Bulletin
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Central Station Air Handlers Indoor & Outdoor

USA COIL & AIR

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Custom & Replacement Air Handling Units

Unique Replacement Engineering and quality design creates the perfect fit.

Design/Build Specialists

USA Coil & Air has been an industry leader in building air handlers for both new and replacement applications for decades. We bring all the newest technology to both the design and performance of our central station air handling units, and we offer extensive experience in design-build and retrofit applications.

USA builds units that are a cross between standard air handlers and custom units. We offer all kinds of options and accessories that allow you to semi-customize your unit. You can vary dimensions, add special sections, use painted or galvanized sections, and just generally design the unit that you need for your job. And the best part is that you're not paying for a total custom unit. You're getting most of what you want at "standard unit" prices.

USA can tailor our selection to meet your requirements. Our software is designed to offer you the equivalent of a complete submittal at the time of our proposal to you. You will get complete performance, dimensions and choices in options and accessories. You will have a menu to choose from, so that you can design the unit that fits your space and meets your requirements for your specific job.

Also, many existing units fail to meet revised conditions or systematic conditions that might mean that you require new units to do your job. USA has a wealth of experience in retrofit/replacement and nobody can do a better job of walking you through the design of your new unit. We offer suggestions and engineering recommendations that create better performance, higher efficiency and longevity. Call us and we will be happy to work with you on your next project.

HORIZONTAL DRAW THRU DOUBLE WALL UNIT

Expedited Shipping Schedules

Many projects require some form of quick shipment when you need units for design-build or units for replacement. Quick shipment is often your first thought. “How do I get the units on the job quickly?”

USA offers quick ships on many of our units. Often we ship central stations within a month. We can’t offer every option or accessory under this program, because that just wouldn’t be practical. We can’t always do it, just based on scheduling and backlog. USA, however, does a great job of shipping quick when it’s possible. If we can help you solve your problem with our quick ship program, then we will.

Flexible Design

- **Modular Design** that allows you to mix and match sections to essentially build an air handler your way!
- **Flexible Dimensioning** gives you the ability to design a unit and its components in a box size that meets the dimensional criteria of the installation.
- **Indoor and Outdoor Construction** available. If it is on a platform, pad, steel or a curb, then we have a unit to meet your exacting design.
- **Galvanized Steel Cabinets or Painted Steel** which offers a quality option if a smooth appearance is required.
- **Ship Assembled or In Sections** gives the installer the ability to move units into place quickly and efficiently. Special design is always a possibility to move units through building openings to include fresh air, doorways, elevators and stairs. In really tight areas, each section can be totally knocked down and reassembled on site.

Simple, Low Cost Installation

- **Bolted Frame Construction** with easy to remove panels
- **Simple Section Attachment** via patented splicing design
- **Gasketed Extended Coil Connections and Drain Pan Connections** that eliminate constant panel removable and guaranteed air tight unit.
- **Huge Offering of Adaptable Inlet and Outlet Sections** that minimize the attachment of ductwork and reduces labor costs
- **Complete Drive Side Assembly** to include custom fan, motor drive and vibration isolation mounted and factory tested on a unit mounted steel base.

Operating Efficiency

- **Computer selected Components** provide the highest efficiency at a reasonable first cost basis.
- **Solid or Perforated Double Wall Liners** reduce condensation and air leakage
- **Double wall injected foam insulation** increases panel strength and R-value of R-13
- **Low Leak Cabinet Design** means you’re providing heated or cooled air to the intended space and not to a remote area.
- **Low Leak Dampers** reduce operating costs and simplify installation.

Easy Service and Maintenance

- **Access Panels and Doors** strategically located to allow for proper service and maintenance of unitary components.
- **Extended Fan Bearing Lube Lines and Coil Connections** to easily maintain drain lines and keep air moving equipment lubricated.
- **Special Access Sections** can be located between any system components allowing walk in space or change any item.

General Features - Indoor Units

Quality

For many years USA Coil & Air has been respected and highly regarded for their fast shipment of high quality air handling equipment. USA has taken a major step forward in redefining the indoor central station air handler. Demands for improved indoor air quality, low sound, high operating efficiency and smaller mechanical rooms require a better product for today's air handler market. The USA Indoor Central Station air handler has been designed to meet or exceed these demands.

The key to providing such a high quality product is in the basic design. The USA Indoor Central Station's unique construction has been designed to provide unequaled thermal efficiencies and to be airtight. In addition, USA Indoor Air Handlers offer tremendous flexibility in sizing, component options and unit arrangements to meet the indoor air quality requirements, operating efficiency, sound and installation requirements for today's extensive commercial and custom markets.

Flexibility

By virtue of its unique frame design, the USA Indoor Air Handler offers incredible flexibility. This is reflected in our Variable Increment feature that allows USA air handlers to be sized in two-inch increments (height and width) to fit the available space. Numerous section and component options, and the ability to arrange components in whatever arrangement required, allow USA air handlers to be customized to the requirements of each job without expensive field modifications. Finally, USA air handlers can be shipped as a completely assembled unit, in modules or by component sections for new or retrofit applications that require smaller sections for passage through the building.

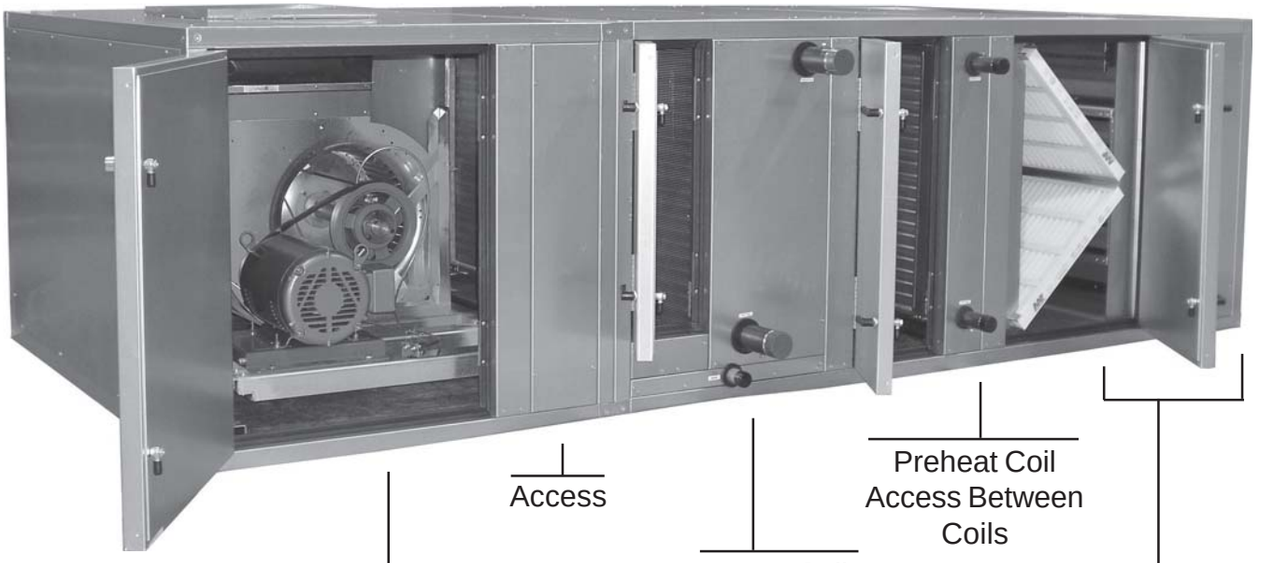
Cabinet Construction

USA Indoor Air Handler cabinetry consists of a box-type frame channel - the backbone of the unit - and easy-to-remove panels or hinged access doors. The unique, patented frame channel design allows three identical pieces to be bolted together to form a corner of the unit. Channels are formed of G90 galvanized steel or G60 painted galvanized with factory applied neoprene gasketing on all flanges to minimize thermal leakage. Gasketing is also factory applied at all contact surfaces between interior and exterior metal components to minimize thermal bridging. Panels are secured to the unit with fasteners that can be easily removed to access the unit interior. The frame channel and panels can be easily disassembled and reassembled, giving contractors tremendous flexibility in installing and servicing the units - even where space is very limited - saving time and money. Patented splice joints help guide sections together for a tight fit, saving additional time and money on installation. Splice joints are also fully insulated at the factory.

Access and Serviceability

Equipment must be designed to perform efficiently and withstand the wear and tear of everyday use. It must also be designed to provide easy access to interior components for routine maintenance and service to maintain peak performance. Special frame channels and easy-to-remove panels or hinged access doors of the USA Indoor Air Handler cabinet provide complete access to the unit interior and components. These components, including the fan and coil assembly, can be removed through the side of the unit, top of the unit, or a combination of both, which reduces required service clearances. Coil removal on unstacked coils does not require access to the non-connection end of the coil. A unique coil tie down method simplifies coil removal and replacement.

Indoor Central Station Air Handlers



Typical Filter Section

Base Rail Detail with Rigging Channel

General Features - Outdoor Units

Quality

USA Coil & Air is committed to providing high quality air handling equipment with the fastest shipment times possible. Our high quality standards begin with the basic construction design. In addition to providing unequaled thermal efficiencies and low leak rates (capable of less than 0.5 CFM/ ft^2 of cabinetry at 0.5" positive w.c.), our designs offer tremendous flexibility in sizing and component options to meet your indoor air quality, operating efficiency, sound and installation requirements.

Our outdoor air handler construction features a durable weathertight cabinet that promotes long life. Units shipped completely assembled or by section (if necessary) with a curb-ready base rail and heavy duty lifting lugs on all four corners to facilitate easy rigging and installation. An optional factory supplied roof curb, specifically designed for your unit, is available in variable heights (from 16" to 30") to further simplify installation.

Flexibility

By virtue of its unique frame design, the USA air handler offers incredible flexibility. This is reflected in our Variable Increment feature that allows USA air handlers to be sized in two-inch increments (height and width) to fit the available space. Numerous section and component options, and the ability to arrange components in whatever arrangement required, allow USA air handlers to be customized to the requirements of each job without expensive field modifications.

Cabinet Construction

USA Outdoor Air Handler cabinetry consists of a box-type frame channel, easy-to-remove panels or hinged access doors and a standard base rail or an optional integral curb-ready base with heavy-duty lifting lugs. Channel material is painted G60 galvanized steel (optional G90 unpainted galvanized steel) with neoprene gasketing on all flanges to minimize leakage. Gasketing is also on all contact surfaces between interior and exterior metal components to minimize thermal bridging.

Panels are constructed of 16- or 18-gauge pre-painted steel and are secured to the unit with fasteners that can be easily removed to access the unit interior. Optional doors with full grip handles are also available.

This unique cabinet design results in air tight, thermally efficient units, which translates into energy savings over the life of the unit. Fiberglass insulation is 2-inches thick and is 1½ or 3-pound per cubic foot in density. The thickness of the insulation is never compromised for maximum thermal efficiency. A full thickness of uncompressed insulation is provided throughout the unit - including underneath the drain pan. All units are double wall construction with solid galvanized or stainless steel liners.

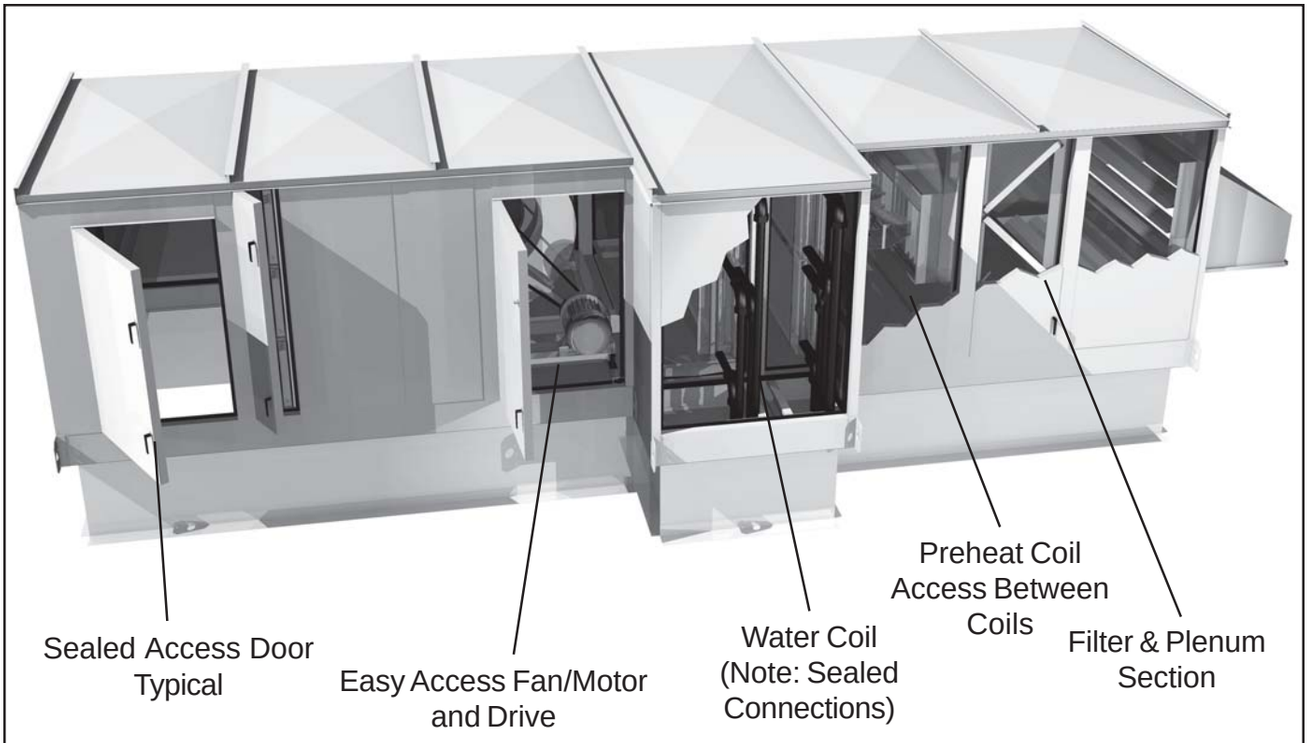
A standard base rail or a heavy-duty curb-ready base rail with integral lifting lugs on all four corners facilitates easy rigging for installation. If it is necessary to ship a unit in multiple sections, each section is equipped with a base rail and lifting lugs. A special splice joint helps guide sections together for a tight fit, saving additional time and money on installation. Splice joints are also fully insulated at the factory.

USA Outdoor Air Handlers are equipped with several features to provide durability against harsh outdoor conditions. Cross-broken roofcaps eliminate standing water on the unit and a "C" cap over seam joints provides a watertight seal. The roof cap extends over optional piping vestibules without any seams. Drip shield on all sides and over doors, as well as intake and exhaust hoods with screens, direct water away from the unit and required openings. An insulated, double-walled piping vestibule encloses all piping and control valves within the unit cabinet and can be selected in varying depths to meet your piping requirements.

Access and Serviceability

Equipment must be designed to perform efficiently and withstand the wear and tear of everyday use. It must also be designed to provide easy access to interior components for routine maintenance and service to maintain peak performance. Our special frame channels and easy-to-remove panels or hinged access doors of the USA Outdoor Air Handler cabinet provide complete access to the unit interior and components.

Outdoor Central Station Air Handlers



Low-leak Dampers
- Maximize operating efficiency
- Reduce operating costs

Durable, Weathertight Cabinet
- Cross-broken roofcaps eliminate standing water.
- Standing “C” cap over seam joints provides a water tight seal.
- Drip shield on all sides and over doors.
- Pre-painted cabinetry (Galvanized optional).
- 20-gauge outer panels and 1 ½ or 3 pound density insulation.

Visible Double-sloped Drain Pan
- Microbial-resistant galvanized or optional stainless steel drain pan to inhibit bacterial growth
- Makes inspection and cleaning easier
- Improves IAQ

USA can build the ideal Indoor or Outdoor Air Handler for your specific application.

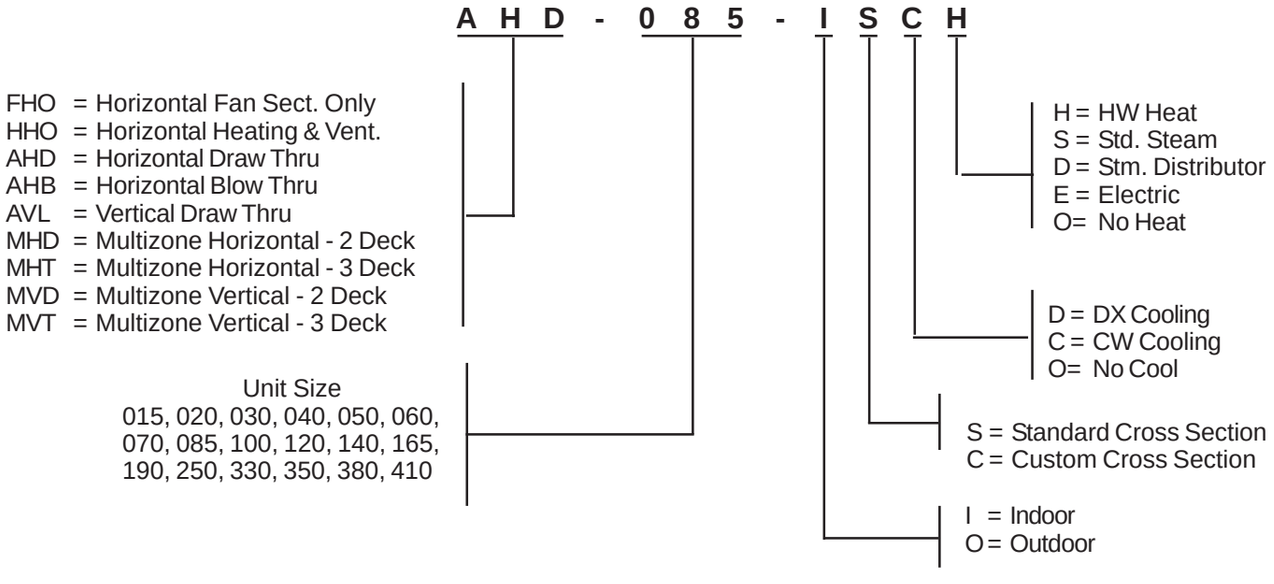
Custom Indoor Unit options include:

- Variable Increment feature for flexible cabinet sizing on 2" increments (height and width)
- Galvanized or painted cabinet
- Multiple section depths
- Variable base rail heights (4" - 12")
- Various casing and drain pan materials
- Mixing boxes/economizers
- Sound attenuators
- Integral face and bypass dampers
- Blenders and air mixers
- Multiple coil section depths
- Energy recovery sections (heat wheels, fixed plate heat exchangers, and runaround coil loops)
- Multiple fan selections including forward curve, airfoil, inline, belt or direct drive plenum fans and twin fans (two forward curved fans on one shaft)
- Filters (flat, angular, bag and cartridge) available in side load and/or front-loading configuration
- Flush-mounted filter gauges
- Starters and inverters (VFDs)
- Electric heaters
- Ultraviolet lights
- Inward opening doors
- Windows, doors, marine lights and receptacles
- Manual selections to accommodate special components
- Flexibility in shipping arrangements

Custom Outdoor Unit options include:

- Variable Increment design for cabinet sizing on 2" increments (height and width)
- Multiple coil face areas per unit size
- Multiple section depths
- Curb-ready base
- Variable height roof curbs (16", 20", 24" or 30")
- Variable depth piping vestibules (18", 24", 30")
- Various casing and drain pan materials
- Mixing boxes/economizers
- Sound attenuators
- Multiple fan selections including forward curve, airfoil, inline, belt or direct drive plenum fans and twin fans (two forward curved fans on one shaft)
- Filters (flat, angular, bag and cartridge) available in side load and/or front-loading configuration
- Marine lights and receptacles
- Hinged access doors with full grip handles
- Manual selections to accommodate special components

NOMENCLATURE



Standard Components

FANS

Fan types available with USA Air Handling Units are housed DWDI forward curved and airfoil fans, plenum fans, in-line fans and twin fans. Forward curved fans generally provide the lowest first cost option and are used for lower static pressure applications. USA housed forward curved fans will typically operate up to 6.0" of static pressure. Airfoil fans have a higher first cost, but are more efficient, quieter and can handle higher static pressures. USA housed airfoil fans will operate up to 9.0" of static pressure.

Plenum fans save space by eliminating turns in ductwork. They also provide a high degree of flexibility when locating the outlet ductwork. Plenum fans are also very good for blow through applications as they generate a uniform outlet velocity profile. Both belt drive and direct drive plenum fans are available.

In-line fans are quieter and more efficient than most standard fans. In-line fans are most beneficial in VAV applications.

Twin fans (two housed forward curved fans mounted on one common shaft) are excellent in both retrofit units and stacked energy recovery units. Twin fans can handle high CFMs in very low profile units.

These different types of fans are available in numerous wheel diameters per unit size. The fan size selection is always optimized and identified by the software selection program. The program offers a number of fan sizes to select from, considering performance, efficiency, sound generation and first cost. Fan and motor assemblies can be provided with 2" spring, rubber in shear, or rigid mount allowing the customer the option of isolating the fan and motor assembly internally or isolating the entire unit. All fans are dynamically balanced at the plant as an assembly including the motors and drives.

All fans rotate on a solid steel shaft of uniform diameter that has been ground, polished, and coated with a rust inhibitor. Fan shafts are selected to have a maximum operating speed well below the first critical speed.

Belt guards are available on plenum fans and in-line fans. Seismic restraint is also available for applications requiring additional fan support.

The fan bearings provided will have a minimum L50 life of 200,000 hours, and are available as high as 1,000,000 hours. Bearings are selected for minimum noise levels and minimal service. Bearings are self aligning and prelubricated for immediate use. Bearings are mounted on rigid frames and positioned to provide proper balance. All bearings include copper lubrication lines that are extended to the access side of the fan cabinet with the grease fittings located near the access door opening.

All fan motors are internally mounted. The appropriate motor size will be selected by the selection software program. Motors cannot be undersized, but may be oversized if desired. Motor options include open drip proof, totally inclosed fan cooled, 1 speed/1 winding, 2 speed/1 winding, and 2 speed/2 winding. Motor efficiencies available include standard efficiency, high efficiency and premium efficiency depending on the motor type.

COILS

USA Indoor Air Handlers offer broad application flexibility in the coil sections and coils. Coils can be arranged in draw through, blow through, or multizone configurations. Heating only, cooling only, or cooling and heating sections are available. All coils are installed with space between each coil to allow for access for cleaning and mounting of controls.

Cooling coil sections, and cooling and heating coil sections, are available in seven different section lengths to accommodate every application requirement. Drain pans extend the full length of the section. Removable access panels or doors may be provided in the deeper sections that will not interfere with the piping connections extending through the unit side panels.

All cooling coils are mounted over a double sloped drain pan. The cooling coil rests on coil supports located over the drain pan. The drain pan extends beyond the leaving side of the coil to help recover condensate. The primary drain pan also extends under the coil headers and return bends to help remove condensate from the unit. A full thickness of insulation is always provided between the drain pan and the bottom outer panel. The drain pan is sloped in two planes to promote proper condensate removal. The galvanized drain pan is coated with an antimicrobial treatment as standard to further inhibit the growth of algae and fungi. A stainless steel drain pan is also available as an option.

Coil Connections always extend through the unit cabinetry, allowing for easy connection of valves and piping. Water coil vents and drains are located outside the cabinetry.

A range of different size face area coils is available, including small, medium, medium extended, large, extended and staggered. Generally small face area coils are used for heating applications, the large face area coils are used for heating applications with bypass, and the extended face area coils maximize the unit cross section for restricted space applications. The extended coil is intended to be used to maintain coil face velocity limitations without going to a larger cabinet size. This ultimately saves valuable floor space and money.

USA unit coils can be selected from a full range of coil options. With USA being a major manufacturer of heat transfer coils, the coil options are virtually unlimited. The USA coil line has many different coil types, ranging from hot and cold water, evaporator and steam coils. Standard USA coils are ARI certified. In addition to a broad range of circuitings, fin spacing and row depths, coils can be constructed of different material types for fins, tubes, connections and casings. This provides the ability to specify the coil to exactly meet the application needs.

For more information on USA Coil & Air coils contact the factory.

Standard Components

FILTERS

Good air quality is of utmost importance. A key ingredient in maintaining good air quality is air filtration.

The USA Indoor Air Handler has been designed to house flat, angular, bag, or cartridge filters. These media types range in efficiencies up to 95% and MERV* 15. In addition to offering a full range of efficiencies, the filter media can be provided with an optional antimicrobial treatment. Antimicrobial treatments are highly recommended for a complete filtration system.

An optional filter pressure gauge may be ordered with each filter section to help promote regular servicing and prevent clogging.

Both bag and cartridge filters are provided with a prefilter. Bag and cartridge filters can be either side load or front load, and access can be from either or both sides of the filter section. An access door is provided on either side or both sides of the unit Filters can be positioned any place in the unit and as many filter sections as required can be used. In many health and food industries, stringent filtration is required. Often times there a need for a filter section to be the last component in the air stream. The USA Air Handler can meet these needs by providing a filter section located as the last component in the air stream and with full sheet metal liners.

STANDARD FILTER TYPES AVAILABLE

5700 - 2" depth. Flat panel filter designed for heavy dust loading conditions.

PerfectPleat - MERV 6 (30% efficiency), 2" or 4" depth. Made from pleated, self supporting DuraFlex™ by AAF.

AmAir 62plus - MERV 8 (70% efficiency), 2" or 4" depth. Standard AAF AmAir pleated filter with two layers of added polypropylene laminate to increase efficiency.

VariCel II MH - 95%, 85% and 65% efficiency, 4" depth, 1" track requirement. Mini pleat filters with metal cell sides and headers that provide superior moisture resistance.

VariCel SH - 95%, 85% and 65% efficiency, 12" depth, 1" track requirement. Steel interlocked header and cell sides hold the corrugated aluminum separated pleats allowing optimum airflow. Rated UL Class 1.

VariCel V - 95%, 85% and 65% efficiency, 12" depth, 1" track requirement. Mini pleats held in a V-bank configuration providing greater airflow capacity and longer service.

DriPak2000 bag - MERV 15, 14 and 11, (95%, 85% and 65% efficiency), 36", 30" and 22" depths, 1" track requirement. Extended surface pockets made from high-loft, layered synthetic media. Rated UL Class 1 MERV 8 efficiency DriPak2000 filters also available in 19", 15" and 12" depths.

*WHAT IS THE MERV RATING

Minimum Efficiency Reporting Value (MERV) - ASHRAE Standard 52.2-1999 entitled "Method of Testing General Ventilation Air-Cleaning Devices for Removal by Particle Size" provides a methodology for determining filter efficiency at removing various sizes of particles as the filters become loaded. There are three ranges of particle sizes that define the MERValue:

Range 1 - .03 - 1.0 um particle size
Range 2 - 1.0 - 3.0 um particle size
Range 3 - 3.0 - 10.0 um particle size

The Table to the right shows a comparison of the MERV rating to the average arrestance percentage by the older ASHRAE Std. 52.1 method.

Std. 52.2(MERV)	Approx. Std 52.1		Particle Size Range
	Dust Spot Eff.	Arrestance	
15	>95%	n/a	1
14	90-95%	>98%	1
11	60-65%	>95%	2
8	30-35%	>90%	3
6	<20%	85-90%	3

ULTRAVIOLET LIGHT OPTIONS

USA Air Handlers can be factory-equipped with ultraviolet (UV) light options that are pre-engineered for placement to provide maximum effectiveness. Two UV light options are available. The first can be mounted on the downstream side of all cooling coils and above the unit drain pan for surface kill applications to comply with the GSA Facilities Standard for federal buildings. The second can be mounted in the air stream prior to filter(s) for "kill on the fly" applications. Both applications are agency approved to UL Category Code ABQK specification, HVAC Accessories, Air Duct Mounted, in addition to the ETL listing of USA Air Handlers.

ACCESS

The access section can be selected to meet specific application criteria. Access sections are available to be placed anywhere in a unit in a variety of depths. Sections are available in depths of 16". 24", 30", 36", 42", 48" and 54". Typically access sections are used for field installed components, air monitoring devices or to provide ample space between components.

MIXING BOXES & ECONOMIZERS

When outside and return air mixing is needed, either a mixing box or an economizer section can be selected. Either component will regulate the amount of outside and return air supplied to the conditioned space. The mixing box or economizer can make use of free cooling by opening outside air dampers when the ambient air will help to condition the supply air stream. Additionally, dampers may be individually sized to provide better mixing.

Both the mixing box and economizer are provided with the USA special low leak damper. This damper has one of the lowest leakage rates in the industry, maximizing energy efficiency. At 4.0" static pressure and a face velocity of 1100 fpm through the dampers, the leakage rate is less than 0.2% (it is common to specify leakage rates at higher static pressure, but dampers should not exceed 2" of static pressure). The parallel airfoil blades are hollow core and fully gasketed. Continuous vinyl seals are provided between the damper blades. Stainless steel end seals and linkage built into high strength ABS plastic endcaps provide smooth quiet operation. When mixing boxes or economizers are used on outdoor units, optional rain hoods can be factory installed.

FACE & BYPASS DAMPERS

Face and bypass dampers can be provided for temperature modulation, by bypassing air around the coil. The opposed blades meter varying air volumes through the coil and bypass to attain the final air temperature demanded. USA Air Handlers offer only low leak dampers in their face and bypass sections.

Three styles of face and bypass sections are available. Internal bypass is available for use with medium face area coils. External bypass and external right angle are used when larger face area coils are required. The damper blades are fabricated of continuous galvanized steel with the damper rods rotating in nylon bushings. Damper shaft extensions are supplied to facilitate damper motor location.

INTEGRAL FACE & BYPASS OPTIONS

USA Air Handlers can be factory-equipped with an integral face and bypass coil that is pre-engineered to provide an accurate, reliable method of preheating and tempering air in standard or make-up air applications. Integral face and bypass coils maintain constant steam pressure or tube velocities through the coil to help prevent freeze-ups, while varying airflow through the coil using bypass dampers. The amount of air bypassed or heated is determined by a preset leaving air temperature. It can vary from the bypass dampers being fully closed (all air passes through the coil) for maximum heat output, to the bypass dampers being fully open (no air passes through the coil) for minimum heat output. The air is then mixed at the discharge of the coil to achieve the desired leaving air temperature. Air pressure drop is maintained constant regardless of the position of the dampers.

BLENDERS/AIR MIXERS

Stratification occurs from the mixing box when the airflow of two different temperature air streams do not mix completely. This incomplete mixing can continue through the air handler, and subject an unprotected coil (no glycol) to freezing temperatures, damaging the coil. With the increased minimum outdoor air requirements as indicated by ASHRAE Standard 62, the likelihood for air stratification increases. An air handler must be able to handle the required amount of outdoor air, regardless of temperature, without risking damage to the coil.

Blenders/air mixers help to provide protection for coils from freeze-up due to stratification. Blenders/air mixers add additional turbulence to the passing air streams, boosting air velocity for improved mixing. Proper distance is provided immediately downstream to give the air streams enough time to fully mix before reaching the next air handler component. Because blenders/air mixers are static devices, they require no maintenance. Different blender/air mixer lengths can be selected to satisfy either the acoustic, space, pressure drop, or initial cost requirements. The USA Air Handler selection software will select the appropriate blender/air mixer for the application.

Standard Components

ATTENUATORS

Building occupants have become increasingly conscious of the quality of their environments with low sound levels being a key criteria. Studies have confirmed improved productivity when workers are performing in sound controlled environments. Consequently, building owners, engineers, and architects have become aware of the economic benefits associated with quiet environments.

USA Air Handlers are designed to provide the quietest sound levels possible. Factory installed attenuators are available for the discharge or return sections of the air handling unit to meet the most stringent sound attenuation requirements. Different attenuator lengths can be selected to satisfy either the acoustic, space, pressure drop or initial cost requirements. Quality construction along with aerodynamic design, gives reliable performance, low pressure drop and low initial cost. USA selection software will choose the correct attenuator for the application.

STARTERS & VFDs (NOT AVAILABLE ON OUTDOOR UNITS)

To provide safety, motor efficiency, and flexibility for USA Air Handlers, a variety of factory-installed motor control options are available. These options include: Disconnect Switch, Starters, Combination Started/Disconnect, Variable Frequency Drive (VFD) with Disconnect Switch and VFD with Disconnect Switch and Bypass. Line reactors are available on both VFD with Disconnect Switch and VFD with Disconnect Switch and Bypass.

A unit mounted disconnect switch provides the means for disconnecting power in sight from the motor when required by the National Electric Code (NEC). The switch is a heavy a heavy-duty type with a non-fused disconnect switch in a NEMA 1 enclosure. A fused disconnect is also available.

Factory mounted starters offer remote start/stop operation and overload protection for an individual fan motor with minimum field cost to wire line and control circuit power to the unit. All starters provided are NEMA rated. Additional options include auxiliary contacts, control transformer, selector switch, push buttons, control transformer, selector switch, push buttons and pilot lights. A combination starter is a starter packaged with a safety switch. These motor controllers provide remote start/stop operation as well as disconnection means in sight of the controller.

A VFD provides adjustable speed control of a single fan motor. Factory mounted outside the fan cabinet, the VFD provides not only a lower cost than field installation, but also an optimal installation location. VFDs are preprogrammed and include a keypad for local or remote control.

A unit installed VFD with disconnect provides local or remote speed control for a single fan motor with disconnecting means within sight when required by the NEC. A non-fused disconnect is offered packaged with a VFD in a separate NEMA 1 enclosure. Installation is limited to the connection of power and control wires at the device.

Packaged VFD with disconnect and bypass offers added motor control at the unit for critical fan applications. With bypass control, power to the VFD can be switched to allow full operation of the fan motor in cases of VFD failure. VFDs with disconnect switch, bypass and line reactors provide harmonic control when needed.

ENERGY RECOVERY

Maintaining acceptable indoor air quality is generally accomplished by introducing ventilation from outdoors. The air must be conditioned to match the indoor space requirements. Heat wheels and fixed plate heat exchangers are available as factory-installed options for USA Air Handlers. These energy recovery components can recover 50% or more of the energy normally exhausted from a building. These devices capture heat from exhaust air as it passes through the air handler and transfer it to the supply air stream, reducing the cost of heating or cooling the outside air. Energy recovery components do this by transferring energy from a warm air stream to a colder air stream, heating cold outside air during the winter and cooling hot air during the summer.

The fixed plate creates a cross flow as it collects heat and conducts it to the other side of the plate. The fixed plate has no moving parts, is easy to clean, has a low pressure drop, can be sealed against cross contamination, and is offered in a wide range of configurations.

The heat wheel rotates at low speeds, capturing and transferring both sensible (heat) energy and latent (moisture) energy. The ability to transfer both sensible and latent energy gives the heat wheel several advantages. First, the required capacity of ventilation is significantly reduced. Additionally, the heat wheel works at lower temperatures without frosting. The supply air from the heat wheel is not near saturation, and moisture is the ductwork is not an issue. Further, no condensate pan or drain is required. Finally, heat wheels provide humidification so that the humidifier can be downsized. It also helps to keep humidity in spaces where humidification is not applied, providing greater comfort to these zones.

Both types of energy recovery devices come with double wall construction with solid liners, and are configured on the inlets and outlets with splice collars to match the adjacent sections. The fixed plate requires two drip pans, which can be either microbial resistant galvanized steel or stainless steel.

ELECTRIC HEATERS (NOT AVAILABLE ON OUTDOOR UNITS)

Electric Heaters extend the wide versatility of USA Air Handlers. With negligible air pressure drop, accurate controllability, light weight, easy serviceability and inherent freeze protection, electric heaters are valuable alternatives to conventional steam and hot water heating coils.

ETL-approved electric heaters are available on all standard sizes (003-090) for horizontally-mounted draw through units in both left and right hand configurations. All units are open wire style construction, with automatic and manual backup limit controls, air switch, stainless steel terminals, power on pilot light, magnetic contactors and integral control boxes. Safety interlock switches, step controllers and vernier silicon controlled rectifiers (SCRs) are available options.

The heater requires its own electric service. Heaters are available in 208V, 240V, 480V and 600V (all 3 phase) and use an internal 24-volt control circuit. Standard ranges of kW are available for each heater size and are designed to give an approximate temperature rise from 20ºF to 60ºF, depending on the airflow through the unit. Typical pressure drops range from .01-.04 inches of water, depending on the air velocity and number of rows of heating elements.

An integral control box with optional door handle power disconnect is included with the electric heater. Insulated panels are factory installed behind the control box. Any standard motor may be used, although the discharge air from the electric heater must not exceed 104ºF since the rated ambient temperature of the motor will be exceeded. The heater is assembled into a separate section of the USA Air Handler. Standard section widths include: 30”, 34”, 42” and 46” and vary depending on the unit size, control type and kW used.

Quick Select Table

TABLE 1 - WEIGHTS / DEPTHS

DESCRIPTION		UNIT SIZE								
		015	020	030	040	050	060	070	085	100
AIRFLOW	AIRFLOW RANGE, CFM	900 - 2500	1200-1300	1700-4600	2200-6000	2900-7700	3600-9600	4200-11200	5000-13500	6000-16000
	CFM @ 500FT/MIN. LARGE FACE	1550	1950	2850	3750	4800	6050	7000	8400	10050
	HEIGHT X WIDTH, IN.	26X38	30X40	30X52	34X58	36X64	42X66	42X74	46X80	52X82
COOLING COIL FACE AREA SQ. FT.	EXTENDED/STAGGERED LARGE	3.9	4.8	6.6	8.5	10.7	13.5	15.4	18.3	21.9
	LARGE	3.1	3.9	5.7	7.5	9.6	12.1	14.0	16.8	20.1
	EXTENDED/STAGGERED MEDIUM	2.6	3.4	4.7	6.4	8.3	9.8	11.2	13.7	17.2
	MEDIUM	2.1	2.8	4.1	5.6	7.4	8.8	10.2	12.6	15.8
	SMALL	NA	2.3	3.3	4.7	6.4	7.7	8.9	11.2	14.4
FAN SECTION DEPTH IN./ WEIGHT LBS (LARGEST AVAILABLE)	HOUSED FAN & MOTOR W/TOP DISC.	32/378	32/382	36/623	40/821	40/845	46/1060	46/1087	50/1424	52/1569
	INLINE FAN & MOTOR	N/A	N/A	N/A	N/A	N/A	44/956	44/987	50/1314	54/1577
	BELF DRIVE PLENUM FAN & MOTOR	N/A	N/A	N/A	N/A	34/754	42/1075	42/1168	48/1584	52/1843
	DIRECT DRIVE PLENUM FAN & MOTOR	N/A	N/A	N/A	20/614	20/699	54/1286	54/1337	54/1406	54/1463
	TWIN FAN & MOTOR	N/A	N/A	N/A	50/819	56/1176	56/1232	58/1380	58/1449	661868
MIXING BOX DEPTH IN./ WEIGHT LBS	MIXING BOX ONLY	20/117	20/171	20/201	20/235	22/289	24/305	24/329	26/371	30/427
	MIXING BOX WITH FLAT FILTER	24/208	24/225	24/268	24/312	26/380	28/411	28/438	30/499	34/568
	MIXING BOX WITH ANGULAR FILTER	42/311	42/345	42/403	42/457	44/535	46/569	46/613	48/723	52/800
ECONOMIZER	DEPTH IN./WEIGHT LBS.	40/267	40/288	40/344	40/381	44/470	48/495	48/530	52/600	60/699
BLENDER DEPTH IN./WEIGHT LB	LARGEST KEES	18/126	20/147	24/185	26/220	28/251	34/307	36/337	38/382	42/444
	LARGEST BLENDER PRODUCTS IV	18/125	22/147	16/196	30/238	34/281	38/321	40/365	46/481	48/527
SIDE LOAD FILTER SECTIONS DEPTH IN./WEIGHT LB	FLAT 2" AND 4"	12/118	12/128	12/150	12/169	12/187	12/207	12/219	12/240	12/255
	2" ANGULAR	32/220	30/230	30/267	30/293	30/320	30/340	30/366	30/419	30/437
	CART. (12" DEEP W/2" PRE-FILTER)	22/184	22/208	22/245	22/291	22/317	22/350	22/376	22/427	22/475
	BAG (36" W/2" PRE-FILTER)	42/265	42/290	42/338	42/385	42/422	42/452	42/484	42/526	42/567
FRONT LOAD FILTER SECTIONS DEPTH IN./WEIGHT LB	CART (12" DEEP W/2" PRE-FILTER)	16/399	16/428	16/508	16/574	16/620	16/691	16/741	16/844	16/921
	BAG (36" W/2" PRE-FILTER)	40/508	40/547	40/631	40/714	40/760	40/840	40/900	40/989	40/1078
FACE AND BYPASS DEPTH IN./WEIGHT LB	INTERNAL	12/144	12/158	12/189	12/219	12/248	12/277	12/302	12/334	12/362
	EXTERNAL	18/241	18/246	18/265	20/313	22/360	24/440	24/472	16/537	30/605
COIL SECTIONS DEPTH IN./WEIGHT LB	HEATING ONLY (2 ROW WATER)	12/174	12/193	12/210	12/242	12/276	12/306	12/331	12/366	12/412
	COOLING ONLY (4 ROW WATER)	18/216	18/255	18/307	18/357	18/406	18/463	18582	18/595	18/745
	COOLING ONLY (6 ROW WATER)	24/324	24/333	24/408	24/450	24/518	24/592	24/680	24/765	24/858
	COOLING & REHEAT (12 ROW COOLING & 1 ROW HEATING)	36/438	36/522	36/649	36/769	36/907	36/1067	36/1193	36/1357	36/1546
	VERT. COOLING ONLY (6 ROW WATER)	30/322	30/378	30/451	30/522	36/630	36/729	36/813	36/906	42/1057
MULTIZONE COIL SECT. DEPTH IN./WEIGHT LB	3 DECK HORZ. W/DAMPERS	N/A	N/A	40/810	42/929	42/1028	52/1067	52/1360	54/1512	56/1905
ACCESS SECTIONS DEPTH IN./WEIGHT LB	16" DEEP	16/114	16/124	16/145	16/161	16/174	16/186	16/199	16/215	16/223
	24" DEEP	24/140	24/151	24/174	24/192	24/207	24/223	24/237	24/255	24/268
	30" DEEP	30/159	30/170	30/196	30/216	30/232	30/250	30/266	30/286	30/301
	36" DEEP	36/179	36/193	36/220	36/244	36/261	36/282	36/299	36/322	36/340
	42" DEEP	42/198	42/213	42/242	42/246	42/263	42/284	42/300	42/353	42/374
	48" DEEP	48/221	48/236	48/269	48/298	48/320	48/345	48/415	48/447	48/468
	54" DEEP	54/240	54/253	54/287	54/334	54/358	54/384	54/408	54/439	54/466
DIFFUSER DEPTH IN./WEIGHT LB	WITH HOUSED FAN	10/86	10/92	10/110	12/133	12/143	16/175	16/185	16/201	16/216
	WITH INLINE FAN	N/A	N/A	N/A	N/A	N/A	18/187	18/198	18/214	22/259
ATTENUATOR DEPTH IN./WEIGHT LB	SHORT	40/304	40/315	40/359	40/483	40/541	40/618	40/661	40/749	40/830
	MEDIUM	52/382	52/423	52/523	52/615	52/690	52/891	52/973	52/1105	52/1248
	LONG	64/444	64/513	64/670	64/789	64/884	64/1078	64/1178	64/1340	64/1551
SUPPLY/ RET. PLENUM DEPTH IN./WEIGHT LB	TOP, BOTTOM OR END OPENING	14/120	16/141	16/167	18/197	20/223	22/253	22/273	24/309	28/354

NOTES: *Based on typical industry sizes. USA Air Handling units are available in 2 inch increments of height and width to fit the exact space requirements.
Coil weights based on aluminum fins and 8 fins per inch.
Mixing box and economizer section weights include dampers
Front load filter section include 24" upstream plenum section with tread plate for heavy duty floor liner.

Quick Select Table

TABLE 1 - WEIGHTS / DEPTHS

DESCRIPTION		UNITS								
		120	140	165	190	250	330	350	380	410
AIRFLOW	AIRFLOW RANGE, CFM	7300-19400	8500-22500	10000-26500	11500-31000	15000-40000	20000-54000	21500-57500	23100-61600	24600-65600
	CFM @ 500FT/MIN. LARGE FACE	12150	14150	16700	19300	24500	33300	35900	38450	41000
	HEIGHT X WIDTH, IN.	60x86	60x98	66x102	68x116	80x120	92x136	98x136	104x136	110x136
COOLING COIL FACE AREA SQ. FT.	EXTENDED/STAGGERED LARGE	27.4	31.9	37.1	42.9	58.0	76.9	82.0	87.1	92.2
	LARGE	24.3	28.3	33.4	38.6	49.0	66.6	71.8	76.9	82.0
	EXTENDED/STAGGERED MEDIUM	21.3	24.8	29.7	34.3	40.1	61.5	61.5	66.6	71.8
	MEDIUM	18.2	21.2	24.1	30.0	35.7	51.2	51.2	56.4	61.5
	SMALL	16.7	19.5	22.3	27.9	31.2	46.1	46.1	51.2	56.4
FAN SECTION DEPTH IN./ WEIGHT LBS (LARGEST AVAILABLE)	HOUSED FAN & MOTOR W/TOP DISC.	58/1911	58/2142	58/2198	70/3051	80/4115	92/5514	92/6343	92/6412	92/6472
	INLINE FAN & MOTOR	64/2353	64/2444	70/2923	70/3176	90/5088	96/6048	96/6997	96/7229	96/6995
	BELF DRIVE PLENUM FAN & MOTOR	56/2431	58/2701	62/3104	62/3566	70/4723	82/6970	82/7315	82/7378	82/7427
	DIRECT DRIVE PLENUM FAN & MOTOR	66/2182	78/3289	84/3641	86/4298	86/4494	86/4867	N/A	N/A	N/A
	TWIN FAN & MOTOR	66/2191	74/2691	82/3180	82/3445	82/3631	N/A	N/A	N/A	N/A
MIXING BOX DEPTH IN./ WEIGHT LBS	MIXING BOX ONLY	32/612	32/733	36/825	36/925	40/1078	46/1337	50/1816	54/1927	56/2013
	MIXING BOX WITH FLAT FILTER	36/780	36/923	40/1063	40/1235	44/1397	50/1765	54/2045	58/2162	60/2271
	MIXING BOX WITH ANGULAR FILTER	54/1044	54/1199	58/1354	58/1616	62/1806	68/2184	72/2585	76/2804	78/2900
ECONOMIZER	DEPTH IN./WEIGHT LBS.	64/933	64/1073	72/1228	72/1340	80/1622	92/2057	100/3136	108/3349	112/3488
BLENDER DEPTH IN./WEIGHT LB	LARGEST KEES	46/707	48/847	58/1021	58/1122	68/1324	76/1727	80/2568	84/2719	84/2788
	LARGEST BLENDER PRODUCTS IV	52/733	60/963	64/1067	70/1248	74/1496	88/1914	88/2716	92/2841	92/2914
SIDE LOAD FILTER SECTIONS DEPTH IN./WEIGHT LB	FLAT 2" AND 4"	12/392	12/500	12/530	12/592	12/631	12/737	12/809	12/822	12/854
	2" ANGULAR	32/613	32/730	32/791	32/941	32/1003	32/1176	32/1303	32/1374	32/1390
	CART. (12" DEEP W/2" PRE-FILTER)	22/636	22/789	22/853	22/953	22/1025	22/1233	22/1351	22/1392	22/1500
	BAG (36" W/2" PRE-FILTER)	42/765	42/950	42/1006	42/1119	42/1216	42/1429	42/1587	42/1643	42/1669
FRONT LOAD FILTER SECTIONS DEPTH IN./WEIGHT LB	CART (12" DEEP W/2" PRE-FILTER)	16/1037	16/1165	16/1311	16/1478	16/1481	16/1778	16/2084	16/2125	16/2237
	BAG (36" W/2" PRE-FILTER)	40/1185	40/1406	40/1520	40/1694	40/1728	40/2029	40/2437	40/2497	40/2571
FACE AND BYPASS DEPTH IN./WEIGHT LB	INTERNAL	12/522	12/638	12/689	12/788	12/918	12/1086	12/1252	12/1278	12/1308
	EXTERNAL	32/807	32/945	34/1052	38/1196	44/1370	50/1692	54/2175	56/2306	58/2366
COIL SECTIONS DEPTH IN./WEIGHT LB	HEATING ONLY (2 ROW WATER)	12/619	12/689	12/749	12/836	12/995	12/1198	12/1217	12/1441	12/1488
	COOLING ONLY (4 ROW WATER)	18/992	18/1214	18/1344	18/1508	18/1758	18/2229	18/2570	18/2734	18/2799
	COOLING ONLY (6 ROW WATER)	24/1206	24/1343	24/1485	24/1689	24/1968	24/2514	24/2538	24/3036	24/3168
	COOLING & REHEAT (12 ROW COOLING & 1 ROW HEATING)	36/2075	36/2363	36/2654	36/3037	36/3586	36/4608	36/5287	36/5515	36/5558
	VERT. COOLING ONLY (6 ROW WATER)	48/1511	48/1671	54/1878	N/A	N/A	N/A	N/A	N/A	N/A
MULTIZONE COIL SECT. DEPTH IN./WEIGHT LB	3 DECK HORZ. W/DAMPERS	60/2110	60/2320	70/2685	70/3035	76/3601	88/5335	N/A	N/A	N/A
ACCESS SECTIONS DEPTH IN./WEIGHT LB	16" DEEP	16/355	16/412	16/434	16/521	16/552	16/621	16/783	16/796	16/808
	24" DEEP	24/409	24/469	24/495	24/585	24/621	24/696	24/922	24/938	24/953
	30" DEEP	30/450	30/512	30/581	30/635	30/673	30/753	30/1025	30/1044	30/1063
	36" DEEP	36/497	36/560	36/633	36/690	36/733	36/820	36/1142	36/1196	36/1185
	42" DEEP	42/536	42/670	42/748	42/818	42/867	42/1003	42/1364	42/1389	42/1415
	48" DEEP	48/641	48/716	48/757	48/871	48/952	48/1068	48/1486	48/1514	48/1543
	54" DEEP	54/661	54/775	54/819	54/892	54/949	54/1063	54/1530	54/1559	54/1589
DIFFUSER DEPTH IN./WEIGHT LB	WITH HOUSED FAN	24/400	24/496	24/520	30/613	30/659	30/748	30/1041	30/1060	30/1080
	WITH INLINE FAN	26/423	26/519	28/562	30/628	36/729	38/933	38/1289	38/1312	38/1336
ATTENUATOR DEPTH IN./WEIGHT LB	SHORT	40/1251	40/1434	40/1567	40/1746	40/1992	40/2681	40/3005	40/3148	40/3290
	MEDIUM	52/1697	52/1884	52/2174	52/2448	52/2845	52/3681	52/4026	52/4229	52/4431
	LONG	64/2077	64/2300	64/2605	64/2912	64/3426	64/4455	64/4872	64/5122	64/5373
SUPPLY/ RET. PLENUM DEPTH IN./WEIGHT LB	TOP, BOTTOM OR END OPENING	30/527	30/639	32/698	32/772	38/1018	42/1239	48/1957	52/2082	54/2172

NOTES: *Based on typical industry sizes. USA Air Handling units are available in 2 inch increments of height and width to fit the exact space requirements.
Coil weights based on aluminum fins and 8 fins per inch.
Mixing box and economizer section weights include dampers
Front load filter section include 24" upstream plenum section with tread plate for heavy duty floor liner.

Component and Section Weights

TABLE 3 - UNIT COIL WEIGHTS - BY ROWS

UNIT SIZE	015		020		030		040		050		060		0740		085		100	
ROWS	LBS.	KG	LBS.	KG	LBS.	KG	LBS.	KG	LBS.	KG	LBS.	KG	LBS.	KG	LBS.	KG	LBS.	KG
1	18	8	23	10	29	13	36	16	43	20	53	24	60	27	67	30	78	35
2	26	12	33	15	43	20	54	24	66	30	83	38	92	42	107	49	125	57
3	37	17	47	21	63	29	81	37	99	45	122	55	139	63	161	73	207	94
4	46	21	58	26	78	36	101	46	123	56	151	69	172	78	200	91	257	117
5	55	25	70	32	94	43	120	55	147	67	181	82	206	93	239	108	307	139
6	64	29	81	37	109	49	140	64	171	78	210	95	239	108	278	126	357	162
8	82	37	104	47	140	63	179	81	219	99	269	122	306	139	356	161	457	207
10	100	45	126	57	170	77	218	99	267	121	328	149	373	169	434	197	557	253
12	118	53	149	68	201	91	258	117	315	143	386	175	440	200	512	232	657	298

UNIT SIZE	120		140		165		190		250		330		350		380		410	
ROWS	LBS.	KG	LBS.	KG	LBS.	KG	LBS.	KG	LBS.	KG	LBS.	KG	LBS.	KG	LBS.	KG	LBS.	KG
1	108	49	123	56	143	65	156	71	212	96	267	121	434	195	449	202	466	210
2	166	75	189	86	222	101	258	117	345	157	446	202	663	298	678	305	711	320
3	247	112	291	132	339	154	403	183	559	254	731	332	1239*	558	1297*	584	1324*	596
4	306	139	361	164	420	191	500	227	694	315	907	412	1711**	770	1802**	811	1892**	851
5	366	166	432	196	502	228	598	271	829	376	1084	492	1959**	882	2070**	932	2180**	981
6	425	193	502	228	584	265	695	315	964	437	1260	572	2252**	1013	2383**	1072	2512**	1130
8	544	247	643	292	748	339	890	404	1234	560	1613	732	2828**	1273	3009**	1354	3182**	1432
10	663	301	783	355	911	413	1084	492	1504	682	1966	892	N/A	N/A	N/A	N/A	N/A	N/A
12	782	355	924	419	1075	488	1279	580	1774	805	2318	1052	N/A	N/A	N/A	N/A	N/A	N/A

NOTES:
*3-row coils (unit sizes 350-410) based on staggered medium face area 5EJ with 6 FPI and standard fin, tube and casing materials.
**4-8 row coils (unit sizes 350-410) based on staggered medium face area with 12 FPI and standard fin, tube and casing materials. 1 & 2 row (015-330) based on large face area 5WQ & 5WH coils with 8 FPI and standard fin, tube and casing materials.
3-row and greater (unit sizes 015-330) based on large face area 5W* or 5E* coils with 8 FPI and standard fin, tubing and casing materials.
Staggered coils are not available in 10 and 12-row coils.

TABLE 4 - WEIGHTS FOR SINGLE SPEED & DUEL SPEED MOTORS

MOTOR RPM	MOTOR HP	1/4	1/3	1/3	3/8	1	1 1/2	2	3	5	7 1/2	10	15	20	25	30	40	50	60	75
900 RPM	NEMA FRAME	-	-	-	-	182T	184T	213T	215T	254T	256T	284T	286T	324T	326T	364T	365T	404T	405T	444T
	MOTOR WEIGHT (lbs)	-	-	-	-	56	64	94	111	150	207	300	300	385	415	580	580	750	800	1100
	MOTOR WEIGHT (kg)	-	-	-	-	25	29	43	50	68	94	136	136	175	189	349	264	461	364	500
1200 RPM	NEMA FRAME	-	-	-	-	145T	182T	184T	213T	215T	256T	256T	284T	286T	324T	326T	365T	365T	404T	405T
	MOTOR WEIGHT (lbs)	-	-	-	-	44	66	85	114	145	224	248	330	377	450	487	703	720	1153	1200
	MOTOR WEIGHT (kg)	-	-	-	-	20	30	39	52	66	102	113	150	153	205	221	320	327	524	545
1800 RPM	NEMA FRAME	48	48	56	56	143T	145T	145T	182T	184T	213T	215T	254T	256T	284T	286T	324T	326T	364T	365T
	MOTOR WEIGHT (lbs)	19	24	35	35	44	54	54	84	100	139	165	242	273	351	432	531	592	714	895
	MOTOR WEIGHT (kg)	9	11	16	16	20	24	24	38	45	63	75	110	124	159	196	241	269	324	406
3600 RPM	NEMA FRAME	-	-	-	-	56T	143T	145T	145T	182T	184T	213T	215T	254T	256T	284T	286TS	324TS	326TS	405TS
	MOTOR WEIGHT (lbs)	-	-	-	-	32	40	40	50	76	91	110	147	182	223	359	369	447	558	713
	MOTOR WEIGHT (kg)	-	-	-	-	15	18	18	23	35	41	50	67	83	101	163	168	203	254	324
1800/ 900 RPM	NEMA FRAME	-	-	-	-	143	145	145	182	184	213	215	256	256	286	286	324	326	-	-
	MOTOR WEIGHT (lbs)	-	-	-	-	25	28	31	63	72	104	130	244	323	250	275	350	390	-	-
	MOTOR WEIGHT (kg)	-	-	-	-	11	13	14	29	33	47	59	111	105	114	125	159	177	-	-
1800/ 1200 RPM	NEMA FRAME	-	-	-	-	145	182	182	184	215	256	256	284	286	286	286	-	-	-	-
	MOTOR WEIGHT (lbs)	-	-	-	-	30	56	65	73	113	211	237	318	348	349	295	-	-	-	-
	MOTOR WEIGHT (kg)	-	-	-	-	14	25	30	33	51	96	108	145	158	159	134	-	-	-	-

Data included reflects the largest NEMA frame and/or the heaviest motor weight per motor HP.

Component and Section Weights

TABLE 5 - BASE RAIL WEIGHTS

6" BASE RAIL WRIGHTS	STANDARD UNIT NOMINAL SIZE																	
	015		020		030		040		050		060		0740		085		100	
	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG
END CROSS MEMBERS (PAIR)	29	13	30	14	37	17	41	19	45	20	46	21	51	23	55	25	56	25
ADD'L CROSS MEMBER SUPPORTS	10	5	10	5	14	6	15	7	17	8	17	8	19	9	21	10	21	10
6" BASE RAIL WRIGHTS (CONTINUED)	STANDARD UNIT NOMINAL SIZE																	
	120		140		165		190		250		330		350		380		410	
	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG
END CROSS MEMBERS (PAIR)	57	26	63	29	65	29	68	31	71	32	75	34	75	34	75	34	75	34
ADD'L CROSS MEMBER SUPPORTS	22	10	26	12	27	12	30	14	32	15	35	16	35	16	35	16	35	16

6" BASE RAIL WRIGHTS	STANDARD UNIT NOMINAL SIZE																	
	015		020		030		040		050		060		0740		085		100	
	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG
END CROSS MEMBERS (PAIR)	39	18	40	18	50	23	55	25	60	27	62	28	69	31	74	33	75	34
ADD'L CROSS MEMBER SUPPORTS	14	6	15	7	19	9	21	10	24	11	24	11	27	12	30	14	30	14
6" BASE RAIL WRIGHTS (CONTINUED)	STANDARD UNIT NOMINAL SIZE																	
	120		140		165		190		250		330		350		380		410	
	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG
END CROSS MEMBERS (PAIR)	78	35	86	39	89	40	92	42	95	43	107	49	107	49	107	49	107	49
ADD'L CROSS MEMBER SUPPORTS	32	15	36	16	38	17	43	20	47	21	50	23	50	23	50	23	50	23

Weight factor for 6" high rail = .52 lb./inch (.00929 kg/mm).
Weight factor for 10" high rail = .74 lb./inch (.0132 kg/mm).

Weight Calculation

1. Find Section Weights on pages 14 & 15.
   Add them together for each individual section.
2. Add each individual coil weight from page 16.
3. Add motor weight from page 16.
4. Add Base Rail weight from page 17.

(Not all units have base rails; i.e. ceiling hung, existing steel frame, etc.)

Engineering Considerations

INSTALLATION FLEXIBILITY

USA Coil & Air central station air handlers feature sectionalized design to provide maximum installation flexibility. Fan, coil, filter, mixing box, face and bypass and access components allow the design flexibility of built-up systems with the cost advantage of factory fabricated units. Units can be shipped from the factory in as few or as many sections as required according to job site condition.

MOUNTING & ACCESS

Whether units are floor or ceiling mounted, care should be taken to keep the supporting structure level and rigid enough for satisfactory unit operation. Ideally, a heavy concrete slab should be used for floor mounted units, and main support beams for ceiling hung units. Ceiling suspended units must be trapeezed from the unit base rail, or field supplied materials. Long floor or ceiling spans should be avoided.

Units should be located so as to provide proper access for routine service. Clearance for filter removal on both sides of the filter section is usually necessary. Clearance should be provided as required for access panels. Room should be allowed for coil removal. Cooling units require clearance for a trap in the drain line.

Access to the interior of the USA Air Handler is provided by hinged access doors or removable panels. For access between components, versatile access sections feature hinged access doors on either, or both sides.

DUCTWORK

Good ductwork layout will minimize system resistance and sound generation. Duct connections to and from units should allow straight, smooth airflow. Sharp turns in the fan discharge should be avoided, particularly turns opposed to wheel rotation. Turning vanes should be used. Discharge plenums or any abrupt change in duct size should be avoided.

PIPING & DRAIN PAN TRAPS

Piping should be used in accordance with accepted industry standards. Undue stress should not be applied at the connection to coil headers. Pipe work should be supported independently of the coils with adequate piping flexibility for thermal expansion. Drain lines and traps should be run full size from the drain pan connection. Drain pans should have traps to permit the condensate from the coils to drain freely. On a draw-through unit, the trap depth and the distance between the trap outlet and drain pan outlet should be twice the negative static pressure under normal unit operation.

VIBRATION ISOLATION

To help keep noise and vibration compatible with the intended use of the conditioned air space, good acoustical and vibration engineering practices should be applied during the early stages of design.

Since most applications require vibration isolation, the USA Air Handler is available with factory installed internal isolation. Internally isolated units feature spring or rubber in shear isolators sized specifically for each fan wheel and unit size.

MULTIZONE AIR HANDLER APPLICATIONS

Blow-through air handlers are available in single-zone, two-deck and three-deck configurations. The two- and three-deck units are offered with or without zone dampers. All unit configurations include a perforated plate fan discharge diffuser to provide even airflow downstream of the fan.

Multi-zone and dual duct air handlers typically provide comfort conditioning by distributing a constant air volume at variable temperature. In a typical system a portion of the air is heated by passing through the heating coil and the balance is cooled by the cooling coil. The heated and cooled airstreams are then mixed in the required proportion to provide the optimum temperature air to the conditioned space.

For dual duct applications, a pair of ducts bring heated and cooled air to the air mixing terminal boxes where the airstreams are mixed. By adding zone dampers to the dual duct unit, the air mixing takes place at the unit discharge and only one duct is required to distribute conditioned air to the building. The air mixing terminal boxes are also eliminated.

By adding a third bypass deck to the hot and cold decks, a triple deck multi-zone is created. The triple deck configuration offers significant energy conservation opportunities by allowing return or outside air to bypass both coils. The thermal inefficiency of mixing heated and cooled air is eliminated by the addition of the bypass deck. Bypass air is mixed with heated air for building zones that require heating. Bypass air is mixed with cooled air for building zones that require cooling.

Multi-zone systems result in the absence of water, steam and condensate drain piping, wiring, electrical and mechanical equipment in the conditioned space for more usable commercial floor area and higher rental income.

TABLE 6 - UNIT COIL DIMENSIONAL DATA

STANDARD CHILLED WATER, DX, OR 3 & 4 ROW HEATING COILS							1 & 2 ROW HEATING COILS					
UNIT SIZE		Ext/ Stagg Large	Large	Ext/Stagg Medium	Medium	Small		Ext/ Stagg Large	Large	Ext/Stagg Medium	Medium	Small
015	FH x FL	18 x 31	18 x 25	12 x 31	12 x 25	-	FH x FL	18 x 28	18 x 22	12 x 28	12 x 22	-
	Face Area	3.9	3.1	2.6	2.1	-	Face Area	3.5	2.8	2.3	1.8	-
020	FH x FL	21 x 33	21 x 27	15 x 33	15 x 27	12 x 27	FH x FL	21 30	21 x 24	15 x 30	15 x 24	12 x 24
	Face Area	4.8	3.9	3.4	2.8	2.3	Face Area	4.4	3.5	3.1	2.5	2
030	FH x FL	21 x 45	21 x 39	15 x 45	15 x 39	12 x 39	FH x FL	21 x 42	21 x 36	15 x 42	15 x 36	12 x 36
	Face Area	6.6	5.7	4.7	4.1	3.3	Face Area	6.1	5.3	4.4	3.8	3
040	FH x FL	24 x 51	24 x 45	18 x 51	18 x 45	15 x 45	FH x FL	24 x 48	24 x 42	18 x 48	18 x 42	15 x 42
	Face Area	8.5	7.5	6.4	5.6	4.7	Face Area	8	7	6	5.3	4.4
050	FH x FL	27 x 57	27 x 51	21 x 57	21 x 51	18 x 51	FH x FL	27 x 54	27 x 48	21 x 54	21 x 48	18 x 48
	Face Area	10.7	9.6	8.3	7.4	6.4	Face Area	10.1	9	7.9	7	6
060	FH x FL	33 x 59	33 x 53	24 x 59	24 x 53	21 x 53	FH x FL	33 x 56	33 x 50	24 x 56	24 x 50	21 x 50
	Face Area	13.5	12.1	9.8	8.8	7.7	Face Area	12.8	11.5	9.3	8.3	7.3
070	FH x FL	33 x 67	33 x 61	24 x 67	24 x 61	21 x 61	FH x FL	33 x 64	33 x 58	24 x 64	24 x 58	21 x 58
	Face Area	15.4	14	11.2	10.2	8.9	Face Area	14.7	13.3	10.7	9.7	8.5
085	FH x FL	36 x 73	36 x 67	27 x 73	27 x 67	24 x 67	FH x FL	36 x 70	36 x 54	27 x 70	27 x 64	24 x 64
	Face Area	18.3	16.8	13.7	12.6	11.2	Face Area	17.5	16	13.1	12	10.7
100	FH x FL	42 x 75	42 x 69	33 x 75	33 x 69	30 x 69	FH x FL	42 x 72	42 x 66	33 x 72	33 x 66	30 x 66
	Face Area	21.9	20.1	17.2	15.8	14.4	Face Area	21	19.3	16.5	15.1	13.8
120	FH x FL	48 x 79	48 x 73	-	36 x 73	33 x 73	FH x FL	-	-	42 x 70	36 x 70	33 x 70
	Face Area	26.3	24.3	-	18.2	16.7	Face Area	-	-	20.4	17.5	16
	FH x FL	(2)27x73	(2)24x73	(2)21x73	-	-	FH x FL	(2)27x70	(2)24x70	-	-	-
	Face Area	27.4	24.3	21.3	-	-	Face Area	26.2	23.3	-	-	-
140	FH x FL	48 x 91	48 x 85	-	36 x 85	33 x 85	FH x FL	-	-	42 x 82	36 x 82	33 x 82
	Face Area	30.3	28.3	-	21.2	19.5	Face Area	-	-	23.9	20.5	18.8
	FH x FL	(2)27x85	(2)24x85	(2)21x85	-	-	FH x FL	(2)27x82	(2)24x82	-	-	-
	Face Area	31.9	28.3	24.8	-	-	Face Area	30.8	27.3	-	-	-
165	FH x FL	54 x 95	54 x 89	-	42 x 89	39 x	FH x FL	-	-	-	42 x 86	39 x 86
	Face Area	35.6	33.4	-	24.1	22.3	Face Area	-	-	-	23.3	21.5
	FH x FL	(2)30x89	(2)27x89	(2)24x89	-	-	FH x FL	(2)30x86	(2)27x86	(2)24x86	-	-
	Face Area	37.1	33.4	29.7	-	-	Face Area	35.8	32.3	28.7	-	-
190	FH x FL	54 x 109	54 x 103	-	42 x 103	39 x 103	FH x FL	-	-	-	42 x 100	39 x 100
	Face Area	40.9	38.6	-	30	27.9	Face Area	-	-	-	29.2	27.1
	FH x FL	(2)30x103	(2)27x103	(2)s4x103	-	-	FH x FL	(2)39x100	(2)27x100	(2)24x100	-	-
	Face Area	42.9	38.6	34.3	-	-	Face Area	41.7	37.5	33.3	-	-
250	FH x FL	-	-	-	48 x 107	42 x 107	FH x FL	-	-	-	-	42 x 104
	Face Area	-	-	-	35.7	31.2	Face Area	-	-	-	-	30.3
	FH x FL	(2)39x107	(2)33x107	(2)27x107	(2)24x107	-	FH x FL	(2)39x104	(2)33x104	(2)27x104	(2)24x104	-
	Face Area	58	49	40.1	35.7	-	Face Area	56.3	47.7	39	34.7	-
330	FH x FL	-	-	-	-	54 x 123	FH x FL	-	-	-	-	-
	Face Area	-	-	-	-	46.1	Face Area	-	-	-	-	-
	FH x FL	(2)45x123	(2)39x123	(2)36x123	(2)30x123	(2)27x123	FH x FL	-	(2)39x120	(2)36x120	(2)30x120	(2)27x120
	Face Area	76.9	66.6	61.5	51.2	46.1	Face Area	-	65	60	50	45
350	FH x FL	-	-	-	-	54 x 123	FH x FL	-	-	-	-	-
	Face Area	-	-	-	-	46.1	Face Area	-	-	-	-	-
	FH x FL	(2)48x123	(2)42x123	(2)36x123	(2)30x123	(2)27x123	FH x FL	-	(2)42x120	(2)36x120	(2)30x120	(2)27x120
	Face Area	82	71.9	61.5	51.2	46.1	Face Area	-	70	60	50	45
380	FH x FL	-	-	-	-	-	FH x FL	-	-	-	-	-
	Face Area	-	-	-	-	-	Face Area	-	-	-	-	-
	FH x FL	(2)51x123	(2)45x123	(2)39x123	(2)33x123	(2)30x123	FH x FL	-	-	(2)39x120	(2)33x120	(2)30x120
	Face Area	87.1	76.9	66.6	56.4	51.2	Face Area	-	-	65	55	50
410	FH x FL	-	-	-	-	-	FH x FL	-	-	-	—	
	Face Area	-	-	-	-	-	Face Area	-	-	-	-	-
	FH x FL	(2)54x123	(2)48x123	(2)42x123	(2)36x123	(2)33x123	FH x FL	-	-	(2)42x120	(2)36x120	(2)33x120
	Face Area	92.2	82	71.8	61.5	56.4	Face Area	-	-	70	60	55

Coil section depth limitation by number of rows in coil for single banks of coils (excludes staggered coils)

Section depth — **Maximum number of rows**

12" — 2 row water or steam
14" — 4 row water (except 5WM & 5WD)
16" — 4 row 5WM & 5WD water

Cooling only section (no moisture eliminator)

Section depth — **Maximum number of rows**

18" — 4 row DX or water (except 5WM & 5WD(
24" — 8 row DX or water
30" — 10 row DX or 12 water

Combination cooling and 1 or 2 row reheat (no moisture eliminator)

Section depth — **Maximum number of rows**

24" — 6 row water or DX
30" — 10 row water or DX
36" — 12 row water

NOTES: The spacing between coil casings is a minimum of 4". If more access between coils is required, increase the section depth. Cooling coil sections are available in section depths of 18", 24", 30", 42" 48", 54". If a moisture eliminator is required, use the next larger section size.

TABLE 7 - INSTALLATION FLEXIBILITY

The face area of the multizone cold deck coil is the same as other cooling coils shown in Table 14 on page 21. Multizone hot deck coils have a face area that is different from other heating coils. The face area for the multizone hot deck is generally smaller.

Additional access is available downstream from the cooling coil. Refer to USA software for more detailed information.

MULTIZONE HOT DECK COILS (ENGLISH UNITS - INCHES AND SQUARE FEET)			
UNIT SIZE		1 & 2 ROW	3 & 4 ROW
030	FH X FL	12 X 36	12 X 39
	FACE AREA	3	3.3
040	FH X FL	15 X 42	15 X 45
	FACE AREA	4.4	4.7
050	FH X FL	15 X 48	15 X 51
	FACE AREA	5	5.3
060	FH X FL	18 X 50	18 X 53
	FACE AREA	6.3	6.6
070	FH X FL	18 X 58	18 X 61
	FACE AREA	7.3	7.6
085	FH X FL	21 X 64	21 X 67
	FACE AREA	9.3	9.8
100	FH X FL	24 X 66	24 X 69
	FACE AREA	11	11.5
120	FH X FL	27 X 70	27 X 73
	FACE AREA	13.1	13.7
140	FH X FL	27 X 82	27 X 85
	FACE AREA	15.4	15.9
165	FH X FL	30 X 86	30 X 89
	FACE AREA	17.9	18.5
190	FH X FL	30 X 100	30 X 103
	FACE AREA	20.8	21.5
250	FH X FL	36 X 104	36 X 107
	FACE AREA	26	26.8
330	FH X FL	42 X 120	42 X 123
	FACE AREA	35	35.9
350	FH X FL	N/A	N/A
	FACE AREA	N/A	N/A
380	FH X FL	N/A	N/A
	FACE AREA	N/A	N/A
410	FH X FL	N/A	N/A
	FACE AREA	N/A	N/A

Side Load Filter Data

TABLE 8 - SIZE & QUANTITY OF FILTERS USED PER UNIT SIZE

Unit Size	Filter Size (Inches)	NUMBERS OF FILTERS USED PER FILTER SECTION						
		Flat Panel	2" Angular	4" Angular	Varicel LH	Varicel II MH	Varicel V	DriPak 2000
015	12 x 24		2					
	20 X 20							
	20 X 24		2					
	24 X 12			N/A				
	24 X 20	1			1	1	1	1
	24 X 24							
020	12 x 24	1	2		1	1	1	1
	20 X 20							
	20 X 24							
	24 X 12			N/A				
	24 X 20							
	24 X 24	1	2		1	1	1	1
030	12 x 24							
	20 X 20							
	20 X 24							
	24 X 12			N/A				
	24 X 20							
	24 X 24	2	4		2	2	2	2
040	12 x 24	1	2	2	1	1	1	1
	20 X 20							
	20 X 24	1	2	2	2	2	2	2
	24 X 12							
	24 X 20							
	24 X 24	1	2	2				
050	12 x 24				1			
	20 X 20							
	20 X 24	3	6	6		3	3	3
	24 X 12							
	24 X 20							
	24 X 24				2			
060	12 x 24	1			1	1	1	1
	20 X 20							
	20 X 24		4	4				
	24 X 12	2			2	2	2	2
	24 X 20							
	24 X 24	2	2	2	2	2	2	2
070	12 x 24							
	20 X 20							
	20 X 24				1	1	1	1
	24 X 12	3			2	2	2	2
	24 X 20							
	24 X 24	3	6	6	2	2	2	2
085	12 x 24		3	3				
	20 X 20							
	20 X 24		6	6				
	24 X 12							
	24 X 20	6			6	6	6	6
	24 X 24		3	3				
100	12 x 24							
	20 X 20	4			4	4		4
	20 X 24	4	12	12	4	4		4
	24 X 12							
	24 X 20						3	
	24 X 24						3	

Unit Size	Filter Size (Inches)	NUMBERS OF FILTERS USED PER FILTER SECTION						
		Flat Panel	2" Angular	4" Angular	Varicel LH	Varicel II MH	Varicel V	DriPak 2000
120	12 x 24				2	2	2	2
	20 X 20							
	20 X 24	6	9	9				
	24 X 12							
	24 X 20							
	24 X 24	2	3	3	6	6	6	6
140	12 x 24							
	20 X 20							
	20 X 24							
	24 X 12	4			4	4	4	4
	24 X 20	8			8	8	8	8
	24 X 24		12	12				
165	12 x 24							
	20 X 20	15			15	15		15
	20 X 24		20	20				
	24 X 12							
	24 X 20						12	
	24 X 24							
190	12 x 24		4	4			2	
	20 X 20	6			6	6		6
	20 X 24		16	16				
	24 X 12						4	
	24 X 20	9			9	9		9
	24 X 24		4	4			8	
250	12 x 24							
	20 X 20							
	20 X 24	3	24	24	3	3	3	3
	24 X 12							
	24 X 20							
	24 X 24	12			12	12	12	12
330	12 x 24				3		3	
	20 X 20	9				9		9
	20 X 24	3	10	10		3		3
	24 X 12				5		5	
	24 X 20	9				9		
	24 X 24	3	20	20	15	3	15	
350	12 x 24				3		3	
	20 X 20	3				3		3
	20 X 24	9	10	10		9		9
	24 X 12							
	24 X 20	3			5	3	5	3
	24 X 24	9	20	20	15	9	15	9
380	12 x 24	4			4	4	4	4
	20 X 20							
	20 X 24	20	12	12				
	24 X 12							
	24 X 20							
	24 X 24	4	24	24	20	20	20	20
410	12 x 24						3	
	20 X 20	12			15	12		12
	20 X 24	3	12	12		3		3
	24 X 12						5	
	24 X 20	12			15	12	5	12
	24 X 24	3	24	24		3	15	3

NOTE: Number of filters used per flat panel, 2" angular, and 4" angular filter section is based on Pleated (30%).

Standard Specification

Standard Specification (for estimate only)

DESIGN, PERFORMANCE, ARRANGEMENT.

Provide USA Coil & Air Units including all accessories shown per plans, specifications and other related details.

***Please note Option # next to available options.**

GENERAL - CASING & FRAME

Section reference: all applicable sections.

1. All casing channel posts shall be 16 gauge with removable panels constructed of either galvanized steel or painted steel. Sections shall have highly compressed gasketing between frame members and doors. (Standard)

2. Outside casing shall be:
2A - G90 Galvanized Steel -16 Ga.
2B - G90 Galvanized Steel - 18 Ga.
2C - G60 Steel and painted with enamel paint which meets 600 hour salt spray test.

3. Internal lining for double wall units shall be 20 gauge:
3A - G90 Galvanized Steel Solid
3B - G90 Galvanized Steel Perforated
3C - 304 Solid Stainless Steel

The units shall have inner liner for:
3D - Fan Section only
3E - Fan and Coil Section only
3F - The entire unit in direction of air flow

4. Floor Plates shall be:
4A - Standard G90 20 Ga. Galvanized Steel
4B - G90 14 Ga. Galvanized Steel
4C - 304 Stainless 20 Ga.
4D - 304 Stainless Steel 14 Ga.
4E - Aluminum - .125" thick

5. Entire unit shall have a full Perimeter Base Rail. The Rail height required shall be shown on plans and shall be based on required trapping required for drain pans and/or steam coil piping. (Standard)

6. A full perimeter overlapping with internal splice joint (sealed) with gasketing on mating sections meets indoor air quality standards. Unit leak rate shall not exceed 0.5 CFM per square feet at 5" static pressure.

7. Insulation shall be high density, neoprene coated, glass fiber type with adhesive and pins on units that are single wall type. Insulation shall be:
7A - One inch
7B - Two inch (Double wall only)

8. All access doors shall be flush mounted type, galvanized steel with a minimum of 2 six inch long stainless piano type hinges, latches and full size handles (4.5" minimum). All doors shall swing outward for locations with negative pressure (usually upstream from fans) and inward for doors located with positive pressure. Positive pressure styles have a secondary latch to relieve pressure. Positive pressure styles have a secondary latch to relieve pressure on doors that can't swing inward such as side access filter sections.
8A - Standard door
8B - Door and inspection window
8C - Fan section only - Drive side
8D - Fan section only - Both sides
8E - Fan and coil sections - Drive side only
8F - Fan and coil sections, both sides.

All doors located in coil sections may increase the overall length of units and shall be between coils if multiple coil unit.

9. Drain pans shall be double sloped pitched type towards the drain connection. Drain connections to be located 3" above the base rails to allow for proper trapping.
9A - Galvanized pan with microbial resistant coating
9B - 304 Stainless Steel
9C - Pan under cooling coils only
9D - Pans in fan section and cooling coil sections

SUPPLY AND RETURN AIR FANS

Section reference: 01, 02, 03, 29, 30, 31, and 32.

10. All air moving assemblies including fans, motors and drives shall be dynamically balanced at all three planes and at all bearing supports and will be available at an RPM below the first critical speed. Bearings shall be self aligned, grease lubricated with extended copper lube lines to access on side of unit as ordered. Provide supply fans:
10A - DWDI centrifugal type - forward curved
10B - DWDI centrifugal type - airfoil
10C - Belt drive airfoil plenum style
10D - In-line type
10E - Forward curved - twin style fans
10F - Supply fans only
10G - Supply and return air fans

All fans and motors are internally mounted on steel base and motor also on sliding adjustable base for proper belt tension and alignment. Motor has easy slide out position for repairs or replacement. Fan and motor to be mounted on:
10H - Rubber - in-shear isolators
10J - 2” deflection spring isolators
10K - 2” deflection spring isolators with seismic snubbers.

Bearings shall be self aligning, grease lubricated ball bearing type. Shafts are solid, hot rolled steel that are ground and polished and are keyed to shaft type and protected with industry approved oil. All v-belt drives shall be cast iron, dynamically balanced, bored to fit shaft and keys.
10L - Fixed sheave rated at motor HP
10M - Variable - adjustable drives @ 1.25 service factor
10N - Variable - adjustable drives @ 1.50 service factor

Adjustable sheaves and drives selected at stated RPM at mid point. Field personnel to supply replacement sheaves for RPM requirements not specified when balancing requires new selection. All drives selected by USA shall be two belt type at 10 HP and above.

Bearings to be per AFBMA-ANSI standards and shall be rated at L-50 life based on type and size of unit but a minimum of 200,000 hours and a maximum of 500,000 hours as standard (600,000 hours on in-line fans and 400,000 on belt drive plenum fans). Bearing shall be self-aligning, grease lubricated ball bearing type. Shafts are solid, hot rolled steel that are ground and polished and are keyed to the shaft type and protected with industry approved oil. All V-belt drives shall be cast iron, dynamically balanced, bored to fit shaft and keys.

MOTORS & WIRING

Section reference: 01, 02, 03, 29, 30, 31, 32.

11. Motors shall be mounted internally and shall be of type, service and electrical characteristics as shown on schedule. Motors shall be:
11A - Standard efficiency open type
11B - High efficiency - open type
11C - Premium efficiency open type
11D - Totally enclosed - standard efficiency
11E - 2-speed type open type standard efficiency

Wiring termination provide terminal lugs to match branch circuit conductor quantities, sizes and materials indicated. (Box per NFPA 70.)

Provide:
11F - Factory mounted starters and disconnects as shown on the schedule.

Provide:
11G - Factory mounted variable frequency drives.

Provide:
11H - Marine light in fan section on the drive side of the unit.
11J - Marine light with GFI receptacle in fan section on the drive side of the unit.
11K - Marine light in fan and all coil sections mounted on drive side.
11L - Marine light with GFI receptacle in fan and all coil sections mounted on drive side.

All lights are wired to a junction box and on-off switch on outside of the cabinet.

COIL SECTIONS - HEATING & COOLING

Section Reference: 24, 25, 26, 27, 28, 32, 34, 40, 41, 42 & 43

12. Unit mounted coils shall be provided with coil connections extending at least 5" beyond unit casing. Drain and vent connections shall be provided exterior to unit casing as well. All connections shall have factory sealing with grommets on interior and exterior and gasket sleeve between outer and inner walls, which minimizes air leakage and condensation inside the assembly. All coils shall be removable through side and/or top panels of unit without the need to remove or disassemble the coil section. All return bends and coil headers shall be fully inside the cabinet and cooling coil access shall be from;
12A - both sides of unit
12B - Connections side only
12C - Opposite connection side only for servicing or cleaning. Access to coils is not access between coils but to principle parts on each end of coils.

HEAT TRANSFER COILS - HEATING, COOLING & SENTRY GUARD DESIGNS

Section reference: 24, 25, 26, 27, 28, 32, 34, 40, 41, 42 & 43

13. All coils shall be either built with seamless copper tubes with plate style aluminum fins, copper headers and:
13A - Steel MPT connections (water or steam coils)
13B - Copper MPT connections (water or refrigerant sweat only)
13C - Red brass MPT connections (water or steam coils only).

Fins have full drawn collars and are continuous surface type. All tubes are mechanically expanded into the fins that creates a lifetime bond between primary and secondary surfaces. No bare tubes shall be visible between the fins. Seamless copper headers shall be provided and construction shall be such that tube sheet design does not cause stress with protruding tubes. Drain connections shall be located at the lowest point (water coils only). All coils tested at 315 pounds air pressure under warm water and suited for 250 PSIG working pressure. Coils shall be ARI certified and rated. All coils and connections sized per industry standards based on flow/mass or other requirements.

Refrigerant coils shall be designed for use with R-22 or R-134A and headers shall have sweat type connections located at bottom of coils for proper oil return. Coils are furnished with industry standard circuitry and distributors with leads and orifices sized for proper tonnage and suction temperatures.

Steam coils are tested at 315 pounds under warm water and are rated for 100 PSIG working pressure. All coils shall be pitched towards condensate return and orifice balance plates installed in supply header to properly diffuse steam to all tubes in coil.

All coils as designated on schedule shall have
13D - 5/8" OD copper tubes with .0075" thick aluminum fins and galvanized steel casings
13E - .025" wall copper tubes vs. standard wall
13F - .035" wall copper tubes vs. standard wall
13G - .010 thick aluminum fins vs. .0075" thick
13H - .0075" thick copper fins in lieu of .0075" thick aluminum fins
13J - Stainless steel casing in lieu of galvanized steel casings
13K - Steam coils shall be 1" OD steam distributing type in lieu of 5/8" OD steam distributing type
13L - All coils shall be coated with a six step epoxy coating after fabrication of coil.
13M - Coils shall be patented Sentry Guard burst resistant series and constructed with special freeze plugs on all return bends, tubes and headers. Special fittings shall be screw-on, screw-off design with easy to remove cap. Coils shall be supplied with a 30 month Limited Freeze Resistant Warranty and a 12 month Limited Material and Workmanship Warranty.

AIR FILTERS

Section Reference: 06, 07, 08, 11, 12, 13, 14, 36 & 37

14. All filter sections with filter racks and guides for side loading and filter media shall be UL 900 listed, either class I or Class II as required.

14A - Provide flat, angle or heavy duty filter section as required by filters specified and max.. velocity
14B - Provide filter section with hinged and latched access doors on drive side of unit
14C - Provide filter section (flat type) with 4" filters
14D - Provide bag filter section with side access
14E - Provide cartridge filter section with side access
14F - Bag or cartridge filter section with front loading vs side loading

Please specify dust spot efficiency (standard 2" @ 15%, 2" thick 30/30 throwaway @ 30%, 4" @ 30, bag or cartridge @ 60-65%, 80-85% or 90-95%) and media depth (panel @ 2" or 4" and bag @ 12", 15", 19", 22", 30", or 36" cartridge @ 4" or 12").

Options include:
14G - Microbial resistant intercept coating on all filters
14H - Dwyer Minihelic II (or equal) filter pressure drop instrument mounted and recessed in cabinet to minimize chance of loss or damage during shipment and installation. All bag or cartridge sections have bank of panel type prefilters included.

MIXING BOX & ECONOMIZER SECTIONS

Section reference: 05, 06, 07, 08 & 09

All mixing boxes, combination mixing boxes and economizer sections shall be provided with factory mounted low leak airfoil type outside and return air dampers that are fully gasketed and have continuous vinyl seals between damper blades. All dampers have stainless jamb seals and linkage and ABS plastic end caps provided with outside and return air dampers sized for full airflow.

Dampers leakage rate shall be less than two tenths of one percent at two inches pressure and tested and rated in accordance with AMCA standard 500.

ACCESS SECTIONS

Section reference: 21, 22 & 23.

Access sections provide space between system components and have easily removable panels and same standard construction as the remainder of unit. Provide sections lengths of:
15A - 16"
15B - 24"
15C - 30"
15D - 36"
15E - 42"
15F - 48"
15G - 54"

Access sections can be provided with
15H - Access doors, galvanized steel construction with gasket, latch and full size handle as standard.

Access section can also be provided with:
15J - Galvanized steel drain pan with microbial coating
15K - Stainless steel drain pan. Standard floor thickness is 18 Gauge galvanized steel.
15M - 16 Gauge galvanized steel
15N - 14 Gauge galvanized steel or .125" thick tread plate to accommodate walk in weight of maintenance personnel.

AUXILIARY SECTION

Section reference: 21, 22 & 23 (same as access)

Provide:

18A - Auxiliary section that is absent of any component and is to be used to mount items in the field. The auxiliary section shall be positioned where shown on drawings, and shall be constructed as the remainder of the unit.

Provide an optional:

18B - Access door on drive side of unit in lieu of removable panels.

DIFFUSER SECTION

Section reference: 33

Provide:

19A - Diffuser section downstream of supply fans as shown on drawings. Diffuser sections are used to provide uniform air distribution across downstream components like heating and cooling coils and high efficiency filters or both.

MULTIZONE DAMPERS

Section reference: 40, 41, 42 & 43

Provide zone dampers sections for vertical or horizontal discharge airflow as shown on drawings. Zone dampers are factory mounted in casing constructed of galvanized steel with steel blades and vinyl bulb edging. The low leak dampers have bronze end and side seals are locked into position to a common shaft with rotating ninety degree angles that require one actuator per zone provided. Damper rods rotate in nylon bearings.

20A - Provide vertical discharge arrangement
20B - Provide horizontal discharge arrangement

ROOFTOP CONSTRUCTION & APPLICATIONS

Section reference: All sections

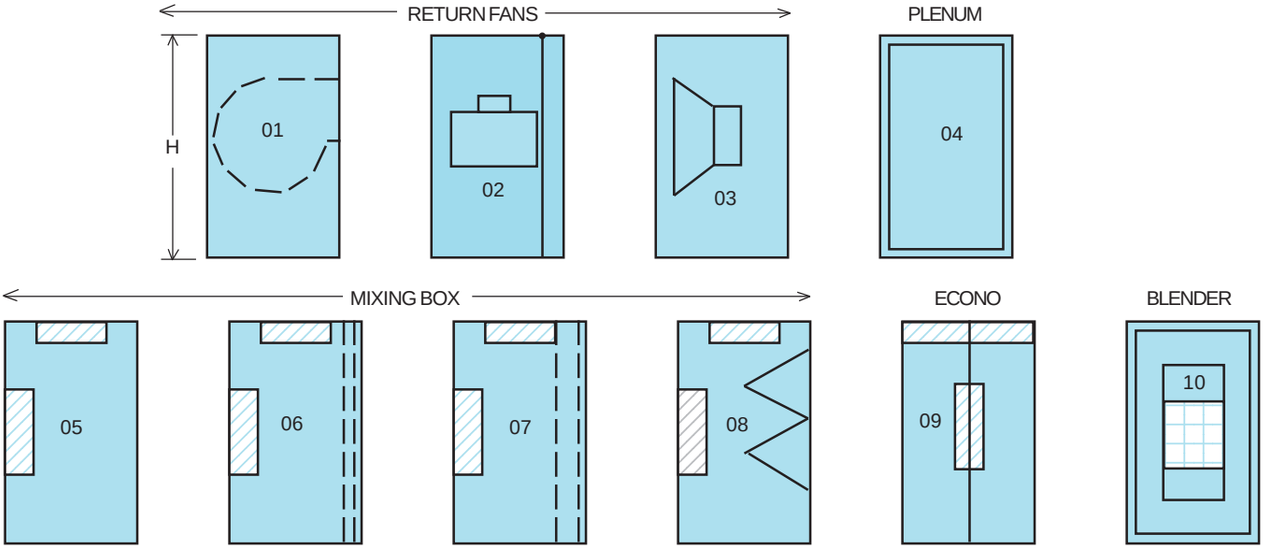
USA Coil & Air can provide units for rooftop steel or curb mounting with weatherized accessories, arrangements and components. Contact USA Coil & Air for specific applications.

Special Note

Please contact USA Coil & Air for sections and specifications not shown. USA can provide hundreds of options and arrangements. Specifications shown above can change and are not certified and are for estimating only.

Dimensional Tables

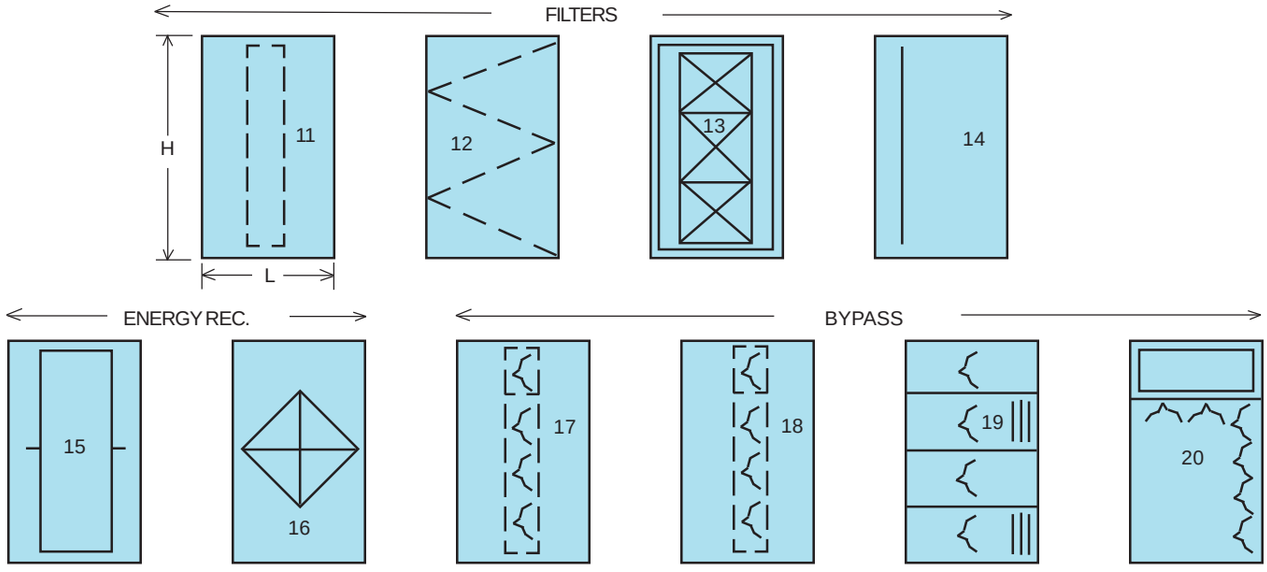
Unit Sections



SECTION DEPTH (WIDTH / HEIGHT - AT BOTTOM OF TABLE)																			
SECT #	DESCRIPTION	015	020	030	040	050	060	070	085	100	120	140	165	190	250	330	350	380	410
01	RETURN FAN CENTIFUGAL	32	32	32	40	42F 40A	46	46	46F 50A	52	60F 58A	60F 58A	60F 58A	74F 70A	82F 80A	92	92	92	92
02	RETURN FAN INLINE CENTR.	-	-	-	-	44 46	52 54	52 54	60 66	66 68	74 78	74 78	78 84	80 86	86	86	86	86	86
03	RETURN FAN PLENUM (BELT)	-	-	-	-	-	42 44	42 44	44 48	50 54	58 64	58 64	64 70	66 70	82 90	90 96	90 96	90 96	90 96
04	PLENUM INLET	14	16	16	18	20	22	22	24	28	30	30	32	32	38	42	42	44	46
05	MIXING BOX NO FILTERS	20	20	20	20	22	24	24	26	30	32	32	36	36	40	46	50	54	56
06	MIXING BOX 2" FILTERS	24	24	24	24	26	28	28	30	34	36	36	40	40	44	50	54	58	60
07	MIXING BOX 4" FILTERS	26	26	26	26	28	30	30	32	36	38	38	42	42	46	52	56	60	62
08	MIXING BOX 2" ANGULAR FILT.	42	42	42	42	44	46	46	48	52	54	54	58	58	62	68	72	76	78
09	ECONOMIZER OA-RA MIX	40	40	40	40	44	48	48	52	60	64	64	72	72	80	92	100	108	112
10	AIR BLENDER BLEND OA-RA	-	12	14	16	18	20	22	24	28	32	34	36	38	46	52	54	56	58
— WIDTH (W) —		38	40	52	58	64	66	74	80	82	86	98	102	116	120	136	136	136	136
— HEIGHT (H) —		26	30	30	34	36	42	42	46	52	60	60	66	68	80	92	98	104	110

Centrifugal Fan Section: A = Airfoil
F = Forward Curved

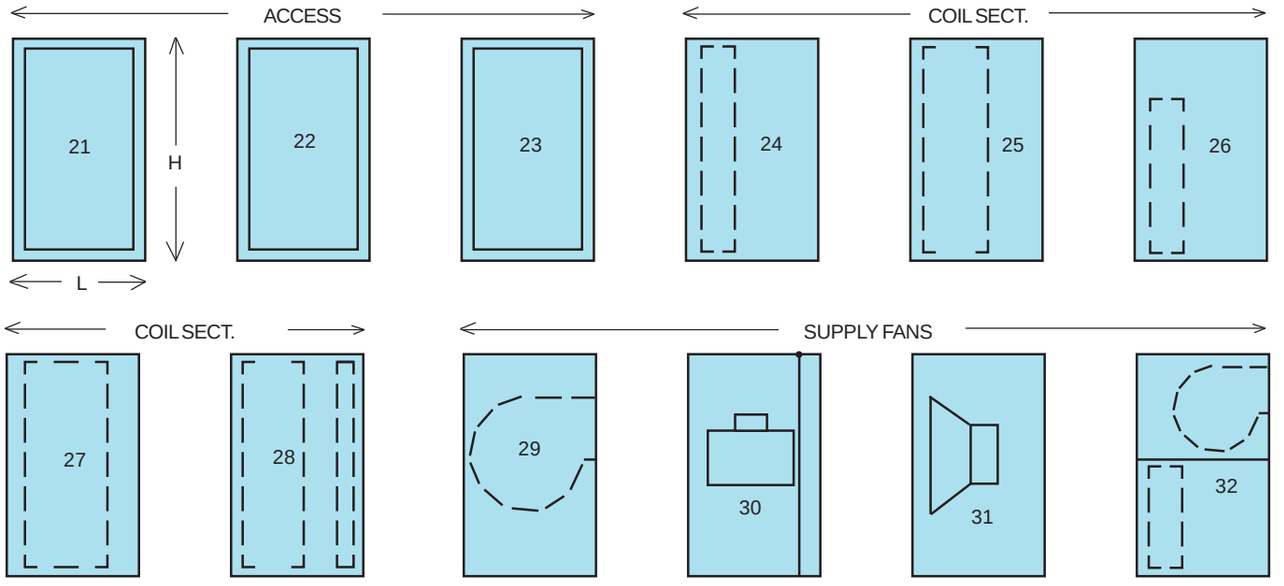
Dimensional Tables



SECTION DEPTH (WIDTH / HEIGHT - AT BOTTOM OF TABLE)																			
SECT #	DESCRIPTION	015	020	030	040	050	060	070	085	100	120	140	165	190	250	330	350	380	410
11	FLAT FILTER 2" OR 4" FILT.	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
12	ANG. FILTER 2" OR 4" FILT.	32 (2) -	30 (2) -	30 (2) -	30 (2) 32 (4)	30 (2) 32 (4)	30 (2) 32 (4)	30 (2) 32 (4)	30 (2) 32 (4)	30 (2) 32 (4)	32 (2) 32 (4)	32 (2) 32 (4)	32 (2) 32 (4)	32 (2) 32 (4)	32 (2) 32 (4)	32 (2) 32 (4)	32 (2) 32 (4)	32 (2) 32 (4)	32 (2) 32 (4)
13	CARTRIDGE FILTER (SIDELOAD)	14-24	14-24	14-24	14-24	14-24	14-24	14-24	14-24	14-24	14-24	14-24	14-24	14-24	14-24	14-24	14-24	14-24	14-24
14	BAG FILTER (SIDELOAD)	18-44	18-44	18-44	18-44	18-44	18-44	18-44	18-44	18-44	18-44	18-44	18-44	18-44	18-44	18-44	18-44	14-24	14-24
15	WHEEL ENERGY RECOVERY	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	18-44	18-44
16	AIR TO AIR ENERGY RECOVERY	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	18-44	18-44
17	FACE & BYPASS INTERNAL	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	CF	CF
18	FACE & BYPASS EXTERNAL	18 (36H)	18 (40H)	18 (40H)	20 (44H)	22 (48H)	24 (58H)	24 (58H)	26 (62H)	30 (74H)	32 (84H)	32 (84H)	34 (92H)	38 (94H)	44 (112H)	50 (128H)	54 (136H)	56 (146H)	58 (156H)
19	FACE & BYPASS HEAT - INTERNAL	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
20	FACE & BYPASS RIGHT ANGLE	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
— WIDTH (W) —		38	40	52	58	64	66	74	80	82	86	98	102	116	120	136	136	136	136
— HEIGHT (H) —		26	30	30	34	36	42	42	46	52	60	60	66	68	80	92	98	104	110

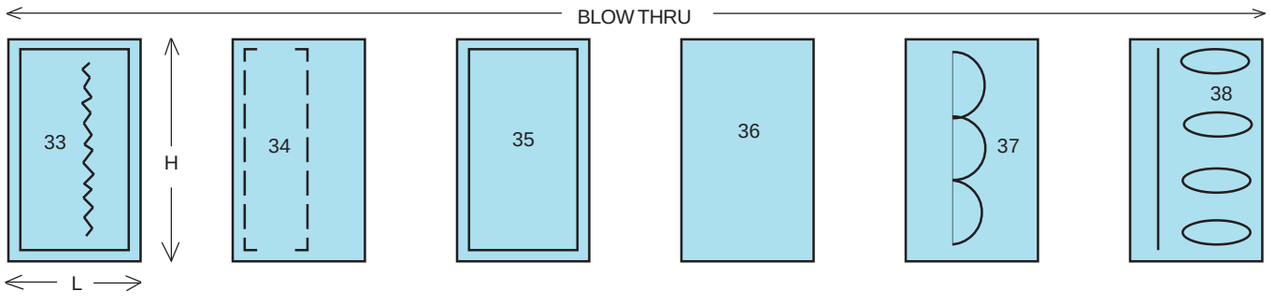
Dimensional Tables

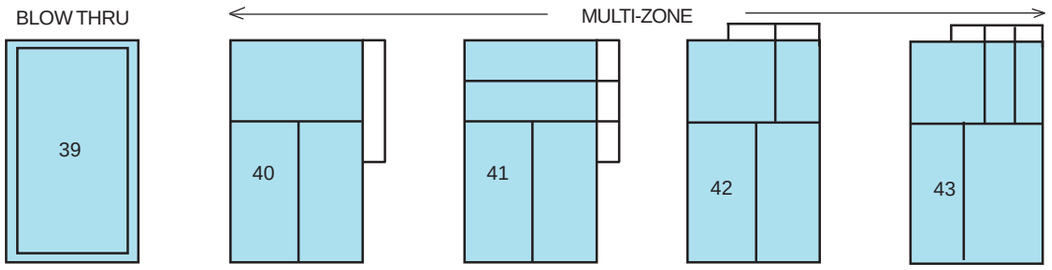
Unit Sections



SECTION DEPTH (WIDTH / HEIGHT - AT BOTTOM OF TABLE)																			
SECT #	DESCRIPTION	015	020	030	040	050	060	070	085	100	120	140	165	190	250	330	350	380	410
21	ACCESS LONG	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48
22	ACCESS STANDARD	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	48	48
23	ACCESS SHORT	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	36	36
24	COIL SECTION HORIZ - HEAT	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	36	36
25	COIL SECTION HORIZ - 4 ROW	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	24	24
26	COIL SECTION HORIZ - F & B	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	24	24
27	COIL SECTION HORIZ - 10 ROW	18-54	18-54	18-54	18-54	18-54	18-54	18-54	18-54	18-54	18-54	18-54	18-54	18-54	18-54	18-54	18-54	12	12
28	COIL SECTION COOL / HEAT	24-54	24-54	24-54	24-54	24-54	24-54	24-54	24-54	24-54	24-54	24-54	24-54	24-54	24-54	24-54	24-54	12	12
29	SUPPLY FAN CENTRIFUGAL	32	32	32	40	42F 40A	46	46	46F 50A	52	60F 58A	60F 58A	60F 58A	74F 70A	82F 80A	92	92	92	92
30	SUPPLY FAN INLINE CENTER	-	-	-	-	-	42 44	42 44	44 48	50 54	58 64	58 64	64 70	66 70	82 90	90 96	90 96	90 96	90 96
31	SUPPLY FAN PLENUM	-	-	-	-	44 46	52 54	52 54	60 66	66 68	74 78	74 78	78 84	80 86	86	86	86	86	86
32	SUPPLY FAN W/VERT. COIL.	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF	CF
— WIDTH (W) —		38	40	52	58	64	66	74	80	82	86	98	102	116	120	136	136	136	136
— HEIGHT (H) —		26	30	30	34	36	42	42	46	52	60	60	66	68	80	92	98	104	110

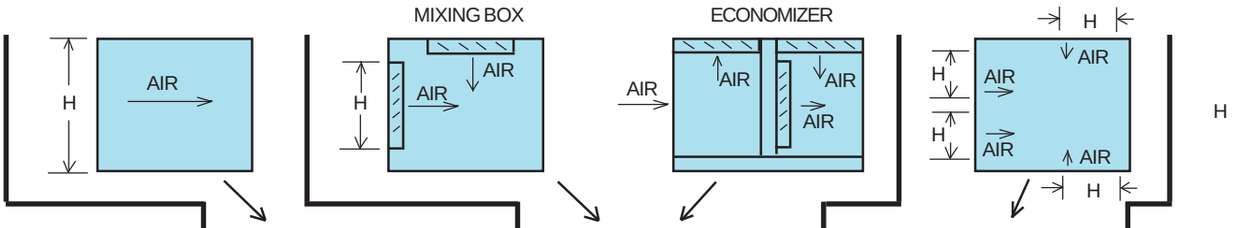
Dimensional Tables





SECTION DEPTH (WIDTH / HEIGHT - AT BOTTOM OF TABLE)																			
SECT #	DESCRIPTION	015	020	030	040	050	060	070	085	100	120	140	165	190	250	330	350	380	410
33	BLOW THRU DIFFUSER	10	10	10	12	12	16	16	16	16	24	24	24	30	30	30	30	30	30
34	BLOW-THRU COIL SECT.	SEE SECTIONS 24 THROUGH 28																	
35	BLOW THRU ACCESS	SEE SECTIONS 21 THROUGH 23																	
36	BLOW THRU CARTRIDGE FILT.	SEE SECTION 13																	
37	BLOW THRU BAG FILTER	SEE SECTION 14																	
38	BLOW THRU SOUND ATTEN.	40-64	40-64	40-64	40-64	40-64	40-64	40-64	40-64	40-64	40-64	40-64	40-64	40-64	40-64	40-64	40-64	40-64	40-64
39	BLOW THRU DISCH. PLENUM	14	16	16	18	20	22	22	24	28	30	30	32	32	38	42	42	44	46
40	MULTI-ZONE 2 DECK-HORIZ.	-	-	40 52H	42 58H	42 60H	52 70H	52 70H	54 76H	56 84H	60 96H	60 96H	70 106H	70 108H	76 126H	88 144H	-	-	-
41	MULTI-ZONE 3 DECK-HORIZ.	-	-	40 64H	42 70H	42 72H	52 84H	52 84H	54 92H	56 102H	60 116H	60 116H	70 128H	70 130H	-	-	-	-	-
42	MULTI-ZONE 2 DECK-VERT.	-	-	46 48H	48 54H	48 56H	58 66H	58 66H	60 72H	62 80H	72 92H	72 92H	82 102H	82 102H	94 122H	-	-	-	-
43	MULTI-ZONE 3 DECK-VERT.	-	-	50 58H	54 64H	54 66H	64 76H	64 76H	70 82H	76 90H	86 102H	86 102H	96 112H	96 112H	-	-	-	-	-
— WIDTH (W) —		38	40	52	58	64	66	74	80	82	86	98	102	116	120	136	136	136	136
— HEIGHT (H) —		26	30	30	34	36	42	42	46	52	60	60	66	68	80	92	98	104	110

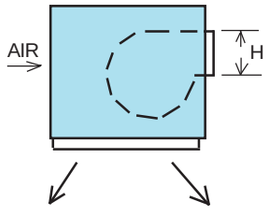
Inlet Opening Dimensions - Standard Units

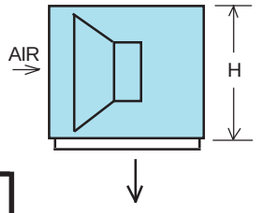


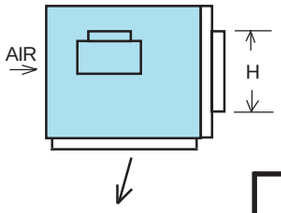
UNIT SIZE	STANDARD SECTIONOUTSIDE INLET DIMENSION		MIXING BOX/ECONOMIZER OUTSIDE DAMPER INLET DIMENSION		RETUIRN PLENUM	
	WIDTH "W"	HEIGHT "H"	WIDTH "W"	HEIGHT "H"	WIDTH "W"	HEIGHT "H"
015	38	26	34	16	34	10
020	40	30	36	16	36	12
030	52	30	48	16	48	12
040	58	34	54	16	54	14
050	64	36	60	18	60	16
060	66	42	62	20	62	18
070	74	42	70	20	70	18
085	80	46	76	22	76	20
100	82	52	78	26	78	24
120	86	60	82	28	82	26
140	98	60	94	28	94	26
165	102	66	98	32	98	28
190	116	68	112	32	112	28
250	120	80	116	36	116	34
330	136	92	132	42	132	38
350	136	98	132	46	132	38
380	136	104	132	50	132	40
410	136	110	132	52	132	42

- Standard section inlet dimensions include all sections except mixing boxes, economizers and return plenums.
- Standard sections include opening and face mounting flange.
- Mixing box & economizer damper opening include face mounting flange.
- Return plenums have six different inlet positions (top, bottom, front top, front bottom, drive side or opposite drive side. Openings include 1” face flange.

Outlet Opening Dimensions - Standard Units



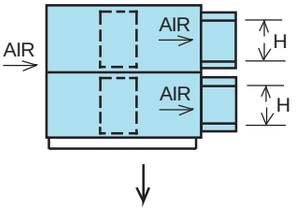


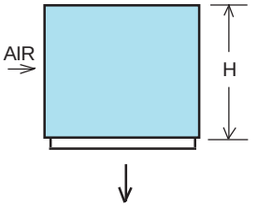


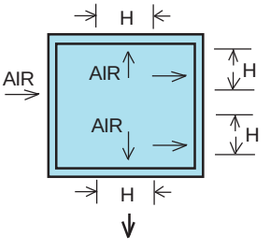
UNIT SIZE	FORWARD CURVED CENTIFUGAL		AIRFOIL CENTIFUGAL		PLENUM BELT DRIVE PLENUM DIRECT DRIVE		INLINE FAN	
	WIDTH "W"	HEIGHT "H"	WIDTH "W"	HEIGHT "H"	WIDTH "W"	HEIGHT "H"	WIDTH "W"	HEIGHT "H"
015	7.61 9.99	11.05 11.05	—	—	—	—	—	—
020	12.61	11.05	—	—	—	—	—	—
030	9.99 12.60 13.92	11.05 11.05 12.18	—	—	—	—	—	—
040	16.42	14.24	19.94	16.68	—	—	—	—
050	19.42	16.68	19.94	16.68	64	36	—	—
060	22.68	19.68	24.31	22.37	66	42	25.80 27.80	27.80 29.80
070	22.68	19.68	24.31	22.37	74	42	15.80 27.80	27.80 29.80
085	22.68	19.68	29.70	24.13	80	46	27.80 31.80	29.80 31.80
100	28.98	27.27	32.45	27.27	82	52	35.80	33.80 35.80
120	35.45	32.51	35.95	29.51	86	60	39.80 43.80	41.80 43.80
140	35.45	32.51	35.95	29.51	98	60	39.80 43.80	41.80 43.80
165	35.45	32.51	35.95	29.51	102	66	43.80 47.80	43.80 47.80
190	35.05	35.05	39.11	29.43	116	68	43.80 47.80	43.80 49.80
250	43.55	43.74	47.99	35.74	120	80	57.80 63.80	57.80 63.80
330	58.30	43.36	58.30	43.36	136	92	63.80 69.80	63.80 69.80
350	58.30	43.36	58.30	43.36	136	98	63.80 69.80	63.80 69.80
380	58.30	43.36	58.30	43.36	136	104	63.80 69.80	63.80 69.80
410	58.30	43.36	58.30	43.36	136	104	63.80 69.80	63.80 69.80

Forward curved, airfoil and inline fan discharge are duct collar w/1” flange.
Plenum belt & direct drive fan discharge are outside section opening including face mounting flange.

Outlet Opening Dimensions - Standard Units







UNIT	MULTIZONE DISCHARGE EACH ZONE SECTION			STANDARD SECTION (*OUTSIDE DIMENSIONS)		DISCHARGE PLENUM (*OUTSIDE DIMENSIONS)	
	WIDTH	HEIGHT	MAX ZONES	WIDTH	HEIGHT	WIDTH	HEIGHT
015	—	—		38	26	34	10
020	—	—		40	30	36	12
030	40.6	12	5	52	30	48	12
040	48.6	14	6	58	34	54	14
050	56.6	14	7	64	36	60	16
060	56.6	18	7	66	42	62	18
070	64.6	18	8	74	42	70	18
085	72.6	20	9	80	46	76	20
100	72.6	22	9	82	52	78	24
120	72.6	26	9	86	60	82	26
140	88.6	26	11	98	60	94	26
165	88.6	30	11	102	66	98	28
190	104.6	30	13	116	68	112	28
250	112.6	36	14	120	80	116	34
330	128.6	42	16	136	92	132	38
350	—	—		136	98	132	38
380	—	—		136	104	132	40
410	—	—		136	110	132	42

MULTIZONE
Horizontal Discharge - 2 deck multizone available sizes 030 - 330 only
Vertical Discharge - 2 deck multizone available sizes 030 - 330 only
Horizontal Discharge - 3 deck multizone available sizes 030 - 190 only
Vertical Discharge - 3 deck multizone available sizes 030 - 190 only

* Outside dimensions include mounting flanges (face) type

Basic Warranty

USA Coil & Air Standard Material & Workmanship 1 Year Warranty

Basic Warranty - Material and Workmanship

Seller warrants, to the original buyer only, that any equipment manufactured by it will be free of defects in material and workmanship, under normal use and service, for one year from date of shipment. Seller's obligation under this warranty shall be strictly and exclusively limited to repairing or replacing parts and materials, free of charge, f.o.b. our plant, which, in seller's judgement are defective. Seller can't control the environment nor the manner in which the equipment is used; therefore this warranty does not cover corrosion of equipment during use, or deterioration caused by conditions of use, or that applications of finishes supplied by others is sufficient, or that finishes applied are suitable for the Buyer's environment. Seller assumes no responsibility for reimbursing repair or replacement expenses incurred without its prior written authorization.

Buyer shall be responsible for all labor costs incurred in connection with such repair or replacement at installation site. Buyer shall also be responsible for all costs in removing, packing and shipping defective equipment back to seller. Seller shall be responsible for freight charges back to its factory and Buyer shall use the Seller's designated means to transportation. It is the total responsibility of the Buyer to send back equipment samples quickly (it requested by Seller) to determine possible warranty claims.

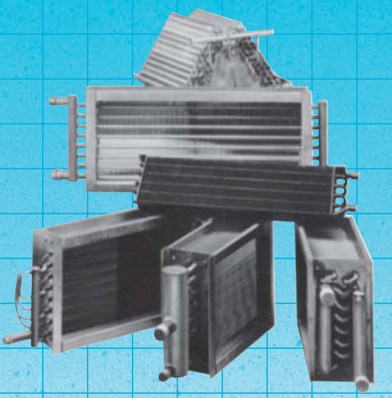
Disclaimer of Warranties and Limitation of Remedies
Seller makes no other warranties, expressed or implied with regard to goods and services provided by seller other than those set forth herein. Any implied warranty of merchantability or fitness for a particular purpose of buyer which exceeds the foregoing warranty is hereby disclaimed by Seller.

Seller will not be liable for any direct or indirect consequential or incidental damages, losses or expenses, including, but not limited to; commercial losses, business interruption, or damages resulting to property other than that which is the subject of the sales transaction, nor shall Seller be liable for any personal injuries arising in connection with the sale, resale of operation of its goods or ability of the buyer to use the goods of Seller for any reason whatsoever.

Limitation of remedy here stated shall apply to ALL warranties arising out of the sale here subject. It is understood between the parties that damage to the contents of the product herein vended, ineffectiveness of the product, or other unintended consequences may result because of many factors including the manner of use of application of the product, all of which are beyond the control of Seller. All such risks shall be assumed by the Buyer. Seller's maximum liability shall not, in any case, exceed the price of the goods claimed to be defective. Seller will not be liable for the infringement of any patents by the Buyer's use of any materials delivered herein.

No promise, representation or affirmation of fact, written or oral, of the Seller or its agent or employees, other than as stated herein, shall constitute a warranty of seller or give rise of any liability or other obligation of Seller, unless specifically agreed to in writing by Seller.

HVAC and Industrial Coils
Fast shipment on all types of HVAC Coils to include: steam, hot water, chilled water, DX, and condenser replacement for any existing coil available in 5 or 10 work days.

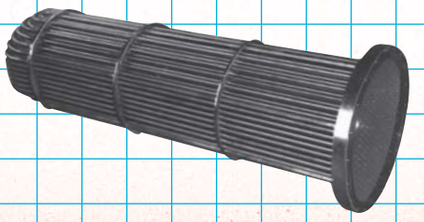


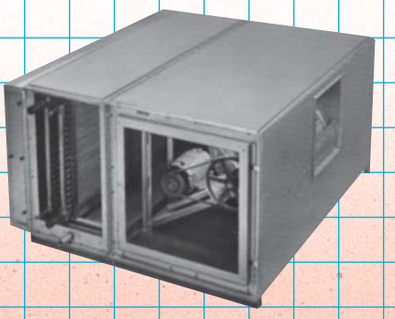
Stock Cooling and Heating Coils
Immediate shipment of Chilled Water and DX Cooling Coils for Vertical or Horizontal Airflow. Also available are 1 row and 2 row Flanged Hot Water/Steam Coils from 6 x 12 to 30 x 60.

Chillers and Water Cooled Condensers
Immediate shipment of chillers (7½ to 150 ton) and Water Cooled Condensers (5 to 150 ton). Replacements and special configurations and construction available.

USA Coil & Air.
An outstanding product line *plus*, service, availability and quality.

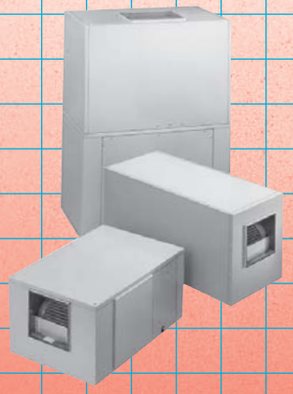
Replacement Tube Bundles and Heat Exchangers
5 and 10 working day shipments available for most U-Tube and Straight-Tube bundles constructed of copper. Cupronickel, carbon steel, brass and stainless steel also available.





Central Station Air Handling Units
Fast shipment on a complete line of Horizontal and Vertical Units. Cooling up to 38,000 CFM and heating up to 60,000 CFM. Options include forward curved or airfoil fans, variable inlet vanes, special coils, filter sections and mixing box also are available.

Represented by:



Belt Drive Fan-Coil Units
Immediate shipment available on nominal 2 ton to 20 ton Horizontal or Vertical Units for either Chilled Water or Refrigerant Cooling. Options include hot water or steam heating, mixing box and discharge grills.