air opening to measure airflow. The damper blades shall be galvanized steel, housed in a galvanized steel frame and mechanically fastened to a rotating axle rod. The damper shall be rated for a maximum leakage rate of one percent of nominal airflow at 1 in. wg. The airflow measurement station shall measure from 15 percent to 100 percent of unit nominal airflow. The airflow measurement station shall adjust for temperature variations and shall provide a 2 to 10 Vdc signal that corresponds to actual airflow for controlling and documenting airflow. The accuracy of the airflow measurement station shall be ±5 percent.

Internal and External Face-and-Bypass Modules

Low-leakage, face-and-bypass dampers shall be provided as scheduled on drawings. The dampers shall be of double-skin, airfoil design with metal, compressible jamb seals and extruded-vinyl blade-edge seals on all blades. The blades shall rotate on stainless-steel sleeve bearings. The dampers shall be rated for a maximum leakage rate of 5 cfm/ft² at 1 in. wg and 9 cfm/ft² at 4 in. wg. The dampers shall be arranged in an opposed-blade configuration. The face damper and bypass damper shall be mechanically linked together and provided with end-driven control shafts.

Other Modules and Options

Access/Inspection Modules

A module shall be provided to allow additional access/inspection of unit components and space for field-installed components as needed. An access door or removable panels shall be provided for easy access.

Blender Modules

Blender module shall be provided to properly mix outdoor and return air, to prevent air stratification, and to reduce the risk of coil freeze-up. Blender modules shall be supplied and installed by the air handler manufacturer. The proper blender size and space upstream and downstream shall conform to the manufacturer's recommendations to allow for proper performance. Blender modules shall meet or exceed cataloged mixing capabilities.

Diffuser Modules

A diffuser module shall be provided immediately downstream of the fan module. The diffuser shall provide equal air distribution to blow-thru components immediately downstream of the diffuser.

Humidifier Modules

The humidifier shall be designed for building steam. The humidifier shall include a fabricated separator/header and a multiple-steam-jacketed-dispersion-tube design, with all wetted parts constructed of stainless steel. All active tube-to-header (steam-handling) joints shall be welded.

The assembly shall include inactive tubes to minimize heat gain while shortening non-impinging vapor trail. The humidifier module shall provide a uniform discharge of steam. The control valve shall be protected by a steam-supply strainer and an inverted-bucket trap. All pipe connections shall be made from one side of the air handler.

Intake Modules

An intake module shall be provided with a heavy-duty bird screen on the entering face, followed by a maintenance-free moisture eliminator with galvanized "sine-wave" fins. The module shall be provided with an insulated, double-wall, galvanized or stainless-steel drain pan. To promote good indoor air quality, the drain pan shall be sloped in two planes to eliminate stagnant water conditions and to promote positive drainage.

Moisture Eliminator Module

A module consisting of a vertically mounted, maintenance-free moisture eliminator shall be provided. The moisture eliminator shall have galvanized-steel, "sine-wave" fins for effective moisture removal.

Multizone Modules

Multizone dampers shall be of double-skin airfoil design with metal, compressible jamb seals and extruded-vinyl blade-edge seals on all blades. The blades shall rotate on stainless-steel sleeve bearings. The dampers shall be rated for a maximum leakage rate of 11 cfm/ft² at 1 in. wg.

Turning and Discharge Plenum Modules

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

Controls

Combination Starter–Disconnects

An IEC starter–disconnect combination shall be provided for each fan motor. Each starter–disconnect shall be properly sized, mounted, and wired to the motor by the air handler manufacturer. IEC starter–disconnects shall include a circuit breaker.

The starters shall include a control transformer with fusing and secondary grounding, Hand-Off-Auto (H-O-A) switch, two normally open auxiliary contacts, overload heaters, and manual reset overloads. Units with factory-mounted controls shall also include power wiring from the starter control transformer to the control system transformers, and start–stop wiring from the direct digital controller start–stop relay to the starter H-O-A switch.

Starters–disconnects shall have full metal enclosures with welded seams. The door shall be removable for ease of wiring and service.

Starter–Disconnect Enclosure Options

- NEMA Type 1
- NEMA Type 4/Type 12

Combination Variable-Frequency Drive and Disconnects

Combination variable-frequency drives (VFDs) and disconnects shall be provided for each fan motor. Each VFD–disconnect shall be properly sized, mounted, wired to the fan motor, and commissioned by the air handler manufacturer to facilitate temporary heating, cooling, ventilation, and/or timely completion of the project.

The combination VFD–disconnect shall include the VFD, a circuit-breaker disconnect, a drive-off switch, and manual speed-control.

Units with factory-mounted controls shall include a control transformer with sufficient capacity to support both the VFD and controls requirements, binary output on/off wiring, analog output-speed-signal wiring, and all interfacing wiring between the VFD and the direct digital controller.

The VFD shall include the following minimal protective features:

- Current-limited stall prevention
- Auto restart after momentary power loss
- Speed search for starting into rotating motor
- Anti-windmill with DC injection before start
- Phase-to-phase short-circuit protection
- Ground-fault protection

The VFD–disconnect shall be supplied with an instantaneous, short-circuit-trip circuit breaker. A through-the-door interlocking handle shall be spring loaded and designed to rest only in the full On or Off state. A concealed defeater mechanism shall allow entry into the enclosure when the handle is in the On position. A heavy-duty, snap-action, flange-operated, fusible disconnect switch is also acceptable. The blades shall be visible in the Off position. A terminal guard shall be supplied on the line-side terminals.

The VFD–disconnect shall have a NEMA Type 1 enclosure.

The VFD shall be UL508C-listed and CSA-certified and shall conform to applicable NEMA, ICS, NFPA, IEC, and ISO 9001 standards.

Optional Bypass

Bypass circuitry with a drive-bypass switch shall be provided. The bypass switch is a four-position switch with Auto/Off/Bypass Hand/Bypass Auto operation.

Factory-Mounted DDC Systems

Factory-mounted direct-digital control (DDC) systems shall be engineered, mounted, wired, and tested by the air handler manufacturer to reduce installed costs, improve reliability, and save time at unit startup. Each control system shall be fully functional in a stand-alone mode or may be tied to a building automation system with a single pair of twisted wires. All factory-mounted controls shall be covered by the air handler manufacturer's standard warranty.

Direct Digital Controller

Factory-Configured Controller

A dedicated, factory-configured controller with the appropriate point capabilities shall be unit-mounted on each air-handling unit. The controller shall be factory-configured to reduce installed costs, improve reliability, and save time at unit startup. A portable touch pad shall be provided to facilitate local monitoring, troubleshooting, and changing of setpoints. The touch pad shall be able to quickly plug into other factory-configured controllers by the same manufacturer.

Field-Programmable Controller

A dedicated, programmable, direct digital controller with the appropriate point capabilities shall be unit-mounted on each air-handling unit. A screen and keypad shall be provided to facilitate local monitoring, troubleshooting, and changing of setpoints.

Factory-Mounted Control Options—Electronic End Devices

Mixing Box Damper Actuators

Spring return actuators shall be mounted with the outdoor air damper linked as normally closed and the return-air damper linked as normally open.

Airflow Measuring Stations (Traq Dampers)

Airflow monitoring stations shall provide a 2 to 10 Vdc signal, which corresponds to cfm, for controlling and documenting airflow.

Face-and-Bypass Damper Actuators

Spring-return actuators shall be linked as indicated on the order and the control drawings.

Multizone Damper Actuators

Nonspring-return actuators shall be linked as indicated on the order and the control drawings.

Inlet-Guide-Vane Actuators

Spring-return actuators shall be mounted with the inlet guide vanes linked as normally closed. On units larger than size 66, nonspring return is acceptable, but a static-pressure high-limit switch shall be provided to protect the ductwork.

Fan Discharge Temperature Sensors

A thermistor-type sensor shall be mounted in the fan discharge.

Averaging Temperature Sensors

A 1,000 ohm at 0ºC, platinum 385 curve, resistive temperature detector shall be serpentined across the module. Bends of the capillaries shall be curved and fastened with capillary clips to prevent crimping and minimize wear.

Low-Limit Switches

A manual-reset, double-pole, single-throw, low-limit switch shall be serpentined across the face of the coil module. The bends of the capillaries shall be curved and fastened with capillary clips to prevent crimping and minimize wear.

Airflow Switches

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

Dirty Filter Switches

A differential pressure switch piped to both sides of the filter shall indicate filter status.

Customer Interface Relays

Five-amp double-pole, double-throw relays shall be provided as required for each binary output of the controller for customer interface to:

- Motor starters of supply, return, and exhaust fans
- Relief dampers
- Pumps
- Condensing units

Field-Mounted Control Options

Control Valves

Control valves shall be provided by the air-handling unit (AHU) manufacturer and field-piped by the piping contractor. Power and signal wiring shall be by a simple quick connect provided by the air handler manufacturer.

Space Temperature Sensors

Thermistor-type sensors shall be provided as required for field wiring.

Outdoor Air Sensors

Thermistor-type sensors shall be provided as required for field wiring.

Literature References

For additional information, refer to the following Trane literature:

CLCH-PRC008-EN
Fan Performance Data for M-Series and T-Series Climate Changer Air Handlers, Sizes 3 to 120

CLCH-SVX03C-EN
Installation, Operation, and Maintenance for M-Series Climate Changer Air Handlers

CLCH-PRB020-EN
Trane CDQ™ Desiccant Dehumidification engineering Bulletin

CLCH-PRB012-EN
Energy Wheel Overview for Modular and T-Series Climate Changer Air Handlers

SYS-AM-15
Managing Building Moisture

SYS-APM003-EN
Air-to-Air Energy Recovery in HVAC Systems

CLCH-PRB005-EN
Split Dehumidification Unit for Modular Climate Changer Air Handlers

BAS-PRC001-EN
Tracer Summit Building Automation System

CLCH-PRC006-EN
Type A Energy Wheel for Modular and T-Series Climate Changer Air Handlers

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Trane
A businesss of American Standard Companies
www.trane.com

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