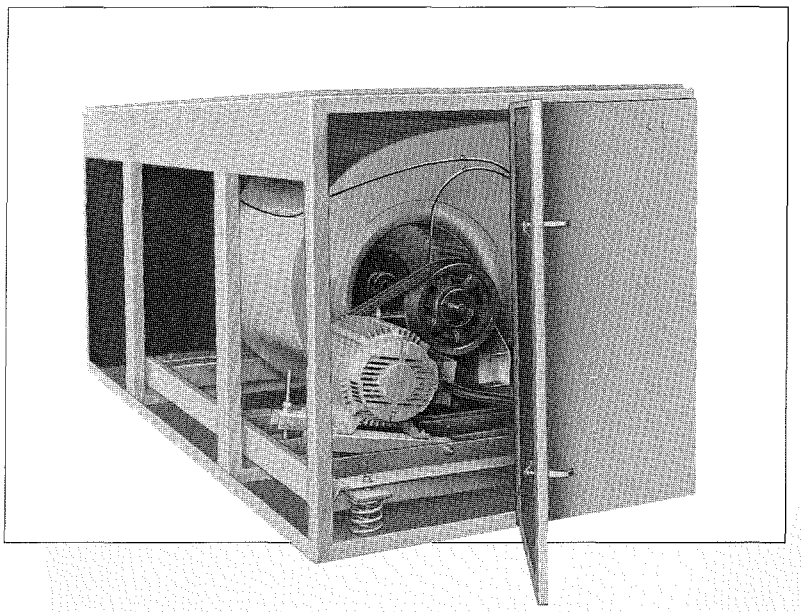
Catalog 500-9



Central Station Air Handlers

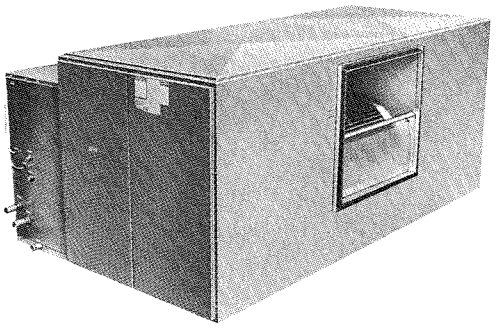
ARI CERTIFICATION OF THIS UNIT DOES NOT INCLUDE CERTIFICATION OF THE INSTALLED COIL. COIL PERFORMANCE MAY BE ARI CERTIFIED SEPARATELY.

McQUAY OFFERS ARI CERTIFIED COILS FOR ITS CENTRAL STATION AIR HANDLERS

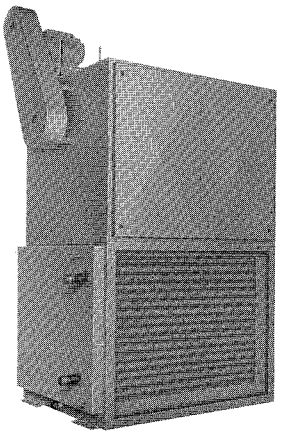
McQuay
SnyderGeneral

SEASONMASTER draw-through Central station air conditioning units

LSL Horizontal Unit



LSL Vertical Unit



Type LSL Low Pressure Units

- 15 horizontal, 13 vertical unit sizes.
- 700 cfm to 50,000 cfm.
- 1.8 sq. ft. to 70.4 sq. ft. coil face area.
- Total static pressure up to 3.5″ W.G.
- Internally mounted motors for unit sizes having 14 sq. ft. and over coil face area.
- Selection of fan wheel sizes and types for all units.
- Optional inlet vane control for forward curved or airfoil fans.
- ARI certified.

Type MSL Medium Pressure Units

- 13 horizontal and 10 vertical unit sizes.
- 2,000 cfm to 60,000 cfm.
- 5.9 sq. ft to 96.8 sq. ft. coil face area.
- Total static pressure up to 6.5″ W.G.
- Internally mounted motors for unit sizes having 14 sq. ft. and over coil face area.
- Selection of fan wheel sizes for all units.
- Optional inlet vane control for forward curved or airfoil fans.
- ARI certified.

Type HSH High Pressure Units

- 7 horizontal unit sizes.
- 5,000 cfm to 41,000 cfm.
- 13.4 sq. ft. to 62.8 sq. ft. coil face area.
- Total static pressure up to 9.0″ W.G.
- Optional inlet vane control for airfoil fans.
- ARI certified.

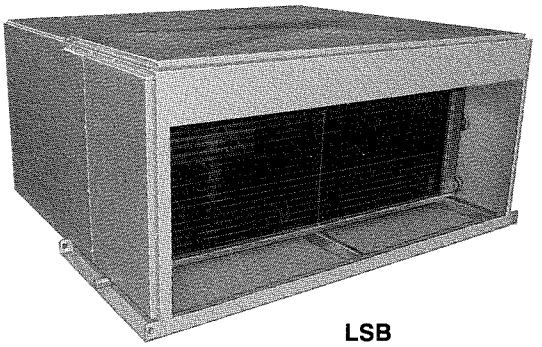
McQuay has the complete air handler line to meet your exact building design requirements.

(9/90)

SEASONMASTER blow-through Central station air conditioning units

Type LSB & MSB Singlezone Units

- 13 LSB low pressure and 12 MSB medium pressure unit sizes
- 1,800 cfm to 50,000 cfm
- 3.9 sq. ft. to 70.4 sq. ft. coil face area
- Total static pressure up to 3.5″ W.G. (LSB) and 6.5″ W.G. (MSB).
- Vertical or horizontal discharge, horizontal or inverted intake.
- Optional perforated or solid liners for coil or diffuser section.
- Internally mounted motors for unit sizes having 14 sq. ft. and over coil face area.
- Selection of fan wheel sizes and types for all units.
- Optional inlet vane control for forward curved or airfoil fans.
- ARI certified.

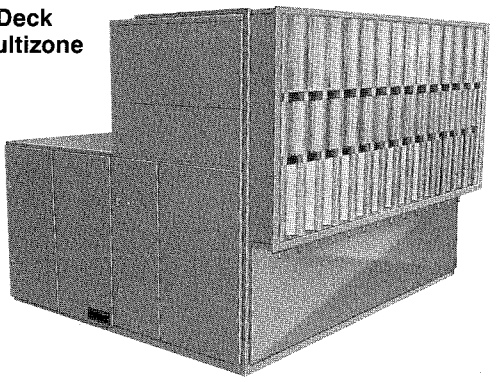


LSB
Blow-through
Singlezone

Type LML & MMM Multizone Units

- 13 LML low pressure and 12 MMM medium pressure unit sizes.
- 1,800 cfm to 50,000 cfm.
- 3.9 sq. ft. to 70.4 sq. ft. coil face area.
- Total static pressure up to 3.5″ W.G. (LML) and 6.5″ W.G. (MMM).
- Two or three deck configurations with or without zone dampers.
- Vertical or horizontal discharge, horizontal or inverted intake.
- Optional perforated or solid liners for coil or diffuser section.
- Internally mounted motors for unit sizes having 14 sq. ft. and over coil face area.
- Selection of fan wheel sizes and types for all units.
- Optional inlet vane control for forward curved or airfoil fans.
- ARI certified.

LML
3-Deck
Multizone



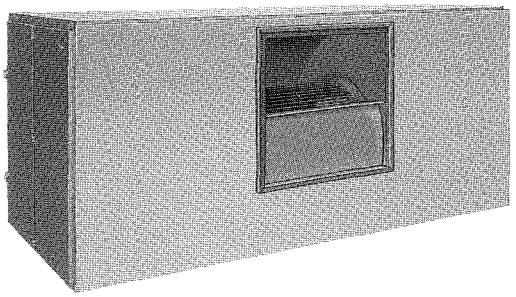
Type HMH High Pressure Multizone

- 7 units sizes.
- 5,000 cfm to 41,000 cfm.
- 13.4 sq. ft to 62.8 sq. ft. coil face area.
- Total static pressure up to 9.0″ W.G.
- Vertical or horizontal discharge, horizontal or inverted intake.
- Optional inlet vane control for airfoil fans.
- ARI certified.

Contents

SEASONVENT
Heating and ventilating units

LYF Horizontal Ventilating Unit



Type LYF Ventilating & LHD Heating Units

- 15 horizontal, 11 vertical and 11 inverted unit sizes.
- 700 cfm to 56,000 cfm.
- 1.8 sq. ft. to 62.8 sq. ft. coil face area.
- Total static pressure up to 3.5" W.G.
- Optional condenser/reclaim coil section.
- Internally mounted motors for larger unit sizes.
- Selection of fan wheel sizes and types for all units.
- Optional inlet vane control for forward curved or airfoil fans.
- ARI certified.

ARI certification

ARI CERTIFICATION OF THIS UNIT DOES NOT INCLUDE CERTIFICATION OF THE INSTALLED COIL. COIL PERFORMANCE MAY BE ARI CERTIFIED SEPARATELY.

McQUAY OFFERS ARI CERTIFIED COILS FOR ITS CENTRAL STATION AIR HANDLERS.

McQuay's air handlers are tested and rated in accordance with Air Conditioning and Refrigeration Institute (ARI) Standard 430 and certified in accordance with the ARI Certification Program. McQuay air handler coils are certified under ARI Standard 410, a separate performance certification program.

To obtain ARI certification of performance ratings, it is first necessary to have the testing facilities reviewed for proper instrumentation, control and accuracy of test data.

An air handler is then submitted to an ARI approved independent testing facility for comparative tests. ARI then approves the air handler manufacturer's testing facilities. After the testing facilities are approved, the air handler is tested over a wide range of operating conditions. All rating data is then reviewed by ARI engineers for accuracy and confirmation that procedures established by ARI have been followed. Periodic check tests of production air handlers by ARI on a random basis assures compliance with ARI standards.

Nomenclature

L SB - 1 14 - E I

BLOWER SECTION PRESSURE CLASS
- L = Low
- M = Medium
- H = High

COIL SECTION TYPE & PRESSURE CLASS
- YF = No coil section
- HD = Heating coil section
- SL = Draw-through, singlezone, low pressure
- SH = Draw-through, singlezone, high pressure
- SB = Blow through, singlezone, low & medium pressure
- ML = Blow-through, multizone, low pressure
- MM = Blow-through, multizone, medium pressure
- MH = Blow-through, multizone, high pressure

NUMBER OF FANS

NOMINAL COIL FACE AREA (Sq.Ft.)

UNIT VINTAGE

UNIT ARRANGEMENT
- H = Horizontal
- V = Vertical
- I = Inverted

A complete line of accessories for maximum flexibility

Filter options

To address indoor air quality concerns, McQuay offers a complete line of air handling filter optons. Filter sections are available to house throwaway, pleated, cleanable, high velocity, rigid, bag, HEPA and roll filter media. Each section is compactly designed with a maximum filter area for proper air cleaning over the full range of unit air volume. Quick opening access doors on both ends of the filter sections simplify servicing.

Combination angular filter and mixing box

Ideal for installations where equipment space is at a premium, this compact section combines the advantages of an angular filter section and a mixing box. Standard sized 2-inch thick filters are accessible from either end through hinged and latched access doors.

This accessory provides a simplified means of introducing and accurately modulating any desired ratio or recirculated and fresh air. The interconnected parallel acting blades are positioned so as to direct the two airstreams into a merging pattern to assist in mixing. Stratification is thereby minimized, assuring reduced danger of coil freeze-up.

The entire assembly is of heavy-gauge galvanized steel construction with the damper rods rotating in low friction nylon bushings for trouble-free operation. Damper sections are generously flanged for easy duct connections and are available with any single or combination of top, bottom or back openings.

All McQuay mixing boxes and combination angular filter/mixing boxes are provided with low leak dampers as standard. These dampers are tested in accordance with the Air Moving and Control Association (AMCA) Standard 500-83 to have a leakage rate of less then two-tenths of one percent leakage at two inches total static pressure differential.

Electric heat sections

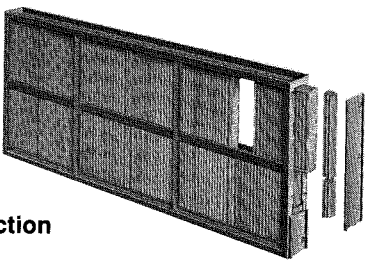
Electric heaters are available for either blow-through or draw-through units. They can be located in a preheat or reheat position and are available with either remote or built-in control systems. Our electric heaters are open coil type, standard with 80% nickel and 20% chromium wire, and have been derated to insure maximum life. See Catalog 530 for full details.

Face and bypass dampers

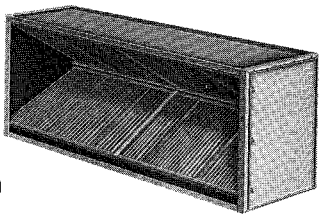
The face and bypass damper section offers modulation for temperature control. The opposed blades meter varying air volumes through the coil and bypass to attain the final air temperature demanded.

Two styles of face and bypass sections are available. Internal bypass is available for use with small face area coils and external bypass is used when larger face area coils are required. The external bypass duct is fully insulated with 1-inch neoprene coated glass fiber insulation and is sized to handle 100% air bypass with an air pressure drop approximately equal to that of a 10-fin, 4-row coil with "C" wetness.

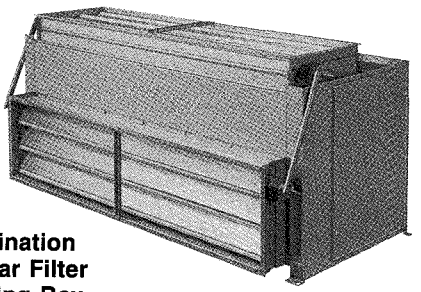
The damper section and blades are fabricated of continuous galvanized steel with the damper rods rotating in nylon bushings. Damper shaft extensions are supplied on both ends to facilitate damper motor location.



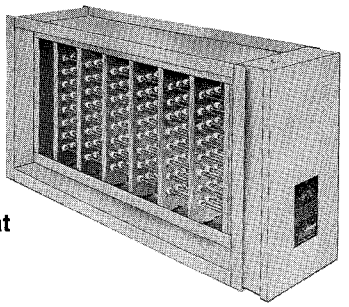
Flat Filter Section



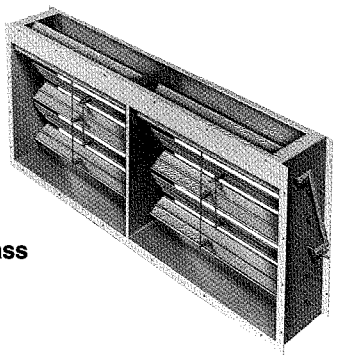
Angular Filter Section



Combination Angular Filter & Mixing Box

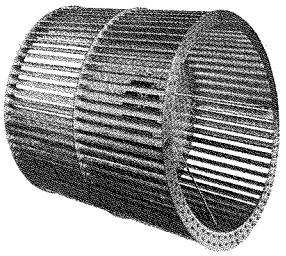


Electric Heat

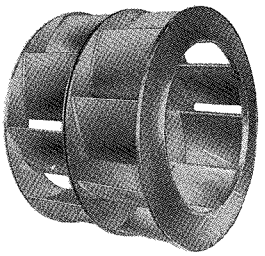


Face & Bypass

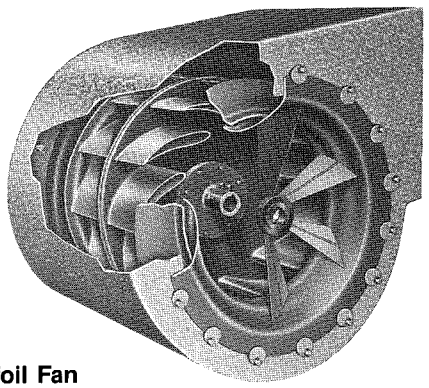
Design features for energy economy and long life



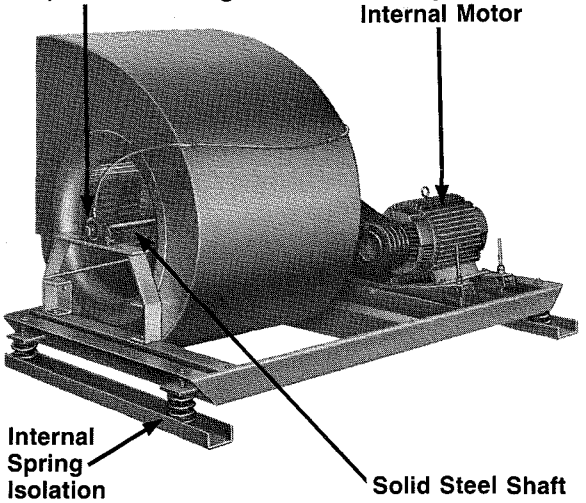
Forward Curved Fan



Airfoil Fan



Airfoil Fan
With Inlet Vanes



Fan wheels

As today's energy costs continue to spiral upward, it is becoming increasingly more important to maximize air handling system efficiency. McQuay has met this challenge by offering a combination of up to six different fan wheel diameters and types in today's most commonly used air handler sizes. For McQuay, this means the low and medium pressure unit sizes 114 through 172. This flexibility allows you the ability to select the most efficient fan for the system, whether it be Class I forward curved, Class II forward curved, or airfoil wheel.

Forward curved fan wheels are standard on all low and medium pressure units except the MSL-190. Airfoil wheels are optional on all low and medium pressure units, sizes 106 through 172 and the MSL-190. All high pressure units utilize airfoil wheels as standard. All fan wheels are dynamically balanced and the entire fan section is again trim balanced after assembly to assure smooth operation.

Air volume control

In order to meet the needs of an ever growing variable air volume market, McQuay offers two different methods of fan volume modulation.

Inlet guide vanes are available for use with forward curved fans on unit sizes 106 through 134 and airfoil fans on unit sizes 114 through 190. Units equipped with variable inlet vanes include heavy-duty linkage for easy installation of field supplied vane actuator motor.

Discharge dampers are available for use with forward curved fans. Discharge dampers are shipped separately for field installation at least three fan diameters downstream for minimized noise and air turbulence. Discharge dampers have opposed blades in a vertical configuration closely matched to the fan outlet area.

Internal isolation

Internal isolation is now available as a standard option on the most popular of the air handling units, sizes 114 through 172 low and medium pressure. McQuay's internal isolation option reduces both installation time and installed cost. For the engineer, it means less time spent selecting and sizing vibration isolators for each air handling unit on the job. For the contractor, it not only eliminates the need for vibration eliminators on the coil piping and flex connections on the ductwork, but also eliminates the problems associated with jobsite coordination needed to get the correct isolator under the specific corner of the right unit at the time needed. Internal isolation assures the owner that the proper isolator selection has been made. The use of 2-inch deflection spring isolators means smooth vibration-free air handler operation.

Factory installed internally mounted motor

All McQuay low and medium pressure central station air handling units (sizes 114 through 172) have factory installed, internally mounted motors and drives. This means that expensive jobsite coordination and field mounting of motors has been eliminated.

Motor life is increased with the McQuay air handling units since the motor is operating in an environment of cooled, dehumidified filters air. And since the only heat gain with an internally mounted motor and drive is due to motor inefficiency and drive losses, there is seldom a need for an increase in cooling capacity and never a need for an increase in heating capacity.

Heavy-duty galvanized construction

McQuay air handler fan sections are designed using proven structural principles. Heavy-gauge channel and angle members are located and welded together to support the rotating assembly and motor, transmitting their static and dynamic forces directly to the base. All frame members are sized for the highest speeds, pressures and weights encountered. All channels, angles, and panels are fabricated of continuous galvanized steel.

Solid steel shafting

All fan shafts are of uniform diameter, ground and polished, solid steel and coated with rust inhibitor. Shaft sizes are selected to insure maximum operating speeds well below the first critical speed.

200,000 hour bearings

Trouble-free service and minimum noise level is the quality specification for selection of bearings used on McQuay air handlers. Rigidly supported on heavy-gauge structural frame members and located for proper balance, the bearings are sized for a minimum average life rating of 200,000 hours. Bearings are self-aligning type and are prelubricated for immediate service. Extended lubrication lines with external grease fittings are standard equipment, assuring ease of service.

Cooling coil sections

To assure maximum flexibility, McQuay offers three standard face area coils — small, large and extra large — on low and medium pressure units, thereby permitting the selection of the most economical heat transfer surface.

Draw-through units will accommodate combinations of preheat, cooling and reheat coils with a maximum of an 8-row cooling coil and a 2-row heating coil or a 6-row cooling coil and two 1- or 2-row heating coils.

Blow-through singlezone units will also accommodate a maximum of an 8-row cooling coil and 2-row heating coil or a 6-row cooling coil and two 1- or 2-row heating coils. Blow-through multizone units will accommodate an 8-row cooling coil and a 4-row heating coil, and feature a factory installed balancing plate to assure equal air distribution over the hot, cold (and bypass) decks.

For applications where a cooling coil is required with fan supplied by others, or where additional coil sections are desired, McQuay offers stand-alone type LSC coil sections. The LSC coil section is identical in design and construction to LSL/MSL 103—172 cooling/heating coil sections.

Heating coil sections

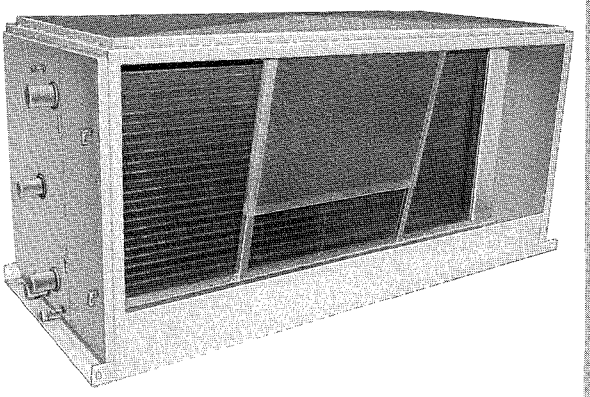
McQuay offers a separate coil section for preheat or reheat applications. The section is available with large or small face area coils. This coil section is standard on type LHD SEASON-VENT heating and ventilating units. Separate heating coil sections are available in two configurations to accommodate 1- and 2-row coils or 3- and 4-row heating coils.

Double drain pan

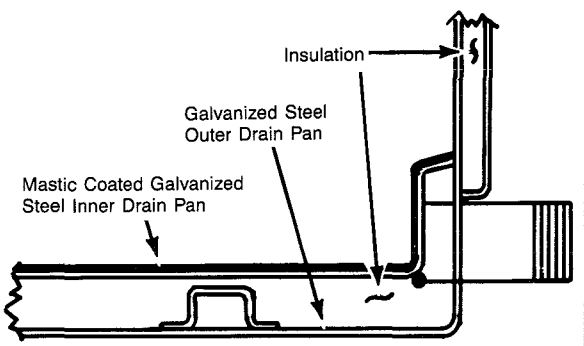
All McQuay draw-through as well as low and medium pressure blow-through units have a double drain pan as standard. Heavy-gauge continuous galvanized steel inner and outer pans provide positive protection against damage to the insulation during installation, servicing or inspection. The drain pan is fully sized to receive and rapidly remove all condensate and is thermally isolated from the exterior of the unit by a full inch of insulation to insure positive protection against sweating in this most critical area. The inner drain pan is mastic coated for added protection against corrosion. High pressure blow-through units have a single drain pan with ½" closed cell polyurethane board oversprayed and sealed with mastic.

Draw-through Cooling Coil Section

Blow-through Singlezone Coil Section



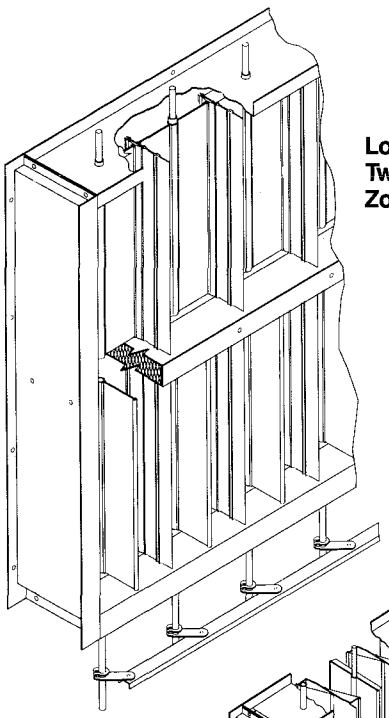
Double Drain Pan



Low Leak
Mixing Box Dampers

Ultra-Seal™ mixing box dampers

Ultra-Seal low leak dampers are standard for all McQuay mixing boxes and combination filter/mixing boxes equipped with dampers. Ultra-Seal maximizes energy savings by providing the lowest mixing box damper leakage rate in the industry (0.2% leakage at 4.0″ W.G. static pressure and 1,100 fpm face velocity through the companion set of dampers). Dual durometer gasketing and stainless steel end seals provide this impressive leakage rate. The hollow core airfoil blade design offers low air friction and improved insulating capability. A patented blade linkage results in smooth operation allowing a single 50 inch-pound actuator to handle up to 70 sq. ft. of damper blade.



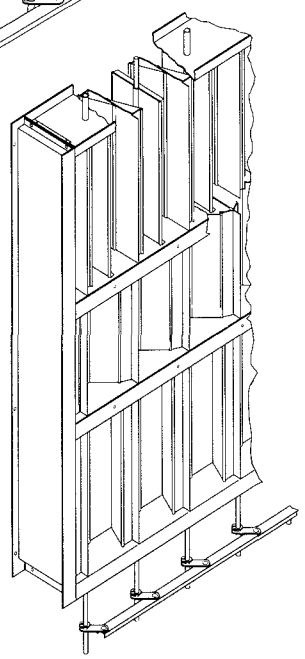
Low Leak
Two-Deck
Zone Dampers

Ultra-Seal™ zone dampers

McQuay low and medium pressure multizone air handlers feature low leak zone dampers as standard. The low leak design features extruded aluminum blades with bronze side seals and end seals on hot and cold decks to maintain energy efficiency throughout the operating life of the air handler.

Damper blades are parallel acting within individual partitions to provide smooth, accurate control. Hot, cold and bypass dampers are locked in position on a common damper rod rotating in bronze bushings. On three-deck units the dampers rotate through full heating, heating/bypass, full bypass, bypass/cooling and full cooling through a rotation angle of 90 degrees. This unique design requires only one actuator motor to operate the dampers for all three decks of each zone. Two-deck unit zone dampers are similar.

All dampers are interconnected externally with a single rod to permit easy on-the-job zoning. Duct-to-damper connections are simplified due to wide duct flanges and duct clips at the zone partitions.



Low Leak
Three-Deck
Zone Dampers

Evaporative coolers

Evaporative cooling satisfies cooling and humidification requirements in many commercial and industrial applications. Evaporative cooling sections are available for all but the three smallest McQuay air handler sizes. Water is distributed to the media bank through two rows of upflow orifices discharging into a hemispherical water deflector. A distribution pad evenly distributes water across the full media width. Self cleaning action of the media helps maintain a pressure drop of less than 0.6″ W.G. by flushing potential mineral and dust accumulation out of the system.

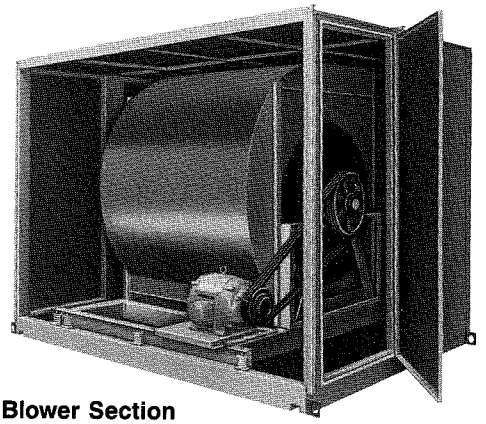
Two water supply arrangements are available. A non-recirculating arrangement operates directly from a line water supply. The water control assembly includes two pressure gauges, a control valve and strainer. The recirculating arrangement incudes a circulation pump and motor in addition to the basic control package. Humidity and temperature controls are also available.

Excellent surface characteristics for evaporative cooling are provided by the media. Fluted openings allow water downflow and horizontal airflow at high velocities without excessive pressure drop. Drain shelves on the leaving air side are provided to deter moisture carryover.

MSL-190 for large air handling applications

Blower section

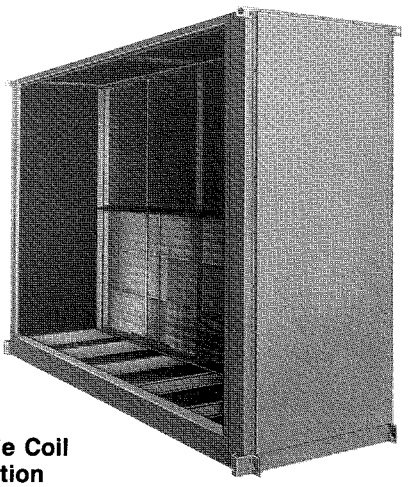
To accommodate large air handling applications, McQuay offers the MSL-190 draw-through unit. Blower sections are internally isolated as standard. Three airfoil fan options, with or without inlet vanes, provide application flexibility from 20,000 to 60,000 cfm. Two access doors on each side (four total) allow service access unmatched in the industry. Solid steel shafts, high quality ball bearings, extended lube lines and heavy-gauge galvanized steel construction result in long trouble-free performance. ARI certification assures confidence in equipment selection.



Blower Section

Coil sections up to 96.8 sq. ft.

Three coil section types provide application flexibility from 48.4 sq. ft. to 96.8 sq. ft. coil face area. Single coil sections are available with or without face and bypass. Wide coil sections accommodate larger face areas with no space penalty in the direction of airflow. Staggered coil sections provide the largest face area options with or without face and bypass. All coil sections feature the McQuay double drain pan. Hinged access doors are provided on both single and staggered coil sections. Removable panels provide access to wide coil sections.



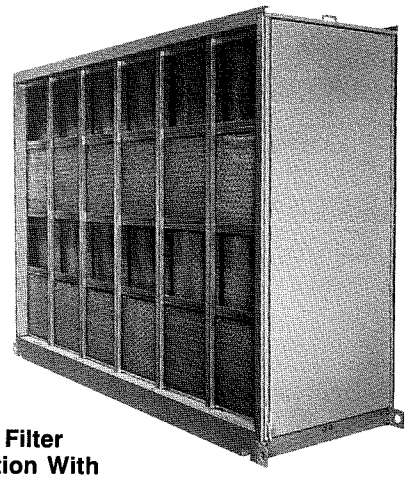
Wide Coil Section

Full line of accessories

MSL-190 accessories include filter sections, mixing boxes, and access sections. Three filter types are accommodated by the basic filter section. By altering the internal configuration this section will house throwaway, bag or rigid filters. Angular racks provide large filtration face areas for 2″ throwaway, pleated or cleanable filters. The vertical rack configuration accommodates bag or rigid filters with or without throwaway prefilters. Full size hinged access doors are standard on all filter sections.

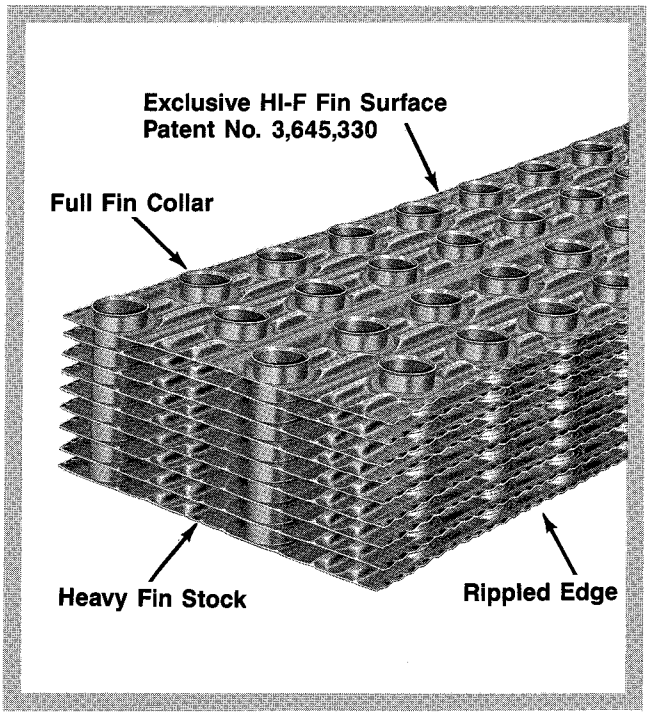
Mixing box sections are furnished with Ultra-Seal low leak hollow airfoil dampers as standard. Ultra-Seal dampers provide the ultimate in energy economy, minimum air friction and reduced damper actuator torques. Two hinged access doors on each side (four total) provide unmatched access.

Access/spacer sections allow unit arrangement flexibility. These sections, as well as blower, coil, filter and mixing box sections are constructed of heavy-gauge galvanized steel for exceptional durability. Full size hinged access doors are provided on each side.



Bag Filter Section With Pre-Filters

A pioneer in corrugated fin development



McQuay HI-F means HI-Efficiency

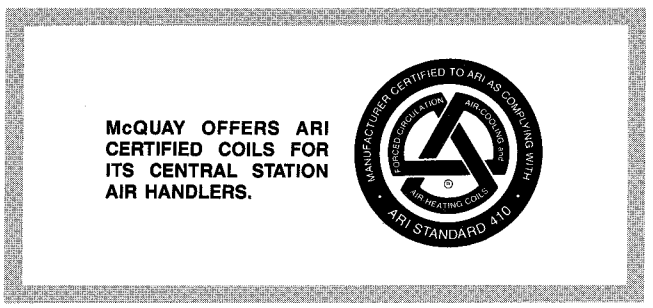
A principal factor governing fin heat transfer efficiency is the boundary layer film of air adhering to any fin surface. This boundary layer insulates the fin, severely reducing the rate of heat exchange.

The advanced rippled-corrugated HI-F design creates a state of continuous turbulence which effectively reduces the boundary layer formation. The exclusive rippled edge instantly deflects the incoming air to create initial turbulence. A succession of corrugations across the fin depth, in conjunction with the staggered tubes, increases the turbulating effect and eliminates the "dead spots" behind the tubes. In this manner, the McQuay HI-F design establishes a new high in heat transfer efficiency, yielding sharply increased performance. The rippled fin edge also strengthens the fin edge and provides a pleasing overall appearance.

McQuay E-F means Energy Efficient

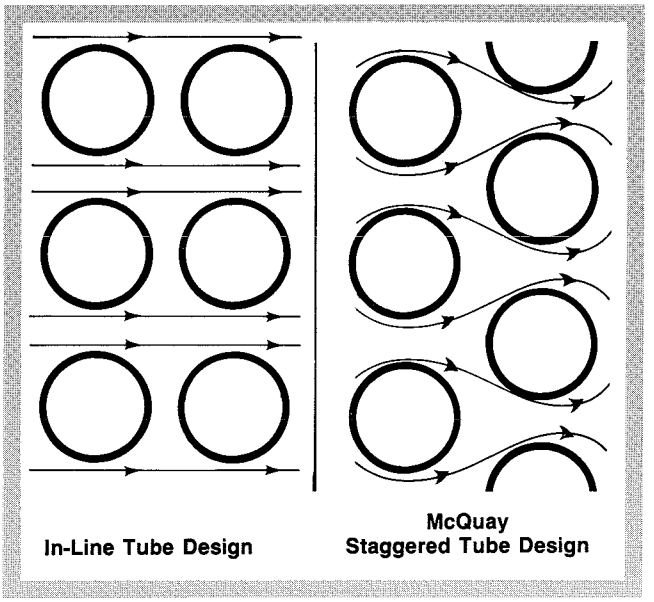
The term "energy efficient," which is used to describe how well a system utilizes energy, is becoming a common expression in the HVAC industry.

With costs of energy rising, the need for cutting operating expenses is apparent. Lowering the air pressure drop across the face of the coil will reduce the bhp and kw requirements of the system. McQuay meets this need with the E-F fin surface. The smoother fin design of the E-F surface results in lower operating costs over the life of the equipment.



McQuay coils are ARI certified

McQuay offers an unmatched variety of fin spacing, row and circuiting combinations permitting the use of standard coils to accurately meet the load requirements and fully achieve the desired results in the conditioned space. To match the optimum coil to the best air handler size, McQuay provides the MS-85™ Microcomputer Selection program. McQuay coils and the MS-85™ Coil and Air Handler Selection Programs are ARI certified to assure full rated performance.



McQuay staggered tube design means high performance

The more moving air in contact with the tubes of the coil, the more performance obtained from the total available surface. The staggered tube design exposes the tubes to more moving air than the in-line design.

The geometry of the staggered design allows the rows to be spaced closer together. This results in a more compact coil providing higher capacities. The combination of rippled fins and staggered tubes gives McQuay coils the performance and flexibility needed now and in the future.

For more information on McQuay coils, consult the following catalogs:

COOLING:
Water cooling/Evaporator cooling/Cleanable . . Catalog 411

HEATING:
Water heating/Booster heating/Cleanable . . . . Catalog 412

STEAM:
Standard/Distributing . . . . . Catalog 413

Water cooling coils

Water cooling coils, designated "4W," "5W," and "5M," are designed and engineered to meet the widest range of cooling applications. Realizing the need for variable coil circuiting to obtain optimum water velocities, McQuay offers flow-controlled circuiting in five standard counterflow arrangements. For complete information on water coil performance and construction, see Catalog 411.

Cleanable coils

Removable header, cleanable, tube water coils are available where scaling or other water conditions require inspection and mechanical cleaning to maintain the original high coil efficiency. McQuay makes available three types of removable header coils:

1. "5K" coils have easily removable headers at both ends of the coils.
2. "5Q" coils have one removable header on the end opposite the supply connection.
3. "5P" coils have one removable header on the supply connection end.

All three types are available with five standard counterflow circuit arrangements as well as all the features of the standard water coil line. For complete details, refer to Catalog 411.

Evaporator coils

McQuay offers a full line of evaporator coils denoted by "5E." Standard coils are available with flow-controlled circuiting for use with HCFC-22 and CFC-12 refrigerants. To assure maximum efficiency, each coil is equipped with pressure type brass distributors selected for the specified conditions. Consult Catalog 411 for full details.

Water heating coils

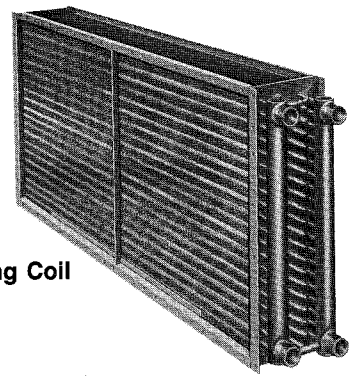
HI-F5 and E-F5 water heating coils are available, 1 through 4 rows with 06 through 14 fin series, in a variety of circuitings. McQuay heating coils are designated "4W," "5W," and "5M." Refer to Catalog 412 for complete details.

Steam heating coils

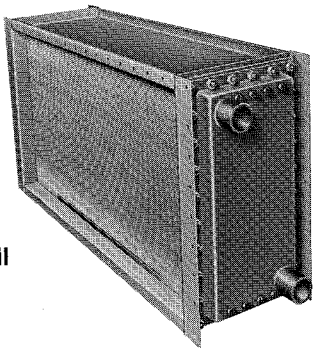
HI-F5 and E-F5 coils have $\frac{5}{8}$" O.D. tubes and HI-F8 coils have 1" O.D. tubes. Model "5JA" steam coils have directionally orificed steam distributing tubes with supply and return connections at the same end. Model "8RA" jet tube steam distributing coils are similar to the "JA" coils except that the supply and return connections are located on opposite ends. Model "5SA" steam coils with $\frac{5}{8}$" O.D. tubes are of standard construction, single tube and opposite end connections. See Catalog 413 for complete details.

Condenser coils

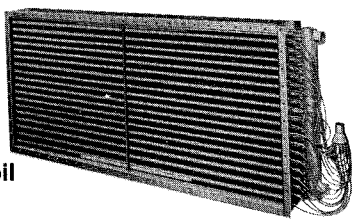
The condenser coil is constructed of $\frac{1}{2}$" O.D. seamless copper tubes arranged in a staggered tube pattern with plate type, rippled aluminum fins. The fins completely cover the copper tubing and are mechanically bonded to the tubes. Copper headers and connections are sized for minimum refrigerant pressure drop. All coils are pressure tested, dehydrated and sealed with a holding charge of dry air for shipment. Condenser coil ratings are not within the scope of McQuay's rating certification program with ARI.



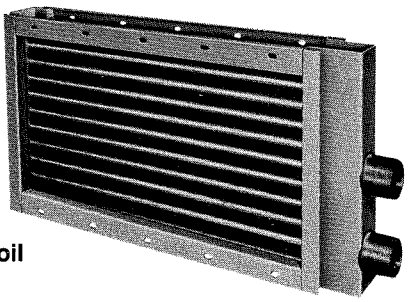
Water Cooling Coil



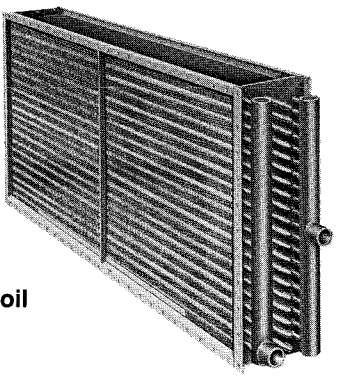
Cleanable Coil



Evaporator Coil



Steam Coil



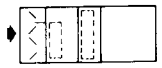
Condenser Coil

Unit coil information

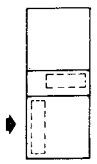
Table 1. Coil casing depth dimensions (inches)

ROWS	COIL TYPE					
	4W,4C 5W,5C	5M	5E	5K, 5P 5Q	5J, 5S 5G, 5H	8G, 8J 8R, 8T
1	4⅛	5½	—	4⅛	4⅛	4⅛
2	4⅛	6⅞	5½	4⅛	4⅛	—
3	5½	—	5½	5½	—	—
4	6⅞	—	6⅞	9⅝	—	—
5	8¼	—	8¼	11	—	—
6	9⅝	—	9⅝	12⅜	—	—
8	12⅜	—	12⅜	15⅛	—	—
10	15⅛	—	15⅛	—	—	—

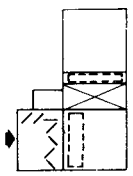
Figure 1. Coil Location Limitations



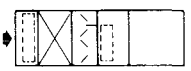
Heating coil in reheat position with internal bypass of cooling coil only. Cooling coil space consumed may not exceed 9⅝". Heating coil need not be same face area as cooling coil.



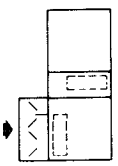
Heating coil in reheat position. Heating coil must be small face area and cooling coil space consumed may not exceed 9⅝".



Heating coil in reheat position with external face and bypass of cooling coil only. NOTE: Access/spacer section is required with this arrangement.



Heating coil in preheat position with internal bypass of cooling coil. Cooling coil must be small face area. For proper air distribution, an access/spacer section is required between the heating coil and the internal face and bypass damper section.



Heating coil in reheat position with internal face and bypass of cooling coil only. All coils must be small face area.

Coil size limitations

McQuay offers three coil face area sizes — small, large and extra large — for most air handler unit sizes. The following guidelines apply to unit sizes 103 through 172. MSL-190 coil guidelines are presented separately.

1. All coils mounted in the same coil section must be of the same face area.
2. Extra large face area coils are not available for LHD heating units and some high pressure unit sizes. Note that extra large face area coil dimensions for blow-through unit sizes 114, 117, 122, 128, 137, 141 and 172 differ from those of the comparable draw-through unit sizes. Refer to the Physical Data section, pages 32 through 35.
3. All coils being bypassed using internal face and bypass dampers must have small face areas.

Coil depth limitations

Table 1 lists the depth (in direction of airflow) of the various types of coils offered by McQuay, All dimensions are overall casing depth. The sum of the casing depths of all coils to be mounted in the same coil sections must not exceed the maximum space available.

The maximum coil depth available in standard coil sections is as follows:

Draw-through horizontal or vertical cooling coil section:
- Low & medium pressure units ..... 17⅞"
- High pressure units (117—128 sizes) ..... 17⅞"
- High pressure units (137—164 sizes) ..... 49⅛"

Singlezone blow-through cooling coil section:
- Horizontal discharge ..... 17⅞"
- Vertical discharge ..... 12⅜"
- Vertical discharge with cabinet extension ..... 17⅞"

Multizone blow-through coil section:
- Cold deck ..... 12⅜"
- Hot deck ..... 6⅞"

Heating coil sections:
- 1- and 2-row ..... 4⅛"
- 3- and 4-row ..... 6⅞"

LSL and MSL unit sizes 137 and 141, with small face area cooling coils, are not equipped with the intermediate drain trough. For this reason, the maximum space available with these units may be increased by 2¾".

LSL and MSL-172 units with heating coil only, cooling coil only, or when the cooling coil is second in the airstream have a maximum coil depth of 16½". When the heating coil is second in the airstream, the maximum depth is 13½". This restriction is necessary to maintain adequate airflow over the top portion of the coil.

MSL-190 coil considerations

The three MSL-190 coil sections — single, staggered and wide — can each house a range of coil face areas. Coil face area options are presented in the Physical Data section, page 36. The maximum coil depth (in direction of airflow) for all coil sections is 30" without face and bypass. Single and staggered coil sections equipped with face and bypass are restricted to a maximum coil depth of 23".

Condenser/heat reclaim coil selection

There are many applications which require year-round operation of air cooled condensing equipment. Typical examples include supermarkets, restaurants, refrigerated food warehouses and data processing rooms.

In the past, it has been general practice to waste the heat energy developed in the refrigeration process by discharging it into the atmosphere. This wasted heat is significant and, in many instances, the utilization of it can mean substantial savings in fuel cost.

McQuay condenser coils may be ordered in many ways. LAC cased coils are sized to fit directly to LYF fan sections. This LAC casing allows the use of most AHU accessories.

Condenser coils may also be used with standard units in the preheat or reheat positions. Coils may be selected to be used in full condensing applications or for partial condensing (heat reclaim) with a remote condensing unit.

With the wide selection of AHU accessories such as face and bypass or variable inlet vanes, a number of economical means may be used for head pressure control. (Refer to Catalog 630 for more information concerning head pressure control.)

In cases where heat must be rejected to the atmosphere, the condensing air handler may be used to satisfy building exhaust requirements. Since the unit must normally be operated, the exhaust feature is obtained with virtually no added expense.

Selection procedure

1. Determine the total heat rejection required at the condenser for the desired net refrigeration effect at the evaporator. If the compressor manufacturer does not publish heat rejection ratings, factors from Tables 3 and 4 may be used to estimate the Total Heat of Rejection (THR). For heat reclaim applications determine the amount of heat to be reclaimed by the air hander reclaim coil.
2. Establish the design entering air temperature, entering refrigerant temperature, refrigerant type, airflow cfm and degree of subcooling (if any). A typical condenser coil face velocity is 600 fpm.
3. Contact your local representative to obtain a selection customized to your requirements.

Head pressure control

The capacity of a condenser coil varies with the difference between the entering air dry bulb temperature and the condensing temperature of the refrigerant. The lower limit of the head pressure is dependent upon the required pressure drop across the thermostatic expansion valve. For normal air conditioning applications, head pressure control is not required for ambient air temperatures above 60°F. When condenser operation is required at ambient air temperatures below 60°F, head pressure control is required.

LYF Air Handler
With LAC Condenser Coil

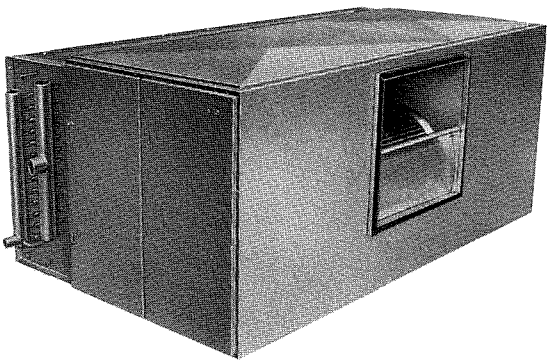


Table 2. LAC Coil Sizes

AIR HANDLER SIZE	COIL SIZE (INCHES)	FACE AREA (SQ.FT.)	AIR HANDLER SIZE	COIL SIZE (INCHES)	FACE AREA (SQ.FT.)
103	18 x 30	3.8	122	39 x 93.0	25.2
104	21 x 36	5.3	128	39 x 116.0	31.4
106	24 x 46	7.7	137	51 x 115.5	40.9
108	33 x 44	10.1	141	60 x 115.5	48.1
111	33 x 59	13.5	150	69 x 115.5	55.3
114	33 x 74	17.0	164	87 x 115.5	69.8
117	33 x 89	20.4			

Table 3. Approximate Heat Rejection Factors For Open Compressors

EVAPORATOR TEMPERATURE (°F)	CONDENSING TEMPERATURE (°F)					
	90	100	110	120	130	140
-30	1.37	1.42	1.47	*	*	*
-20	1.33	1.37	1.42	1.47	*	*
-10	1.28	1.32	1.37	1.42	1.47	*
0	1.24	1.28	1.32	1.37	1.41	1.47
10	1.21	1.24	1.28	1.32	1.36	1.42
20	1.17	1.20	1.24	1.28	1.32	1.37
30	1.14	1.17	1.20	1.24	1.27	1.32
40	1.12	1.15	1.17	1.20	1.23	1.28
50	1.09	1.12	1.14	1.17	1.20	1.24

*Outside of normal limits for single stage compressor application.

Table 4. Approximate Heat Rejection Factors For Suction Cooled Hermetic Compressors

EVAPORATOR TEMPERATURE (°F)	CONDENSING TEMPERATURE (°F)					
	90	100	110	120	130	140
-30	1.57	1.62	1.68	*	*	*
-20	1.49	1.53	1.58	1.65	*	*
-10	1.42	1.46	1.50	1.57	1.64	*
0	1.36	1.40	1.44	1.50	1.56	1.62
10	1.31	1.34	1.38	1.43	1.49	1.55
20	1.26	1.29	1.33	1.37	1.43	1.49
30	1.22	1.25	1.28	1.32	1.37	1.42
40	1.18	1.21	1.24	1.27	1.31	1.35
50	1.14	1.17	1.20	1.23	1.26	1.29

*Outside of normal limits for single stage compressor application.

Air handler selection data

Computerized air handler selection

The achievement of an efficient air handling system is dependent on accurate system design and proper equipment selection. Factors which control the unit selection include applicable codes, ventilation requirements, heating and cooling space loads, acceptable temperature differentials, thermal media and installation limitations. The selection of the unit can then be resolved in four steps: 1) unit type and size, 2) coils, 3) accessories, and 4) fan wheel type and motor horsepower.

The following paragraphs outline a suggested procedure for Central Station Air Handler selection. To obtain an optimal selection, McQuay provides the MS-85™ Microcomputer Air Handler Selection Program. The selection program should be used with the following procedure to determine unit size, coil rows, fins and circuiting as well as motor horsepower requirements. Contact your nearest McQuay representative for a copy of the MS-85™ software or an air handler selection that meets your specifications.

Selection of unit type and size

With the overall system designed to minimize the number of units and the requirements of heating, cooling and ventilation for the various zones established, selection of the optimum unit size can be made based on the required air volume. The heating load, cooling load and ventilation requirement will establish an airflow requirement, any one of which may be the maximum.

The unit air volume for cooling is dependent upon the sensible space cooling load and the design dry bulb temperature differential. Normal temperature differentials for air conditioning are from 12°F to 25°F. The minimum air volume is solved using the following formula:

$$CFM = \frac{Sensible\ Space\ Load\ (BTUH)}{1.08 \times Temp.\ Differential}$$

Normal temperature differentials for heating are from 20°F to 50°F. The required minimum air volume for heating is solved by using the same formula. The required air volume for ventilation is generally less than that for cooling or heating. Where toxic fumes or unusual contaminants are encountered, the exhaust requirements may establish a minimum air volume in excess of that determined for cooling or heating.

The unit size can now be selected based on the maximum air volume required. Coil face velocity is usually the best parameter for unit size selection and the coil area will determine the unit size.

With the coil selections available, usually more than one unit and/or fan size can be selected to deliver the required air. Therefore, fan outlet velocity, fan speed and brake horsepower should also be considered in the final selection.

The fan performance curves and tables are found in Catalog 520. They are organized in an easy-to-use manner showing all fan sizes and types available for each unit type and size. Fan selection can also be made by using the ARI certified MS-85™ Air Handler Selection Program.

Selection of coils

The selection of a coil can be done in three steps:

1. The coil face area that will give the optimum face velocity.
2. The type of coil that will best suit the application.
3. The circuiting, number of rows and fin spacing that will satisfy the heating and/or cooling requirement.

The coil size should be selected for maximum face velocity to obtain peak heat transfer efficiency and minimum cost. For cooling coils, 400 to 600 fpm is generally considered the optimum face velocity range for dehumidification and no moisture carryover. For heating coils, the optimum face velocity range is 400 to 1200 fpm.

The coil type is determined by the specific application. Proper selection is dependent upon the choice of thermal medium and associated data such as temperature, quantities available and thermal properties. Types of coils available are discussed on pages 10 and 11. For blow-through units using steam heating coils, experience has shown that jet tube steam distributing coils (type 5J or 8J) provide the best temperature distribution over the face of the coil.

Determination of coil circuiting, rows and fin spacing is based on the cooling or heating requirements. For units with internal fan motors, the motor heat gain must be considered in the cooling and heating loads. Fan motor heat values are shown in Figure 11, page 24.

For more information about McQuay water cooling, evaporator, water heating and steam coils, refer to Catalogs 411, 412 and 413. Coil selections for central station air handlers should be made by using the MS-85™ Air Handler Selection Program.

Selection of accessories

McQuay offers a complete line of accessories to insure proper cleaning, mixing and temperature control of the air.

For proper air cleaning, the filter section should be selected to provide filter area such that the filter velocity will be compatible with the choice of filter media. McQuay offers three filter sections — flat, angular and heavy-duty — to provide a full range of filter capacities for each unit size. Bag, roll, rigid and HEPA filter sections are also available.

For air mixing, dampers provide a simple means of introducing outside air with thorough mixing and proportional control of the recirculated and fresh air. A mixing box or combination angular filter/mixing box is available for each unit size. Mixing box dampers feature McQuay's Ultra-Seal™ low leak dampers as standard.

Dampers are also often selected as an effective means of temperature control because they provide close control without time lag. Face and bypass dampers are provided for singlezone units and zone dampers are available for multizone units. The face and bypass dampers are available with an internal bypass duct (used with small face area coils only) or with an external bypass duct. Low leak zone dampers are standard on all multizone units equipped with dampers.

Selection of fan wheel type and motor

Fan motor size is dependent on fan brake horsepower which, in turn, is a function of fan performance. Fan performance determination requires an accurate calculation of the resistance to airflow through the entire system. This total resistance consists of the sum of two parts — the external static pressure of the distribution system and the internal unit resistance. External static pressure is a function of the supply and return ductwork along with any damper or other equipment external to the air handler.

The internal unit resistance is found by summing the resistances of the coils and various unit components and accessories. Component resistances are tabulated in Table 5 on page 16. On multi-zone or double duct units, the resistance value of only one coil is used, the higher of either the cooling or heating coil.

Having determined the total static pressure, the fan speed and brake horsepower can be determined from the MS-85™ Air Handler Selection Program or the fan performance curves found in Catalog 520.

Example selection

General requirements

Minimum outside air requirements	210 cfm
Summer design conditions:	
Outdoor design temperature	95°F DB/77°F WB
Required sensible heat ratio	0.90
Required sensible building load	183, 120
Desired space temperature	75°F DB/63°F WB
Supply air temperature	55°F DB
Mixed air temperature	80°F DB/67°F WB
Winter design conditions:	
Outdoor design temperature	10°F DB
Required heating capacity	280,000
Desired space temperature	70°F DB
Supply air temperature	105°F DB
Mixed air temperature	50°F DB
External static pressure	1.2
Unit arrangement	Horizontal draw-through with preheat coil
Accessory arrangement	Combination angular filter and mixing box with throwaway filters

Selection of unit size

Calculate the cfm required for cooling and for heating:

a) $Cooling\ CFM = \dfrac{Sensible\ Space\ Load}{1.08 \times (Mixed\ Air\ Temp - Supply\ Air\ Temp)}$

$= \dfrac{182{,}120}{1.08\ (80-55)} = 6782\ cfm$

b) $Heating\ CFM = \dfrac{Sensible\ Space\ Load}{1.08 \times (Supply\ Air\ Temp. - Mixed\ Air\ Temp)}$

$= \dfrac{280{,}000}{1.08\ (105-50)} = 4713\ cfm$

The cooling load requires the most air to satisfy the space conditions, so 6782 cfm should be used to select the unit. The selection of unit size depends on the air face velocity over the coil. The required cfm is 6782 and, using a design parameter of 500 fpm face velocity, the required coil size is 13.6 sq.ft. From pages 34 and 35, model LSL-114 with large face area coil has a coil size of 13.7 sq.ft. The extra large face area coil could be selected as an option to reduce coil face velocity for lower coil air friction.

Selection of the coil

McQuay's wide variety of circuiting, row, and fin spacing assures a coil selection that will handle the load requirements. All air handler coils sould be selected by using the MS-85™ Air Handler Selection Program. Contact your nearest McQuay representative for a copy of the software or an air handler selection tailored to your application.

Determination of total static pressure

The external static pressure is given as 1.2″ and the internal losses of the unit must now be calculated. Calculation of internal static pressure is done automatically by the MS-85™ Air Handler Selection Program. Internal static can also be calculated by hand as follows.

The pressure loss of the angular filter mixing box can be found under component losses on pages 16 and 17. In the example, the angular filters will have a maximum air pressure drop of 0.09″ and the filter mixing box will have a maximum pressure drop of 0.04″.

The cooling coil air friction loss can be determined by entering on the appropriate chart on page 18 or 19. Plot the coil face velocity at the bottom of the chart (Point ①). From this point, draw a line diagonally upward to the appropriate degree of wetness (Point ②). Beginning with this point, draw a line vertically up to the fin series selected (Point ③). Now continue the line horizontally to either the right or left to the appropriate number of rows (Point ④ or ⑤) and read the air pressure drop directly from the chart.

For example, the air friction is 0.82 for a 5-row HI-F5 coil with 10 fins per inch and "C" degree of wetness. The heating coil air pressure drop is estimated in much the same way, with the exception of the various degrees of wetness. For example, the air friction is 0.11 for a 1-row, 6 fins per inch coil.

Adding:	
External	1.20″
Filter	0.09″
Cooling coil	0.82″
Heating coil	0.11″
Mixing section	0.04″
Cabinet loss	*
Total	2.26″

*Cabinet losses for horizontal units are allowed for in the fan performance tables.

Selection of fan wheel

Factors involved in selecting the fan include fan speed, brake horsepower, sound, and first cost. The Air Handler Selection Program output includes all of the above factors for the various fan wheels available in each unit size.

Fan performance can also be determined from Catalog 520. For example, the LSL-114 with standard forward curved fan will operate at 840 rpm and 4.0 bhp for 6782 cfm against 2.26″ TSP. A 5.0 horsepower motor would be required to operate the unit. See Table 7 on page 24 for temperature and altitude correction factors if they are required.

General formulas

1. TOTAL BTUH (AIRSIDE)

Total BTUH = 4.5 × cfm × (Total Heat Ent. Air − Total Heat Lvg. Air)

Where: 4.5 = Density Std. Air × Min./Hr.
Density Std. Air = 0.75 lbs./cu.ft.
Min./Hr. = 60

2. TOTAL BUTH (WATER SIDE)

Total BTUH = 500 × gpm × (Lvg. Water Temp. − Ent. Water Temp.)

Where: 500 = Lbs./gal. × Min./hr. × Spec. Heat Water
Lbs./gal. = 8.33
Min./hr. = 60
Spec. Heat Water = 1

3. SENSIBLE BTUH

Sensible BTUH = 1.08 × cfm × (Ent. Air DB − Lvg. Air DB)

Where: 1.08 = (Sp. Ht. of Air at 70°F) × Min./hr. × Density Std. Air
Sp. Ht. of Air = 0.24 at 70°F
Min./hr. = 60
Density Std. Air = 0.075 lbs./cu.ft.

4. FACE AREA: $F.A. = \dfrac{cfm}{Face\ Velocity\ (fpm)}$

5. FACE VELOCITY: $F.V. = \dfrac{cfm}{Face\ Area\ (sq.ft.)}$

6. SENSIBLE HEAT RATIO: $S.H.R. = \dfrac{Sensible\ BTUH}{Total\ BTUH}$

Component air friction

Table 5. Component Air Friction

UNIT SIZE	CFM	FILTERS												DAMPERS			VERT. * UNIT CASING
		FLAT				ANGULAR				HEAVY-DUTY				MIXING BOX	FACE & BYPASS	ZONE	
		T.A.	Clean-able	Hi Vel.	35% Eff.	T.A.	Clean-able	Hi Vel.	35% Eff.	T.A.	Clean-able	Hi Vel.	35% Eff.				
103	800	.04	.04	.04	.05	.02	.02	.03	.01	—	—	—	—	.01	.02	—	.05
	1000	.06	.06	.05	.07	.04	.04	.04	.05	—	—	—	—	.02	.03	—	.10
	1200	.09	.08	.06	.10	.05	.05	.05	.06	—	—	—	—	.02	.04	—	.17
	1400	.12	.11	.07	.14	.07	.07	.06	.09	—	—	—	—	.03	.05	—	.25
	1600	.15	.13	.08	.17	.10	.09	.07	.12	—	—	—	—	.04	.07	—	.31
	1800	.19	.16	.11	.21	.12	.11	.08	.14	—	—	—	—	.05	.08	—	—
	2000	—	.21	.13	.25	.15	.13	.09	.17	—	—	—	—	.06	.10	—	—
104	1000	.04	.04	.04	.05	.01	.01	.02	—	—	—	—	—	.01	.02	—	.06
	1200	.05	.05	.05	.06	.02	.02	.03	.01	—	—	—	—	.02	.02	—	.10
	1400	.07	.07	.06	.09	.03	.03	.03	.03	—	—	—	—	.02	.03	—	.16
	1800	.12	.11	.08	.14	.05	.05	.04	.06	—	—	—	—	.03	.05	—	.28
	2200	.18	.15	.09	.20	.07	.07	.05	.09	—	—	—	—	.05	.06	—	.35
	2600	—	.19	.13	.26	.10	.09	.06	.12	—	—	—	—	.06	.09	—	.41
	3000	—	—	.19	.34	.14	.12	.08	.15	—	—	—	—	.08	.11	—	—
106	2000	.07	.07	.05	.08	.02	.03	.03	.02	—	—	—	—	.02	.03	.04	.35
	2500	.11	.10	.06	.13	.04	.05	.04	.05	—	—	—	—	.04	.05	.06	.43
	3000	.15	.13	.08	.17	.06	.06	.05	.07	—	—	—	—	.05	.06	.09	.63
	3500	.21	.17	.11	.22	.08	.08	.05	.10	—	—	—	—	.07	.08	.12	.85
	4000	—	.21	.15	.28	.11	.10	.06	.13	—	—	—	—	.08	.10	.16	1.11
	4500	—	—	.19	.34	.14	.12	.08	.15	—	—	—	—	.11	.13	—	—
	5000	—	—	.23	.41	.17	.14	.09	.18	—	—	—	—	.13	.16	—	—
206	1800	.06	.06	.04	.06	.02	.02	.03	.01	—	—	—	—	.01	.02	—	—
	2000	.07	.07	.05	.08	.02	.03	.03	.02	—	—	—	—	.01	.03	—	—
	2200	.09	.08	.06	.10	.03	.03	.04	.03	—	—	—	—	.01	.03	—	—
	3000	.15	.13	.08	.17	.06	.06	.05	.07	—	—	—	—	.02	.05	—	—
	3800	—	.19	.13	.25	.10	.09	.07	.12	—	—	—	—	.04	.08	—	—
	4600	—	—	.20	.35	.14	.12	.08	.16	—	—	—	—	.05	.11	—	—
	5400	—	—	—	.48	.19	.16	.10	.21	—	—	—	—	.07	.16	—	—
108	2200	.06	.06	.04	.06	.02	.02	.03	.01	—	—	—	—	.01	.02	.02	.05
	2600	.08	.08	.05	.10	.03	.03	.03	.03	—	—	—	—	.03	.03	.03	.08
	3400	.14	.12	.08	.15	.05	.05	.04	.06	—	—	—	—	.03	.05	.06	.15
	3800	.17	.14	.10	.19	.06	.06	.05	.07	—	—	—	—	.04	.06	.07	.22
	4600	—	.18	.12	.26	.09	.09	.06	.11	—	—	—	—	.06	.08	.11	.31
	5400	—	—	.19	.34	.16	.14	.09	.14	—	—	—	—	.08	.11	.15	.36
	7000	—	—	—	.55	.21	.17	.11	.22	—	—	—	—	.13	.18	—	—
209	2600	.06	.06	.05	.08	.03	.03	.03	.02	.01	.01	.02	—	.01	.02	—	—
	3000	.09	.08	.06	.10	.04	.04	.04	.04	.02	.02	.03	.01	.02	.03	—	—
	3400	.11	.10	.07	.13	.05	.05	.04	.06	.02	.03	.03	.02	.02	.04	—	—
	4200	.17	.14	.09	.18	.07	.07	.06	.08	.04	.05	.04	.05	.03	.05	—	—
	5000	—	.19	.13	.25	.11	.10	.06	.11	.06	.06	.04	.07	.04	.07	—	—
	6200	—	—	.20	.36	.16	.14	.09	.16	.09	.09	.06	.11	.06	.10	—	—
	7800	—	—	—	.55	—	.18	.12	.24	.14	.12	.08	.16	.10	.16	—	—
111	3000	.06	.06	.05	.07	.02	.02	.03	.02	.01	.01	.02	—	.02	.02	.02	.05
	3500	.08	.08	.05	.10	.03	.03	.04	.03	.02	.02	.03	.01	.02	.03	.03	.08
	4000	.11	.10	.06	.13	.04	.05	.04	.06	.03	.03	.03	.03	.03	.04	.05	.11
	5000	.16	.14	.09	.18	.07	.07	.05	.08	.05	.05	.04	.06	.04	.06	.08	.21
	6000	—	.19	.13	.25	.10	.09	.07	.12	.07	.07	.05	.08	.06	.08	.09	.30
	8000	—	—	.19	.41	.17	.14	.09	.19	.12	.11	.08	.14	.10	.13	.21	.40
	10000	—	—	—	.61	—	.21	.15	.28	.19	.16	.10	.21	.16	.21	—	—
114	4000	.07	.07	.05	.08	.03	.03	.03	.03	.02	.02	.03	.01	.02	.02	.02	.06
	4500	.09	.08	.06	.10	.04	.04	.04	.05	.02	.02	.03	.02	.02	.03	.03	.08
	5000	.11	.10	.06	.13	.05	.05	.04	.06	.03	.03	.03	.03	.02	.04	.04	.11
	7000	.21	.17	.11	.22	.09	.09	.06	.11	.06	.06	.04	.07	.04	.07	.08	.26
	9000	—	—	.19	.34	.15	.13	.09	.17	.10	.09	.07	.12	.07	.11	.14	.36
	11000	—	—	—	.48	—	.18	.12	.24	.14	.12	.08	.16	.10	.16	—	—
	13000	—	—	—	.65	—	—	.17	.32	—	.17	.11	.22	.14	.22	—	—

*Cabinet losses on the horizontal draw-through units and all blow-through units are allowed for in the fan performance tables.

Table 5. Component Air Friction (Continued)

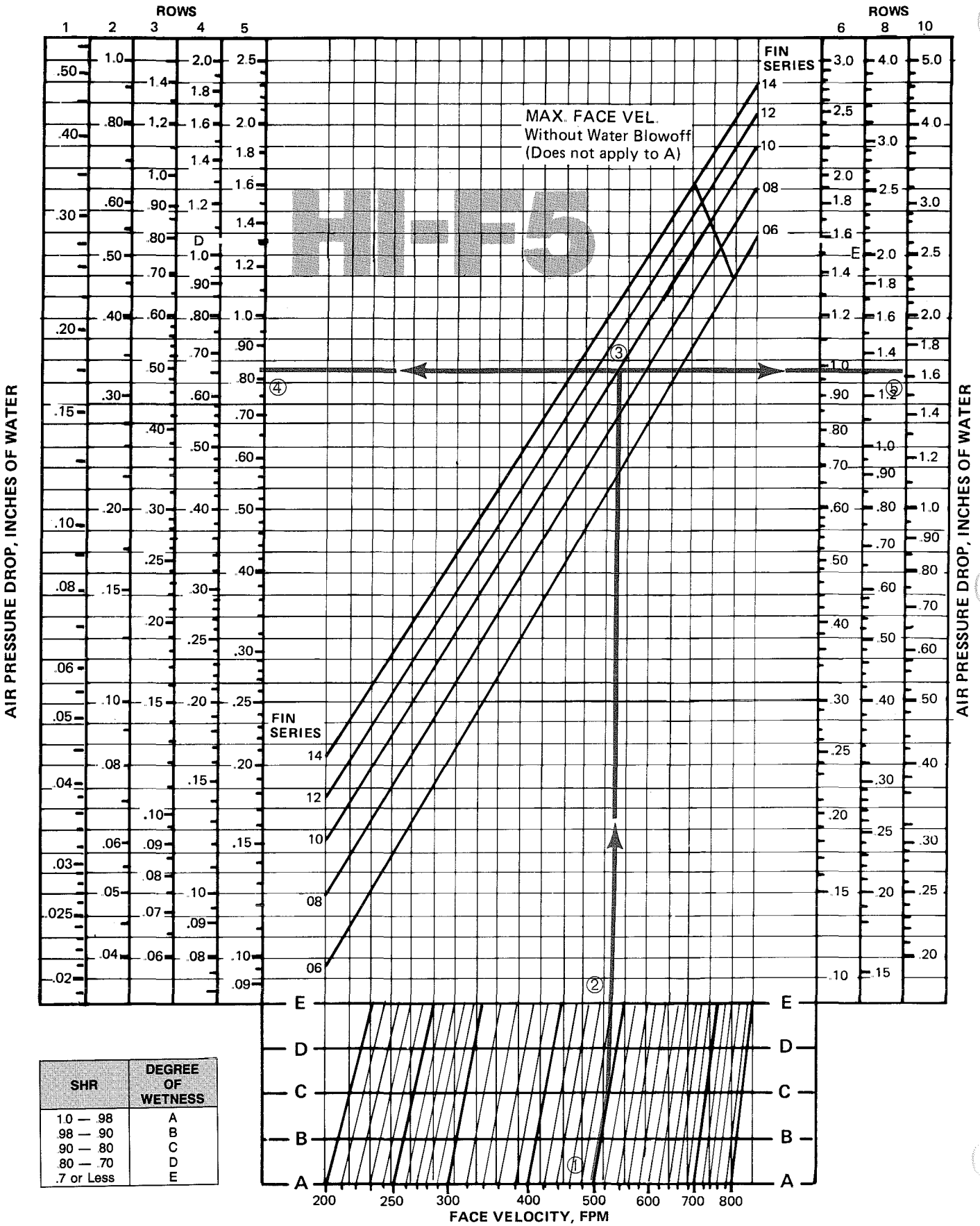
UNIT SIZE	CFM	FILTERS												DAMPERS			VERT. * UNIT CASING
		FLAT				ANGULAR				HEAVY-DUTY				MIXING BOX	FACE & BYPASS	ZONE	
		T.A.	Clean-able	Hi Vel.	35% Eff.	T.A.	Clean-able	Hi Vel.	35% Eff.	T.A.	Clean-able	Hi Vel.	35% Eff.				
117	5000	.07	.07	.06	.09	.04	.04	.04	.05	.02	.02	.03	.01	.02	.03	.03	07
	6000	.11	.10	.06	.13	.06	.06	.04	.06	.03	.03	.03	.03	.02	.04	.04	.11
	7000	.14	.12	.08	.16	.07	.07	.06	.09	.04	.04	.04	.05	.03	.05	.06	.18
	9000	—	.19	.13	.25	.10	.09	.07	.14	.07	.07	.05	.08	.05	.08	.13	.30
	11000	—	—	.19	.35	.19	.16	.10	.20	10	.09	.07	.12	.07	.11	.16	.37
	13000	—	—	—	.47	—	.20	.15	.26	.14	.12	.08	.15	.10	.15	—	.42
	15000	—	—	—	.61	—	—	.19	.34	.18	.15	.09	.20	.12	.20	—	—
122	6000	.06	.06	.04	.07	.04	.04	.04	.05	.01	.01	.02	—	.01	.02	.03	.04
	7000	.08	.08	.05	10	.05	.05	.05	.06	.02	.02	.03	01	.02	.03	.04	.05
	8000	.11	.10	.06	.13	.07	.07	.05	.08	02	.03	.03	.02	.02	.04	.06	.08
	10000	.16	.14	.09	.18	.11	.10	.06	.13	.04	.05	.04	.05	.03	.06	.08	.14
	12000	—	.19	.13	.25	.15	.13	.08	.17	.06	.06	.05	.07	.05	.08	.12	.24
	15000	—	—	.20	.35	—	.19	13	.25	.09	.09	.06	.11	.07	.13	.20	.33
	19000	—	—	—	.55	—	—	.21	.38	.14	.12	.08	.16	.11	.20	—	—
128 134	8000	.07	.07	05	.08	.04	.05	.04	.05	.01	.01	.02	—	.01	.03	.03	.05
	9000	.09	.08	.06	.10	.06	.06	.04	.06	.02	.02	.03	.01	.02	.03	.04	.06
	10000	.11	.10	.06	.13	.11	.07	05	.08	.02	.03	.03	.02	.02	.04	.05	.08
	13000	.18	.15	.09	.20	.17	.10	.07	.13	.05	.05	.04	.06	.03	.06	.08	.17
	17000	—	—	.16	.31	.19	.16	.11	.21	.07	.07	.06	.09	.06	.10	.14	.30
	21000	—	—	—	.45	—	.22	.16	.30	.11	.10	.07	.13	.08	.16	—	.38
	25000	—	—	—	.61	—	—	.23	.41	.17	.14	.09	.18	.12	.22	—	—
137	10000	.07	.07	.05	.08	.04	.04	.04	.05	.01	.01	.02	—	.02	.02	.03	.02
	12000	.10	.09	.06	.11	.06	.06	.04	.06	.02	.02	.03	.02	.02	.03	.04	.03
	14000	.14	.12	.08	.15	.07	.07	.06	.09	.03	.03	.04	.03	.02	.04	.06	.05
	18000	.22	.17	.12	.23	.12	.11	.07	.14	.06	.06	.04	.06	.04	.07	.09	.09
	22000	—	—	.18	.33	.19	16	.10	.20	.08	.08	.05	.10	.05	.10	.14	.17
	26000	—	—	—	.44	—	.20	.15	.26	.11	.10	.07	.13	.07	.13	.21	.25
	32000	—	—	—	.64	—	—	.22	.38	.17	.14	.09	.19	.11	.20	—	—
141	12000	.07	.07	.05	.08	.04	.04	.04	.05	.01	.01	.02	—	.01	.03	.04	.02
	14000	.09	.08	.06	.11	.05	.05	.05	.06	.02	.02	03	.01	.02	.04	.06	.03
	16000	.12	.11	.07	.12	.07	.07	.05	.08	.03	.03	.03	.03	.02	.04	.07	.05
	20000	.19	.15	.10	.20	.11	10	.06	.13	.05	.05	.04	.06	.03	.06	.12	.08
	24000	—	.21	15	.28	.15	.13	08	.17	.07	.07	.05	.08	.04	.09	.17	.13
	28000	—	—	.20	.36	.21	.17	.11	.22	.09	.09	.06	.11	.06	.12	.25	.19
	36000	—	—	—	.56	—	—	.19	.34	.15	.13	.08	.17	.09	.20	—	—
150	15000	.08	.08	.05	.10	.04	.04	.04	.05	.01	.01	.02	—	.02	.03	.04	.03
	18000	.11	.10	07	13	.06	.06	.04	.06	.02	.02	.03	.02	.02	.04	.06	.04
	21000	.15	.13	.08	.17	.07	.07	.06	.09	.03	.03	.04	.03	.03	.05	.09	.05
	27000	—	.19	.13	.26	.12	.11	.07	.14	.06	.06	.04	.06	.05	.08	.15	.10
	33000	—	—	.20	.37	.19	.15	.10	.20	.08	.08	.05	.10	.08	.12	.23	.18
	39000	—	—	—	50	—	.20	.14	.26	.11	.10	.07	.13	.11	.17	—	.26
	45000	—	—	—	.64	—	—	.19	.34	.15	.13	.08	.17	.14	.22	—	—
164	18000	.07	.07	.06	.10	.03	.03	.04	.04	.02	.02	.03	.02	.02	.03	.04	—
	20000	.09	.09	.06	.11	.04	.05	.04	.06	.03	.03	.03	.03	.02	.03	.06	—
	24000	.14	.12	.08	.15	.06	.06	.05	.08	.04	.05	.04	.06	.03	.03	.08	—
	32000	—	.19	.13	.25	.11	.10	.07	.13	.08	.08	.05	.09	.05	.07	.15	—
	40000	—	—	.21	.37	.18	.15	.09	.19	.12	.11	.07	.14	.08	.11	.25	—
	48000	—	—	—	.51	—	.19	13	.26	.18	.15	.09	.19	.11	.15	—	—
	56000	—	—	—	.68	—	—	.19	.34	—	.19	.13	.25	.15	.21	—	—
172	28000	.14	.12	.08	16	.08	.08	05	.10	.06	.06	.04	.07	.04	.05	.11	—
	30000	.16	.14	.09	.18	.10	.09	.06	.12	.07	.07	.05	.08	.05	.06	.13	—
	32000	.19	.15	.10	.20	.11	.10	.06	.13	.08	.08	.05	.09	.05	.06	.16	—
	36000	—	.19	.13	.25	.14	.12	.08	.16	.10	.09	.06	.12	.06	.07	.19	—
	40000	—	.22	.16	.30	.18	.14	.09	.19	.13	.11	.07	.14	.08	.09	.25	—
	44000	—	—	.19	35	.22	.16	.11	.23	.15	.13	.08	.16	.09	.11	.32	—
	50000	—	—	—	.44	—	.21	.14	.28	.20	.16	.10	.20	.12	.14	.44	—

*Cabinet losses on the horizontal draw-through units and all blow-through units are allowed for in the fan performance tables.

SEE PAGE 36 FOR MSL-190 AIR FRICTION

Coil air pressure drop

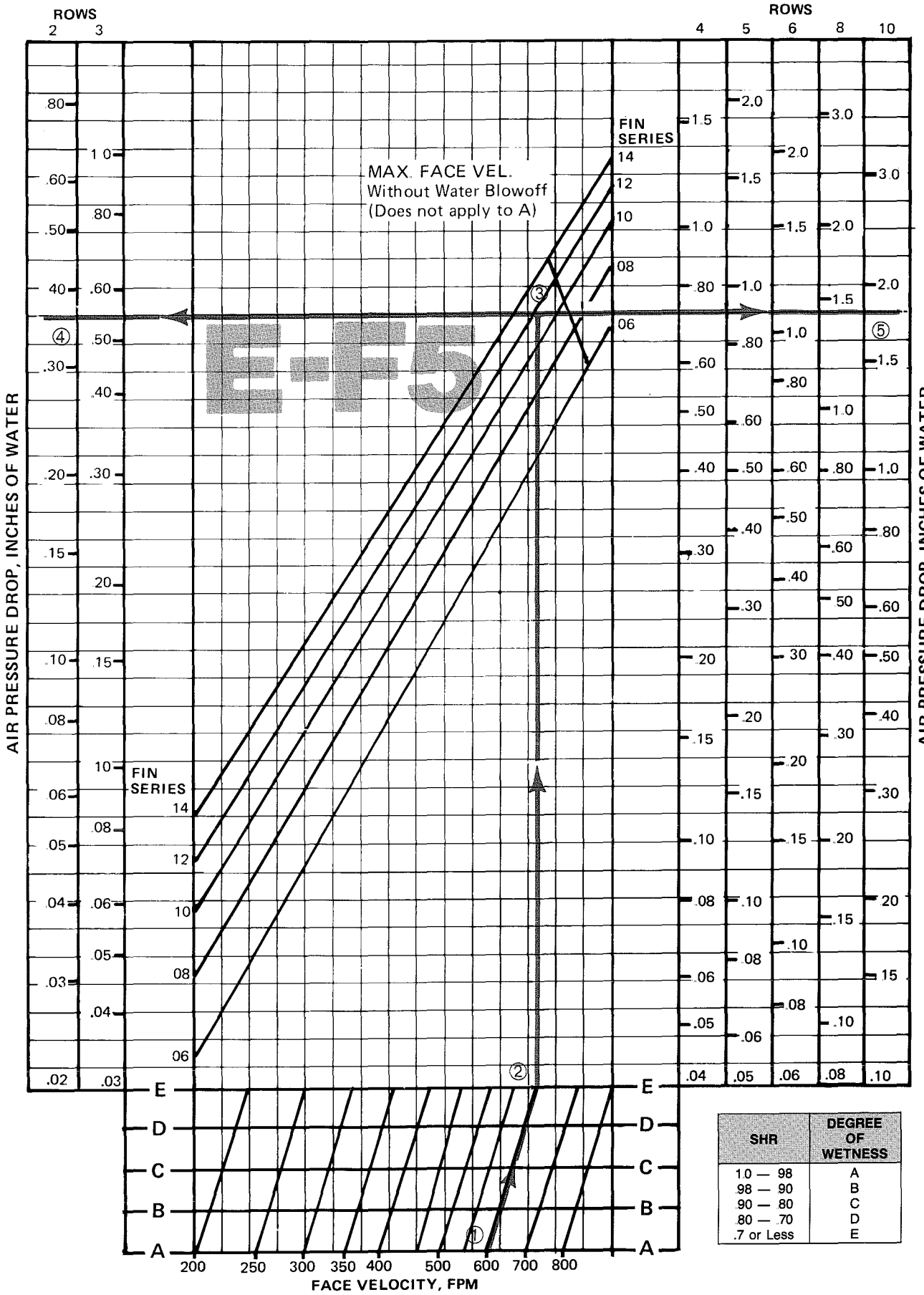
Figure 2. HI-F5 Air Pressure Drop



SHR	DEGREE OF WETNESS
1.0 — .98	A
.98 — .90	B
.90 — .80	C
.80 — .70	D
.7 or Less	E

NOTE: The letters A, B, C, D or E following the face velocity indicate the degree of wetness at which the coil would be operating. Refer to the chart at the lower left-hand corner for the appropriate degree of wetness.

Figure 3. E-F5 Air Pressure Drop (2 Thru 10 Rows)



NOTE: The letters A, B, C, D or E following the face velocity indicate the degree of wetness at which the coil would be operating. Refer to the chart at the lower right-hand corner for the appropriate degree of wetness.

Figure 4. E-F5 Air Pressure Drop (1-Row)

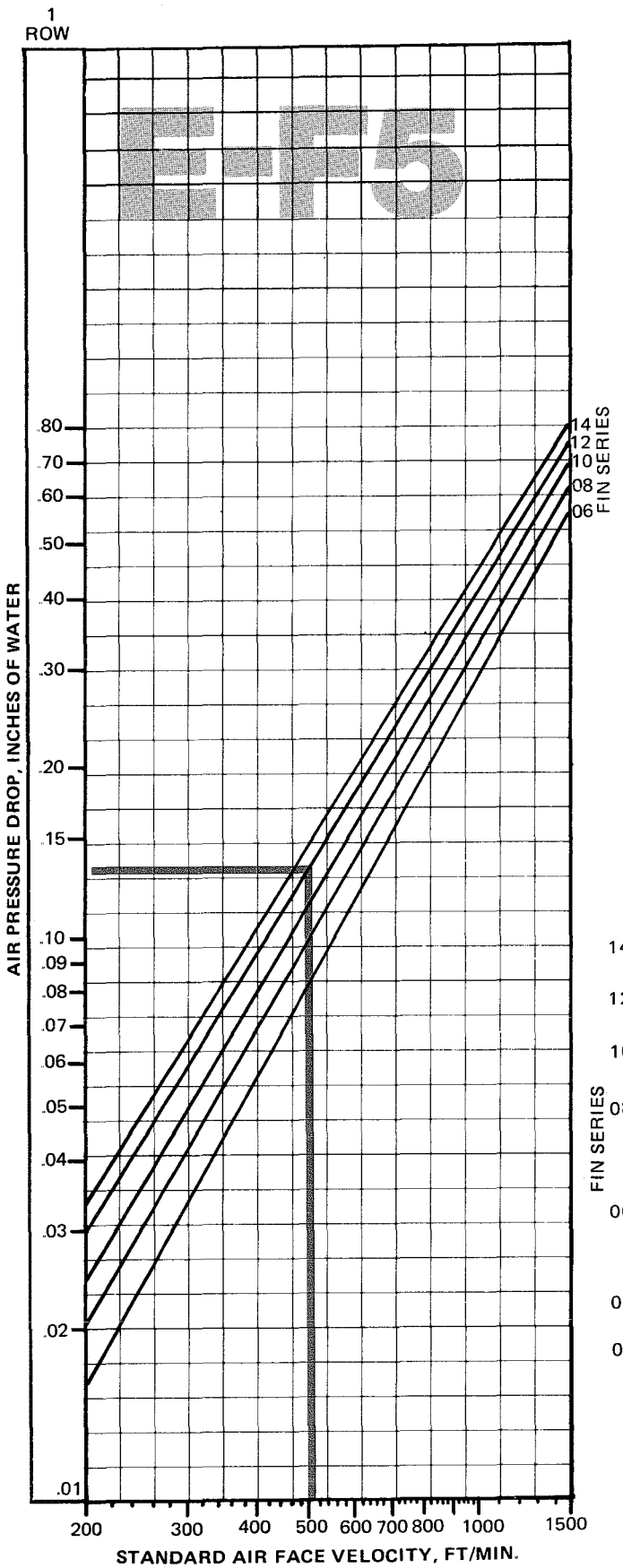
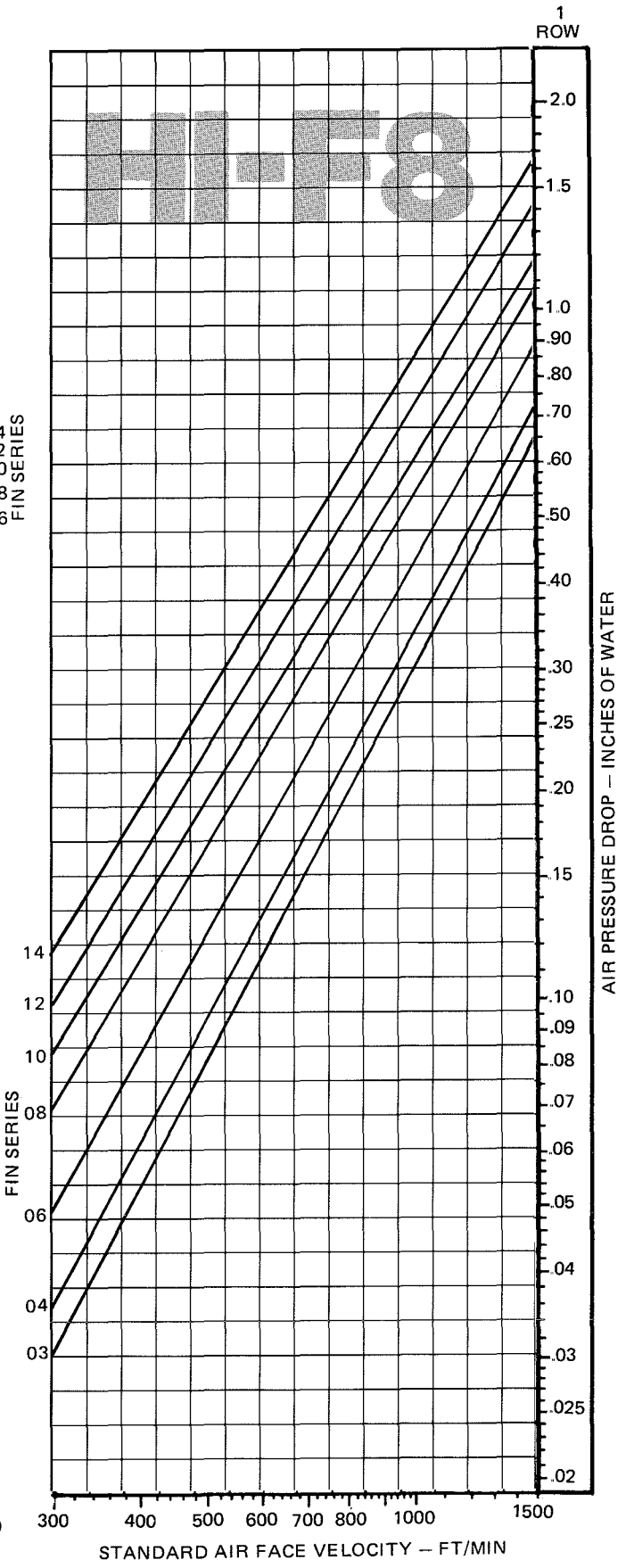


Figure 5. HI-F8 Air Pressure Drop (1″ Steam)



Discharge Arrangements

Fan discharge arrangements, air intakes and motor locations

It is imperative that everyone designate the fan discharge arrangement, coil connection location, etc., with the same view of the unit. McQuay designations for fan rotation, motor location and air discharge arrangements are determined by looking at the drive end of the unit. Table 6 gives a complete listing of the fan rotation and fan discharge arrangements available. Having established the proper view of the unit for reference purposes, the coil connection locations, damper extensions, etc., are designated as drive end or opposite drive end.

Table 6. Fan Discharge & Rotation Arrangements

DESIGNATION	FAN ROTATION	FAN DISCHARGE
1	Clockwise	Top Horizontal
2	Counterclockwise	Top Horizontal
3	Clockwise	Bottom Horizontal
4	Counterclockwise	Bottom Horizontal
5	Clockwise	Upblast
6	Counterclockwise	Upblast
7	Clockwise	Downblast
8	Counterclockwise	Downblast

Figure 6. Blow-through LSB, MSB, LML & MMM Units

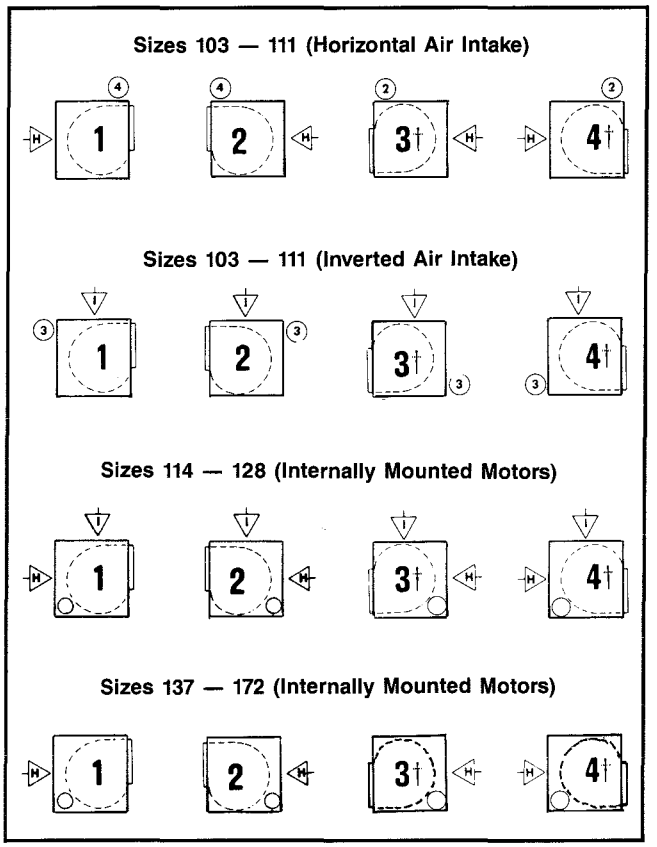
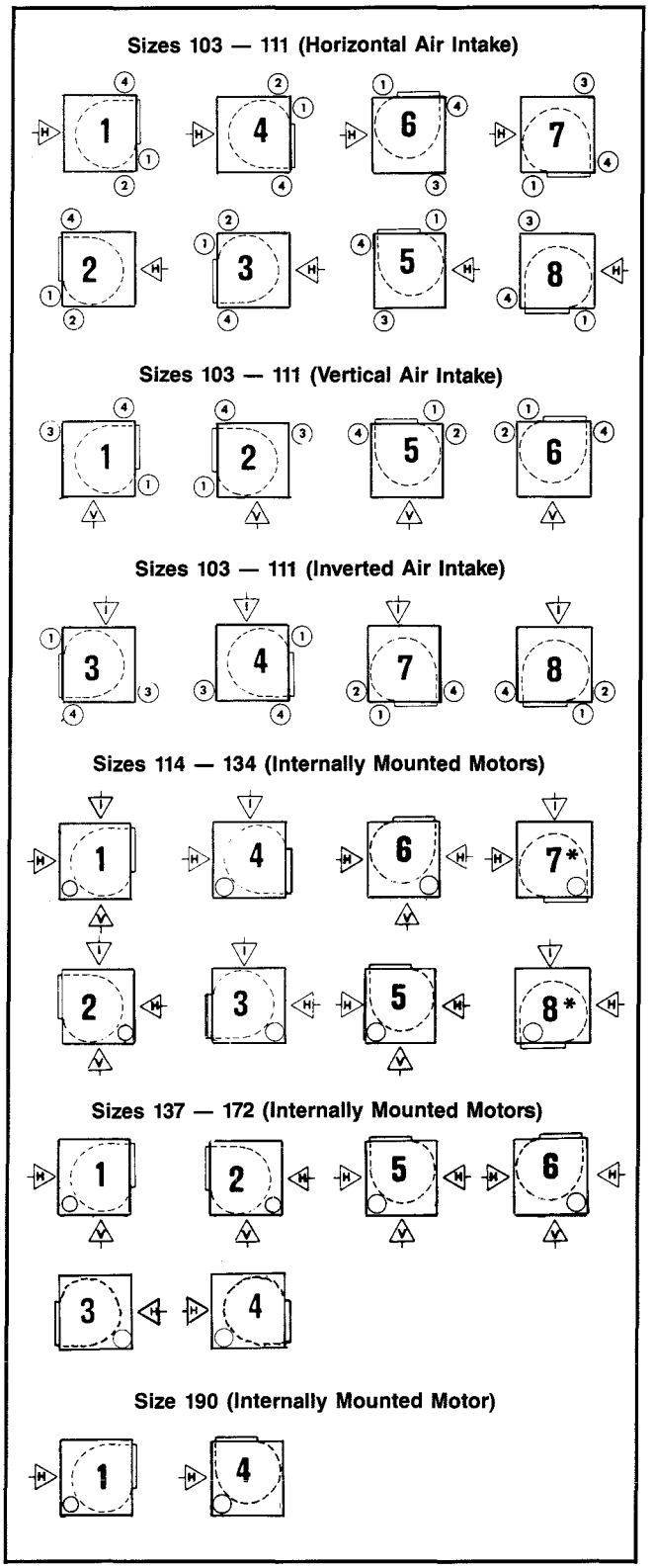


Figure 7. LSL, MSL, LHD & LYF Units

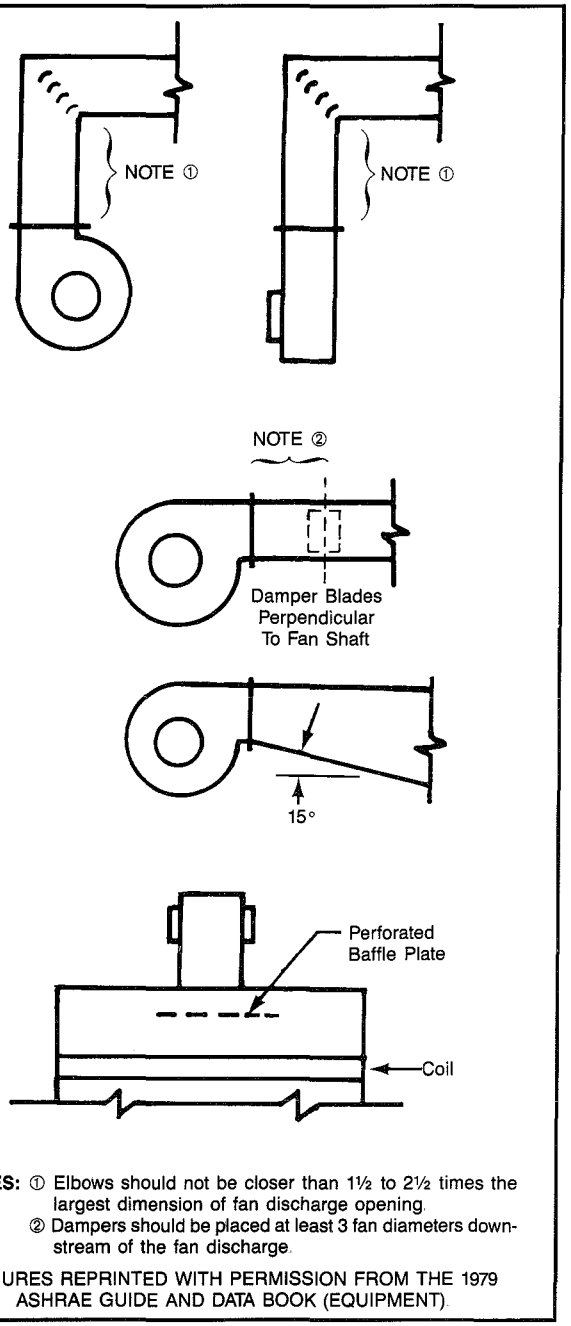


NOTES: 1. ① ② ③ and ④ indicate available motor locations. Motor and external face and bypass cannot be located on same panel.
2. *Internal isolation not available with downblast discharge.
3. †Bottom horizontal discharge not available for LML and MMM units.

ALL UNITS VIEWED FROM DRIVE END

Application considerations

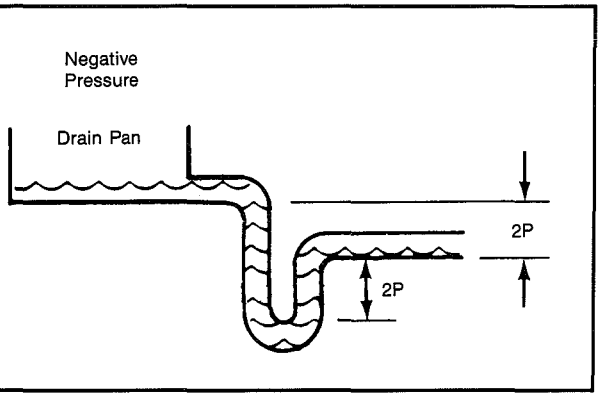
Figure 8. Discharge Duct Layout



NOTES: ① Elbows should not be closer than 1½ to 2½ times the largest dimension of fan discharge opening.
② Dampers should be placed at least 3 fan diameters downstream of the fan discharge.

FIGURES REPRINTED WITH PERMISSION FROM THE 1979 ASHRAE GUIDE AND DATA BOOK (EQUIPMENT).

Figure 9. Drain Pan Traps



Installation flexibility

McQuay Central Station Air Handlers feature sectionalized design to provide maximum installation flexibility. Fan, coil, filter, mixing box, face and bypass, and access sections allow the design flexibility of built-up systems with the cost advantage of factory fabricated units. Every section is fabricated of heavy-gauge continuous galvanized steel with exacting assembly procedures and rigid quality control standards.

Mounting and access

Whether units are floor or ceiling mounted, care should be taken to insure that the supporting structure is level and rigid enough for satisfactory unit operation. Ideally, a heavy concrete slab should be used for bottom mounted units, and main support beams for top hung units. 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 pan line.

Access to the interior of McQuay air handlers is provided by hinged access doors or removable panels wherever possible. Hinged access door kits are also available for field installation. For access between components, McQuay offers a versatile access section featuring hinged access doors at both ends.

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. When a factory fan section is to be matched with a field fabricated coil bank in a blow-through configuration, a diffuser plate should be located so as to distribute the airflow as evenly as possible across the coil face area. See Figure 8 for good fan outlet practices.

Piping and drain pan traps

Piping should be 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 the drain pan outlet should be twice the negative static pressure under normal unit operation.

Vibration isolation

To insure that noise and vibration are 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.

While most applications require vibration isolation, McQuay Central Station Air Handlers are available with factory installed internal isolation for most unit sizes and field installed externally mounted isolators for all unit sizes. Internally isolated units feature internally mounted 2″ deflection spring isolators sized specifically for each fan wheel and unit size. Internally isolated units are thrust restrained for smooth startup. Because internal isolation minimizes vibration at the source (fan and motor), there is seldom a need for flexible connections on ductwork or coil piping. Internal isolation provides an opportunity for significantly reduced installation costs.

Blow-through air handler applications

Blow-through SEASONMASTER central station air handlers are available in singlezone, two-deck and three-deck configurations. Singlezone units are offered with cooling coil sections or with diffuser sections only. 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.

Multizone 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 multizone 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.

Multizone air handling systems result in an 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.

Air handler insulation

Air handler cabinet insulation requirements are dependent on moisture and noise control concerns. Insulation greatly reduces the possibility of cabinet sweating for cooling applications in humid climates. Cabinet insulation also contributes significantly to unit sound attenuation.

SEASONVENT and SEASONMASTER draw-through units are available with 1″ thick neoprene coated fiber insulation in ¾ lb, 1½ lb. and 3 lb. densities. Heating and ventilating units can also be ordered uninsulated.

The fan section of blow-through units can be furnished with 1″ thick neoprene coated fiber insulation in ¾ lb., 1½ lb. and 3 lb. densities. The fan section can also be ordered uninsulated for applications in which fiber insulation in the airstream is not desired. Coil sections on blow-through units are available fully lined and insulated. Liner options include solid and perforated liners covering 1″ fiber insulation of ¾ lb., 1½ lb. and 3 lb. densities. The coil sections can also be ordered unlined and provided with insulation only.

Air supply systems and fan laws

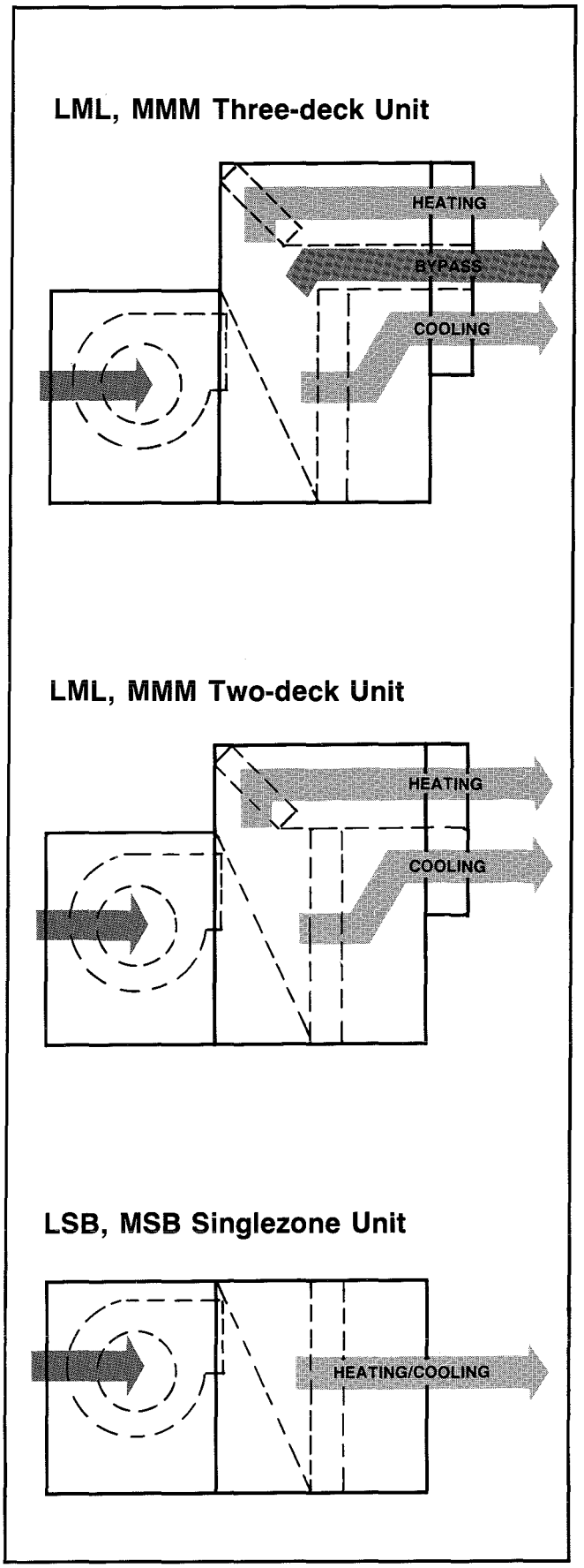
An air supply system consists of an air handler cabinet, heat exchanger, filters, ductwork, grilles and registers used to distribute air throughout the building. The system is independent of the fan used to supply the system.

The resistance of the system, referred to as static pressure (SP), is dependent upon the quantity of air (cfm) that is moved through it. The air quantity is determined by the cooling, heating and ventilating requirements.

For any system, the static pressure will vary directly as the square of the air quantity. This relationship between cfm and SP establishes the system curve for that system and may be expressed as follows:

$$\left(\frac{CFM_1}{CFM_2}\right)^2 = \frac{SP_1}{SP_2} \quad \text{or} \quad SP_2 = SP_1\left(\frac{CFM_2}{CFM_1}\right)^2$$

Figure 10. Blow-through Air Handler Configurations



The system curve is unique for a particular system configuraton. Any change to the system caused by dirty filters, damper changes, etc., will result in a new system curve.

For fans operating at low pressures (less than 10″ W.G.), the effects of air compression are negligible. Disregarding air compression allows fan operation in a fixed system to be expressed by simple relationships. These relationships are know as fan laws and may be used to calculate the effects of fan speed and air density changes on this system.

1. The flow rate varies directly with the change in fan speed:

$$\frac{CFM_1}{CFM_2} = \frac{RPM_1}{RPM_2} \quad \text{or} \quad CFM_2 = CFM_1\left(\frac{RPM_2}{RPM_1}\right)$$

   A 10% increase in fan speed will give a 10% increase in air quantity.

2. The static pressure varies as the square of the change in fan speed:

$$\frac{SP_1}{SP_2} = \left(\frac{RPM_1}{RPM_2}\right)^2 \quad \text{or} \quad SP_2 = SP_1\left(\frac{RPM_2}{RPM_1}\right)^2$$

   A 10% increase in fan speed will give a 21% increase in static pressure.

3. The fan brake horsepower varies as the cube of the change in fan speed:

$$\frac{HP_1}{HP_2} = \left(\frac{RPM_1}{RPM_2}\right)^3 \quad \text{or} \quad HP_2 = HP_1\left(\frac{RPM_2}{RPM_1}\right)^3$$

   A 10% increase in fan speed will give 33% increase in fan horsepower.

4. System static pressure and brake horsepower are directly proportional to the air density:

$$SP_2 = SP_1\left(\frac{Density_2}{Density_1}\right)\left(\frac{RPM_2}{RPM_1}\right)^2$$

$$HP_2 = HP_1\left(\frac{Density_2}{Density_1}\right)\left(\frac{RPM_2}{RPM_1}\right)^3$$

   Consequently, the static pressure and brake horsepower decrease with an increase in air temperature or higher altitude, and increase with a decrease in air temperature or lower altitude.

   To determine fan performance for temperatures and altitudes other than standard (70°F, 0 ft. altitude), the static pressure must be adjusted by the density ratio before the fan rpm and bhp requirements can be determined. Density ratios are expressed as temperature and altitude conversion factors in Table 7.

Table 7. Temperature and altitude conversion factors

AIR TEMP. (°F)	ALTITUDE (FEET)								
	0	1000	2000	3000	4000	5000	6000	7000	8000
-20	1.20	1.16	1.12	1.08	1.04	1.00	.97	.93	.89
0	1.15	1.10	1.08	1.02	.99	.95	.92	.88	.85
20	1.11	1.06	1.02	.98	.95	.92	.88	.85	.82
40	1.06	1.02	.98	.94	.91	.88	.84	.81	.78
60	1.02	.98	.94	.91	.88	.85	.81	.79	.76
70	1.00	.96	.93	.89	.86	.83	.80	.77	.74
80	.98	.94	.91	.88	.84	.81	.78	.75	.72
100	.94	.91	.88	.84	.81	.78	.75	.72	.70
120	.92	.88	.85	.81	.78	.76	.72	.70	.67
140	.89	.85	.82	.79	.76	.73	.70	.68	.65
160	.85	.82	.79	.76	.74	.70	.68	.65	.63
200	.80	.77	.75	.72	.69	.67	.64	.62	.60
250	.75	.72	.69	.67	.65	.62	.60	.58	.56

Fan and motor heat

Motor and drive heat — The total energy input to any fan motor is always eventually converted into heat. The input energy is consumed in two ways — by heat dissipated through the motor frame and by work output. The amount of heat dissipated by the motor is a function of its operating efficiency:

$$Motor\ Heat = Input \times (1 - Motor\ Efficiency)$$

A small amount of the motor work output is dissipated by the drive mechanism, which also results in a heat gain. Belt drive losses are a function of belt tension and number of belts as well as power transmitted. Typical belt drive losses range from 2% to 6% of bhp.

Whether motor and drive heat gain become part of an air handling system cooling load depends on the motor location relative to the conditioned space. For air handlers with internal motors, the motor and drive are within the conditioned space. Therefore, the motor and drive add heat to the system. This heat must be subtracted from the cooling capacity and added to the heating capacity of the unit.

For units with external motors located in an equipment room, the motor and drive heat are part of the equipment room heat gain. For equipment rooms vented to the outside (and also for roof mounted units), heat generated by an external motor and drive need not be considered.

Fan heat generation — All of the power input to a fan results in heat gain which must be considered as a cooling load. The amount of heat generated is directly proportional to the fan bhp:

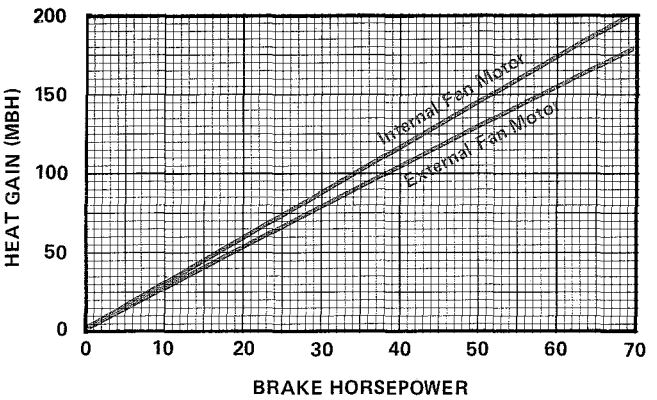
$$Fan\ Heat\ (Btuh) = Bhp \times 2545$$

Much of this heat generation occurs within the fan itself. Fans are far from 100% efficient, and the energy losses which occur are converted directly into heat. The work done by the fan on the airstream increases the temperature, pressure and velocity of air. The heat of compression required to raise the airstream to this increased energy level is also a heat gain.

As the air travels throughout the building, its energy is deteriorated by friction, resulting in pressure drop. This is also heat gain, but it does not result in a temperature rise because the air expands as the pressure is reduced. The expansion is a cooling process which offsets the heat generated by friction.

Typical fan and motor heat values are given in Figure 11. The upper curve expresses fan heat as a function of bhp, and should be used for units with internal motors. This curve should also be used for units with external motors located within the conditioned space.

Figure 11. Fan & Motor Heat Gain



Air handler sound

Sound generation from air handlers must be carefully considered in well engineered systems. In selecting the unit, the engineer should analyze the expected sound power spectrums of unit size and fan wheel options and proceed with an attenuation analysis. The unit placement location, duct silencers, acoustical duct lining and equipment room construction are among the attenuation options available.

Sound power levels can be used as a basis of comparison between air handlers of various manufacturers and between fan wheel options of a specific McQuay air handler unit size. Because an industry standard of air handler sound testing does not presently exist, an equitable means of comparison between manufacturers is the procedure of fan sound power level estimation presented in the 1987 ASRHAE Systems and Applications Handbook.

Sound power levels in decibels for the center frequency of 7 of the 8 octave bands can be estimated with equation 1. The equation is applied to each of the 7 octave bands. The 8th octave band is not included in the ASHRAE method for fan sound power estimation.

$$PWL = (specific\ sound) + (system) + (blade\ frequency) + (point\ of\ operation) - (cabinet\ attenuation) \quad (1)$$

All terms in the equation are expressed in decibels and are defined below:

PWL — Air handler sound power level at the center frequency of each octave band.

Specific Sound — The specific sound power level is dependent on fan wheel type, diameter and octave band. Refer to Table 8 for specific sound power levels.

System — The system decibel level is dependent on fan airflow (cfm) and total static pressure (TSP, inches W.G.). The system level can be calculated from equation 2. Note that the system level is the same for all octave bands.

$$System = 10\ (log\ cfm) + 20\ (log\ TSP) \quad (2)$$

Blade Frequency — Fans generate a pure tone at the blade passage frequency. The resulting sound power can be estimated for forward curved and airfoil fans as follows:

1. For forward curved fan wheel units, add 2 dB to the one octave band which contains the frequency equal to the RPM of the fan.
2. For airfoil fan wheel units, add 3 dB to the one octave band which contains the frequency equal to the fan rpm divided by 5.

NOTE: Blade passage frequency occurs in only one octave band.

Point of Operation — Fan performance at peak efficiency point of operation generally corresponds to the lowest noise level for the fan. If the fan cannot be selected near its peak efficiency, the noise level will increase and a point of operation factor must be included in the sound power estimation for all octave bands. The point of operation factor is included in the MS-85™ Air Handler Selection Program Sound Calculation. The factor varies from 3 dB for a fan operating at 85% of its peak efficiency to 15 dB for a fan operation at 50% of peak efficiency.

Cabinet Attenuation — The cabinet of an air handler significantly reduces the sound radiated from the fan. To estimate radiated sound power for air handler fans, 15 dB should be subtracted from each octave band. Equation 1 without the cabinet attenuation term represents total sound power emanating from the inlet, outlet and fan housing of a bare fan having no cabinet.

Sound power levels of each octave band can be used directly as a comparison between air handlers or they can be used as a basis for determining several other means of air handler sound comparison and sound attenuation analysis. For a more detailed discussion of air handler sound including basic definitions, the A weighted scale, NC curves, variable air volume, and noise attenuation, refer to Air Handler Sales and Engineering Data Bulletin SED 1007.

Table 8. Specific Sound Power Levels By Octave Band

FAN TYPE	WHEEL DIAMETER	OCTAVE BAND NUMBER						
		1	2	3	4	5	6	7
AIRFOIL	36″ & Over	32	32	31	29	28	23	15
	Under 36″	36	38	36	34	33	28	20
FORWARD CURVED	All Sizes	47	42	39	33	28	25	23

NOTE: The above values are the specific sound power levels radiated from either the inlet or outlet of the fan. If the total sound power level (including cabinet radiation) is desired, add 3 dB to the above values.

Table reprinted with permission from the 1987 ASHRAE Systems and Applications Handbook.

Air volume modulation

Discharge dampers

The simplest form of fan modulation used today is the practice of riding the fan curve. What this involves is simply allowing a forward curved fan to rise to the left on its constant rpm line in response to an increase in system static pressure. There are two methods of increasing system static pressure. One is simply closing off the variable air volume terminals. The other is through the use of discharge or inlet dampers.

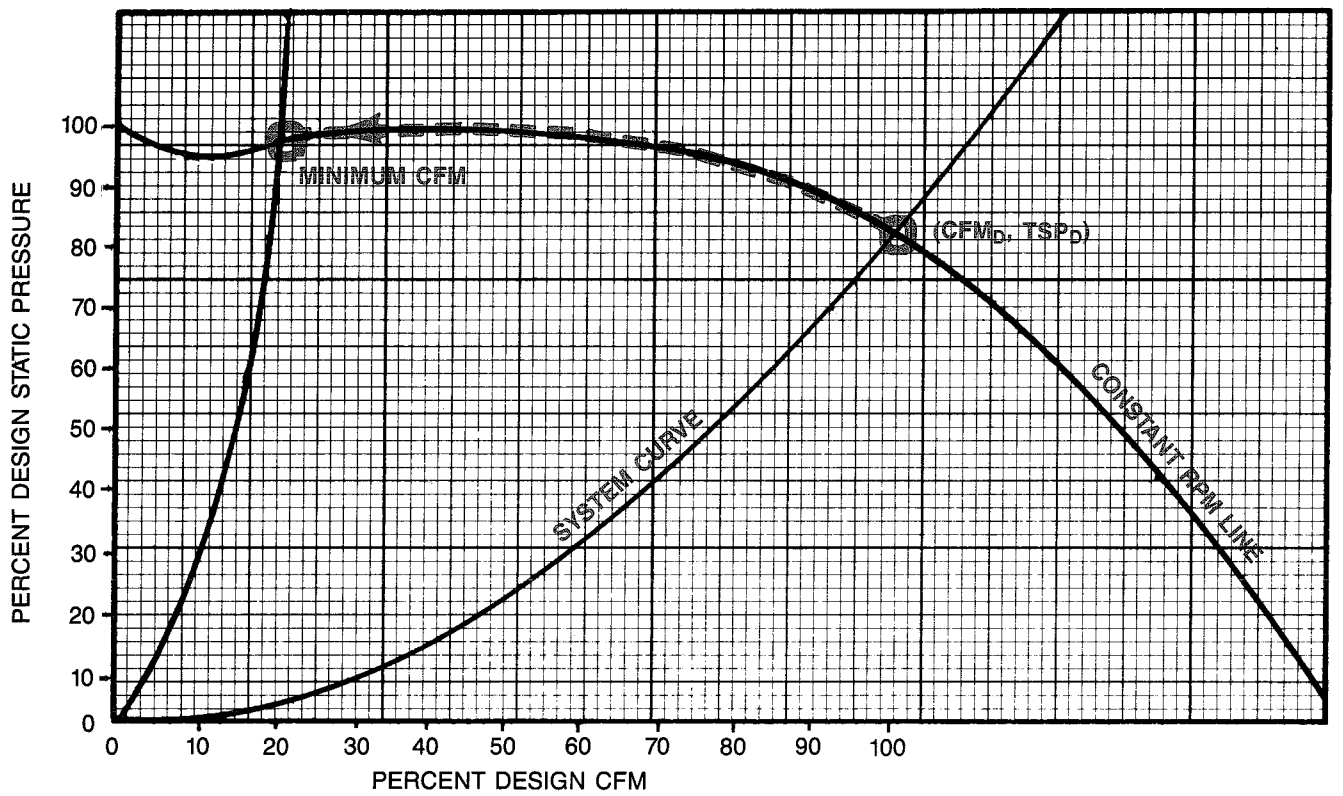
Discharge dampers are preferred to merely closing off variable air volume terminals since they greatly reduce the possibility of overpressurizing the ductwork and eliminate the potential for air velocity noise problems at the space that would occur when the variable air volume terminals begin to close. As the discharge dampers begin to close, more and more pressure drop is seen across the damper. As this static pressure is increased, it causes the operating point of the fan to move upward to the left along the constant rpm line, thus resulting in a reduction in airflow.

Because of the characteristics of a forward curved fan, the brake horsepower is reduced significantly as the fan operating point rides up this rpm curve (Figure 12). By riding the rpm line back to the surge area, the minimum recommended cfm is obtained. Brake horsepower reduction can be read directly off the fan curve for reduced cfm values.

The characteristics of an airfoil fan allow virtually no bhp savings with discharge dampers. Excessive duct pressure will also be encountered. For these reasons, airfoil fans are not typically used with discharge dampers.

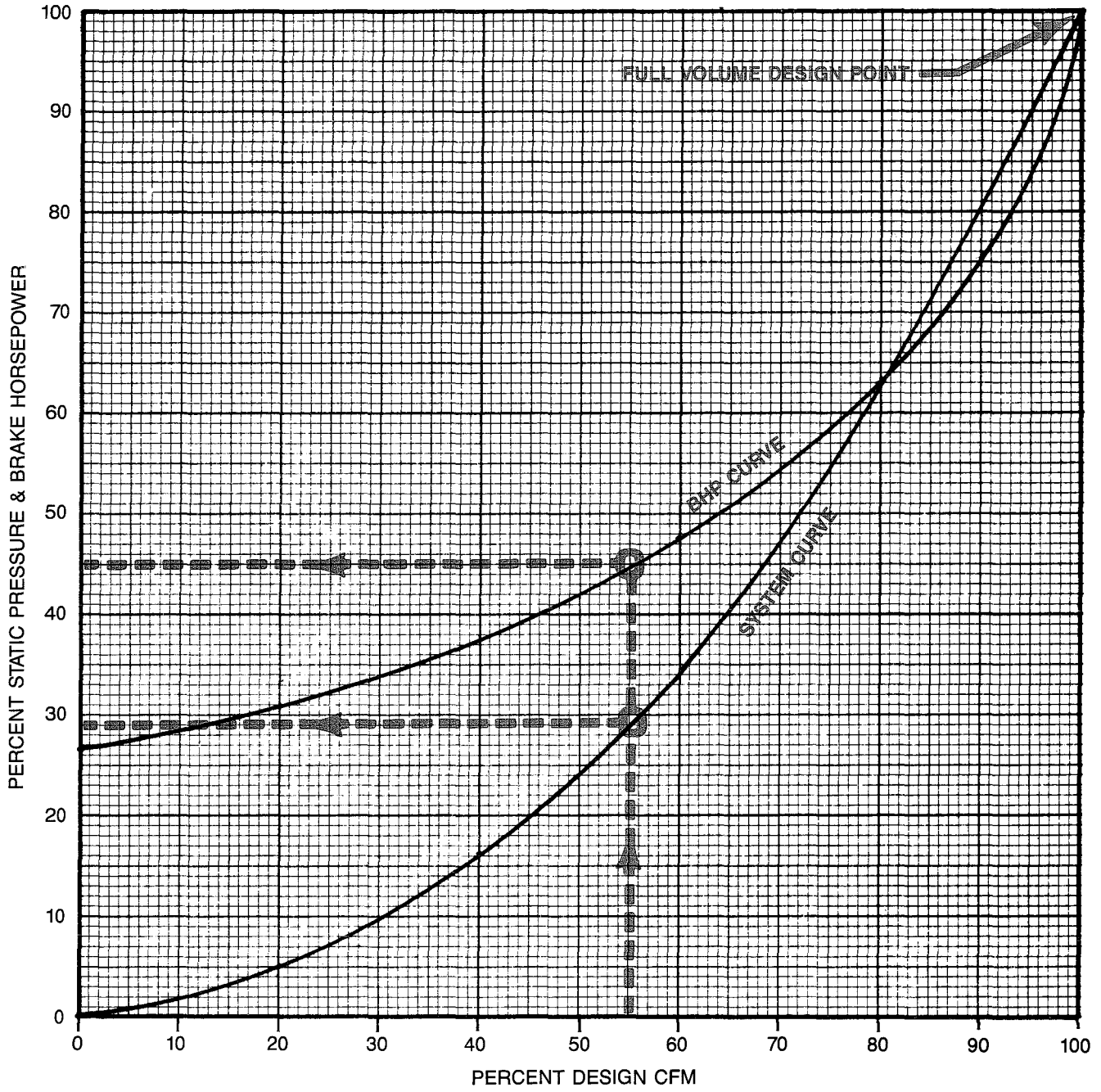
To assure uniform airflow across the discharge damper and to reduce the possibility of excessive noise or vibration, McQuay recommends that discharge dampers be located at least three fan diameters downstream of the fan outlet. Discharge dampers offer good power savings over a fairly wide modulation range with both low first cost and low maintenance costs.

Figure 12. Discharge Damper Air Volume Modulation



Find design cfm and total static pressure. Follow constant rpm line left to minimum cfm point. Read new bhp and cfm.

Figure 13. Inlet Vane Control Reduction Factors



Follow percent of design cfm up to system curve and left for percent of design static pressure. Follow percent of design cfm up to bhp curve and left for percent of rated horsepower.

Inlet guide vanes

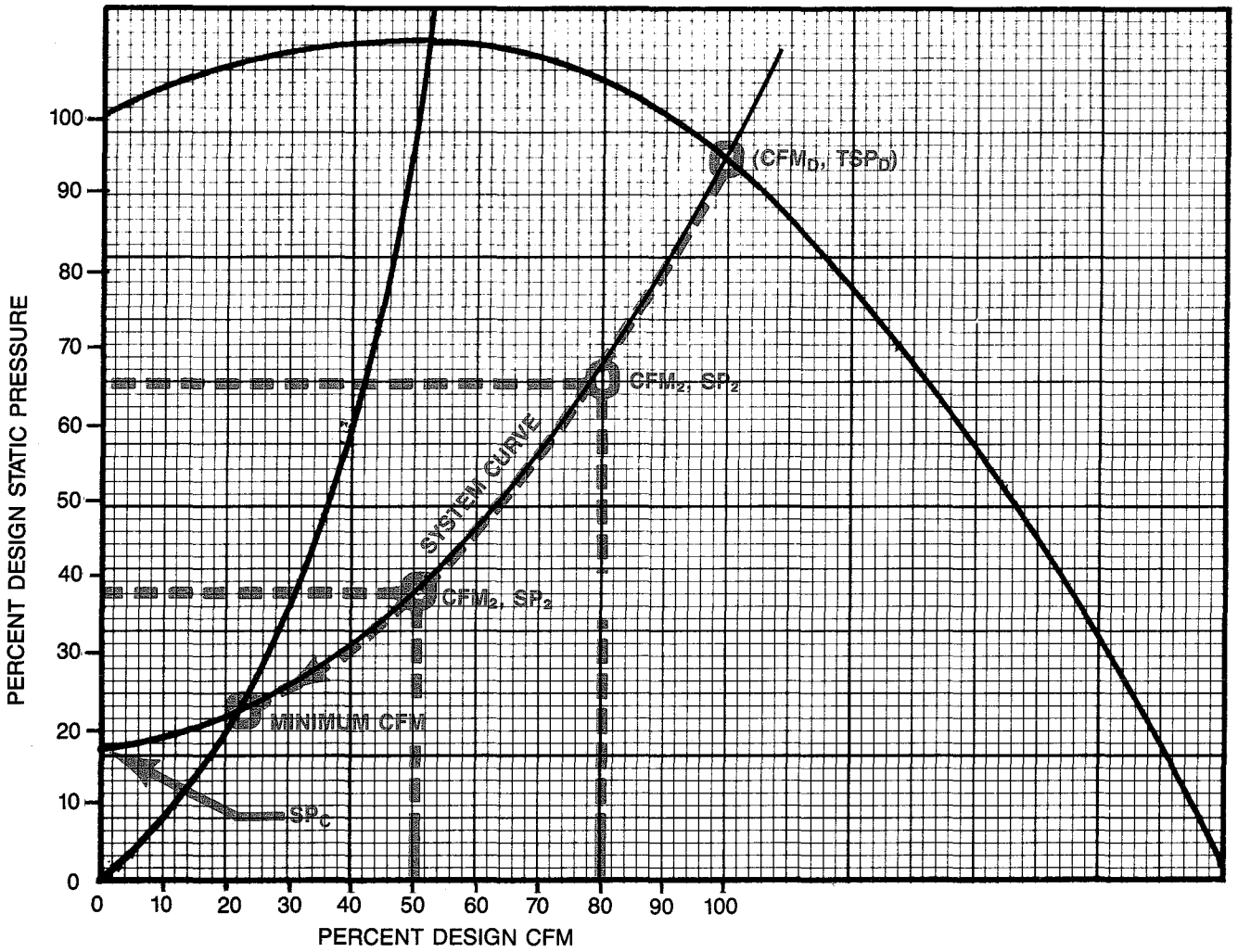
One of the most common methods of fan modulation is the use of inlet guide vanes. McQuay offers inlet vanes for unit sizes 106 through 134 with forward curved fans and 114 through 190 with airfoil fan wheels. Fan volume reduction with inlet vanes is accomplished by pre-spinning the air in the direction of fan rotation. The effect of pre-spinning results in decreased air delivery, static pressure and brake horsepower. For each position of inlet guide vanes, a new fan curve is created. Brake horsepower reductions cannot be read directly off the fan curve on inlet vane applications because a new fan curve is generated as the inlet vane closes.

It is also difficult to estimate turndown capability on inlet vane applications. Any time a VAV system with terminal boxes is controlled by a static pressure sensor, a system resistance curve is developed which passes through the design operating point and a minimum static pressure control point. This system curve will affect where the fan will cross into the unstable operating range. An illustration of inlet vane turndown is presented in Figure 13.

Inlet vanes operate most efficiently when the fan is chosen at or near peak efficiency. Inlet guide vanes offer good power savings, wide modulation range, and low maintenance.

NOTE: Fan performance with inlet vane control at other than wide open position is not within the scope of our central station air handler certification program with ARI.

Figure 14. Mechanical Drive Reduction Factors



Find design cfm and total static pressure. Calculate system line with the following formula:

$$SP_2 = \frac{TSP - SP_C}{(CFM_D)^2} \times (CFM_2)^2 + SP_C$$

SP_C = Control static required to operate VAV boxes.
CFM_2, SP_2 = Points less than design condition used to develop system line.
CFM_D, TSP_D = Design condition.

Approximate shipping weights — blow-through units

Table 9. Approximate Blow-through Air Handler Shipping Weights Per Unit Size

DESCRIPTION	UNIT SIZE											
	106	108	111	114	117	122	128	137	141	150	164	172
BLOWER SECTION												
Low/Medium Pressure Forward Curve Wheel	260	396	459	730	730	860	1060	2202	2474	2782	3078	3078
Low/Medium Pressure Airfoil Wheel	—	396	459	785	785	920	1120	2206	2473	2805	3097	3097
Add For Internal Isolation	—	—	—	74	74	107	154	45	50	60	65	65
High Pressure	—	—	—	—	1138	1429	1575	2540	2716	3275	4019	—
BLOW-THROUGH COIL SECTION, LOW AND MEDIUM PRESSURE												
Singlezone Diffuser Section	80	102	118	136	150	186	272	303	358	407	495	495
Singlezone Coil Section	258	302	358	484	527	693	744	947	1052	1146	1433	1522
Multizone 2-Deck Coil Section	403	469	550	668	785	951	1138	1455	1591	1711	2086	2171
Multizone 3-Deck Coil Section	522	626	723	876	1024	2306	1515	2140	2293	2486	2759	3121
BLOW-THROUGH ZONE DAMPERS, LOW AND MEDIUM PRESSURE												
Multizone 2-Deck Dampers	94	96	136	180	230	255	301	362	374	396	440	440
Multizone 3-Deck Dampers	155	180	218	265	332	388	475	573	593	637	721	721
BLOW-THROUGH COIL SECTION LINERS, LOW AND MEDIUM PRESSURE												
Singlezone Diffuser Liners	22	31	35	39	45	60	69	88	99	116	143	143
Singlezone Coil Liners	52	71	85	88	124	151	182	208	239	267	364	402
Multizone 2-Deck Liners	80	100	134	165	180	205	263	263	294	333	442	470
Multizone 3-Deck Liners	118	155	184	240	283	321	384	498	536	605	677	814
BLOW-THROUGH COIL SECTION EXTENSION, LOW AND MEDIUM PRESSURE												
Singlezone Vertical Discharge Coil Section Extension	76	80	91	106	121	170	180	290	309	326	365	386
BLOW-THROUGH COIL SECTION, HIGH PRESSURE												
Multizone 2-Deck Coil Section	—	—	—	—	803	961	1125	1795	1936	2177	2623	—
Multizone 2-Deck Zone Dampers	—	—	—	—	196	241	406	467	467	506	568	—
HEATING COIL SECTION												
1 & 2 Row	72	81	93	112	124	149	177	267	282	297	325	325
3 & 4 Row	90	131	185	209	243	286	342	385	432	459	576	576
HEATING AND COOLING COILS (LFA) — ALUMINUM FINS												
1 Row	29	38	48	58	68	83	101	146	158	188	226	267
2 Rows	45	58	76	92	110	135	165	236	258	308	376	444
3 Rows	61	84	108	134	154	197	260	370	412	485	609	706
4 Rows	76	104	135	166	192	244	323	459	511	602	756	877
5 Rows	91	124	161	199	229	292	386	549	611	719	903	1047
6 Rows	106	144	187	231	266	339	449	683	710	836	1050	1218
8 Rows	136	184	239	296	340	434	575	817	909	1070	1344	1559
10 Rows	165	225	292	360	415	529	700	995	1108	1304	1638	1900
BLOW-THROUGH HEATING COILS — ALUMINUM FINS												
1 Row	20	25	32	39	47	55	67	73	79	93	113	113
2 Rows	29	37	50	61	73	87	107	118	126	154	188	188
3 Rows	38	50	67	85	102	122	166	185	206	242	305	305
4 Rows	47	62	83	106	127	151	206	230	256	301	378	378
CONDENSER COIL												
6 Row, 12 FPI	—	213	267	320	375	442	573	774	888	999	1298	—
ACCESSORY SECTIONS												
Mixing Box Only	162	203	274	318	368	461	565	757	898	923	1027	1027
Combination Angular Filter/Mixing Box	281	330	426	554	635	768	932	1238	1392	1512	1793	1793
Flat Filter Section	62	86	118	140	161	189	232	278	303	342	416	458
Angular Filter Section	150	188	231	305	348	377	449	625	656	776	903	903
Heavy-Duty Filter Section	—	—	253	338	408	534	642	747	878	1046	1074	1074
Access and Spacer Section	81	89	107	118	129	159	188	248	296	340	415	—

SEE TABLE 11, PAGE 30, FOR MOTOR WEIGHTS

Approximate shipping weights — draw-through units

Table 10. Approximate Draw-through Air Handler Shipping Weights Per Unit Size

DESCRIPTION	UNIT SIZE																
	103	104	106	206	108	209	111	114	117	122	128	134	137	141	150	164	172
BLOWER SECTION																	
Lo/Med. Press. FC Wheel	144	175	260	330	396	430	459	730	730	860	1060	1060	2202	2474	2782	3078	3078
Lo/Med. Press. AF Wheel	—	—	—	—	396	—	459	785	785	920	1120	1120	2206	2473	2805	3097	3097
Add for Internal Isolation	—	—	—	—	—	—	—	74	74	107	154	154	45	50	60	65	65
High Pressure	—	—	—	—	—	—	—	—	1138	1429	1575	—	2540	2716	3275	4019	—
DRAW-THROUGH COIL SECTION — HORIZONTAL																	
Lo/Med. Pressure	108	120	142	—	144	—	176	203	228	283	324	370	947	1046	1109	1188	1243
High Pressure	—	—	—	—	—	—	—	—	228	283	324	—	977	1104	1298	1642	—
DRAW-THROUGH COIL SECTION — VERTICAL																	
	135	145	171	—	230	—	278	307	342	486	555	685	1393	1611	1844	—	—
HEATING COIL SECTION																	
1 & 2 Row	52	59	72	79	81	93	93	112	124	149	177	177	267	282	297	325	325
3 & 4 Row	61	76	90	125	131	185	185	209	243	286	342	342	385	432	459	576	576
HEATING AND COOLING COILS (LFA) — ALUMINUM FINS																	
1 Row	13	21	29	31	38	42	48	58	68	83	101	111	146	158	188	226	267
2 Rows	22	30	45	48	58	66	76	92	110	135	165	182	236	258	308	376	444
3 Rows	28	39	61	—	84	—	108	134	154	197	260	286	370	412	485	609	706
4 Rows	35	49	76	—	104	—	135	166	192	244	323	355	459	511	602	756	877
5 Rows	42	58	91	—	124	—	161	199	229	292	386	425	549	611	719	903	1047
6 Rows	49	68	106	—	144	—	187	231	266	339	449	494	683	710	836	1050	1218
8 Rows	63	87	136	—	184	—	239	296	340	434	575	633	817	909	1070	1344	1559
10 Rows	76	106	165	—	225	—	292	360	415	529	700	770	995	1108	1304	1638	1900
CONDENSER COIL																	
6 Row, 12 FPI	—	—	—	—	213	—	267	320	375	442	573	—	774	888	999	1298	—
ACCESSORY SECTIONS																	
Mixing Box Only	122	133	162	182	203	240	274	318	368	461	565	565	757	898	923	1027	1027
Combination Angular Filter Mixing Box	155	214	281	310	330	400	426	554	635	768	932	932	1238	1392	1512	1793	1793
Vert. Angular Filter & Base	163	225	295	326	346	420	446	581	666	807	978	—	—	—	—	—	
Flat Filter Section	39	49	62	78	86	96	118	140	161	189	232	242	278	303	342	416	458
Angular Filter Section	90	109	150	165	188	215	231	305	348	377	449	449	625	656	776	903	903
Heavy-Duty Filter Section	—	—	—	—	—	250	253	338	408	534	642	642	747	878	1046	1074	1074
Inter. Face & Bypass Sect.	39	51	65	70	75	90	102	119	136	167	210	—	216	238	267	315	—
Ext. Face & Bypass Sect. Lo-Med.	69	86	114	132	152	172	221	265	306	367	419	435	614	697	822	996	1090
Ext. Face & Bypass Sect. High	—	—	—	—	—	—	—	—	306	367	419	—	644	727	852	1026	—
Access & Spacer Section	61	69	81	91	89	105	107	118	129	159	188	200	248	296	340	415	—

Table 11. Motor Weights — Standard Open Drip-proof (1800 rpm)

MOTOR HP	¼	⅓	½	¾	1	1½	2	3	5	7½	10	15	20	25	30	40	50	60	75
NEMA Frame	48	48	56	56	143T	145T	145T	182T	184T	213T	215T	254T	256T	284T	286T	324T	326T	364T	365T
Motor Weight	17	22	32	32	39	48	48	75	91	126	150	225	255	330	410	500	560	670	850

Table 12. Maximum Motor Frame Size

MOTOR POSITION	UNIT SIZE																
	103	104	106	206	108	209	111	114	117	122	128	134	137	141	150	164	172
Top	145T	182T	213T	215T	215T	215T	254T	NA	NA	NA	NA	NA	324T	324T	326T	326T	NA
Side & Bottom	145T	182T	213T	215T	215T	215T	254T	NA	NA	NA	NA	NA	286T	286T	286T	324T	NA
Internal	NA	NA	NA	NA	NA	NA	NA	256T	284T	284T	286T	286T	326T	364T	365T	365T	365T
Extended Base	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	324T	326T	364T	365T	NA

NA = Not Available

High Pressure Only

Approximate shipping weights — blow-through units

Table 9. Approximate Blow-through Air Handler Shipping Weights Per Unit Size

DESCRIPTION	UNIT SIZE											
	106	108	111	114	117	122	128	137	141	150	164	172
BLOWER SECTION												
Low/Medium Pressure Forward Curve Wheel	260	396	459	730	730	860	1060	2202	2474	2782	3078	3078
Low/Medium Pressure Airfoil Wheel	—	396	459	785	785	920	1120	2206	2473	2805	3097	3097
Add For Internal Isolation	—	—	—	74	74	107	154	45	50	60	65	65
High Pressure	—	—	—	—	1138	1429	1575	2540	2716	3275	4019	—
BLOW-THROUGH COIL SECTION, LOW AND MEDIUM PRESSURE												
Singlezone Diffuser Section	80	102	118	136	150	186	272	303	358	407	495	495
Singlezone Coil Section	258	302	358	484	527	693	744	947	1052	1146	1433	1522
Multizone 2-Deck Coil Section	403	469	550	668	785	951	1138	1455	1591	1711	2086	2171
Multizone 3-Deck Coil Section	522	626	723	876	1024	2306	1515	2140	2293	2486	2759	3121
BLOW-THROUGH ZONE DAMPERS, LOW AND MEDIUM PRESSURE												
Multizone 2-Deck Dampers	94	96	136	180	230	255	301	362	374	396	440	440
Multizone 3-Deck Dampers	155	180	218	265	332	388	475	573	593	637	721	721
BLOW-THROUGH COIL SECTION LINERS, LOW AND MEDIUM PRESSURE												
Singlezone Diffuser Liners	22	31	35	39	45	60	69	88	99	116	143	143
Singlezone Coil Liners	52	71	85	88	124	151	182	208	239	267	364	402
Multizone 2-Deck Liners	80	100	134	165	180	205	263	263	294	333	442	470
Multizone 3-Deck Liners	118	155	184	240	283	321	384	498	536	605	677	814
BLOW-THROUGH COIL SECTION EXTENSION, LOW AND MEDIUM PRESSURE												
Singlezone Vertical Discharge Coil Section Extension	76	80	91	106	121	170	180	290	309	326	365	386
BLOW-THROUGH COIL SECTION, HIGH PRESSURE												
Multizone 2-Deck Coil Section	—	—	—	—	803	961	1125	1795	1936	2177	2623	—
Multizone 2-Deck Zone Dampers	—	—	—	—	196	241	406	467	467	506	568	—
HEATING COIL SECTION												
1 & 2 Row	72	81	93	112	124	149	177	267	282	297	325	325
3 & 4 Row	90	131	185	209	243	286	342	385	432	459	576	576
HEATING AND COOLING COILS (LFA) — ALUMINUM FINS												
1 Row	29	38	48	58	68	83	101	146	158	188	226	267
2 Rows	45	58	76	92	110	135	165	236	258	308	376	444
3 Rows	61	84	108	134	154	197	260	370	412	485	609	706
4 Rows	76	104	135	166	192	244	323	459	511	602	756	877
5 Rows	91	124	161	199	229	292	386	549	611	719	903	1047
6 Rows	106	144	187	231	266	339	449	683	710	836	1050	1218
8 Rows	136	184	239	296	340	434	575	817	909	1070	1344	1559
10 Rows	165	225	292	360	415	529	700	995	1108	1304	1638	1900
BLOW-THROUGH HEATING COILS — ALUMINUM FINS												
1 Row	20	25	32	39	47	55	67	73	79	93	113	113
2 Rows	29	37	50	61	73	87	107	118	126	154	188	188
3 Rows	38	50	67	85	102	122	166	185	206	242	305	305
4 Rows	47	62	83	106	127	151	206	230	256	301	378	378
CONDENSER COIL												
6 Row, 12 FPI	—	213	267	320	375	442	573	774	888	999	1298	—
ACCESSORY SECTIONS												
Mixing Box Only	162	203	274	318	368	461	565	757	898	923	1027	1027
Combination Angular Filter/Mixing Box	281	330	426	554	635	768	932	1238	1392	1512	1793	1793
Flat Filter Section	62	86	118	140	161	189	232	278	303	342	416	458
Angular Filter Section	150	188	231	305	348	377	449	625	656	776	903	903
Heavy-Duty Filter Section	—	—	253	338	408	534	642	747	878	1046	1074	1074
Access and Spacer Section	81	89	107	118	129	159	188	248	296	340	415	—

SEE TABLE 11, PAGE 30, FOR MOTOR WEIGHTS

Approximate shipping weights — draw-through units

Table 10. Approximate Draw-through Air Handler Shipping Weights Per Unit Size

DESCRIPTION	UNIT SIZE																
	103	104	106	206	108	209	111	114	117	122	128	134	137	141	150	164	172
BLOWER SECTION																	
Lo/Med. Press. FC Wheel	144	175	260	330	396	430	459	730	730	860	1060	1060	2202	2474	2782	3078	3078
Lo/Med. Press. AF Wheel	—	—	—	—	396	—	459	785	785	920	1120	1120	2206	2473	2805	3097	3097
Add for Internal Isolation	—	—	—	—	—	—	—	74	74	107	154	154	45	50	60	65	65
High Pressure	—	—	—	—	—	—	—	—	1138	1429	1575	—	2540	2716	3275	4019	—
DRAW-THROUGH COIL SECTION — HORIZONTAL																	
Lo/Med. Pressure	108	120	142	—	144	—	176	203	228	283	324	370	947	1046	1109	1188	1243
High Pressure	—	—	—	—	—	—	—	—	228	283	324	—	977	1104	1298	1642	—
DRAW-THROUGH COIL SECTION — VERTICAL																	
	135	145	171	—	230	—	278	307	342	486	555	685	1393	1611	1844	—	—
HEATING COIL SECTION																	
1 & 2 Row	52	59	72	79	81	93	93	112	124	149	177	177	267	282	297	325	325
3 & 4 Row	61	76	90	125	131	185	185	209	243	286	342	342	385	432	459	576	576
HEATING AND COOLING COILS (LFA) — ALUMINUM FINS																	
1 Row	13	21	29	31	38	42	48	58	68	83	101	111	146	158	188	226	267
2 Rows	22	30	45	48	58	66	76	92	110	135	165	182	236	258	308	376	444
3 Rows	28	39	61	—	84	—	108	134	154	197	260	286	370	412	485	609	706
4 Rows	35	49	76	—	104	—	135	166	192	244	323	355	459	511	602	756	877
5 Rows	42	58	91	—	124	—	161	199	229	292	386	425	549	611	719	903	1047
6 Rows	49	68	106	—	144	—	187	231	266	339	449	494	683	710	836	1050	1218
8 Rows	63	87	136	—	184	—	239	296	340	434	575	633	817	909	1070	1344	1559
10 Rows	76	106	165	—	225	—	292	360	415	529	700	770	995	1108	1304	1638	1900
CONDENSER COIL																	
6 Row, 12 FPI	—	—	—	—	213	—	267	320	375	442	573	—	774	888	999	1298	—
ACCESSORY SECTIONS																	
Mixing Box Only	122	133	162	182	203	240	274	318	368	461	565	565	757	898	923	1027	1027
Combination Angular Filter Mixing Box	155	214	281	310	330	400	426	554	635	768	932	932	1238	1392	1512	1793	1793
Vert. Angular Filter & Base	163	225	295	326	346	420	446	581	666	807	978	—	—	—	—	—	
Flat Filter Section	39	49	62	78	86	96	118	140	161	189	232	242	278	303	342	416	458
Angular Filter Section	90	109	150	165	188	215	231	305	348	377	449	449	625	656	776	903	903
Heavy-Duty Filter Section	—	—	—	—	—	250	253	338	408	534	642	642	747	878	1046	1074	1074
Inter. Face & Bypass Sect.	39	51	65	70	75	90	102	119	136	167	210	—	216	238	267	315	—
Ext. Face & Bypass Sect. Lo-Med.	69	86	114	132	152	172	221	265	306	367	419	435	614	697	822	996	1090
Ext. Face & Bypass Sect. High	—	—	—	—	—	—	—	—	306	367	419	—	644	727	852	1026	—
Access & Spacer Section	61	69	81	91	89	105	107	118	129	159	188	200	248	296	340	415	—

Table 11. Motor Weights — Standard Open Drip-proof (1800 rpm)

MOTOR HP	¼	⅓	½	¾	1	1½	2	3	5	7½	10	15	20	25	30	40	50	60	75
NEMA Frame	48	48	56	56	143T	145T	145T	182T	184T	213T	215T	254T	256T	284T	286T	324T	326T	364T	365T
Motor Weight	17	22	32	32	39	48	48	75	91	126	150	225	255	330	410	500	560	670	850

Table 12. Maximum Motor Frame Size

MOTOR POSITION	UNIT SIZE																
	103	104	106	206	108	209	111	114	117	122	128	134	137	141	150	164	172
Top	145T	182T	213T	215T	215T	215T	254T	NA	NA	NA	NA	NA	324T	324T	326T	326T	NA
Side & Bottom	145T	182T	213T	215T	215T	215T	254T	NA	NA	NA	NA	NA	286T	286T	286T	324T	NA
Internal	NA	NA	NA	NA	NA	NA	NA	256T	284T	284T	286T	286T	326T	364T	365T	365T	365T
Extended Base	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	324T	326T	364T	365T	NA

NA = Not Available

High Pressure Only

Table 13. Approximate MSL-190 Shipping Weights

COMPONENT DESCRIPTION	WEIGHT (LBS.)
FAN SECTION	
40-Inch Diameter Fan	3641
44-Inch Diameter Fan	3873
48-Inch Diameter Fan	4349
Add For Door Liners	152
COIL SECTION	
Single Coil Section	1618
Add For Face & Bypass Dampers	342
Add For Door Liners	76
Wide Coil Section	1720
Staggered Coil Section	2975
Add For Face & Bypass Section	722
Add For Door Liners	152
ACCESS/SPACER SECTION	
Basic Section	1053
Add For Door Liners	76
Add For Floor Liners	132
FILTER SECTION	
Bag Filter Section — Less Media	1338
Add For Bag Filters	119
Add For Door Liners	76
Add For Floor Liners	132
Angular Filter Section — Less Filters	1203
Add For Throwaway or Pleated Filters	56
Add For Cleanable Filters	426
Add For Door Liners	76
Add For Floor Liners	132
MIXING BOX SECTION	
Basic Section	2066
Add For Floor Liners	263
Add For Door Liners	152

SEE TABLE 11, PAGE 30, FOR MOTOR WEIGHTS

Table 14. MSL-190 Coil Weights For Single & Staggered Coil Sections (Aluminum Fins)

COIL TYPE	NO. OF ROWS	FIN HEIGHT (INCHES) — ALL FIN LENGTHS ARE 129 INCHES									
		54	60	66	72	78	84	90	96	102	108
E-F5 & HI-F5 (⅝" DIA. TUBES)	1	206	220	237	256	273	290	315	333	351	369
	2	329	356	386	419	451	481	519	551	583	615
	3	469	509	554	601	565	689	741	788	833	879
	4	603	658	717	777	834	894	960	927	1020	1139
	5	733	802	876	949	1022	1092	1174	1247	1247	1394
	6	868	950	1037	1125	1209	1299	1392	1481	1566	1654
	8	1090	1250	1365	1482	1393	1713	1834	1950	2066	2182
	10	1406	1547	1690	1834	1720	1849	2269	2413	2369	2702
HI-F4 (½" DIA. TUBES)	1	189	201	215	233	248	263	285	301	318	333
	2	294	318	343	373	397	427	460	488	516	543
	3	415	451	491	529	569	608	653	631	733	772
	4	532	580	631	682	734	784	842	893	945	997
	5	645	705	768	831	893	957	1026	1090	1153	1217
	6	761	836	909	983	1058	1134	1214	1290	1366	1441
	8	997	1093	1194	1293	1393	1493	1598	1698	1799	1899
	10	1229	1350	1620	1597	1720	1845	1975	2099	2223	2347

Table 15. MSL-190 Coil Weights For Wide Coil Sections (Aluminum Fins)

NO. OF ROWS	FIN HEIGHT (IN.) — ALL FIN LENGTHS ARE 142 INCHES					
	E-F5 & HI-F5			HI-F4		
	78	84	90	78	84	90
1	279	298	322	252	268	290
2	474	508	548	418	448	474
3	690	738	793	605	648	696
4	898	961	1032	785	864	884
5	1104	1185	1269	965	1033	1108
6	1312	1405	1507	1144	1225	1313
8	1735	1863	1997	1513	1650	1702
10	2155	2312	2475	1873	2009	2151

NOTE: Tabulated coil weights based on 10 fins per inch Use the correction factors at right for coils with other fin spacings.

FIN CORRECTION FACTORS

FPI	
6	Deduct F.A. × Rows × .44 from standard weight
8	Deduct F.A. × Rows × .22 from standard weight
12	Add F.A. × Rows × .22 to standard weight
14	Add F.A. × Rows × .44 to standard weight

F.A. = Coil face area in square feet
Rows = Number of rows in coil

Physical data — blow-through units

Table 16. Blow-through Air Handler Physical Data

DESCRIPTION				UNIT SIZE					
				106	108	111	114	117	122
CFM Range By Unit Type			LML/LSB Lo Press. Blow-thru	1750—4000	2200—5500	3000—7500	4000—9600	5000—11600	6000—14700
			MMM/MSB Med. Press. Blow-thru		2200—5500	3000—7500	4000—9600	5000—11600	6000—14700
			HMH High Press. Blow-thru					5000—10900	6000—13800
FAN DATA									
LML MMM LSB MSB	STD	FC	Diameter (In.)	12¼	15	16½	18¼	18¼	20
			Outlet Area (Sq.Ft.)	1.88	2.82	3.45	4.2	4.2	5.19
			Shaft & Bearing Size (In.)	1 3/16	1 3/16	1 7/16	1 7/16	1 7/16	1 7/16
		AF	Diameter (In.)	13 7/32	14 9/16	16 3/16	19 11/16	19 11/16	21 9/16
			Outlet Area (Sq.Ft.)	1.88	2.82	3.45	4.79	4.79	5.93
			Shaft & Bearing Size (In.)	1 3/16	1 7/16	1 7/16	1 15/16	1 15/16	1 15/16
	OPT	FC	Diameter (In.)				20	20	22¼
			Outlet Area (Sq.Ft.)				5.19	5.19	6.29
			Shaft & Bearing Size (In.)				1 7/16	1 7/16	1 11/16
		AF	Diameter (In.)				21 9/16	21 9/16	24
			Outlet Area (Sq.Ft.)				5.93	5.93	7.13
			Shaft & Bearing Size (In.)				1 15/16	1 15/16	2 3/16
MMM	108** 111	FC	Diameter (In.)		13½	15			
			Outlet Area (Sq.Ft.)		2.82	3.45			
			Shaft & Bearing Size (In.)		1 11/16	1 15/16			
HMH	STD	AF	Diameter (In.)					19 11/16	21 9/16
			Outlet Area (Sq.Ft.)					3.45	4.13
			Shaft & Bearing Size (In.)					1 15/16	2 3/16
COIL DATA									
EXTRA LARGE FACE AREA*			(Number) Size (In.)	(1) 21 × 42.5	(1) 30 × 40.5	(1) 30 × 55.5	(1) 36 × 65.5	(1) 36 × 80.5	(1) 42 × 84.5
			Face Area (Sq.Ft.)	6.2	8.5	11.6	16.4	20.1	24.6
LARGE FACE AREA			(Number) Size (In.)	(1) 21 × 37.5	(1) 30 × 35.5	(1) 30 × 50.5	(1) 30 × 65.5	(1) 30 × 80.5	(1) 36 × 84.5
			Face Area (Sq.Ft.)	5.5	7.4	10.6	13.7	16.8	21.2
SMALL FACE AREA			(Number) Size (In.)	(1) 15 × 37.5	(1) 24 × 35.5	(1) 24 × 50.5	(1) 24 × 65.5	(1) 24 × 80.5	(1) 27 × 84.5
			Face Area (Sq.Ft.)	3.9	5.9	8.4	10.9	13.4	15.9
LAC CASED CONDENSER COIL			(Number) Size (In.)	(1) 24 × 46	(1) 33 × 44	(1) 33 × 59	(1) 33 × 74	(1) 33 × 89	(1) 39 × 93
			Face Area (Sq.Ft.)	7.7	10.1	13.5	17.0	20.4	25.2
BLOW-THRU HEATING HOT DECK			(Number) Size (In.)	(1) 12 × 37.5	(1) 18 × 35.5	(1) 18 × 50.5	(1) 18 × 65.5	(1) 18 × 80.5	(1) 21 × 84.5
			Face Area (Sq.Ft.)	3.1	4.5	6.3	8.2	10.1	12.3
MAXIMUM ZONES ON MULTIZONE				5	5	7	9	11	11
AVERAGE TORQUE PER ZONE DAMPER SHAFT (INCH POUNDS)				15	15	15	15	15	15
FILTER DATA									
FLAT FILTER SECTION			(Number) Size (In.)	(3) 16 × 25 × 2	(2) 16 × 20 × 2	(6) 16 × 20 × 2	(6) 16 × 25 × 2	(4) 16 × 20 × 2	(12) 16 × 20 × 2
					(2) 16 × 25 × 2			(4) 16 × 25 × 2	
			Filter Area (Sq.Ft.)	8.4	10.0	13.3	16.7	20.0	26.7
ANGULAR FILTER SECTION			(Number) Size (In.)	(6) 16 × 20 × 2	(6) 16 × 25 × 2	(6) 20 × 25 × 2	(4) 16 × 25 × 2	(8) 20 × 25 × 2	(12) 16 × 25 × 2
							(4) 20 × 25 × 2		
			Filter Area (Sq.Ft.)	13.3	16.7	20.8	24.9	27.8	33.4
HEAVY-DUTY FILTER SECTION			(Number) Size (In.)			(9) 20 × 20 × 2	(9) 20 × 25 × 2	(9) 20 × 20 × 2	(24) 16 × 20 × 2
								(6) 16 × 20 × 2	
			Filter Area (Sq.Ft.)			25.0	31.2	38.3	53.3
METAL GAUGES									
BLOWER SECTION	Structural Frame	All		14, 16	12, 14, 16	12, 14, 16	12	12	12
	Discharge Panel	Low & Medium Press.		16, 18	16	16	16	16, 14	14
		High Press.						16	16
	Removable Panels	Low & Medium Press.		20	20, 18	18	18	18, 16	18, 16
		High Press.						18	18
BLOW-THRU COIL SECTION	Structural Frame	Low & Medium Press.		16, 14	16, 14	16, 14	16, 14	16, 14	14, 12
		High Pressure						12	12
	Bottom Panel	Low & Medium Press.		14	14	14	14	14	14
	Drain Pan	Low & Medium Press.		14	14	14	14	14	14
		High Press.						12	12
	Removable Panels	Low & Medium Press.		16	16	16	16	16	16
		High Press.						16	14

NOTES: *Extra large face area not available in auxiliary heating coil sections.
**MMM and MSB units only.

NOT AVAILABLE

Table 16. Blow-through Air Handler Physical Data (Continued)

UNIT SIZE						DESCRIPTION			
128	137	141	150	164	172				
800—19800	12000—32000	14000—36000	18000—45000	20000—56000	30000—50000	LML/LSB Lo Press. Blow-thru		CFM Range By Unit Type	
8000—19800	12000—32000	14000—36000	18000—45000	20000—56000	30000—50000	MMM/MSB Med. Press. Blow-thru			
8000—17500	10000—23300	12000—26300	15000—32000	18000—40800		HMH High Press. Blow-thru			
									FAN DATA
22¼	27	30	33	36½	36½	Diameter (In.)	FC	STD	LML MMM LSB MSB
6.29	9.36	11.31	13.85	16.81	16.81	Outlet Area (Sq.Ft.)			
1 11/16	1 11/16 2 3/16	1 15/16 2 3/16	2 3/16 2 7/16	2 3/16 2 11/16	2 3/16 2 11/16	Shaft & Bearing Size (In.)			
24	27	30	33	36½	36½	Diameter (In.)	AF		
7.13	9.36	11.31	13.85	16.81	16.81	Outlet Area (Sq.Ft.)			
2 3/16	2 3/16	2 7/16	2 7/16	2 11/16	2 11/16	Shaft & Bearing Size (In.)			
24½	30	33	36½	40¼	40¼	Diameter (In.)	FC	OPT	
7.65	11.31	13.85	16.81	20.52	20.52	Outlet Area (Sq.Ft.)			
1 11/16	1 15/16 2 3/16	2 3/16 2 7/16	2 3/16 2 11/16	2 3/16 2 11/16	2 3/16 2 11/16	Shaft & Bearing Size (In.)			
26 7/16	30	33	36½	40¼	40¼	Diameter (In.)	AF		
8.74	11.31	13.85	16.81	20.52	20.52	Outlet Area (Sq.Ft.)			
2 7/16	2 7/16	2 7/16	2 11/16	2 15/16	2 15/16	Shaft & Bearing Size (In.)			
						Diameter (In.)	FC	108** 111	MMM
						Outlet Area (Sq.Ft.)			
						Shaft & Bearing Size (In.)			
24	29⅛	29⅛	32⅛	35 9/16		Diameter (In.)	AF	STD	HMH
5.13	7.55	7.55	9.30	11.25		Outlet Bearing (Sq.Ft.)			
2 3/16	2 7/16	2 7/16	2 11/16	2 15/16		Shaft & Bearing Size (In.)			
									COIL DATA
(1) 45 x 107.5	(2) 27 x 112.5	(2) 30 x 112.5	(2) 33 x 112.5	(2) 42 x 112.5	(2) 45 x 112.5	(Number) Size (In.)		EXTRA LARGE FACE AREA*	
33.6	42.2	46.9	51.6	65.6	70.3	Face Area (Sq.Ft.)			
(1) 36 x 107.5	(2) 24 x 107.5	(2) 27 x 107.5	(2) 33 x 107.5	(2) 42 x 107.5		(Number) Size (In.)		LARGE FACE AREA	
26.9	35.9	40.4	49.3	62.8		Face Area (Sq.Ft.)			
(1) 27 x 107.5	(1) 39 x 107.5	(1) 42 x 107.5	(2) 24 x 107.5	(2) 33 x 107.5		(Number) Size (In.)		SMALL FACE AREA	
20.2	29.2	31.4	35.9	49.3		Face Area (Sq.Ft.)			
(1) 39 x 116	(1) 51 x 115.5	(1) 60 x 115.5	(1) 69 x 115.5	(1) 87 x 115.5		(Number) Size (In.)		LAC CASED CONDENSER COIL	
31.4	40.9	48.1	55.3	69.8		Face Area (Sq.Ft.)			
(1) 21 x 107.5	(1) 24 x 107.5	(1) 27 x 107.5	(1) 33 x 107.5	(1) 42 x 107.5	(1) 42 x 107.5	(Number) Size (In.)		BLOW-THRU HEATING HOT DECK	
15.7	17.9	20.2	24.7	31.4	31.4	Face Area (Sq.Ft.)			
14	14	14	14	14	14	MAXIMUM ZONES ON MULTIZONE			
15	18	18	18	18	18	AVERAGE TORQUE PER ZONE DAMPER SHAFT (INCH POUNDS)			
									FILTER DATA
(12)20 x 20 x 2	(12)20 x 25 x 2	(18)20 x 20 x 2	(12)20 x 25 x 2	(6)20 x 25 x 2	(36)16 x 20 x 2	(Number) Size (In.)		FLAT FILTER SECTION	
			(6)20 x 20 x 2	(18)20 x 20 x 2					
33.4	41.8	50.0	58.5	70,8	80.0	Filter Area (Sq.Ft.)			
(12)20 x 25 x 2	(16)20 x 25 x 2	(24)20 x 20 x 2	(24)20 x 25 x 2	(30)20 x 25 x 2	(30)20 x 25 x 2	(Number) Size (In.		ANGULAR FILTER SECTION	
41.6	55.5	66.7	83.3	104.0	104.0	Filter Area (Sq.Ft.)			
(24)20 x 20 x 2	(24)20 x 25 x 2	(36)20 x 20 x 2	(36)30 x 35 x 2	(36)20 x 25 x 2	(36)20 x 25 x 2	(Number) Size (In.)		HEAVY-DUTY FILTER SECTION	
66.6	83.3	100.0	125.0	125.0	125.0	Filter Area (Sq.Ft.)			
									METAL GAUGES
10	8	8	8	8	8	Low & Medium Press.	Structural Frame	BLOWER SECTION	
10	10	10	10	10	10	High Press.			
14	14	14	14	14	14	Low & Medium Press.	Discharge Panel		
16	14	14	14	14	14	High Press.			
18, 16	14	14	14	14	14	Low & Medium Press.	Removable Panels		
18	16	16	16	16		High Press.			
14, 12	10	10	10	10	10	Low & Medium Press.	Structural Frame	BLOW-THRU COIL SECTION	
12	10	10	10	10		High Press.			
14	18	18	18	18	18	Low & Medium Press.	Bottom Panel		
14	14	14	14	14	14	Low & Medium Press.	Drain Pan		
12	12	12	12	12		High Press.			
16	16	16	16	16	16	Low & Medium Press.	Removable Panels		
14	14	14	14	14		High Press.			

NOTES: *Extra large face area not available in auxiliary heating coil sections.
**MMM and MSB units only

NOT AVAILABLE

MEDIUM PRESSURE

Physical data — draw-through units

Table 17. Draw-through Air Handler Physical Data

DESCRIPTION				UNIT SIZE								
				103	104	106	206	108	209	111	114	117
CFM Range By Unit Type	LYF Ventilating			700—2000	1000—3000	1750—5000	1800—5400	2200—7000	2600—7800	3000—10000	4000—13000	5000—15000
	LHD Heating & Ventilating			700—2000	1000—3000	1750—5000	1800—5400	2200—7000	2600—7800	3000—10000	4000—13000	5000—15000
	LSL Lo Press. Draw-thru			700—1800	1000—2700	1750—4000		2200—5500		3000— 7500	4000— 9600	5000—11600
	MSL Med. Press. Draw-thru							2200—5500		3000— 7500	4000— 9600	5000—11600
	HSH Hi Press. Draw-thru											5000—10900
FAN DATA												
LYF LHD LSL MSL	STD	FC	Diameter (In.)	9	12	12¼	(2) 9	15	(2) 12¼	16½	18¼	18¼
			Outlet Area (Sq.Ft.)	0.84	1.14	1.88	1.87	2.82	3.76	3.45	4.20	4.20
			Shaft & Bearing (In.)	1	1	1 3/16	1 3/16	1 3/16	1 3/16	1 7/16	1 7/16	1 7/16
		AF	Diameter (In.)			13 7/32		14 9/16		16 3/16	19 11/16	19 11/16
			Outlet Area (Sq.Ft.)			1.88		2.82		3.45	4.79	4.79
			Shaft & Bearing (In.)			1 3/16		1 7/16		1 7/16	1 15/16	1 15/16
	OPT	FC	Diameter (In.)	9.4	9.7						20	20
			Outlet Area (Sq.Ft.)	0.48	0.65						5.19	5.19
			Shaft & Bearing (In.)	1 3/16	1 7/16						1 7/16	1 7/16
		AF	Diameter (In.)								21 9/16	21 9/16
			Outlet Area (Sq.Ft.)								5.93	5.93
			Shaft & Bearing (In.)								1 15/16	1 15/16
MSL	108** 111	FC	Diameter (In.)					13½		15		
			Outlet Area (Sq.Ft.)					2.82		3.45		
			Shaft & Bearing (In.)					1 11/16		1 15/16		
HSH	STD	AF	Diameter (In.)									19 11/16
			Outlet Area (Sq.Ft.)									3.45
			Shaft & Bearing (In.)									1 15/16
COIL DATA												
EXTRA LARGE FACE AREA*	(Number) Size (In.)			(1) 15×26.5	(1) 18×32.5	(1) 21×42.5		(1) 30×40.5		(1) 30×55.5	(1) 30×70.5	(1) 30×85.5
	Face Area (Sq.Ft.)			2.8	4.1	6.2		8.5		11.6	14.7	17.8
LARGE FACE AREA	(Number) Size (In.)			(1) 15×21.5	(1) 18×27.5	(1) 21×37.5	(1) 15×56.5	(1) 30×35.5	(1) 18×70.5	(1) 30×50.5	(1) 30×65.5	(1) 30×80.5
	Face Area (Sq.Ft.)			2.3	3.5	5.5	5.9	7.4	8.8	10.6	13.7	16.8
SMALL FACE AREA	(Number) Size (In.)			(1) 12×21.5	(1) 15×27.5	(1) 15×37.5	(1) 12×56.5	(1) 24×35.5	(1) 15×70.5	(1) 24×50.5	(1) 24×65.5	(1) 24×80.5
	Face Area (Sq.Ft.)			1.8	2.9	3.9	4.9	5.9	7.3	8.4	10.9	13.4
LAC CASED CONDENSER COIL	(Number) Size (In.)			(1) 18×30	(1) 21×36	(1) 24×46		(1) 33×44		(1) 33×59	(1) 33×74	(1) 33×89
	Face Area (Sq.Ft.)			3.8	5.3	7.7		10.1		13.5	17.0	20.4
FILTER DATA												
FLAT FILTER SECTION	(Number) Size (In.)			(2) 16×20×2	(2) 20×20×2	(3) 16×25×2	(3) 20×20×2	(2) 16×20×2	(4) 20×20×2	(6) 16×20×2	(6) 16×25×2	(4) 16×20×2
								(2) 16×25×2				(4) 16×25×2
	Filter Area (Sq.Ft.)			4.4	5.6	8.4	8.3	10.0	11.1	13.3	16.7	20.0
ANGULAR FILTER SECTION	(Number) Size (In.)			(2) 16×25×2	(4) 16×20×2	(6) 16×20×2	(6) 16×20×2	(6) 16×25×2	(8) 16×20×2	(6) 20×25×2	(4) 16×25×2	(8) 20×25×2
											(4) 20×25×2	
	Filter Area (Sq.Ft.)			5.6	8.9	13.3	13.3	16.7	17.8	20.8	24.9	27.8
HEAVY-DUTY FILTER SECTION	(Number) Size (In.)								(8) 20×20×2	(9) 20×20×2	(9) 20×25×2	(9) 20×20×2
												(6) 16×20×2
	Filter Area (Sq.Ft.)								22.2	25.0	31.2	38.3
METAL GAUGES												
BLOWER SECTION	Structural Frame	All		14, 16	14, 16	14, 16	14, 16	12, 14, 16	12, 14, 16	12, 14, 16	12	12
	Discharge Panel	Lo & Med Press		18	18	16, 18	16	16	16	16	16	16, 14
		Hi Press										16
	Removable Panels	Lo & Med Press		20	20	20	18	20, 18	18	18	18	18, 16
		Hi Press										18
DRAW-THRU COIL SECTION	Structural Frame	All		14, 16	14,16	14, 16		14, 16		14, 16	14,16	14,16
	Bottom Panel	All		16	16	16		16		16	16	16
	Drain Pan	Horizontal		18	18	18		18		18	18	18
		Vertical		18	18	18		16		16	16	16
	Removable Panels	All		20	20	20		20		18	18	18

NOTES: *Extra large face area not available in LHD units and auxiliary heating coil sections.
**MSL-108 & 111 only.

NOT AVAILABLE

Table 17. Draw-through Air Handler Physical Data (Continued)

UNIT SIZE								DESCRIPTION			
122	128	134	137	141	150	164	172				
6000—19000	8000—25000		12000—32000	14000—36000	18000—45000	20000—56000		LYF Ventilating			CFM
6000—19000	8000—25000		12000—32000	14000—36000	18000—45000	20000—56000		LHD Heating & Ventilating			Range
6000—14700	8000—19800	8000—19800	12000—32000	14000—36000	18000—45000	20000—56000	30000—50000	LSL Lo Press. Draw-thru			By
6000—14700	8000—19800	8000—19800	12000—32000	14000—36000	18000—45000	20000—56000	30000—50000	MSL Med. Press. Draw-thru			Unit
6000—13800	8000—17500		10000—23300	12000—26300	15000—32000	18000—40800		HSH Hi Press. Draw-thru			Type
											FAN DATA
20	22¼	22¼	27	30	33	36½	36½	Diameter (In.)			
5.19	6.29	6.29	9.36	11.31	13.85	16.81	16.81	Outlet Area (Sq.Ft.)	FC		
1 7/16	1 11/16	1 11/16	1 11/16 2 3/16	1 15/16 2 3/16	2 3/16 2 7/16	2 3/16 2 11/16	2 3/16 2 11/16	Shaft & Bearing (In.)		STD	
21 9/16	24	24	27	30	33	36½	36½	Diameter (In.)			
5.93	7.13	7.13	9.36	11.31	13.85	16.81	16.81	Outlet Area (Sq.Ft.)	AF		
1 15/16	2 3/16	2 3/16	2 3/16	2 7/16	2 7/16	2 11/16	2 11/16	Shaft & Bearing (In.)			
22¼	24½	24½	30	33	36½	40¼	40¼	Diameter (In.)			
6.29	7.65	7.65	11.31	13.85	16.81	20.52	20.52	Outlet Area (Sq.Ft.)	FC		LYF
1 11/16	1 11/16	1 11/16	1 15/16 2 3/16	2 3/16 2 7/16	2 3/16 2 11/16	2 3/16 2 11/16	2 3/16 2 11/16	Shaft & Bearing (In.)		OPT	LHD
24	26 7/16	26 7/16	30	33	36½	40¼	40¼	Diameter (In.)			LSL
7.13	8.74	8.74	11.31	13.85	16.81	20.52	20.52	Outlet Area (Sq.Ft.)	AF		MSL
2 3/16	2 7/16	2 7/16	2 7/16	2 7/16	2 11/16	2 15/16	2 15/16	Shaft & Bearing (In.)			
								Diameter (In.)			
								Outlet Area (Sq.Ft.)	FC	108** 111	MSL
								Shaft & Bearing (In.)			
21 9/16	24		29 1/8	29 1/8	32 1/8	35 9/16		Diameter (In.)			
4.13	5.13		7.55	7.55	9.30	11.25		Outlet Area (Sq.Ft.)	AF	STD	HSH
2 3/16	2 3/16		2 7/16	2 7/16	2 11/16	2 15/15		Shaft & Bearing (In.)			
											COIL DATA
(1) 39×89.5	(1) 39×112.5		(2) 24×112.5	(2) 27×112.5	(2) 33×112.5	(2) 42×112.5	(3) 30×112.5	(Number) Size (In.)		EXTRA LARGE	
24.2	30.5		37.5	42.2	51.6	65.6	70.4	Face Area (Sq.Ft.)		FACE AREA*	
(1) 36×84.5	(1) 36×107.5	(1) 45×107.5	(2) 24×107.5	(2) 27×107.5	(2) 33×107.5	(2) 42×107.5		(Number) Size (In.)		LARGE	
21.2	26.9	33.6	35.9	40.4	49.3	62.8		Face Area (Sq.Ft.)		FACE AREA	
(1) 27×84.5	(1) 27×107.5		(1) 39×107.5	(1) 42×107.5	(2) 24×107.5	(2) 33×107.5		(Number) Size (In.)		SMALL	
15.9	20.2		29.2	31.4	35.9	49.3		Face Area (Sq.Ft.)		FACE AREA	
(1) 39×93	(1) 39×116		(1) 51×115.5	(1) 60×115.5	(1) 69×115.5	(1) 87×115.5		(Number) Size (In.)		LAC CASED	
25.2	31.4		40.9	48.1	55.3	69.8		Face Area (Sq.Ft.)		CONDENSER COIL	
											FILTER DATA
(12) 16×20×2	(12) 20×20×2	(6) 20×20×2	(12) 20×25×2	(18) 20×20×2	(12) 20×25×2	(6) 20×25×2	(36) 16×20×2	(Number) Size (In.)		FLAT FILTER SECTION	
		(6) 20×25×2			(6) 20×20×2	(18) 20×20×2					
26.7	33.4	37.5	41.8	50.0	58.5	70.8	80.0	Filter Area (Sq.Ft.)			
(12) 16×25×2	(12) 20×25×2	(12) 20×25×2	(16) 20×25×2	(24) 20×20×2	(24) 20×25×2	(30) 20×25×2	(30) 20×25×2	(Number) Size (In.)		ANGULAR FILTER SECTION	
33.4	41.6	41.6	55.5	66.7	83.3	104.0	104.0	Filter Area (Sq.Ft.)			
(24) 16×20×2	(24) 20×20×2	(24) 20×20×2	(24) 20×25×2	(36) 20×20×2	(36) 20×25×2	(36) 20×25×2	(36) 20×25×2	(Number) Size (In.)		HEAVY-DUTY FILTER SECTION	
53.3	66.6	66.6	83.3	100.0	125.0	125.0	125.0	Filter Area (Sq.Ft.)			
											METAL GAUGES
12	10	10	8	8	8	8	8	Lo & Med Press	Structural Frame		
12	10	10	10	10	10	10	10	Hi Press			
14	14	14	14	14	14	14	14	Lo & Med Press	Discharge Panel		BLOWER SECTION
16	16		14	14	14	14	14	Hi Press			
18, 16	18,16	18, 16	14	14	14	14	14	Lo & Med Press	Removable Panels		
18	18		16	16	16	16		Hi Press			
12, 14	12, 14	12, 14	10	10	10	10	10	All	Structural Frame		
14	14	14	18	18	18	18	18	All	Bottom Panel		DRAW-THRU COIL SECTION
16	16	16	14	14	14	14	14	Horizontal	Drain Pan		
14	14	14	14	14	14			Vertical			
18	18	18	16	16	16	16	16	All	Removable Panels		

NOTES: *Extra large face area not available in LHD units and auxiliary heating coil sections
**MSL-108 & 111 only.
† Low pressure units only. Refer to air handler Sales & Engineering Data Sheet 1009 for high static fan wheels in unit sizes 103 & 104.

NOT AVAILABLE

MEDIUM PRESSURE

Physical data — MSL-190 units

Table 18. MSL-190 Draw-through Air Handler Physical Data

FAN DATA			
TYPE	AIRFOIL	AIRFOIL	AIRFOIL
DIAMETER (INCHES)	40	44	48
OUTLET AREA (SQ. FT.)	20.62	26.15	31.92
CFM RANGE	20000—60000	20000—60000	20000—60000
COIL DATA			
COIL SECTION TYPE	**FIN LENGTH (IN.)**	**FIN HEIGHT (IN.)**	**FIN AREA (SQ. FT.)**
SINGLE COIL SECTION	129	84	75.25
		78	69.87
		72	64.50
		66	58.12
		60	53.75
		54	48.37
SINGLE SECTION WITH FACE & BYPASS DAMPERS	129	66	58.12
		60	53.75
		54	48.37
WIDE COIL SECTION	142	90	88.75
		84	82.83
		78	76.92
STAGGERED COIL SECTION	129	108	96.75
		102	91.37
		96	86.00
		90	80.62
STAGGERED SECTION WITH FACE & BYPASS DAMPERS	129	108	96.75
		102	91.37
		96	86.00
		90	80.62
		84	75.25
		78	69.87
		72	64.50
FILTER DATA			
FILTER SECTION TYPE	**ANGULAR**	**BAG**	**BAG PRE-FILTERS**
(NUMBER) SIZE (INCHES)	(63) 16 × 25 × 2	(24) 24 × 24 × 19 or 37	(24) 24 × 24 × 2
FILTER AREA (SQ. FT.)	175	96	96

Table 19. MSL-190 Component Air Friction

AIRFLOW (CFM)	FILTERS					
	2″ THROWAWAY	2″ CLEANABLE	PLEATED 35% EFF.	BAG 45% EFF.	BAG 95% EFF.	PREFILTER BAG
20,000	.02	.01	.02	.06	.11	.05
25,000	.03	.01	.03	.09	.15	.08
30,000	.04	.02	.05	.12	.21	.11
35,000	.05	.02	.06	.15	.26	.14
40,000	.07	.03	.07	.19	.33	.17
45,000	.09	.03	.09	.23	.39	.21
50,000	.10	.03	.11	.25	.47	.25
55,000	.12	.04	.14	.28	.55	.30
60,000	.15	.04	.17	.30	.63	.35

DAMPERS										
AIR FLOW (CFM)	FACE & BYPASS DAMPERS									MIXING BOX DAMPERS (△P FOR ONE DAMPER)
	SINGLE COIL SECTION			STAGGERED COIL SECTION						
	66″ HIGH COIL	60″ HIGH COIL	54″ HIGH COIL	108″ HIGH COIL	102″ HIGH COIL	96″ HIGH COIL	90″ HIGH COIL	84″ HIGH COIL	78″ HIGH COIL	72″ HIGH COIL	
20,000	.01	.01	.01	0	0	0	0	.01	.01	.01	.02
25,000	.01	.01	.02	0	.01	.01	.01	.01	.01	.01	.02
30,000	.02	.02	.03	.01	.01	.01	.01	.01	.01	.01	.04
35,000	.02	.03	.04	.01	.01	.01	.01	.01	.02	.02	.05
40,000	.03	.04	.05	.01	.01	.01	.02	.02	.02	.03	.06
45,000	.04	.05	.06	.01	.02	.02	.02	.02	.03	.03	.08
50,000	.05	.06	.07	.02	.02	.02	.03	.03	.03	.04	.09
55,000	.06	.07	.09	.02	.02	.03	.03	.04	.04	.05	.11
60,000	.07	.08	.10	.03	.03	.03	.04	.04	.05	.06	.13

Dimensional data — SEASONMASTER blow-thru Central station air conditioning units

Type LSB & MSB
Low & Medium Pressure
Blow-through Singlezone Units
Unit Sizes 106E thru 111E

Figure 15A. Fan & Diffuser Section

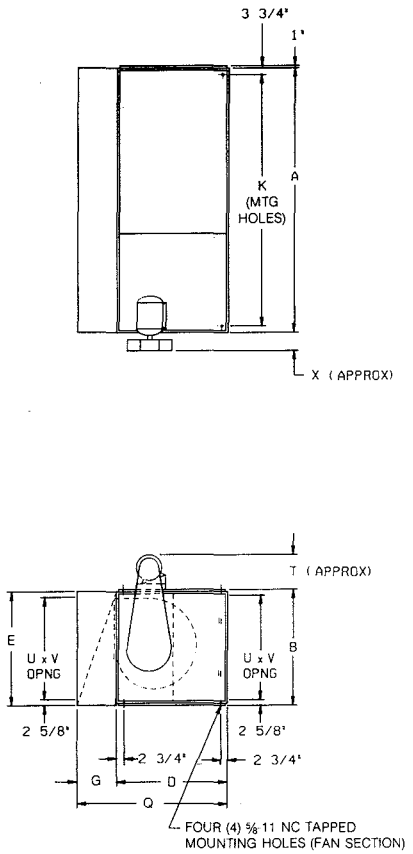
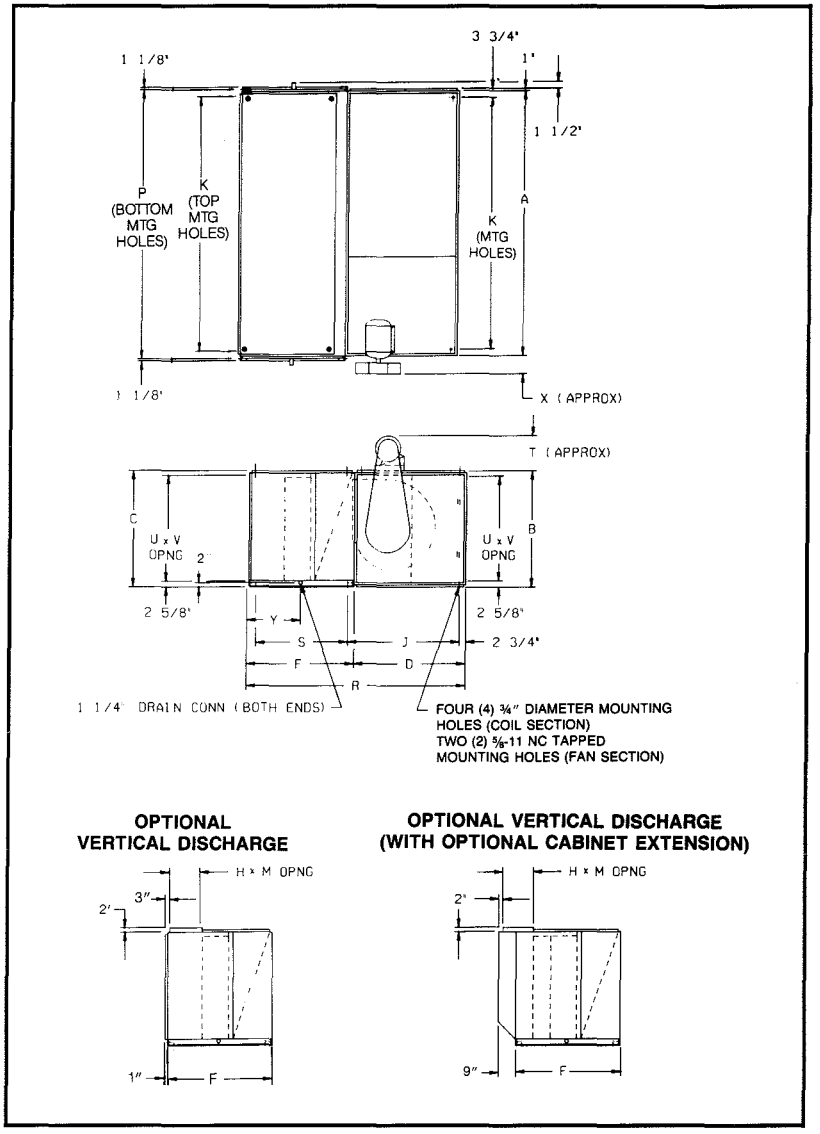


Figure 15B. Fan & Blow-through Coil Section



NOTE: J, Q & R dimensions include 1/8" allowance for gasketing.

Table 20.

UNIT SIZE	PHYSICAL DIMENSIONS (INCHES)																			
	A	B	C	D	E	F	G	H	J	K	M	P	Q	R	S	T	U	V	X	Y
106E	50	29¼	29 11/16	28	29	34	10	10	28⅛	44½	40	51¾	38⅛	62⅛	28½	16	23¾	45⅞	6½	17½
108E	48	38	38 7/16	36¾	37¾	42	14	14	36⅞	42½	40	49¾	50⅞	78⅞	36½	16	32½	43⅞	8	21½
111E	63	38	38 7/16	36¾	37¾	42	14	14	36⅞	57½	56	64¾	50⅞	78⅞	36½	18	32½	58⅞	8	21½

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

Dimensional data — SEASONMASTER blow-thru Central station air conditioning units

Type LSB & MSB
Low & Medium Pressure
Blow-through Singlezone Units
Unit Sizes 106E thru 111E

Figure 15A. Fan & Diffuser Section

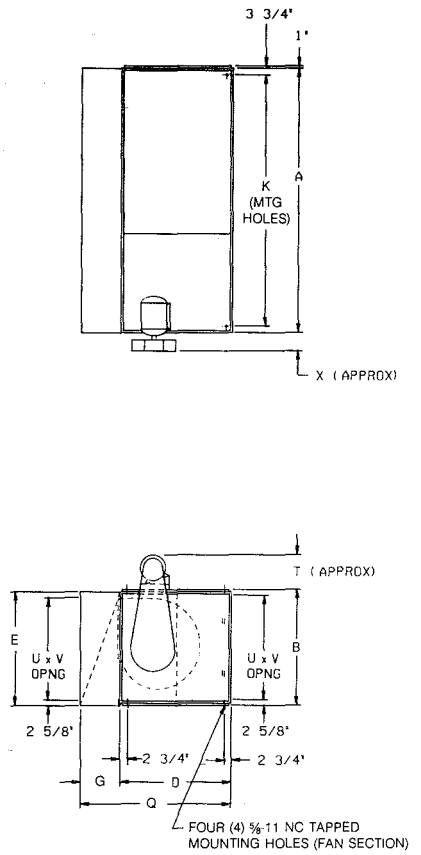
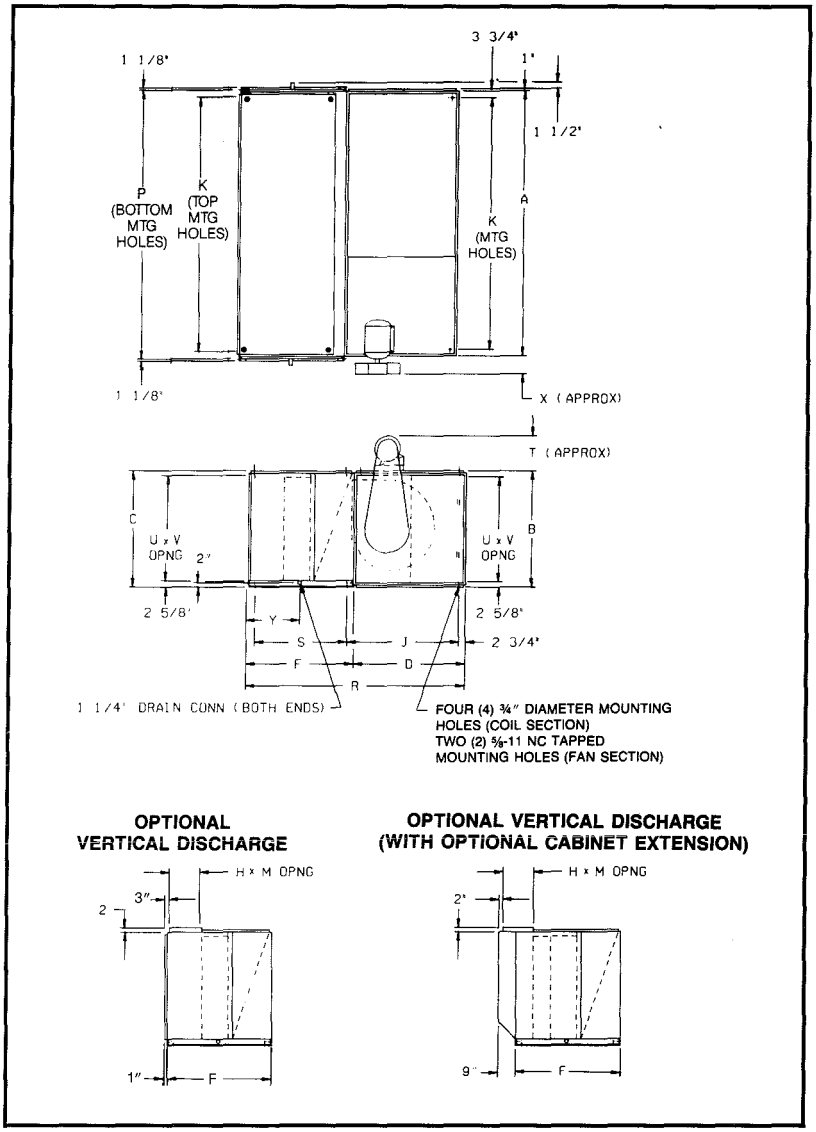


Figure 15B. Fan & Blow-through Coil Section



NOTE: J, Q & R dimensions include 1/8" allowance for gasketing.

Table 20.

UNIT	PHYSICAL DIMENSIONS (INCHES)																			
SIZE	A	B	C	D	E	F	G	H	J	K	M	P	Q	R	S	T	U	V	X	Y
106E	50	29¼	29 11/16	28	29	34	10	10	28⅛	44½	40	51¾	38⅛	62⅛	28½	16	23¾	45⅞	6½	17½
108E	48	38	38 7/16	36¾	37¾	42	14	14	36⅞	42½	40	49¾	50⅞	78⅞	36½	16	32½	43⅞	8	21½
111E	63	38	38 7/16	36¾	37¾	42	14	14	36⅞	57½	56	64¾	50⅞	78⅞	36½	18	32½	58⅞	8	21½

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

Type LSB & Type MSB
Low & Medium Pressure
Blow-through Singlezone Units
Unit Sizes 137E thru 172E

Figure 17A. Fan & Diuser Section

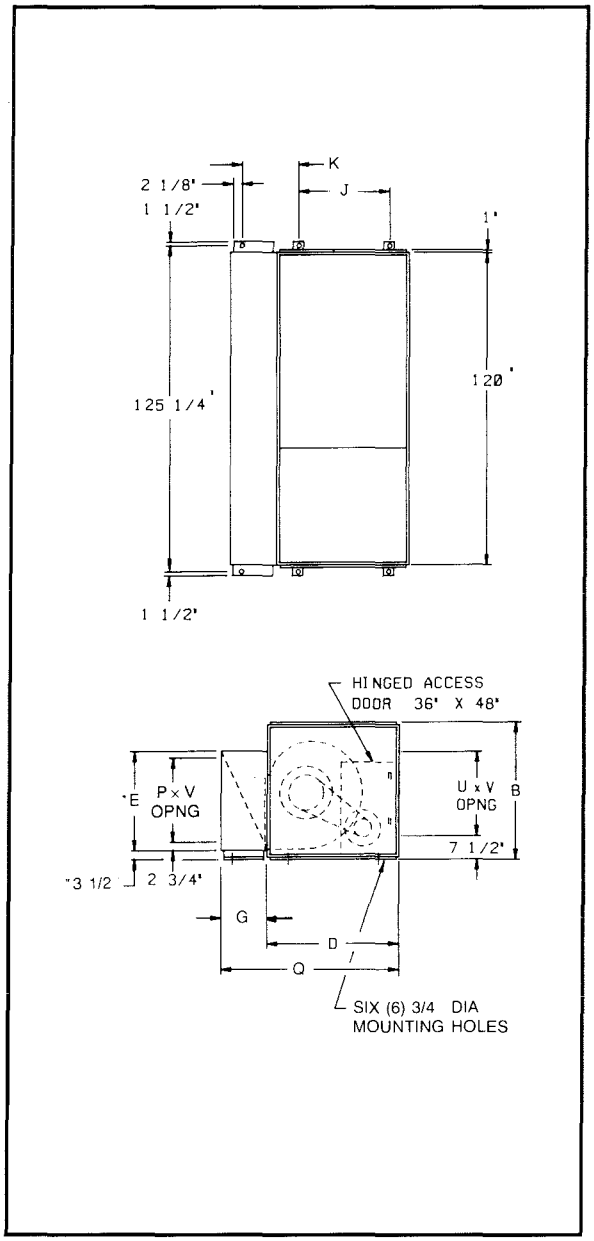
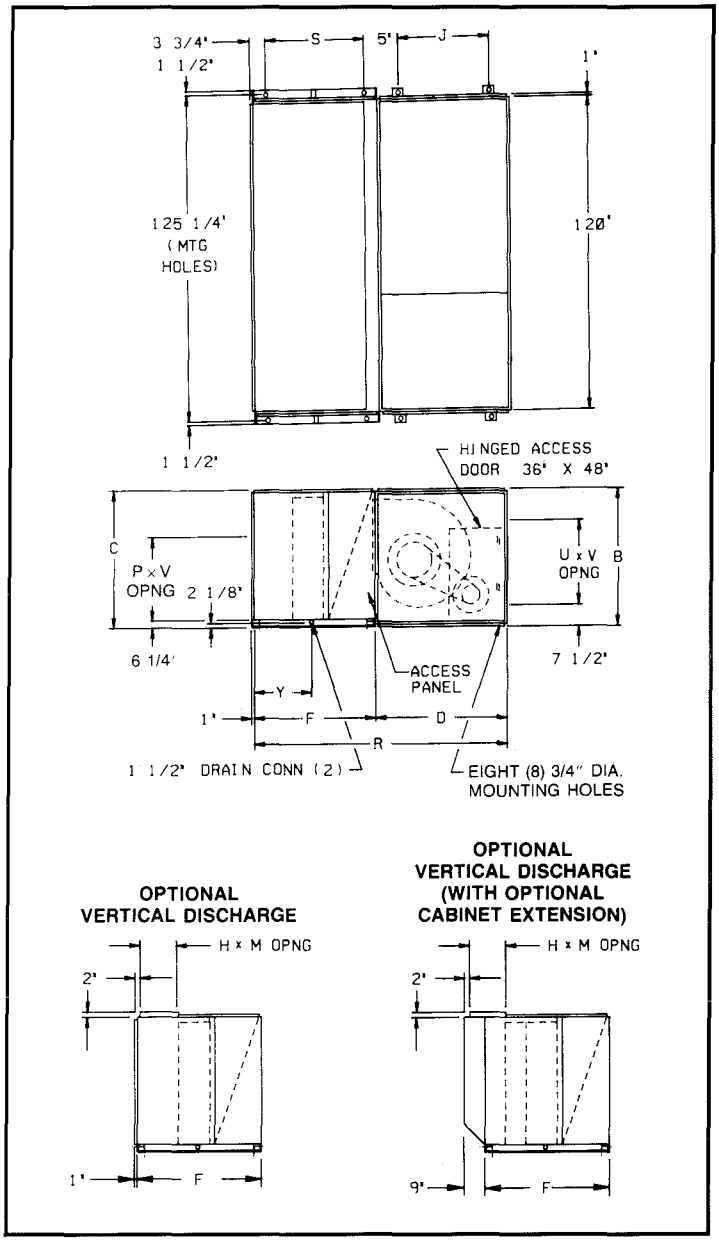


Figure 17B. Fan & Blow-through Coil Section



NOTES:

1. *Bottom horizontal discharge shown. For top horizontal discharge units top of diffuser section is flush with top of fan section. "E" dimension is measured from top of fan section for top horizontal discharge units. 3½" dimension at base of diffuser section changes to 9⅛" for unit size 137E and 6⅞" for unit size 141E with top horizontal discharge.
2. R and K dimensions include ⅛" allowance for gasketing.
3. Blower section access doors extends 3" on units with 50, 60 or 75 HP TEFC or explosion proof motors.
4. Diffuser section is not available for 172 unit size.

Table 22.

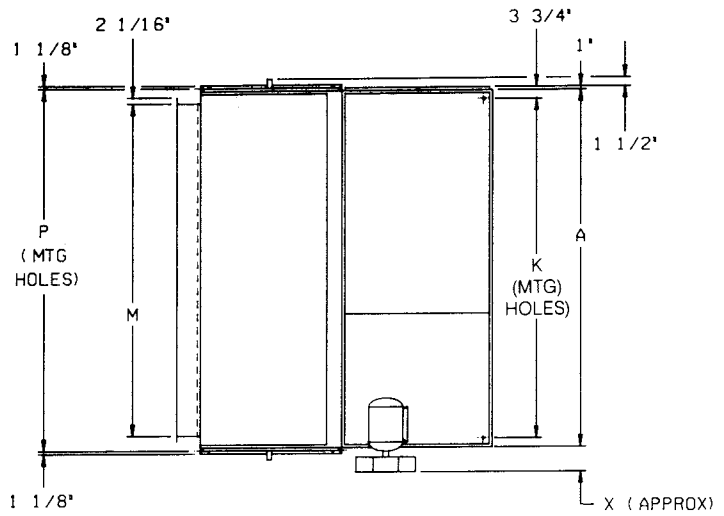
UNIT SIZE	PHYSICAL DIMENSIONS (INCHES)																
	B	C	D	E*	F	G	H	J	K	M	P	Q	R	S	U	V	Y
137E	67	67	58	57⅞	58	22	22	53¾	22⅛	112	52 11/16	80⅛	116⅛	52½	51	116	29½
141E	73	73	66	66⅛	62	24	24	61¾	24⅛	112	60 5/16	90⅛	128⅛	56½	59¼	116	31
150E	79⅜	79⅜	76	75⅞	67	26½	26½	71¾	26⅝	112	70 11/16	102⅝	143⅛	61½	69	116	33½
164E	97⅜	97⅜	76	93⅞	79	31½	31½	71¾	31⅝	112	88 11/16	107⅝	155⅛	73½	87	116	39½
172E	97⅜	103⅜	76	—	79	—	31½	71¾	—	112	88 11/16	—	155⅛	73½	87	116	39½

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

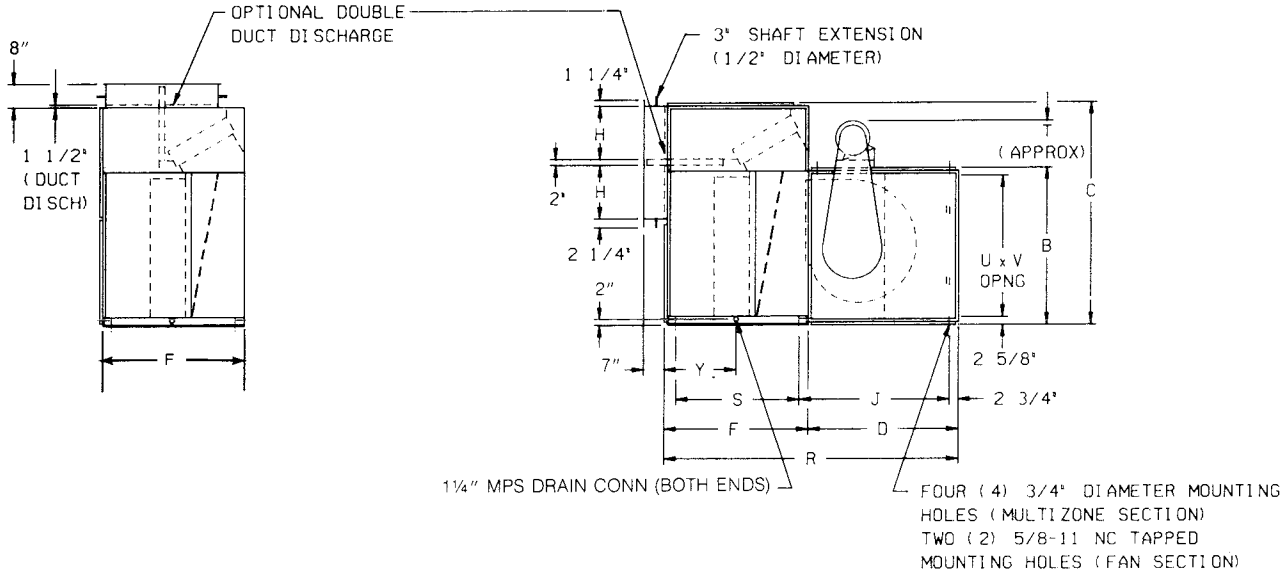
Type LML & Type MMM
Low & Medium Pressure
Blow-through 2-Deck Units
Unit Sizes 106E thru 111E

Figure 18.

ZONE DAMPERS		
Size	Max. Zones	Zone Width
106E	5	8
108E	5	8
111E	7	8



OPTIONAL
VERTICAL DISCHARGE



NOTE: J and R dimensions include ⅛" allowance for gasketing.

Table 23.

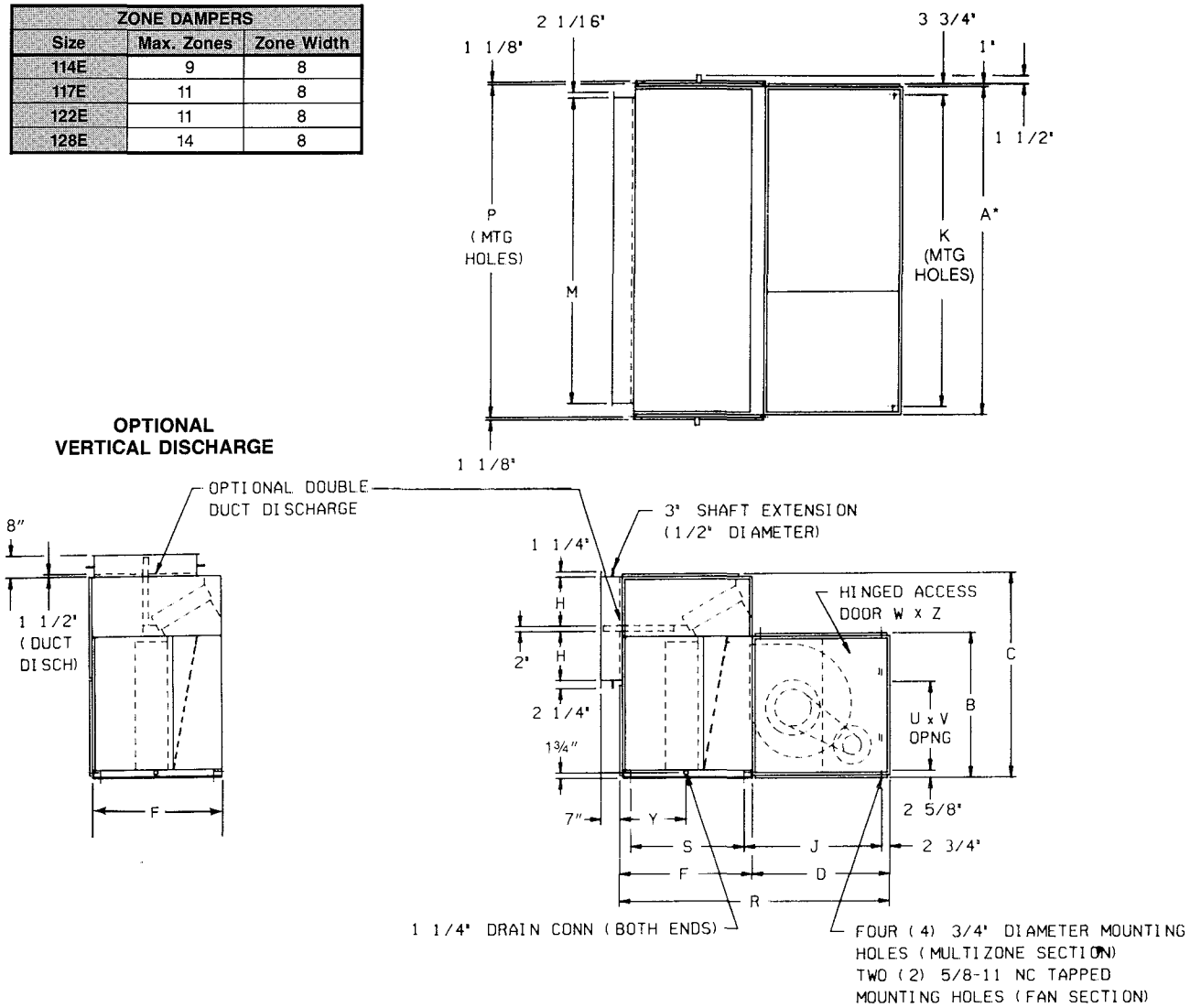
UNIT SIZE	PHYSICAL DIMENSIONS (INCHES)																
	A	B	C	D	F	H	J	K	M	P	R	S	T	U	V	X	Y
106E	50	29¼	47 3/16	28	34	10	28⅛	44½	40⅜	51¾	62⅛	28½	16	23¾	45⅞	6½	17½
108E	48	38	58 15/16	36¾	42	14	36⅞	42½	40⅜	49¾	78⅞	36½	16	32½	43⅞	8	21½
111E	63	38	58 15/16	36¾	42	14	36⅞	57½	56⅜	64¾	78⅞	36½	18	32½	58⅞	8	21½

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

Type LML & Type MMM
Low & Medium Pressure
Blow-through 2-Deck Units
Unit Sizes 114E thru 128E

Figure 19.

ZONE DAMPERS		
Size	Max. Zones	Zone Width
114E	9	8
117E	11	8
122E	11	8
128E	14	8



NOTES:
1. *"A" dimension for unit size 114 coil section is 78".
2. J and R dimensions include 1/8" allowance for gasketing.
3. Unit sizes 114, 117 and 122 with TEFC, explosion proof or 2-speed motors have 4" access door extension regardless of unit arrangement. Applications requiring this extension are listed in the table at right.

MOTOR TYPE	MOTOR HP	FAN TYPE	FAN SIZE
TEFC, E.P.	20 or Larger	AF	Optional
TEFC, E.P. & 2-Speed	25 or Larger	FC	Optional
TEFC, E.P. & 2-Speed	25 or Larger	AF	ALL

Table 24.

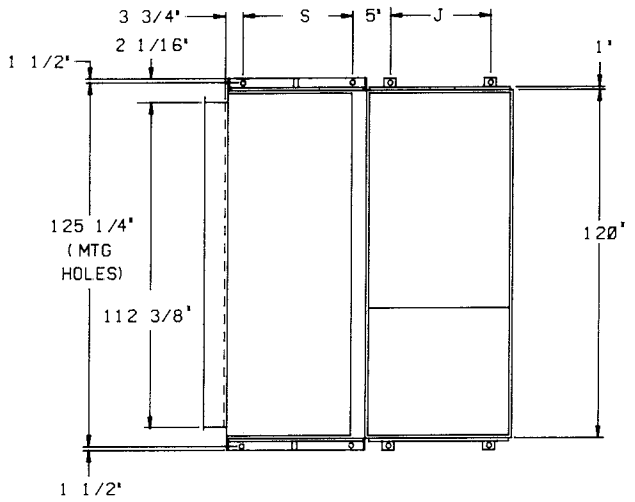
UNIT SIZE	PHYSICAL DIMENSIONS (INCHES)																
	A*	B	C	D	F	H	J	K	M	P	R	S	U	V	W	Y	Z
114E	93	45 1/8	66 1/16	44	42	14	44 1/8	87 1/2	72 3/8	79 3/4	86 1/8	36 1/2	32 1/2	73 7/8	20 7/8	21 1/2	42
117E	93	45 1/8	66 1/16	44	42	14	44 1/8	87 1/2	88 3/8	94 3/4	86 1/8	36 1/2	32 1/2	88 7/8	20 7/8	21 1/2	42
122E	97	48 1/8	71 5/16	47	49	18	47 1/8	91 1/2	88 3/8	98 3/4	96 1/8	43 1/2	39 1/2	92 7/8	22 3/8	24 1/2	45
128E	120	52 1/8	74 5/16	51	49	18	51 1/8	114 1/2	112 3/8	121 3/4	100 1/8	43 1/2	39 1/2	115 7/8	24 3/8	24 1/2	49

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

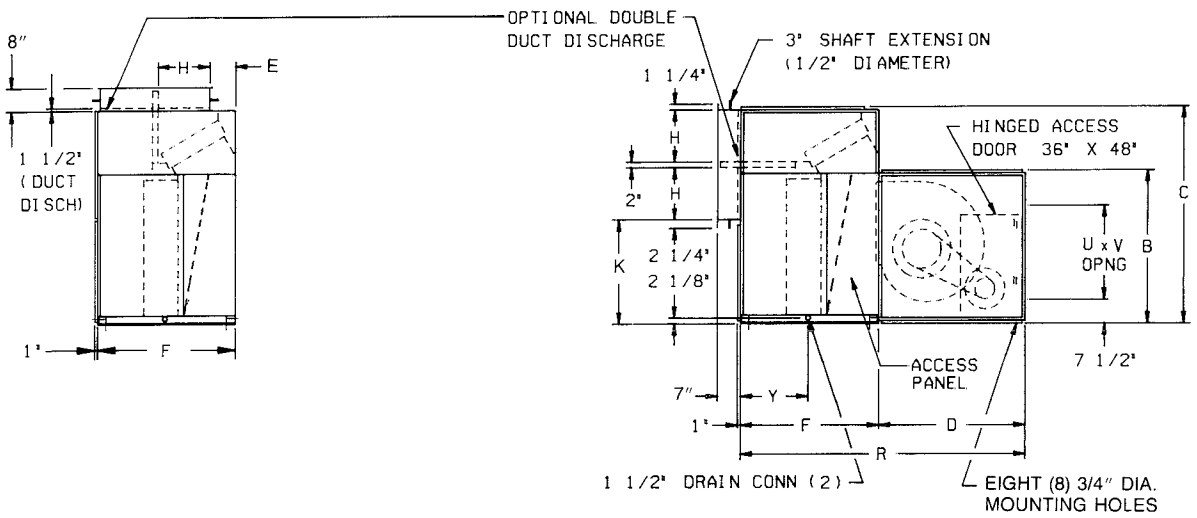
Type LML & Type MMM
Low & Medium Pressure
Blow-through 2-Deck Units
Unit Sizes 137E thru 172E

Figure 20.

ZONE DAMPERS		
Size	Max. Zones	Zone Width
137E	14	8
141E	14	8
150E	14	8
164E	14	8
172E	14	8



OPTIONAL
VERTICAL DISCHARGE



NOTES:
1. R dimension includes 1/8" allowance for gasketing.
2. Blower section access door extends 3" on units with 50, 60, or 75 HP TEFC or explosion proof motors.

Table 25.

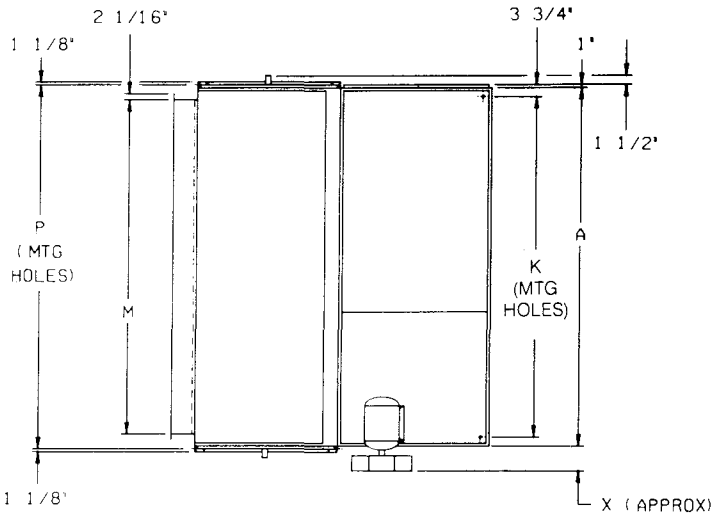
UNIT	PHYSICAL DIMENSIONS (INCHES)												
SIZE	B	C	D	E	F	H	J	K	R	S	U	V	Y
137E	67	92¾	58	9¾	58	22	53¾	45½	116⅛	52½	51	116	29
141E	73	100¾	66	9¾	62	24	61¾	49½	128⅛	56½	59¼	116	31
150E	79⅜	109¾	76	9¾	67	26½	71¾	53 7/16	143⅛	61½	69	116	33½
164E	97⅜	133¾	76	11¾	79	31½	71¾	66 7/16	155⅛	73½	87	116	39½
172E	97⅜	138¾	76	11¾	79	31½	71¾	72 7/16	155⅛	73½	87	116	39½

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

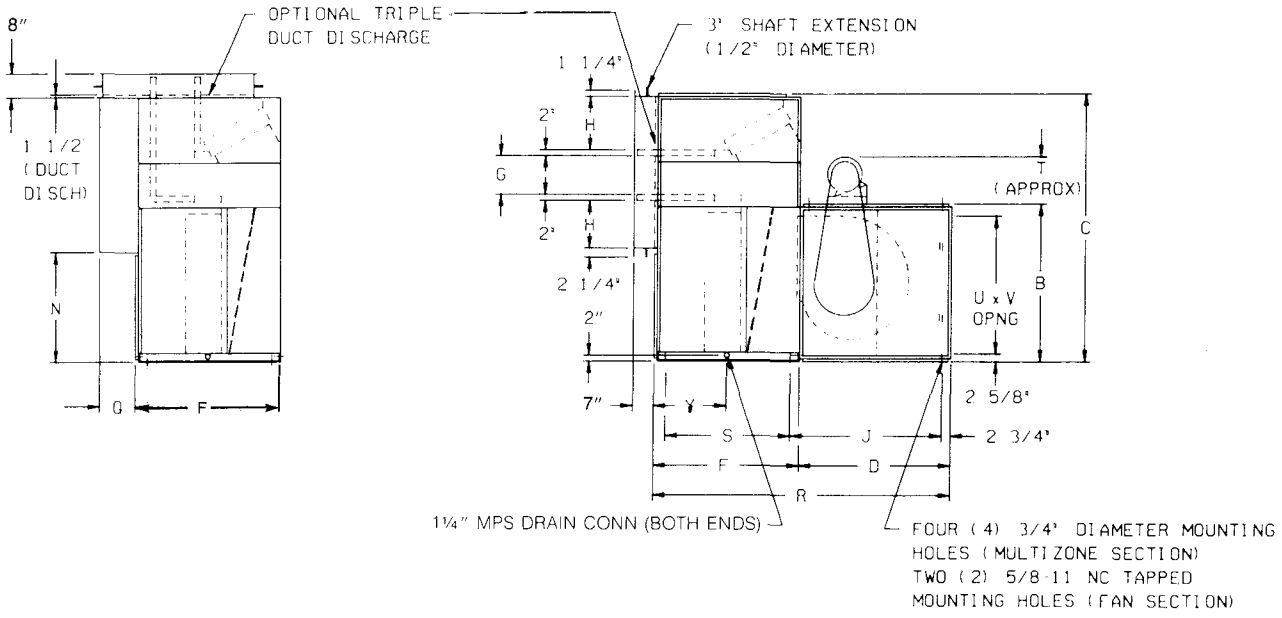
Type LML & Type MMM
Low & Medium Pressure
Blow-through 3-Deck Units
Unit Sizes 106E thru 111E

Figure 21.

ZONE DAMPERS		
Size	Max. Zones	Zone Width
106E	5	8
108E	5	8
111E	7	8



OPTIONAL VERTICAL DISCHARGE



NOTE: J and R dimensions includes 1/8" allowance for gasketing.

Table 26.

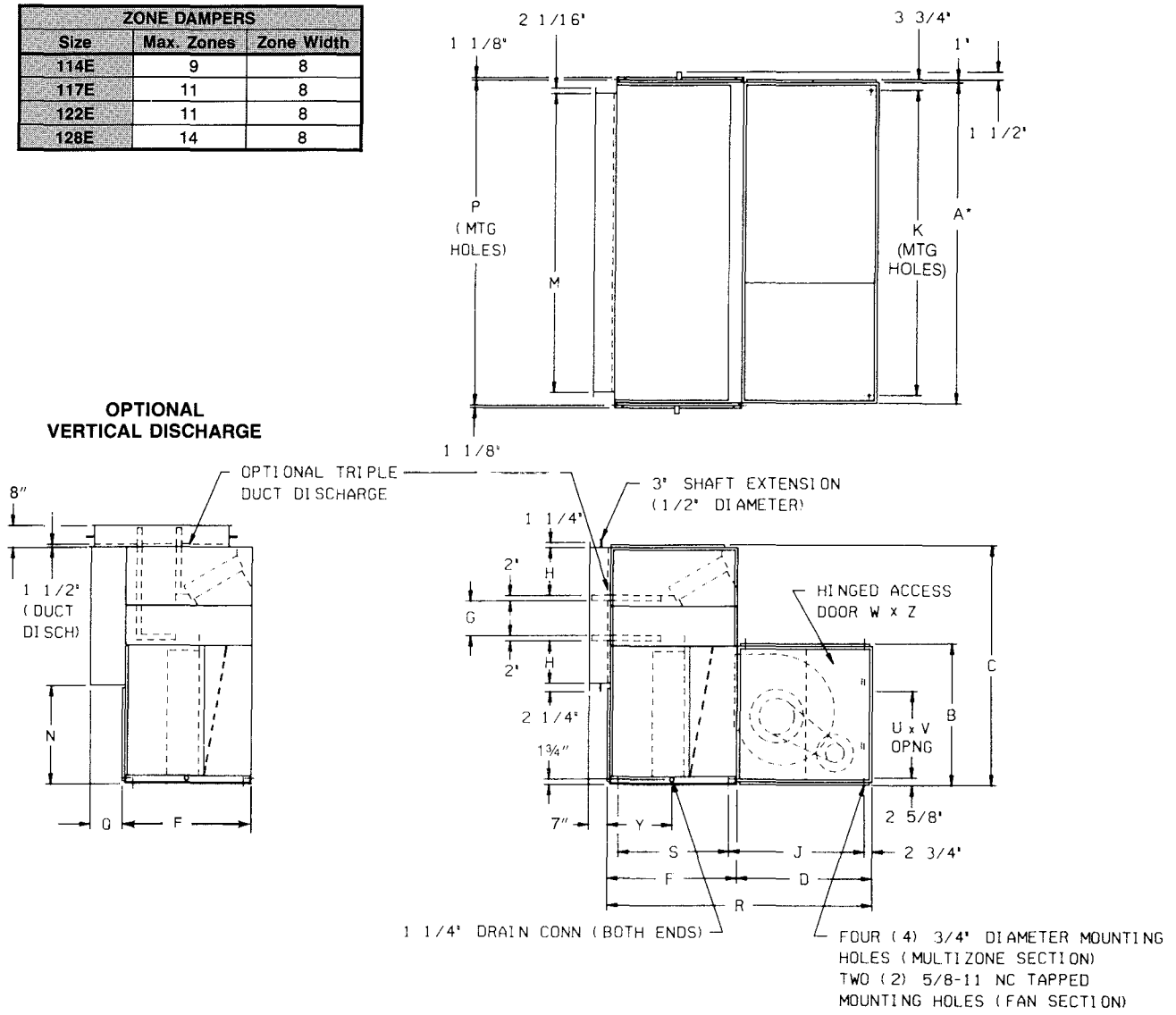
UNIT	PHYSICAL DIMENSIONS (INCHES)																			
SIZE	A	B	C	D	F	G	H	J	K	M	N	P	Q	R	S	T	U	V	X	Y
106E	50	29¼	56 3/16	28	34	7	10	28⅛	44½	43⅜	17 15/16	51¾	9	62⅛	28½	16	23¾	45⅞	6½	17½
108E	48	38	70 15/16	36¾	42	10	14	36⅞	42½	43⅜	22 11/16	49¾	12	78⅞	36½	16	32½	43⅞	8	21½
111E	63	38	70 15/16	36¾	42	10	14	36⅞	57½	56 9/16	22 11/16	64¾	12	78⅞	36½	18	32½	58⅞	8	21½

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

Type LML & Type MMM
Low & Medium Pressure
Blow-thru 3-Deck Units
Unit Sizes 114E thru 128E

Figure 22.

ZONE DAMPERS		
Size	Max. Zones	Zone Width
114E	9	8
117E	11	8
122E	11	8
128E	14	8



NOTES:
1. "A" dimension for unit size 114 coil section is 78".
2. J and R dimensions include 1/8" allowance for gasketing.
3. Unit sizes 114, 117 and 122 with TEFC, explosion proof or 2-speed motors have 4" access door extension regardless of unit arrangement. Applications requiring this extension are listed in the table at right.

MOTOR TYPE	MOTOR HP	FAN TYPE	FAN SIZE
TEFC, E.P.	20 or Larger	AF	Optional
TEFC, E.P. & 2-Speed	25 or Larger	FC	Optional
TEFC, E.P. & 2-Speed	25 or Larger	AF	ALL

Table 27.

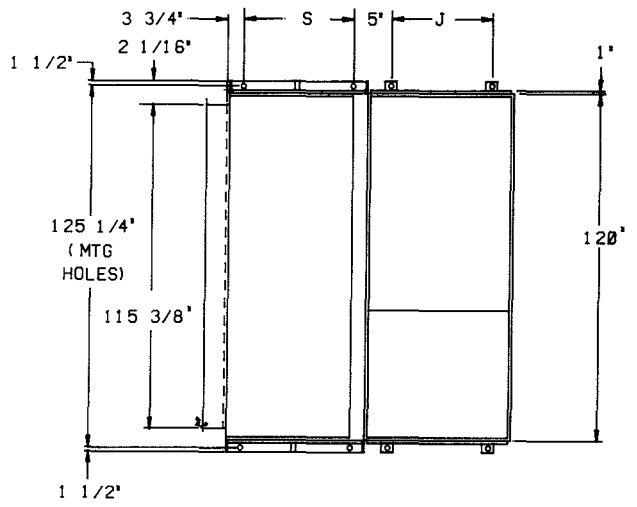
UNIT	PHYSICAL DIMENSIONS (INCHES)																			
SIZE	A*	B	C	D	F	G	H	J	K	M	N	P	Q	R	S	U	V	W	Y	Z
114E	93	45 1/8	78 1/16	44	42	10	14	44 1/8	87 1/2	72 5/8	29 13/16	79 3/4	12	86 1/8	36 1/2	32 1/2	73 7/8	20 7/8	21 1/2	42
117E	93	45 1/8	78 1/16	44	42	10	14	44 1/8	87 1/2	88 5/8	29 13/16	94 3/4	12	86 1/8	36 1/2	32 1/2	88 7/8	20 7/8	21 1/2	42
122E	97	48 1/8	86 5/16	47	49	13	18	47 1/8	91 1/2	91 3/8	29 13/16	98 3/4	15	96 1/8	43 1/2	39 1/2	92 7/8	22 3/8	24 1/2	45
128E	120	52 1/8	89 5/16	51	49	13	18	51 1/8	114 1/2	115 3/8	32 13/16	121 3/4	15	100 1/8	43 1/2	39 1/2	115 7/8	24 3/8	24 1/2	49

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

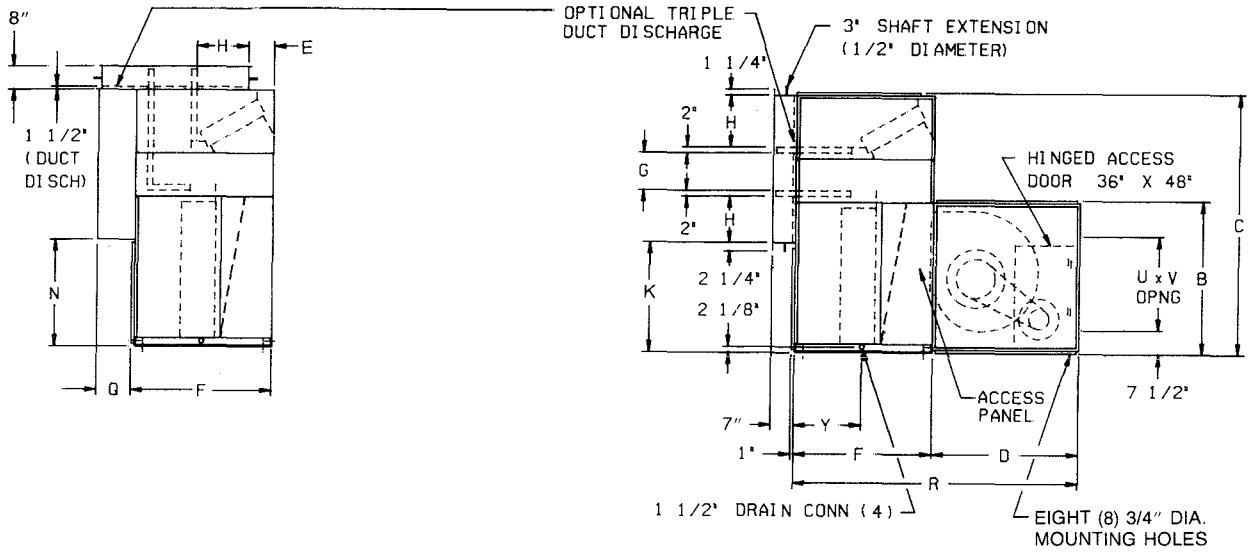
Type LML & Type MMM
Low & Medium Pressure
Blow-thru 3-Deck Units
Unit Sizes 137E thru 172E

Figure 23.

ZONE DAMPERS		
Size	Max. Zones	Zone Width
137E	14	8
141E	14	8
150E	14	8
164E	14	8
172E	14	8



OPTIONAL
VERTICAL DISCHARGE



NOTES:
1. R dimension includes 1/8" allowance for gasketing.
2. Blower section access door extends 3" on units with 50, 60, or 75 HP TEFC or explosion proof motors.

Table 28.

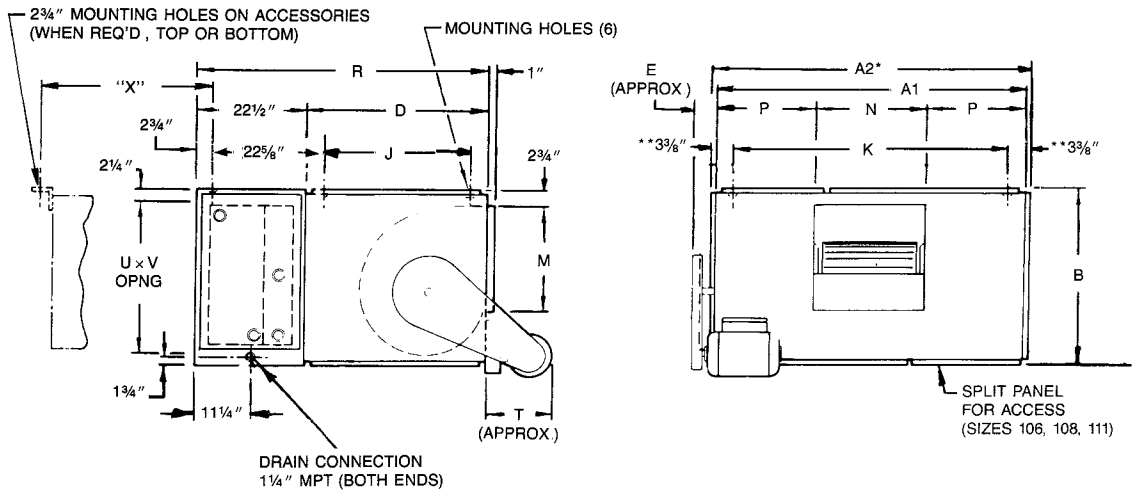
UNIT	PHYSICAL DIMENSIONS (INCHES)															
SIZE	B	C	D	E	F	G	H	J	K	N	Q	R	S	U	V	Y
137E	67	112¾	58	9¾	58	18	22	53¾	45½	43¼	20	116⅛	52½	51	116	29
141E	73	120¾	66	9¾	62	18	24	61¾	49½	47¼	20	128⅛	56½	59¼	116	31
150E	79⅜	131¾	76	9¾	67	20	26½	71¾	53 7/16	51¼	22	143⅛	61½	69	116	33½
164E	97⅜	159¾	76	11¾	79	25	31½	71¾	66 7/16	64¼	27	155⅛	73½	87	116	39½
172E	97⅜	165¾	76	11¾	79	25	31½	71¾	72 7/16	70¼	27	155⅛	73½	87	116	39½

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

Dimensional data — SEASONMASTER draw-through Central station air conditioning units

Type LSL & Type MSL
Low & Medium Pressure
Horizontal Draw-through Units
Unit Sizes 103C thru 111C

Figure 24.



NOTES:
1. MOUNTING HOLE DATA: Blower Section — ⅝" NC tapped, top or bottom. Coil Section — ⅝" tapped, top; ⅝" holes, bottom.
2. A1 and B dimensions for blower section. A2 and B for coil section.
3. "X" dimension found by adding dimension of the optional sections used plus 3⅝". Include ⅛" for gasketing where sections bolt together.
4. "R" dimension includes ⅛" for gasketing.

Table 29.

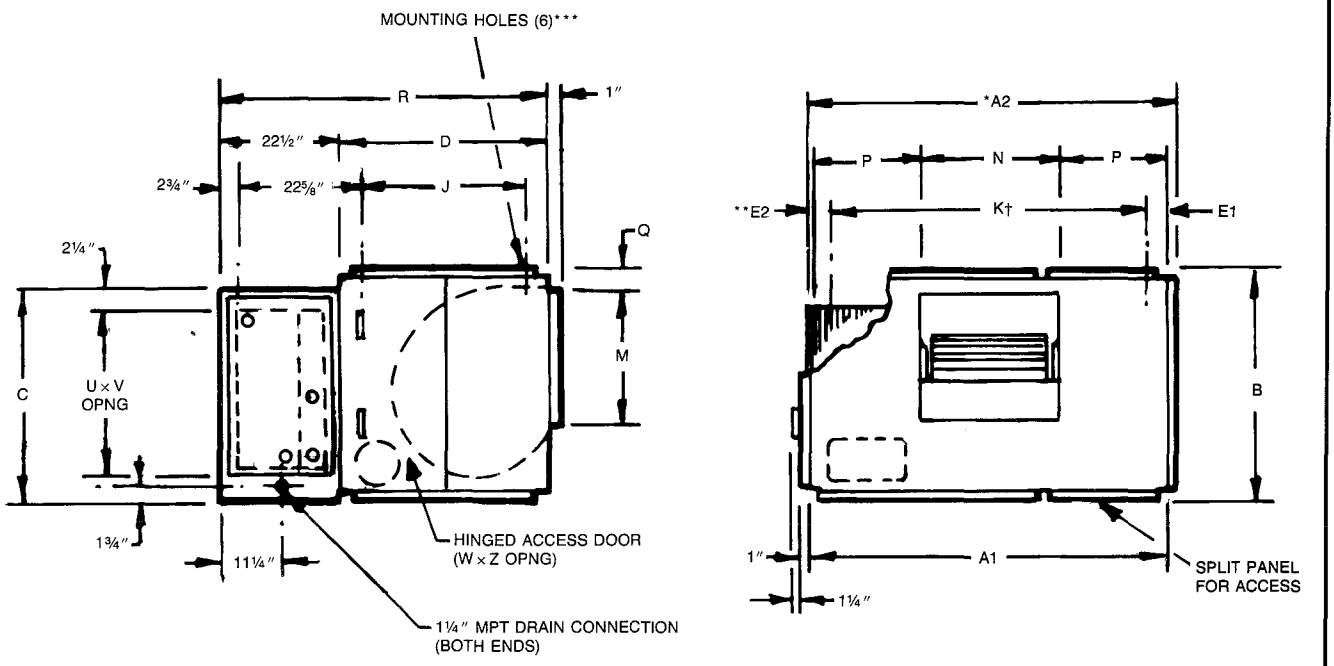
UNIT SIZE	DIMENSIONS (INCHES)													
	A1	A2*	B	D	E	J	K	M	N	P	R	T	U	V
103C	34	35⅛	22¾	21¾	6½	16⅛	28½	10¼	11¾	11⅛	44⅜	15	18¼	29⅞
104C	40	41⅛	25¾	24¾	6½	19⅛	34½	13½	12¼	13⅞	47⅜	15	21¼	35⅞
106C	50	51⅛	29	28	6½	22⅜	44½	15⅞	17¼	16⅜	50⅝	16	24½	45⅞
108C	48	49⅛	37¾	36¾	8	31⅛	42½	19⅜	21⅛	13 7/16	59⅜	18	33¼	43⅞
111C	63	64⅛	37¾	36¾	8	31⅛	57½	21⅝	23¼	19⅞	59⅜	18	33¼	58⅞

*Add 4 inches with extra large face area coils. **Add 2 inches with extra large face area coils.

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

Type LSL & Type MSL
Low & Medium Pressure
Horizontal Draw-through Units
Unit Sizes 114D thru 134D

Figure 25.



NOTE: For fan outlet dimension M, N, P and Q, see page 69.

NOTES:

1. MOUNTING HOLE DATA: Blower Section — ⅝″ NC tapped, top or bottom. Coil Section — ⅝″ tapped, top; ⅝″ holes, bottom. Refer to dimensions "J" and "K".
   † For coil section mounting holes, unit size 114, subtract 15″ from "K" dimension.
2. E1, A1 and J dimensions for blower section. E2, A2 dimensions for coil section.
3. "R" dimension includes ⅛″ for gasketing.
4. ***Top mounting holes not available on units with top external face and bypass duct.
5. Unit sizes 114, 117 and 122 with TEFC, explosion proof or 2-speed motors have 4″ access door extension regardless of unit arrangement. Applications requiring this extension are listed below.

Motor Type	Motor HP	Fan Type	Fan Size
TEFC, E.P.	20	AF	Optional
TEFC, E.P. & 2-Speed	25	FC	Optional
TEFC, E.P. & 2-Speed	25	AF	All

Table 30.

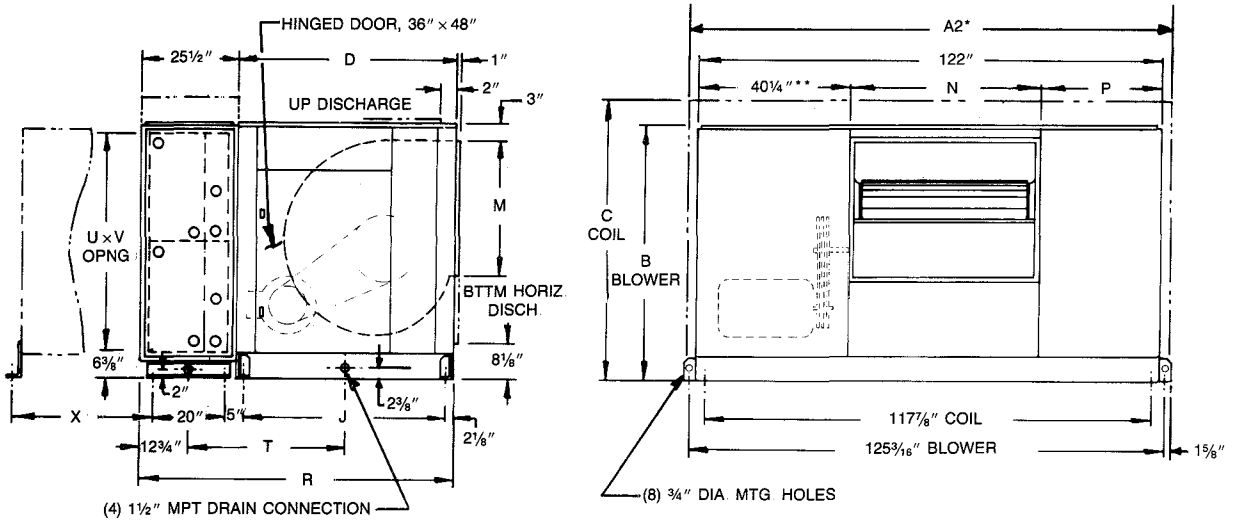
UNIT SIZE	DIMENSIONS (INCHES)													
	A_1	A_2*	B	C	D	E_1	E_2**	J	K†	R	U	V	W	Z
114D	93	79⅛	45⅛	37¾	44	2¾	3⅜	38½	87½	66⅝	33¼	73⅞	20⅞	42
117D	93	94⅛	45⅛	37¾	44	2¾	3⅜	38½	87½	66⅝	33¼	88⅞	20⅞	42
122D	97	98⅛	48⅛	44¾	47	2¾	3⅜	41½	91½	69⅝	40¼	92⅞	22⅜	45
128D	120	121⅛	52⅛	44¾	51	2¾	3⅜	45½	114½	73⅝	40¼	115⅞	24⅜	49
134D	120	121⅛	52⅛	52	51	2¾	3⅜	45½	114½	73⅝	47⅜	115⅞	24⅜	49

*Add 4 inches with extra large face area coils, except 134 size. **Add 2 inches with extra large face area coils.

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

Type LSL & Type MSL
Low & Medium Pressure
Horizontal Draw-through Units
Unit Sizes 137D thru 172D

Figure 26.



NOTE: For fan outlet dimension M, N, and P, see page 69.

NOTES:
1. For ceiling suspension, units 137 through 164 must be platform mounted.
2. "122" and "B" dimensions for blower section. "A2" and "C" dimensions for coil section.
3. "X" dimension is found by adding dimensions of the optional sections used, plus 3⅝". Add ⅛" where sections bolt together.
4. Size 137 and 141 coil sections are shorter than blower section (see "B" and "C").
5. Blower access door extends 3" on units with 50, 60 or 75 horsepower TEFC or explosion proof motors
6. "R" dimension includes ⅛" allowance for gasketing.
7. **40¼" dimension is always located on the drive side of the unit

Table 31.

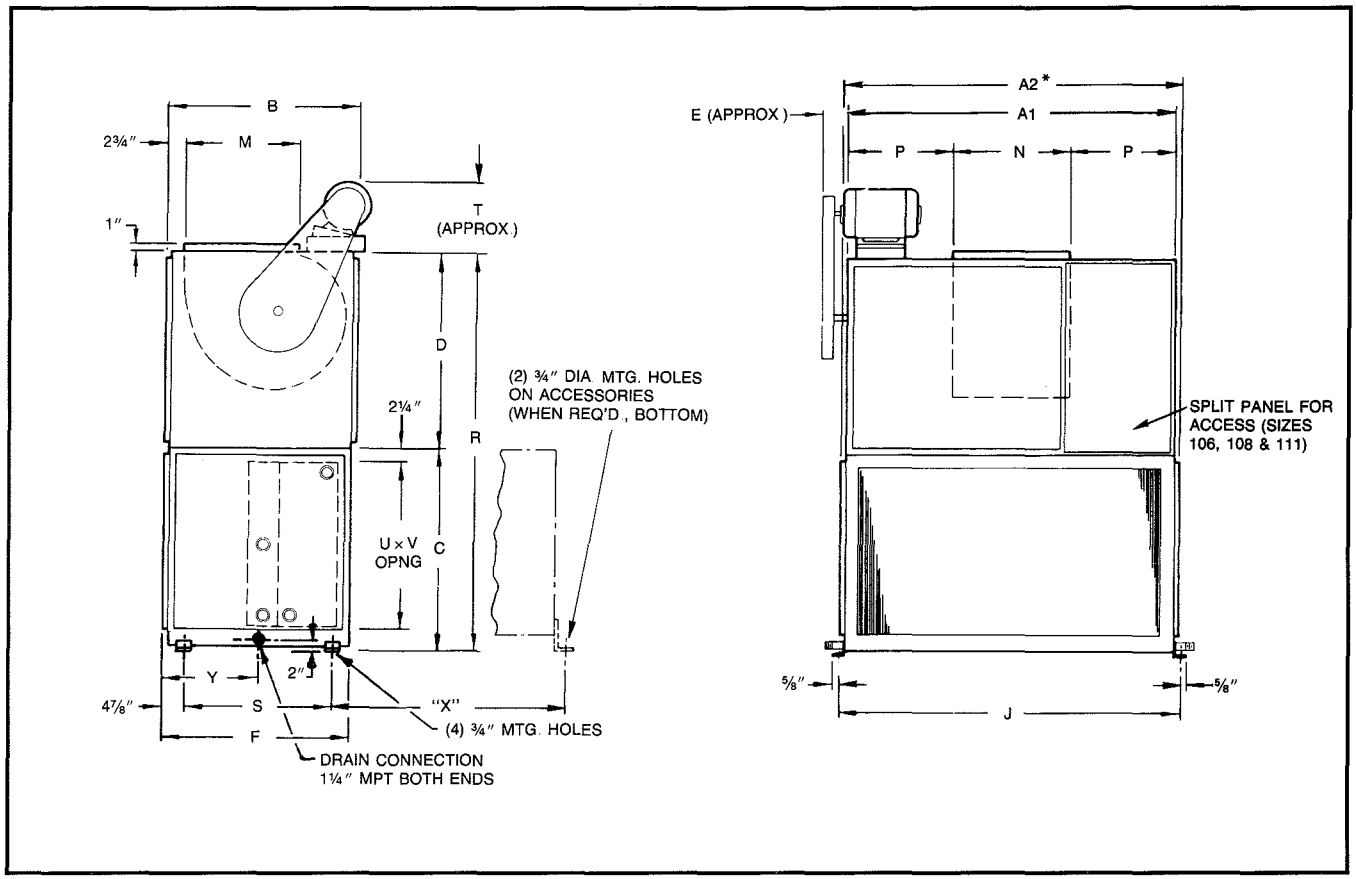
UNIT SIZE	DIMENSIONS (INCHES)								
	A2*	B	C	D	J	R	T	U	V
137D	122	67	61⅜	58	53¾	83⅝	41⅞	52½	116¾
141D	122	73	69⅝	66	61¾	91⅝	45⅞	60¾	116¾
150D	122	79⅜	79⅜	76	71¾	101⅝	50⅞	70½	116¾
164D	122	97⅜	97⅜	76	71¾	101⅝	50⅞	88½	116¾
172D	126⅛	97⅜	105½	76	71¾	101⅝	50⅞	96½	116¾

*Add 4" with extra large face area coils (137 thru 164).

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

Type LSL & Type MSL
Low & Medium Pressure
Vertical Draw-through Units
Unit Sizes 103C thru 111C

Figure 27.



NOTES:
1. "X" dimension is found by adding dimensions of the optional sections used, plus 5⅛". Add ⅛" for gasketing where sections bolt together.
2. "A1" dimension for blower section.
3. "A2*" and "J" dimension for coil section.
4. "R" dimension includes ⅛" allowance for gasketing.

Table 32.

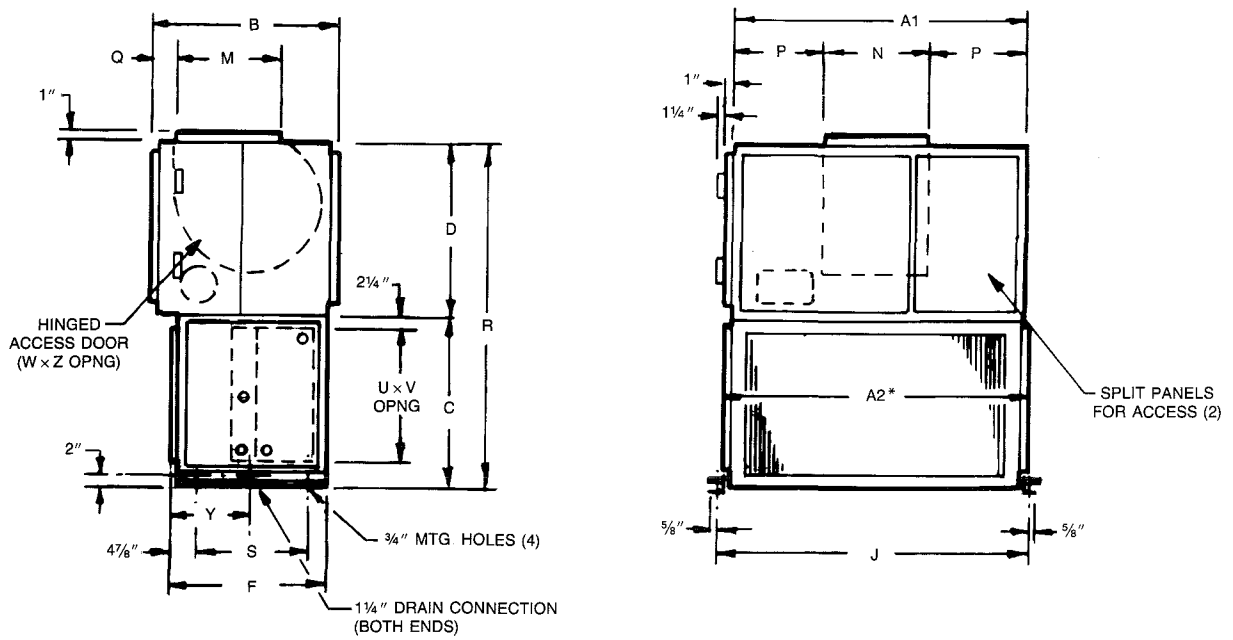
UNIT SIZE	DIMENSIONS (INCHES)																
	A1	A2*	B	C	D	E	F	J	M	N	P	R	S	T	U	V	Y
103C	34	35⅛	22¾	23	21¾	6½	29⅝	35¾	10¼	11¾	11⅛	44⅞	20½	15	18¼	29⅞	15⅛
104C	40	41⅛	25¾	26	24¾	6½	29⅝	41¾	13½	12¼	13⅞	50⅞	20½	15	21¼	35⅞	15⅛
106C	50	51⅛	29	29¼	28	6½	28½	51¾	15⅞	17¼	16⅜	57⅜	19⅜	16	24½	45⅞	14½
108C	48	49⅛	37¾	38	36¾	8	37¼	49¾	19⅜	21⅛	13 7/16	74⅞	28⅛	18	33¼	43⅞	18⅞
111C	63	64⅛	37¾	38	36¾	8	37¼	64¾	21⅝	23¼	19⅞	74⅞	28⅛	18	33¼	58⅞	18⅞

*Add 4 inches for extra large face area coils.

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

Type LSL & Type MSL
Low & Medium Pressure
Vertical Draw-through Units
Unit Sizes 114D thru 134D

Figure 28.



NOTE: For fan outlet dimension M, N, P and Q, see page 69.

NOTES:
1. "A1" dimension for blower section. "J" and "A2" dimensions for coil section
2. "R" dimension includes ⅛″ for gasketing.
3. Top mounting holes not available.
4. Unit sizes 114 and 117 with TEFC, explosion proof or 2-speed motors have 4″ access door extension regardless of unit arrangement. Applications requiring this extension are listed at right.

Motor Type	Motor HP	Fan Type	Fan Size
TEFC, E.P.	20	AF	Optional
TEFC, E.P. & 2-Speed	25	FC	Optional
TEFC, E.P. & 2-Speed	25	AF	All

Table 33.

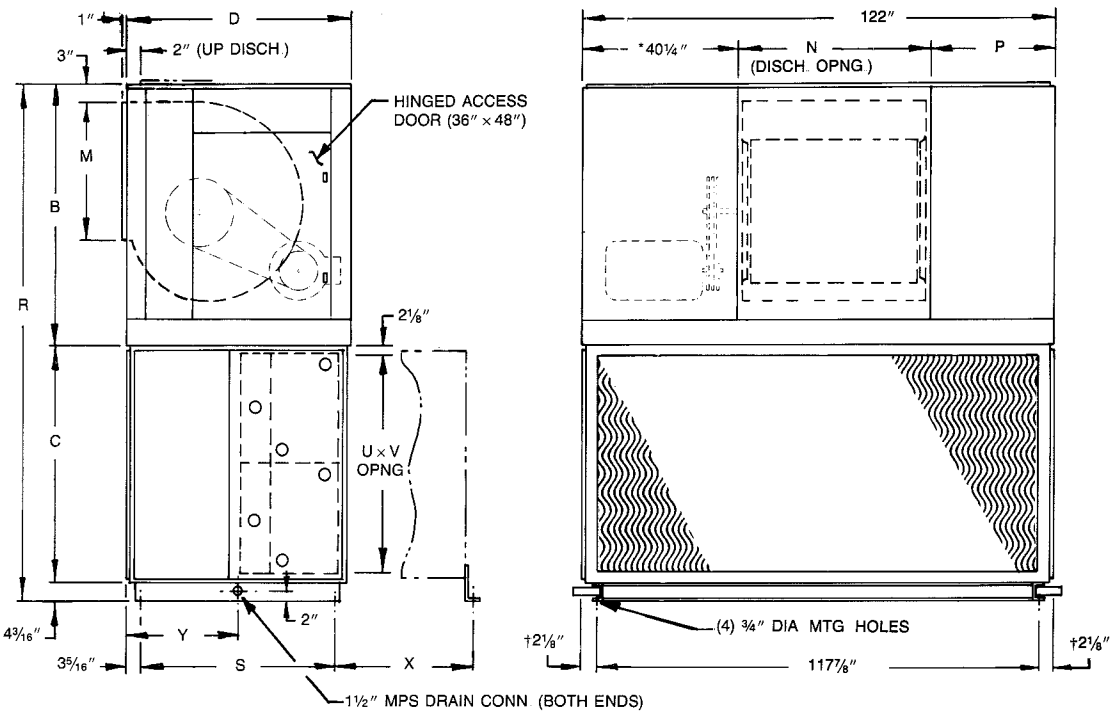
UNIT SIZE	DIMENSIONS (INCHES)													
	A1	A2*	B	C	D	F	J	R	S	U	V	W	Y	Z
114D	93	79⅛	45⅛	38	44	37¼	79¾	82⅛	28⅛	33¼	73⅞	20⅞	18⅞	42
117D	93	94⅛	45⅛	38	44	37¼	94¾	82⅛	28⅛	33¼	88⅞	20⅞	18⅞	42
122D	97	98⅛	48⅛	45	47	44¼	98¾	92⅛	35⅛	40¼	92⅞	22⅜	22⅜	45
128D	120	121⅛	52⅛	45	51	44¼	121¾	96⅛	35⅛	40¼	115⅞	24⅜	22⅜	49
134D	120	121⅛	52⅛	52⅜	51	44¼	121¾	103½	35⅛	47⅜	115⅞	24⅜	22⅜	49

*Add 4″ with extra large face area coils, except 134 size.

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

Type LSL & Type MSL
Low & Medium Pressure
Vertical Draw-through Units
Unit Sizes 137D thru 150D

Figure 29.



NOTE: For fan outlet dimension M, N, and P, see page 69.

NOTES:
1. Blower access door extends 3″ on units with 50, 60 or 75 horsepower TEFC or explosion proof motors.
2. † Add 2″ with extra large face area coils.
3. "X" dimension is found by adding dimensions of the optional sections used, plus 3⅝″. Add ⅛″ for gasketing where sections bolt together.
4. "R" dimension includes ⅛″ allowance for gasketing.
5. *40¼″ dimension is always located on the drive side of the unit.

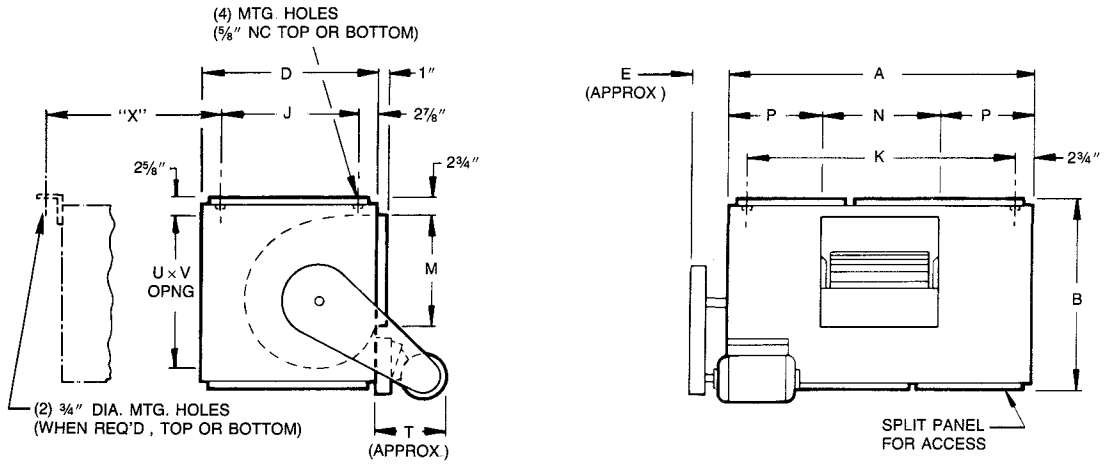
Table 34.

UNIT SIZE	DIMENSIONS (INCHES)							
	B	C	D	R	S	U	V	Y
137D	67	56¾	58	128 1/16	51¼	52½	116¾	29
141D	73	65	66	142 5/16	59½	60¾	116¾	33⅛
150D	79⅜	74¾	76	158 7/16	69¼	70½	116¾	38

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

Type LYF
Low Pressure Ventilating Units
Unit Sizes 103C thru 111C

Figure 30A. Horizontal



NOTE: "X" dimension is found by adding optional accessories plus 3 5/8". Add 1/8" where sections bolt together.

Figure 30B. Vertical (Mounted On Base Section)

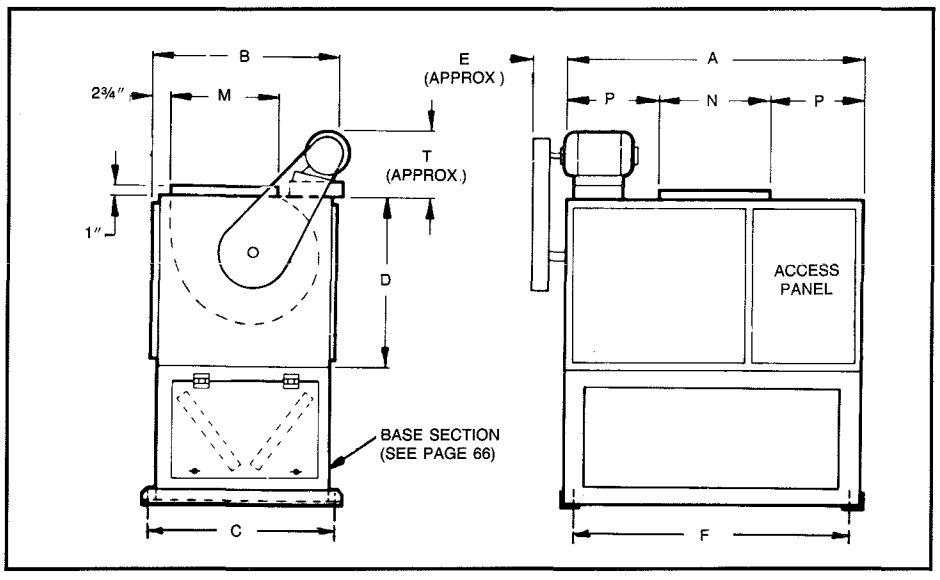


Figure 30C.

Cabinets With Two Fan Wheels (Unit Sizes 206 & 209)

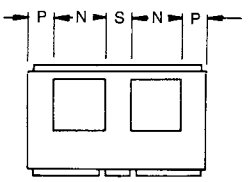


Table 35.

UNIT SIZE	DIMENSIONS (INCHES)														
	A	B	C	D	E	F	J	K	M	N	P	S	T	U	V
103C	34	22 3/4	23 5/8	21 3/4	6 1/2	31 3/8	16 1/8	28 1/2	10 1/4	11 3/4	11 1/8	—	15	17 1/2	29 7/8
104C	40	25 3/4	26 5/8	24 3/4	6 1/2	37 3/8	19 1/8	34 1/2	13 1/2	12 1/4	13 7/8	—	15	20 1/2	35 7/8
106C	50	29	29 7/8	28	6 1/2	47 3/8	22 3/8	44 1/2	15 7/8	17 1/4	16 3/8	—	16	23 3/4	45 7/8
206C	69	22 3/4	23 5/8	21 3/4	6 1/2	66 3/8	16 1/8	63 1/2	10 1/4	13 1/8	13 1/4	16 1/4	18	17 1/2	64 7/8
108C	48	37 3/4	38 5/8	36 3/4	8	45 3/8	31 1/8	42 1/2	19 3/8	21 3/8	13 3/8	—	18	32 1/2	43 7/8
209C	83	25 3/4	26 5/8	24 3/4	6 1/2	80 3/8	19 1/8	77 1/2	15 7/8	17 3/8	15	18 1/4	18	20 1/2	78 7/8
111C	63	37 3/4	38 5/8	36 3/4	8	60 3/8	31 1/8	57 1/2	21 5/8	23 1/4	19 7/8	—	18	32 1/2	58 7/8

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST

Type LYF
Low Pressure Ventilating Units
Unit Sizes 114D thru 128D

Figure 31A. Horizontal and Inverted

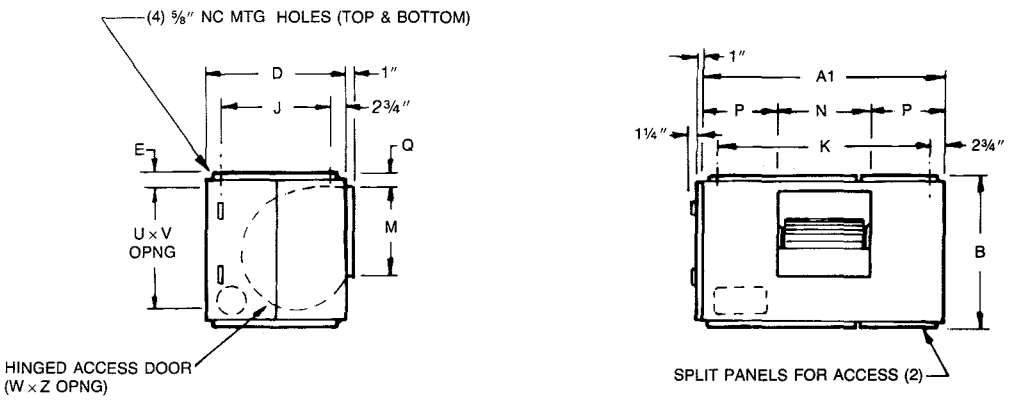
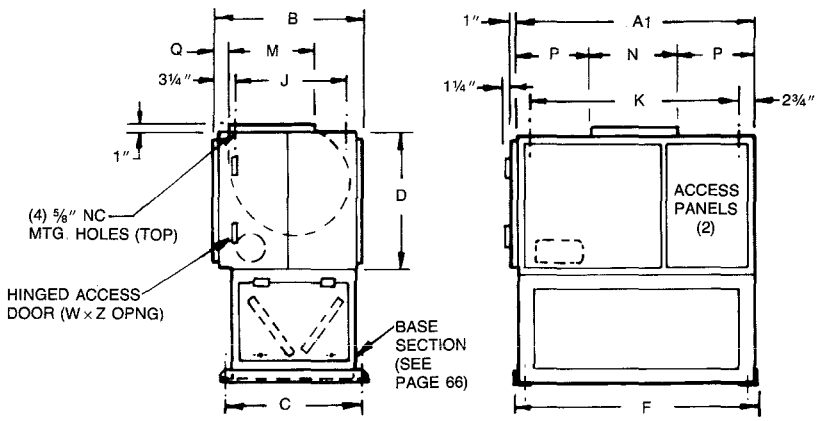


Figure 31B. Vertical (Mounted On Base Section)



NOTE: Unit sizes 114, 117 and 122 with TEFC, explosion proof or 2-speed motors have 4" access door extension regardless of unit arrangement. Applications requiring this extension are as follows:

Motor Type	Motor HP	Fan Type	Fan Size
TEFC, E.P.	20	AF	Opt.
TEFC, E.P. & 2-Speed	25	FC	Opt.
TEFC, E.P. & 2-Speed	25	AF	All

NOTE: For fan outlet dimension M, N, P and Q, see page 69.

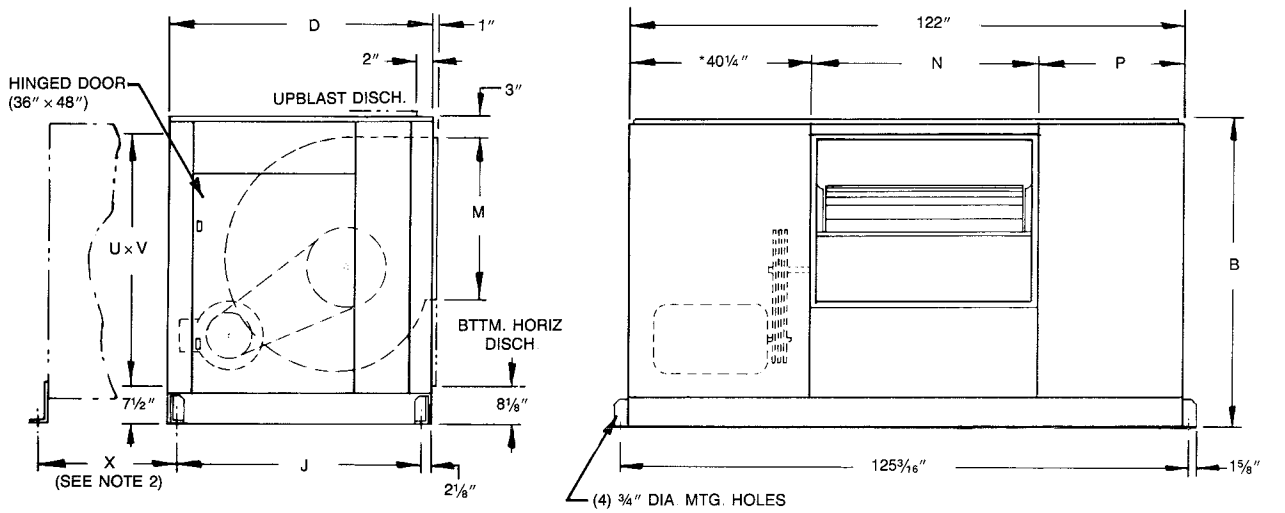
Table 36.

UNIT SIZE	DIMENSIONS (INCHES)											
	A1	B	C	D	E	F	J	K	U	V	W	Z
114D	93	45 1/8	38 5/8	44	10	78	38 1/2	87 1/2	32 1/2	73 7/8	20 7/8	42
117D	93	45 1/8	38 5/8	44	10	93	38 1/2	87 1/2	32 1/2	88 7/8	20 7/8	42
122D	97	48 1/8	45 5/8	47	6	97	41 1/2	91 1/2	39 1/2	92 7/8	22 3/8	45
128D	120	52 1/8	45 5/8	51	10	120	45 1/2	114 1/2	39 1/2	115 7/8	24 3/8	49

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

Type LYF
Low Pressure Ventilating Units
Unit Sizes 137D thru 164D

Figure 32.



NOTE: For fan outlet dimension M, N, and P, see page 69.

NOTES:
1. For ceiling suspension, units 137 through 164 must be platform mounted.
2. "X" dimension is found by adding dimensions of optional sections used, plus 2½″. Add ⅛″ for gasketing where sections bolt together.
3. Blower access door extends 3″ on units with 50, 60 or 75 horsepower TEFC or explosion proof motors.
4. *40¼″ dimension is always located on the drive side of the unit.

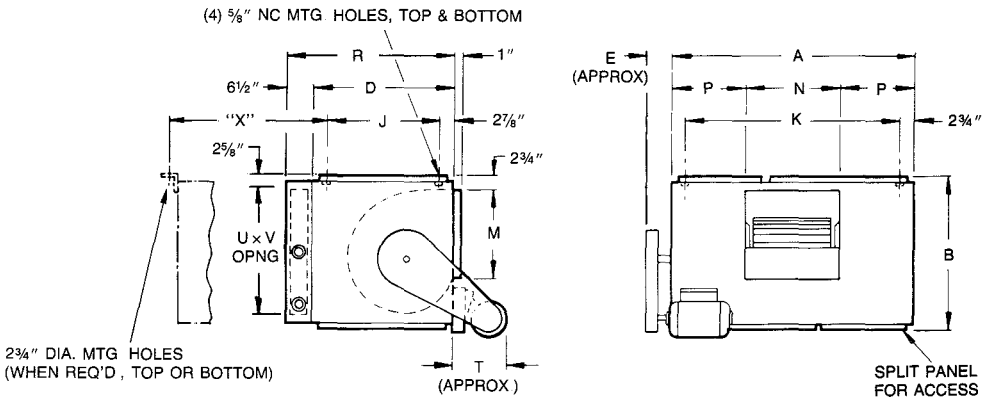
Table 37.

UNIT SIZE	DIMENSIONS (INCHES)				
	B	D	J	U	V
137D	67	58	53¾	51	116
141D	73	66	61¾	59¼	116
150D	79⅜	76	71¾	69	116
164D	97⅜	76	71¾	87	116

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST

Type LHD
Low Pressure Heating Units
Unit Sizes 103C thru 111C

Figure 33A. Horizontal



NOTES:
1. Add 3½" to "R" and "X" dimensions for optional 3- and 4-row heating coil section. "R" dimension includes ⅛" for gasketing.
2. "X" dimension is found by adding optional accessories plus 10¼". Add ⅛" where sections bolt together.

Figure 33B. Vertical (Mounted On Base Section)

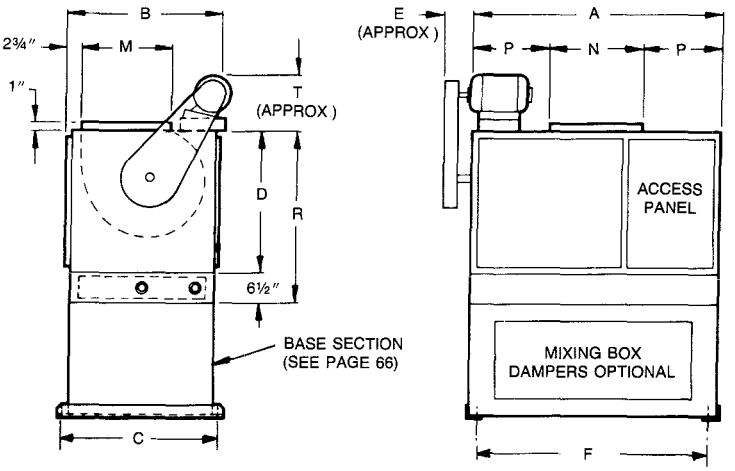


Figure 33C.

Cabinets With Two Fan Wheels (Unit Sizes 206 & 209)

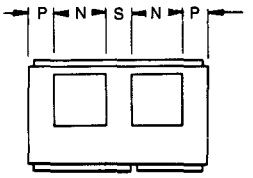


Table 38.

UNIT SIZE	DIMENSIONS (INCHES)															
	A	B	C	D	E	F	J	K	M	N	P	R	S	T	U	V
103C	34	22¾	23⅝	21¾	6½	31⅜	16⅛	28½	10¼	11¾	11⅛	28⅜	—	15	17½	29⅞
104C	40	25¾	26⅝	24¾	6½	37⅜	19⅛	34½	13½	12¼	13⅞	31⅜	—	15	20½	35⅞
106C	50	29	29⅞	28	6½	47⅜	22⅜	44½	15⅞	17¼	16⅜	34⅝	—	16	23¾	45⅞
206C	69	22¾	23⅝	21¾	6½	66⅜	16⅛	63½	10¼	13⅛	13¼	28⅜	16¼	18	17½	64⅞
108C	48	37¾	38⅝	36¾	8	45⅜	31⅛	42½	19⅜	21⅛	13⅜	43⅜	—	18	32½	43⅞
209C	83	25¾	26⅝	24¾	6½	80⅜	19⅛	77½	15⅞	17⅜	15	31⅜	18¼	18	20½	78⅞
111C	63	37¾	38⅝	36¾	8	60⅜	31⅛	57½	21⅝	23¼	19⅞	43⅜	—	18	32½	58⅞

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

Type LHD
Low Pressure Heating Units
Unit Sizes 114D thru 128D

Figure 34A. Horizontal

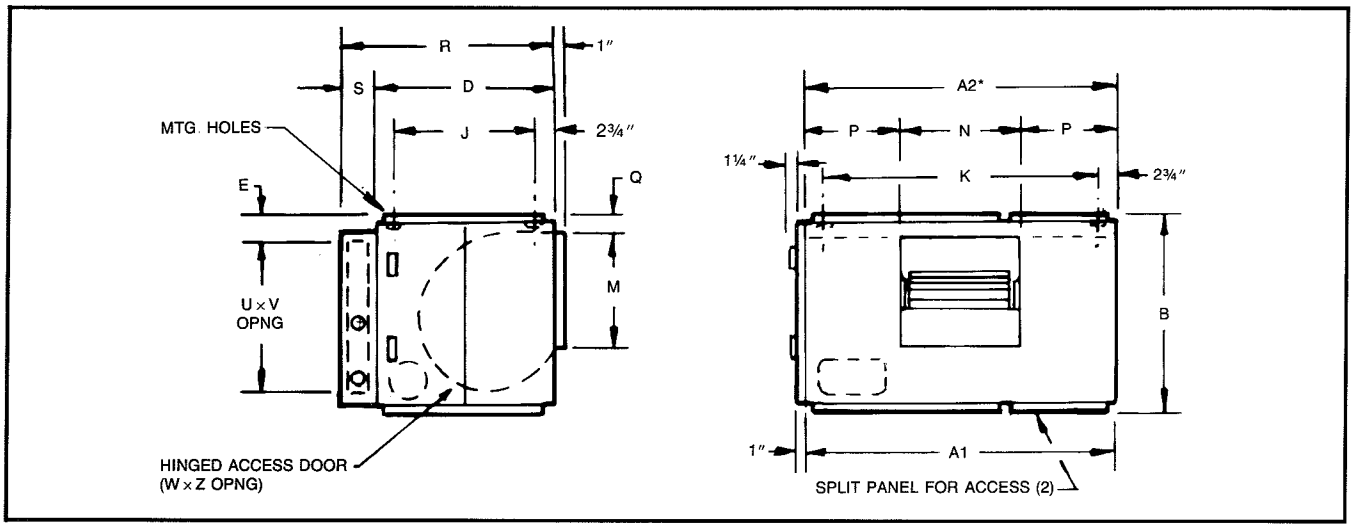
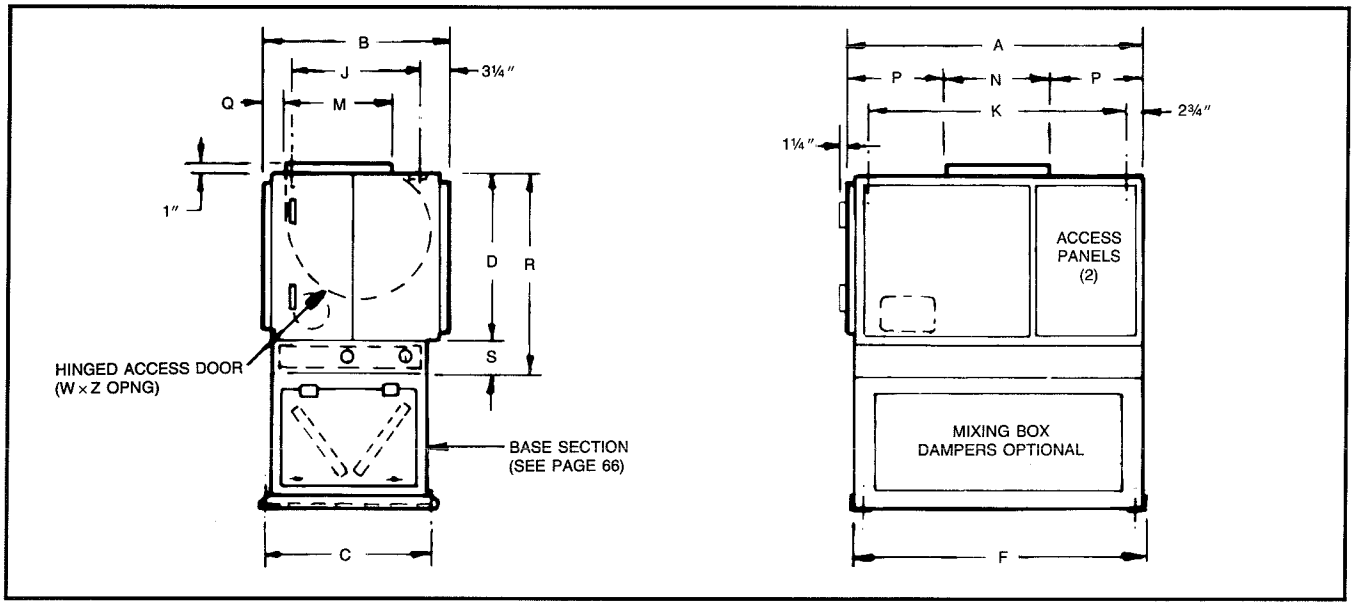


Figure 34B. Vertical (Mounted On Base Section)



NOTE: For fan outlet dimension M, N, P and Q, see page 69.

NOTES:

1. MOUNTING HOLE DATA: Blower section has four (4) ⅝″ NC mounting holes (top or bottom). Refer to dimensions "J" and "K".
2. Top mounting holes not available on units with external face and bypass.
3. A2* dimension is for coil section.
4. Add 3½″ to "S" and "R" dimensions for optional 3- and 4-row heating coil section. "R" dimension includes ⅛″ for gasketing.
5. Unit sizes 114, 117 and 122 with TEFC, explosion proof or 2-speed motors have 4″ access door extension regardless of unit arrangement. Applications requiring this extension are listed at right.

Motor Type	Motor HP	Fan Type	Fan Size
TEFC, E.P.	20	AF	Optional
TEFC, E.P. & 2-Speed	25	FC	Optional
TEFC, E.P. & 2-Speed	25	AF	All

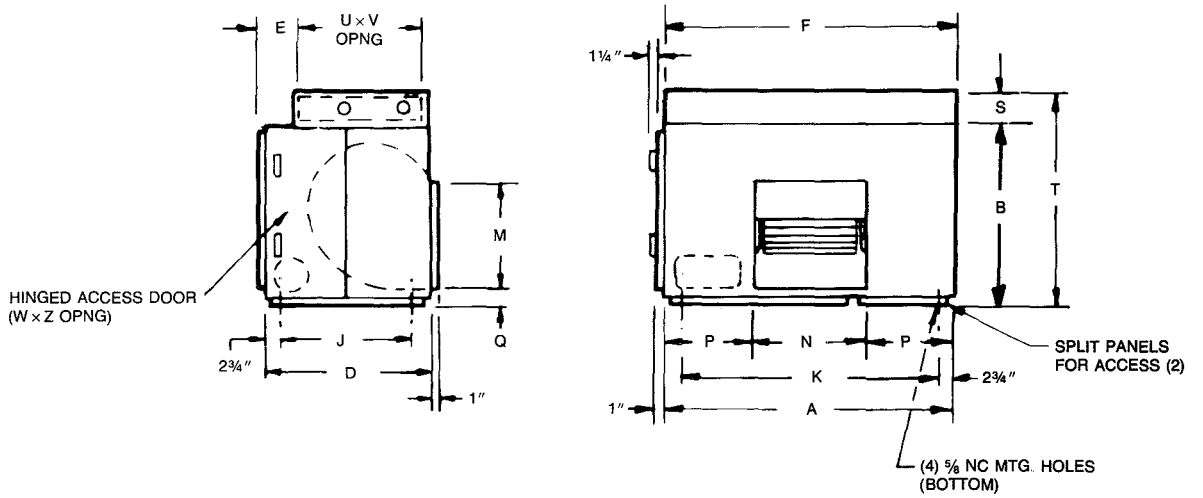
Table 39.

UNIT SIZE	DIMENSIONS (INCHES)														
	A1	A2*	B	C	D	E	F	J	K	R	S	U	V	W	Z
114D	93	78	45⅛	37¾	44	10	78	38½	87½	50⅝	6½	32½	73⅞	20⅞	42
117D	93	93	45⅛	37¾	44	10	93	38½	87½	50⅝	6½	32½	88⅞	20⅞	42
122D	97	97	48⅛	44¾	47	6	97	41½	91½	54⅛	7	39½	92⅞	22⅜	45
128D	120	120	52⅛	44¾	51	10	120	45½	114½	58⅛	7	39½	115⅞	24⅜	49

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

Type LHD
Low Pressure Heating Units
Unit Sizes 114D thru 128D

Figure 34C. Inverted



NOTE: For fan outlet dimension M, N, P and Q, see page 69.

NOTES:

1. MOUNTING HOLE DATA: Blower section has four (4) ⅝" NC mounting holes (top or bottom). Refer to dimensions "J" and "K".
2. "T" dimension includes ⅛" for gasketing.
3. Top mounting holes not available on inverted units.
4. When using downblast discharge, consult factory for mounting instructions.
5. Add 3½" to "S" and "T" dimensions for optional 3- and 4-row heating coil section.
6. Unit sizes 114, 117 and 122 with TEFC, explosion proof or 2-speed motors have 4" access door extension regardless of unit arrangement. Applications requiring this extension are listed at right.

Motor Type	Motor HP	Fan Type	Fan Size
TEFC, E.P.	20	AF	Optional
TEFC, E.P. & 2-Speed	25	FC	Optional
TEFC, E.P. & 2-Speed	25	AF	All

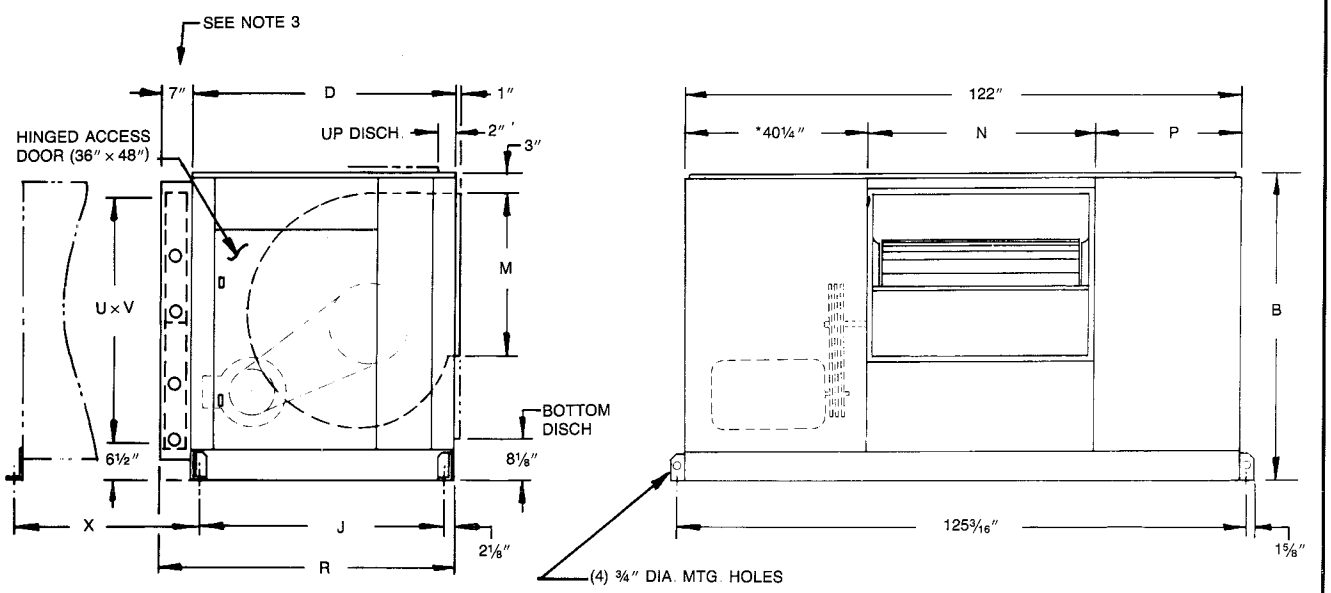
Table 40.

UNIT SIZE	DIMENSIONS (INCHES)												
	A	B	D	E	F	J	K	S	T	U	V	W	Z
114D	93	44 9/16	44	10	78	38½	87½	6½	51 1/16	32½	73⅞	20⅞	42
117D	93	44 9/16	44	10	93	38½	87½	6½	51 1/16	32½	88⅞	20⅞	42
122D	97	47 9/16	47	6	97	41½	91½	7	54 9/16	39½	92⅞	22⅜	45
128D	120	51 9/16	51	10	120	45½	114½	7	58 9/16	39½	115⅞	24⅜	49

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

Type LHD
Low Pressure Heating Units
Unit Sizes 137D thru 164D

Figure 35.



NOTE: For fan outlet dimension M, N, and P, see page 69.

NOTES:
1. "X" dimension is found by adding width of optional sections used, plus 9⅝". Add ⅛" for gasketing where sections bolt together.
2. Blower access door extends 3" on units with 50, 60 or 75 horsepower TEFC or explosion proof motors.
3. Add 3½" to "R" and "X" dimensions for optional 3- and 4-row heaing coil section. "R" dimension includes ⅛" allowance for gasketing.
4. *40¼" dimension is always located on the drive side of the unit.

Table 41.

UNIT SIZE	DIMENSIONS (INCHES)					
	B	D	J	R	U	V
137D	67	58	53¾	65⅛	51¼	115½
141D	73	66	61¾	73⅛	59½	115½
150D	79⅜	76	71¾	83⅛	69¼	115½
164D	97⅜	76	71¾	83⅛	87¼	115½

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST

Dimension data — MSL-190 units

Figure 36A. MSL-190 Fan Section (Top Horizontal)

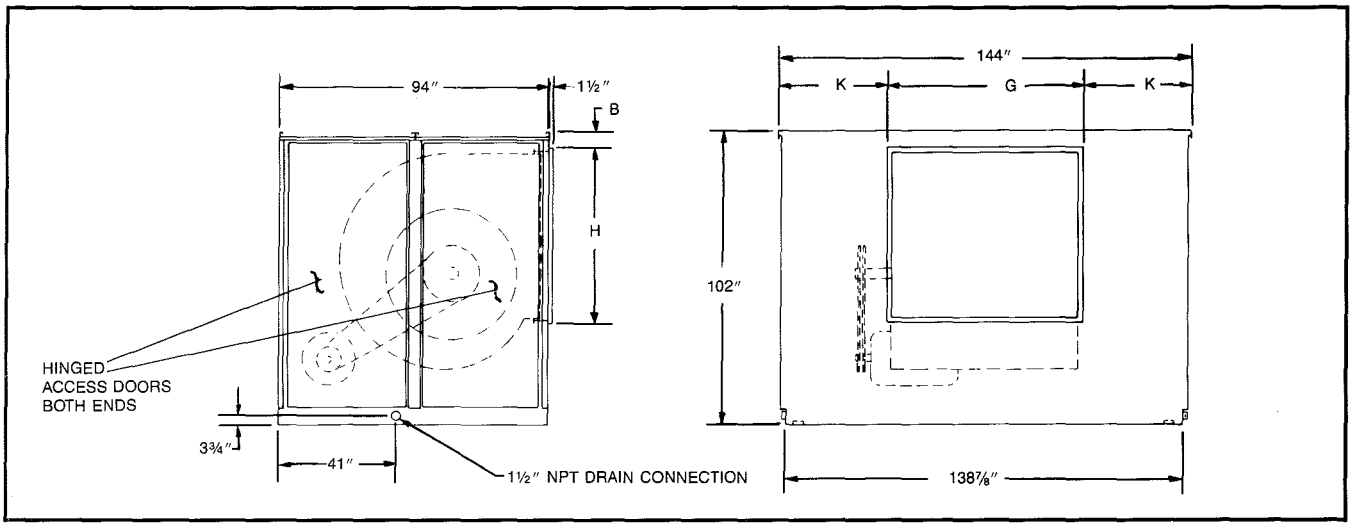


Figure 36B. MSL-190 Fan Section (Upblast)

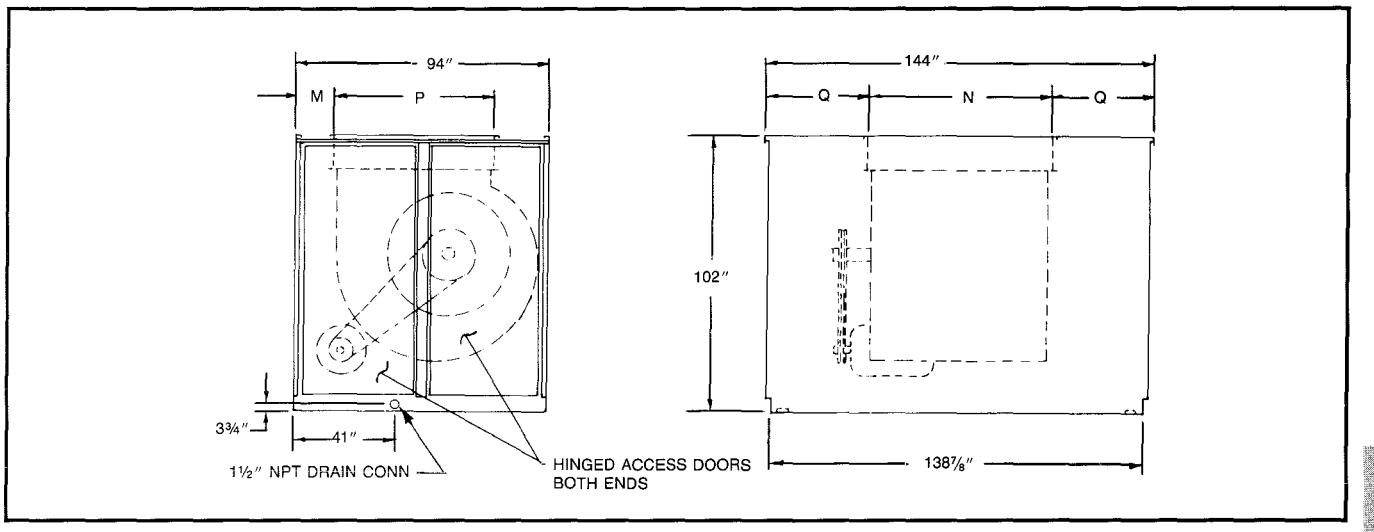
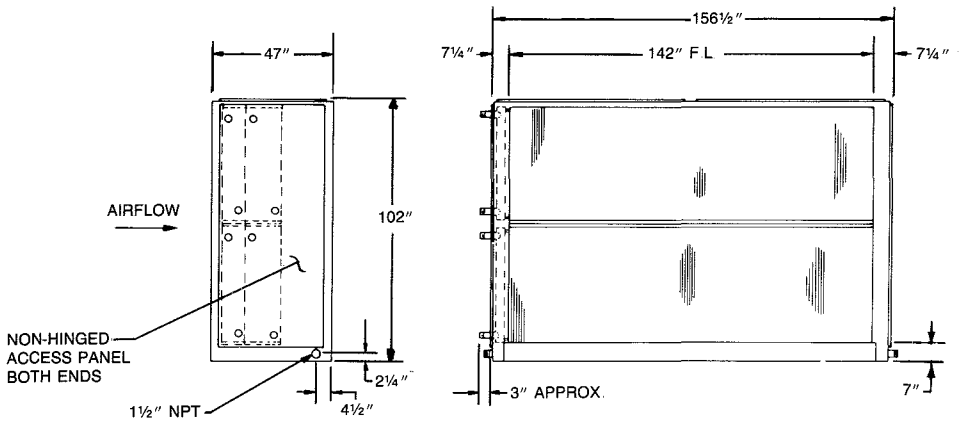


Table 42.

FAN SIZE (INCHES)	DIMENSIONS (INCHES)							
	B	G	H	K	M	N	P	Q
40	5¾	59⅞	55½	42	14⅞	58	53½	43
44	5¾	68	61⅛	38	14⅞	66⅛	59¼	39
48	4½	74⅞	67½	34½	6½	72⅞	65¾	35½

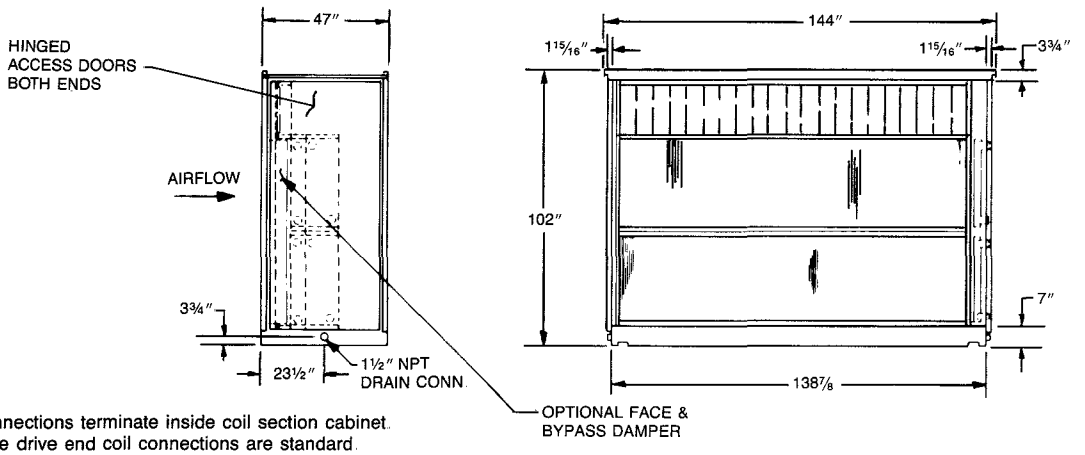
ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

Figure 37A. MSL-190 Wide Coil Section



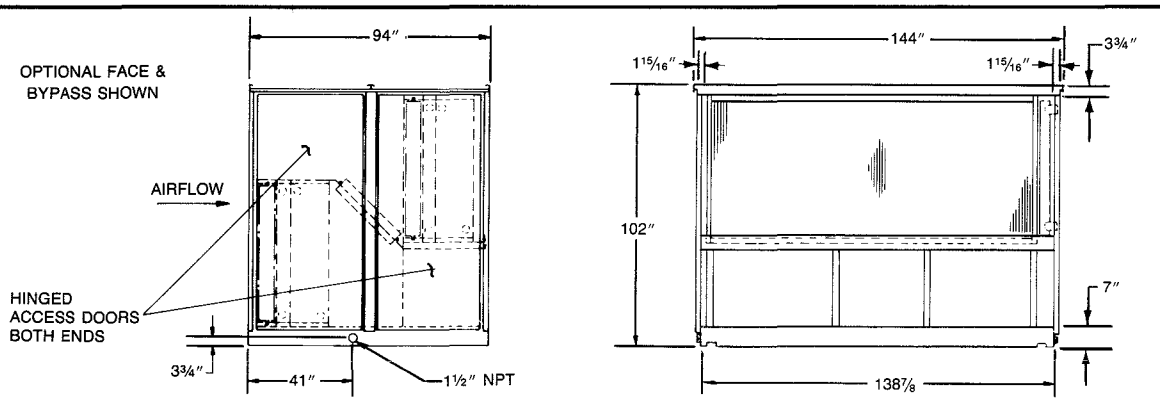
NOTE:
1. Coil connections terminate outside coil section cabinet.

Figure 37B. MSL-190 Single Coil Section



NOTES:
1. Coil connections terminate inside coil section cabinet.
2. Opposite drive end coil connections are standard.

Figure 37C. MSL-190 Staggered Coil Section



NOTES:
1. Coil connections terminate inside coil section cabinet.
2. Opposite drive end coil connections are standard.

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST

Figure 38A. MSL-190 Mixing Box

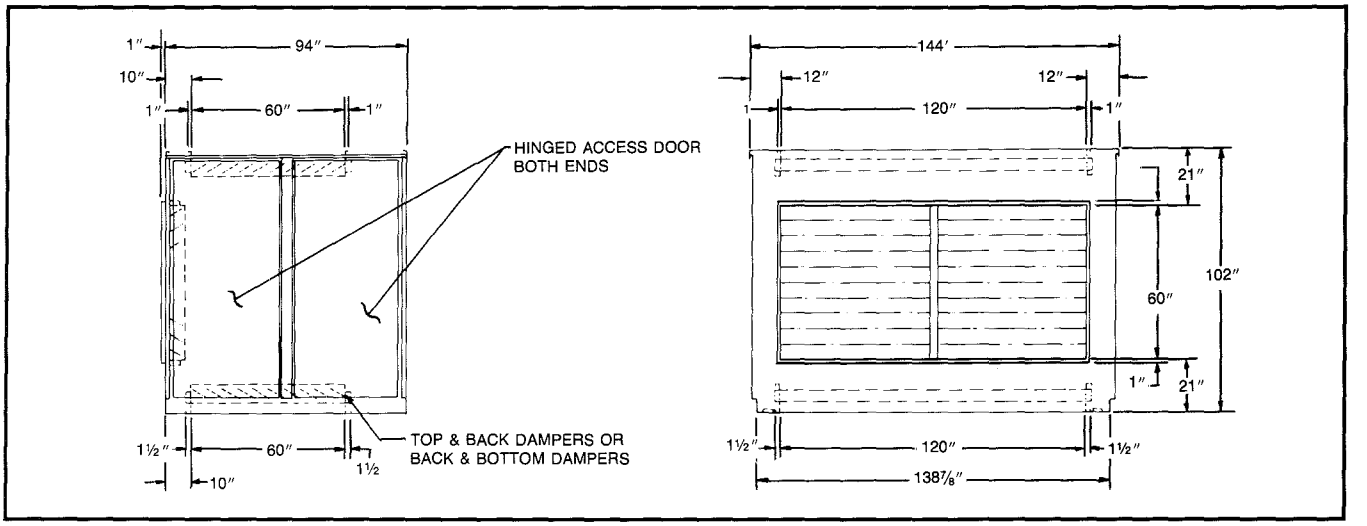


Figure 38B. MSL-190 Access/Spacer Section

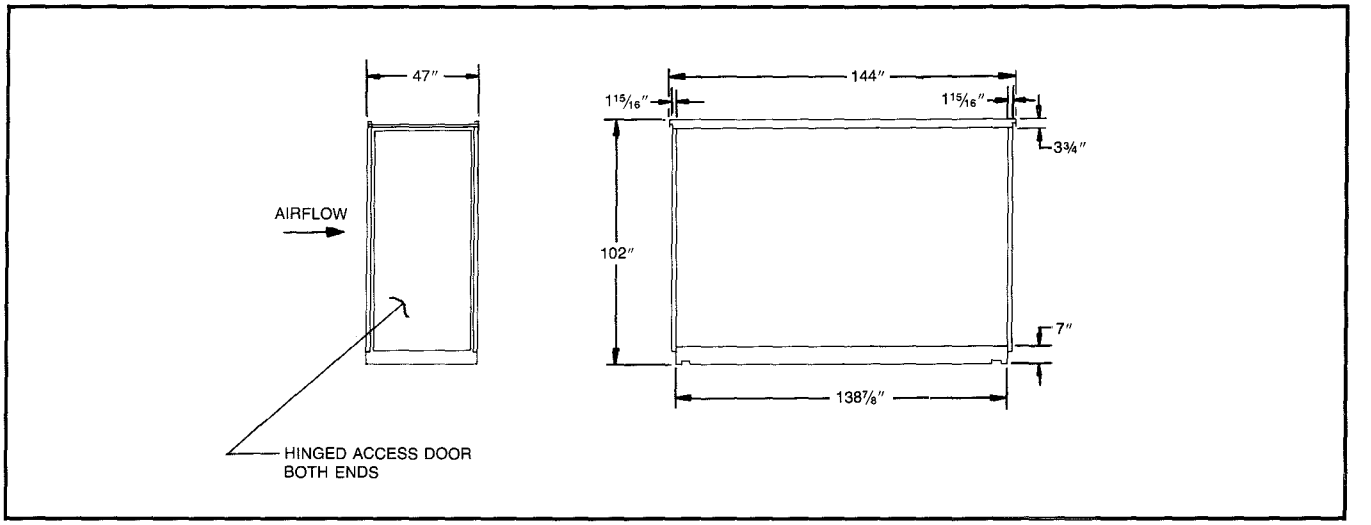
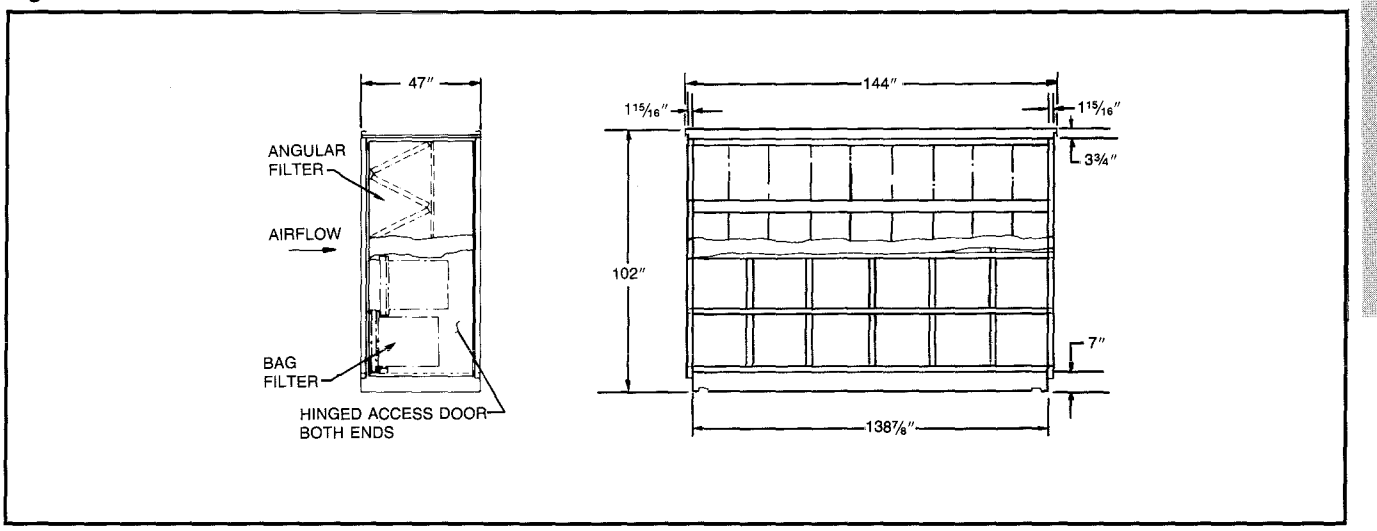


Figure 38C. MSL-190 Filter Sections

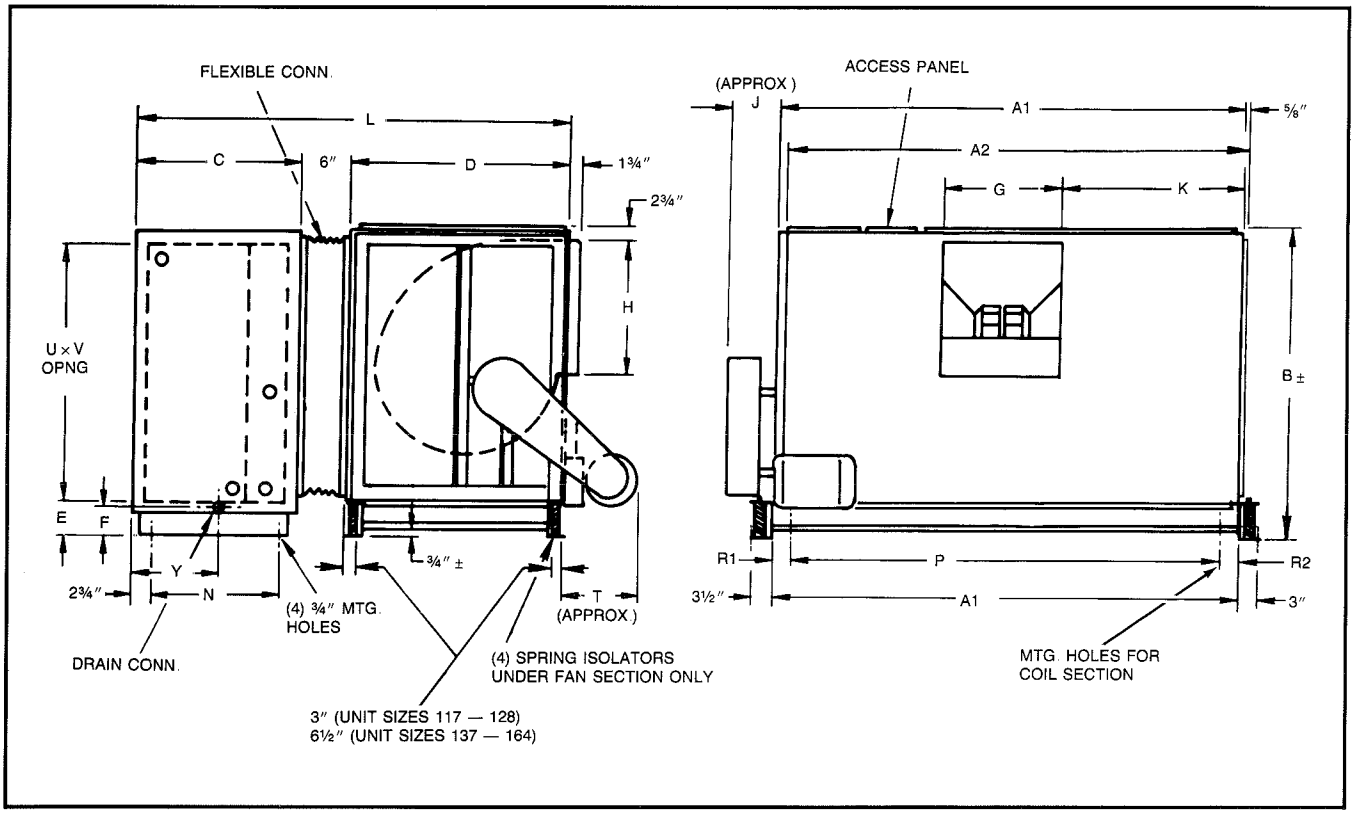


ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

Dimensional data — SEASONMASTER high pressure Central station air conditioning units

Type HSH
High Pressure Draw-through units
Unit Sizes 117C thru 164B

Figure 39.



NOTES:
1. "A1" dimension for blower section. "A2" dimension for coil section.
2. DRAIN CONNECTION DATA: Unit sizes 117 thru 128 — 1¼″ NPT at both ends. Unit sizes 137 thru 164 — 1½″ NPT at both ends.
3. ± dimensions are approximate due to deflection of spring isolators.
4. Units available with No. 1, 2, 5 and 6 fan discharge only.

Table 43A. Outlet dimensions with inlet vane control*

DIMENSION	UNIT SIZE						
	117	122	128	137	141	150	164
G	NA	33⅛	36¾	44¾	44¾	49½	54¼
H	NA	21½	23⅞	29	29	32¼	35½
K	NA	32	41¾	38¼	38¼	35¾	33½

*Units equipped with inlet vane control are not ARI certified

Table 43B.

UNIT SIZE	DIMENSIONS (INCHES)																			
	A1	A2	B	C	D	E	F	G	H	J	K	L	N	P	R1	R2	T	U	V	Y
117C	95½	94⅛	43	22½	36⅝	7¼	6¾	25¾	19⅝	8	33⅝	65⅛	17	87½	5¼	2¾	21	33¼	88⅞	11¼
122C	99½	98⅛	50	22½	43⅝	7¼	6¾	28⅜	21½	8	34⅜	72⅛	17	91½	5¼	2¾	21	40¼	92⅞	11¼
128C	122½	121⅛	50	22½	43⅝	7¼	6¾	31⅝	23⅞	9½	44¼	72⅛	17	114½	5¼	2¾	21	40¼	115⅞	11¼
137B	123½	122⅛	63⅛	56¾	56¾	8 3/16	4	38⅜	29	10¼	41⅜	119½	51¼	117⅞	4⅛	1⅝	22	52½	116¾	28⅜
141B	123½	122⅛	71⅜	56¾	65	8 3/16	4	38⅜	29	10¼	41⅜	127¾	51¼	117⅞	4⅛	1⅝	22	60¾	116¾	28⅜
150B	124	122⅛	81⅛	56¾	74¾	8 3/16	4	42½	32¼	10¼	39¼	137½	51¼	117⅞	4⅝	1⅝	24	70½	116¾	28⅜
164B	124	122⅛	99⅛	56¾	92¾	8 3/16	4	46⅝	35½	10¼	37¼	155½	51¼	117⅞	4⅝	1⅝	24	88½	116¾	28⅜

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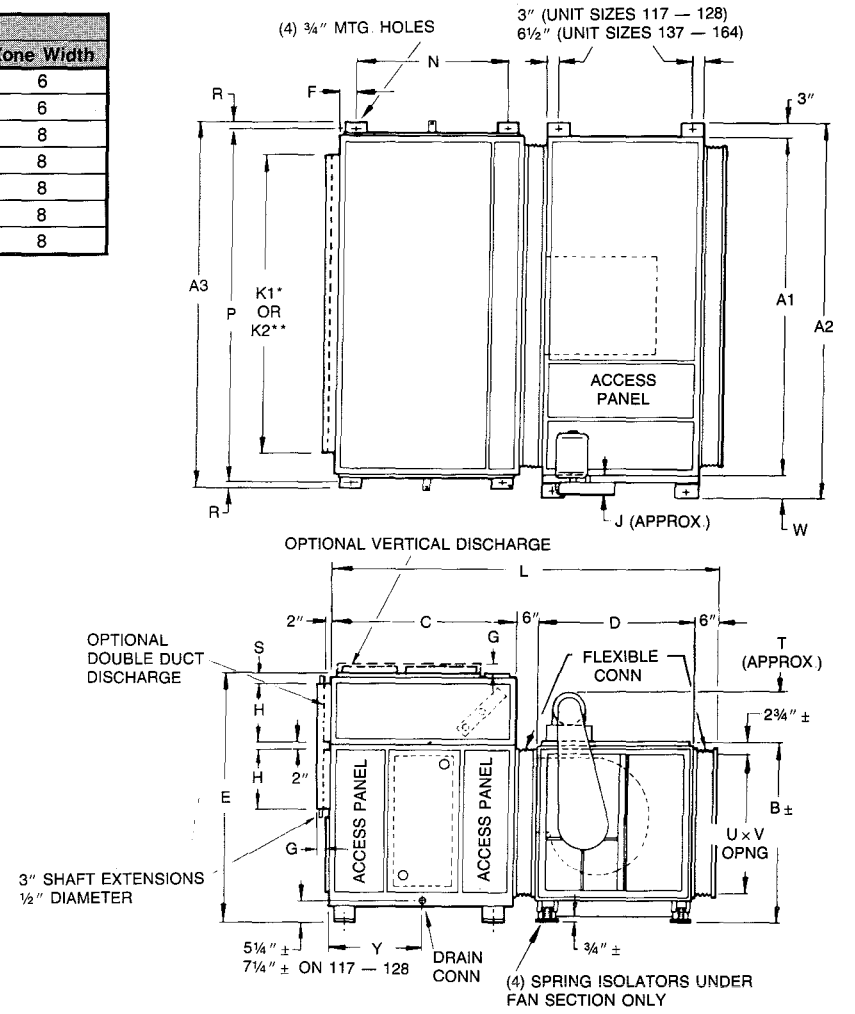
Type HMH
High Pressure Blow-thru Units
Unit Sizes 117C thru 164B

Figure 40.

ZONE DAMPERS		
Size	Max. Zones	Zone Width
117	14	6
122	14	6
128	14	8
137	14	8
141	14	8
150	14	8
164	14	8



NOTES:
1. DRAIN CONNECTION DATA: Unit sizes 117 thru 128: 1¼" NPT at both ends. Unit sizes 137 thru 164: 1½" NPT at both ends.
2. ± Dimensions are approximate due to deflection of spring isolators.
3. *K1 is for double duct collars.
4. **K2 is for zone dampers.

Table 44.

UNIT	DIMENSIONS (INCHES)																						
SIZE	A1	A2	A3	B	C	D	E	F	G	H	J	K1*	K2**	L	N	P	R	S	T	U	V	W	Y
117C	93	102	97	43	43	36⅝	61¾	4¼	5⅝	14½	8	88⅞	84	91⅝	34½	94¾	1⅛	1¾	21	32½	88⅞	6	22
122C	97	106	101	50	49	43⅝	70	4¼	5⅝	17½	8	92⅞	84	104⅝	40½	98¾	1⅛	1¾	21	39½	92⅞	6	25
128C	120	129	124	50	49	43⅝	70	4¼	7⅝	17½	9½	115⅞	112	104⅝	40½	121¾	1⅛	1¾	21	39½	115⅞	6	25
137B	121	129⅞	121	63⅛	58	56¾	87⅜	2¾	7⅝	22½	10¼	116¾	112	126¾	52½	117⅞	1⅝	2⅝	22	52	116¼	6⅛	29½
141B	121	129⅞	121	71⅜	58	65	97⅛	2¾	7⅝	22½	10¼	116¾	112	135	52½	117⅞	1⅝	4⅛	22	60¼	116¼	6⅛	29½
150B	121	130⅜	121	81⅛	68	74¾	109¾	2¾	7⅝	27	10¼	116¾	112	154¾	62½	117⅞	1⅝	2⅝	24	70	116¼	6⅝	34½
164B	121	130⅜	121	99⅛	78	92¾	132⅞	2¾	7⅝	32	10¼	116¾	112	182¾	72½	117⅞	1⅝	2⅝	24	88	116¼	6⅝	39½

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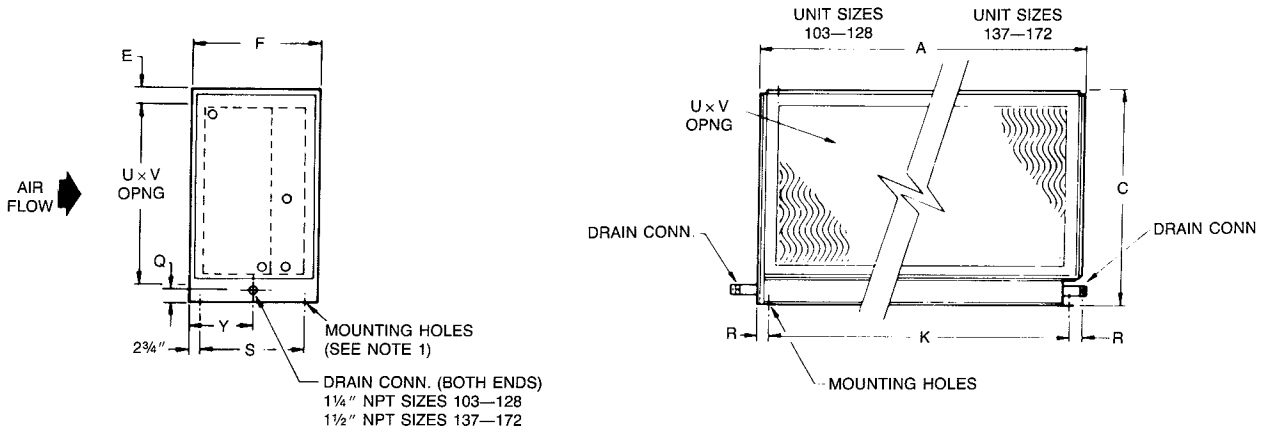
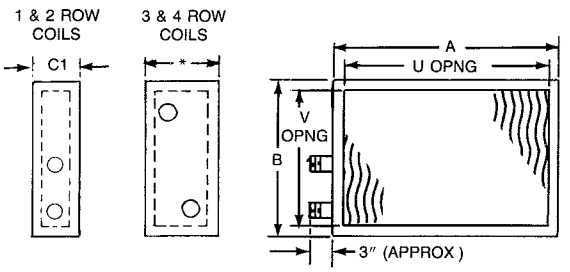
Dimensional data — Coil sections

Figure 41A. LSC Insulated Coil Sections



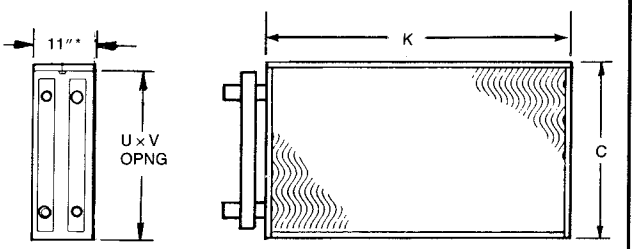
NOTES: 1. Unit sizes 103 thru 128 have two (2) 5/8″ diameter mounting holes on entering air side.
2. Unit sizes 137 thru 172 have four (4) 3/4″ diameter mounting holes.

Figure 41B. Heating Coil Section



*For 3- and 4-row heating coil section, add 3½″ to C1 dimension.

Figure 41C. LAC Cased Condenser Coil Sections



*Through 6-row coil. Dimension is 12½″ for 8 rows, 15″ for 10 rows, 18″ for 12 rows.

Table 45.

UNIT SIZE	LSC COIL SECTIONS											HEATING COIL SECTIONS					LAC CASED CONDENSER COIL SECTIONS			
	A	C	E	F	K	Q	R	S	U	V	Y	A	B	C_1	U	V	C	K	U	V
103C	35 1/8	22 3/4	2 1/4	22 1/2	28 1/2	1 3/4	3 5/16	—	18 1/4	29 7/8	11 1/4	34	21 5/8	6 1/2	29 7/8	17 1/2	22 3/16	33 1/4	18	30
104C	41 1/8	25 3/4	2 1/4	22 1/2	34 1/2	1 3/4	3 5/16	—	21 1/4	35 7/8	11 1/4	40	24 5/8	6 1/2	35 7/8	20 1/2	25 3/16	39 1/4	21	36
106C	51 1/8	29	2 1/4	22 1/2	44 1/2	1 3/4	3 5/16	—	24 1/2	45 7/8	11 1/4	50	27 7/8	6 1/2	45 7/8	23 3/4	28 1/2	49 1/4	24	46
206C	—	—	—	—	—	—	—	—	—	—	—	69	21 5/8	6 1/2	64 7/8	17 1/2	22 3/16	68 1/4	18	65
108C	49 1/8	37 3/4	2 1/4	22 1/2	42 1/2	1 3/4	3 5/16	—	33 1/4	43 7/8	11 1/4	48	36 5/8	6 1/2	43 7/8	32 1/2	37 3/16	47 1/4	33	44
209C	—	—	—	—	—	—	—	—	—	—	—	83	24 5/8	6 1/2	78 7/8	20 1/2	25 3/16	82 1/4	21	79
111C	64 1/8	37 3/4	2 1/4	22 1/2	57 1/2	1 3/4	3 5/16	—	33 1/4	58 7/8	11 1/4	63	36 5/8	6 1/2	58 7/8	32 1/2	37 3/16	62 1/4	33	59
114D	79 1/8	37 3/4	2 1/4	22 1/2	72 1/2	1 3/4	3 5/16	—	33 1/4	73 7/8	11 1/4	78	36 5/8	6 1/2	73 7/8	32 1/2	37 3/16	77 1/4	33	74
117D	94 1/8	37 3/4	2 1/4	22 1/2	87 1/2	1 3/4	3 5/16	—	33 1/4	88 7/8	11 1/4	93	36 5/8	6 1/2	88 7/8	32 1/2	37 3/16	92 1/4	33	89
122D	98 1/8	44 3/4	2 1/4	22 1/2	91 1/2	1 3/4	3 5/16	—	40 1/4	92 7/8	11 1/4	97	43 5/8	7	92 7/8	39 1/2	44 3/16	96 1/4	39	93
128D	121 1/8	44 3/4	2 1/4	22 1/2	114 1/2	1 3/4	3 5/16	—	40 1/4	115 7/8	11 1/4	120	43 5/8	7	115 7/8	39 1/2	44 3/16	119 1/4	39	116
137D	122 1/8	61 3/8	2 5/8	25 1/2	117 7/8	2	2 1/8	20	52 1/2	116 3/4	12 3/4	119 3/8	55 1/8	7	115 1/2	51 1/4	56 1/2	119 3/8	51	115 1/2
141D	122 1/8	69 5/8	2 5/8	25 1/2	117 7/8	2	2 1/8	20	60 3/4	116 3/4	12 3/4	119 3/8	63 3/8	7	115 1/2	59 1/2	64 3/4	119 3/8	60	115 1/2
150D	122 1/8	79 3/8	2 5/8	25 1/2	117 7/8	2	2 1/8	20	70 1/2	116 3/4	12 3/4	119 3/8	73 1/8	7	115 1/2	69 1/4	74 1/2	119 3/8	69	115 1/2
164D	122 1/8	97 3/8	2 5/8	25 1/2	117 7/8	2	2 1/8	20	88 1/2	116 3/4	12 3/4	119 3/8	91 1/8	7	115 1/2	87 1/4	92 1/2	119 3/8	87	115 1/2
172D	126 1/8	105 3/8	2 5/8	25 1/2	117 7/8	2	2 1/8	20	96 1/2	116 3/4	12 3/4	119 3/8	91 1/8*	7	115 1/2	87 1/4	—	—	—	—

*For flat filter section, dimension is 99 1/8″.

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Dimensional data — Accessories

Figure 42. Filter Sections

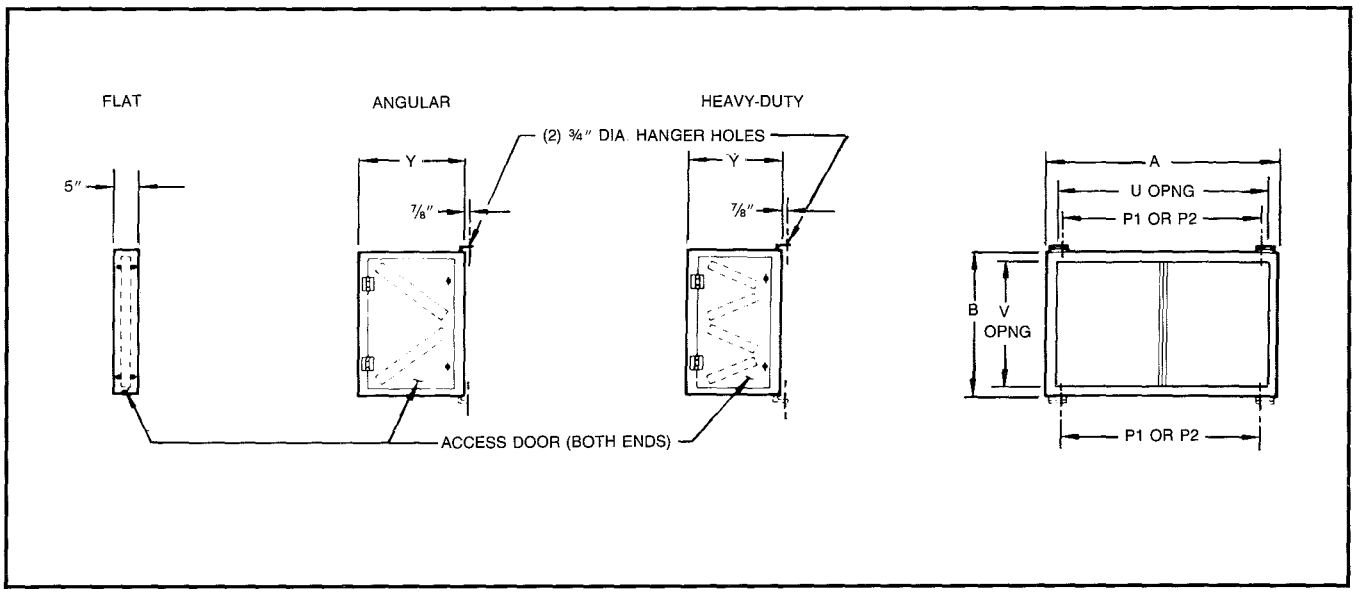

Figure 43A. Accessory Adapter Section, Size 134

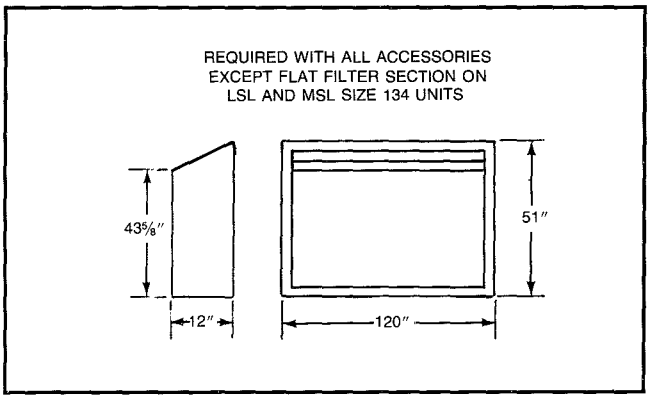

Figure 43B. Accessory Adapter Section, Size 172

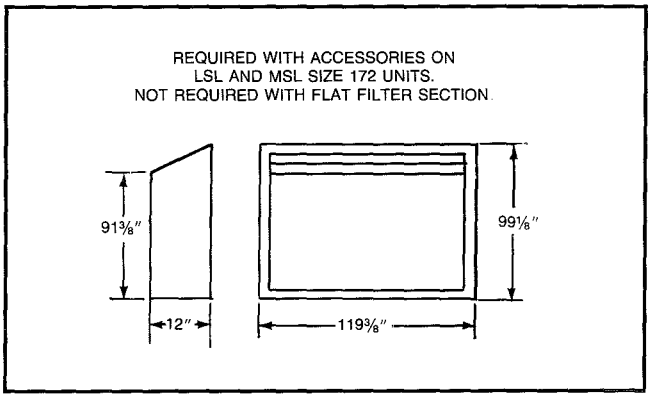

Table 46.

UNIT SIZE	A	B	P_1	P_2	FILTER SECTIONS										
					FLAT			ANGULAR				HEAVY-DUTY			
					T	U	V	T	U	V	Y	T	U	V	Y
103C	34	21⅝	28½	35¾	16½	30⅝	17⅝	25½	30⅝	18¼	19½	—	—	—	—
104C	40	24⅝	34½	41¾	20½	36⅝	20	20½	36⅝	21¼	19	—	—	—	—
106C	50	27⅞	44½	51¾	16½	46⅝	23⅛	22¼	46⅝	24½	22¼	—	—	—	—
206C	69	21⅝	63½	—	20¼	65⅝	17⅝	16½	65⅝	18¼	19½	—	—	—	—
108C	48	36⅝	42½	49¾	25½	44⅝	32½	26	44⅝	33¼	26	—	—	—	—
209C	83	24⅝	77½	—	20½	79⅝	20	20½	79⅝	21¼	19	20½	79⅝	21¼	23¼
111C	63	36⅝	57½	64¾	20½	59⅝	32½	26	59⅝	33¼	26	23	59⅝	33¼	23⅛
114D	78	36⅝	72½	79¾	25½	74⅝	32½	26	74⅝	33¼	26	25½	74⅝	33¼	23⅛
117D	93	36⅝	87½	94¾	25½	89⅝	32½	26	89⅝	33¼	26	23	89⅝	33¼	23⅛
122D	97	43⅝	91½	98¾	16½	93⅝	40⅛	23	93⅝	40¼	23	23	93⅝	40¼	23⅜
128D	120	43⅝	114½	121¾	20½	116⅝	40⅛	23	116⅝	40¼	23	23	116⅝	40¼	23⅜
134D	120	43⅝**	114½	121¾	20½	116⅝	45⅛	23	116⅝	40¼	23	23	116⅝	40¼	23⅜
137D	119⅜	55⅛	117⅞	117⅞	20½	116⅝	50⅛	25½	116	51¾	22¼	28	116	51¾	27⅞
141D	119⅜	63⅜	117⅞	117⅞	20½	116⅝	60⅛	21⅛	116	60	21⅛	23½	116	60	23½
150D	119⅜	73⅛	117⅞	117⅞	20½	116⅝	70⅛	25½	116	69¾	25½	28	116	69¾	28¼
164D	119⅜	91⅛	117⅞	—	20½	116⅝	85¼	27⅛	116	87¾	27⅛	27⅛	116	87¾	27⅛
172D	119⅜	91⅛*	—	—	20½	116⅝	93¼	27⅛	116	87¾	27⅛	27⅛	116	87¾	27⅛

*For flat filter section, dimension is 99⅛"
**For flat filter section, dimension is 51"
P_1 is used with horizontal units; P_2 is used with vertical units
"T" = Clearance required for filter removal

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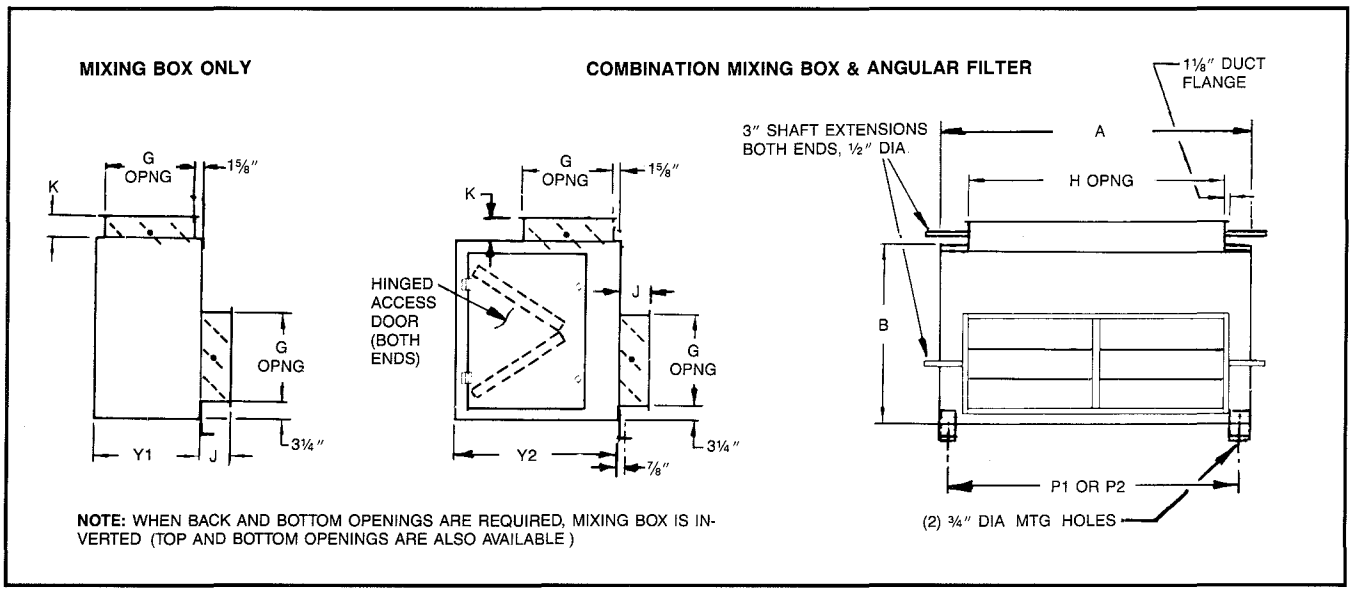
Figure 44A. Combination Angular Filter and Mixing Box



NOTE: WHEN BACK AND BOTTOM OPENINGS ARE REQUIRED, MIXING BOX IS INVERTED (TOP AND BOTTOM OPENINGS ARE ALSO AVAILABLE)

Figure 44B. Base Sections

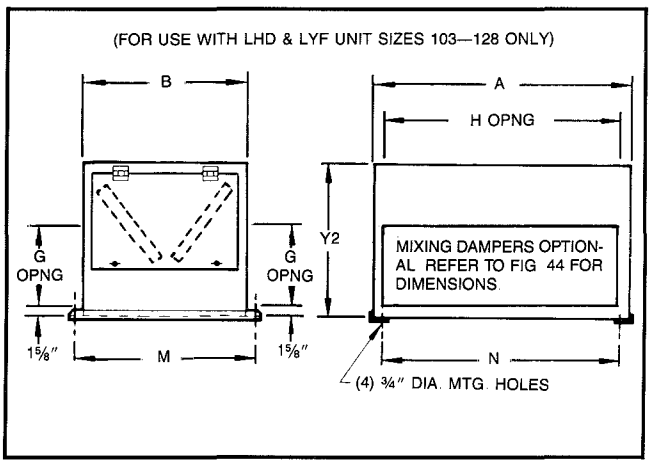


Figure 44C. Low Leak Mixing Dampers

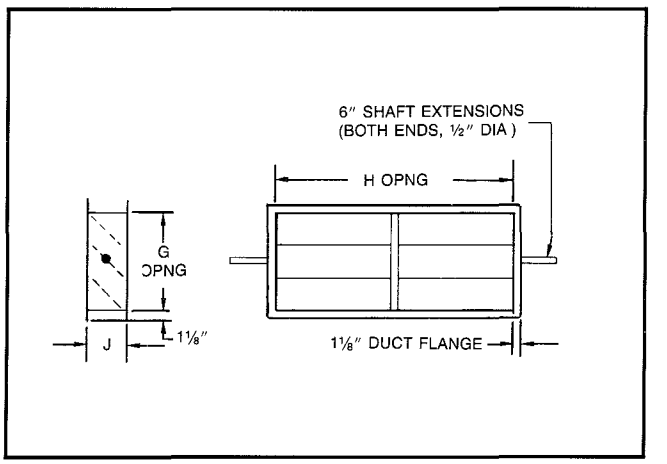


Table 47.

UNIT SIZE	DIMENSIONS (INCHES)												
	A	B	G	H	J	K	M	N	P_1	P_2	T*	Y_1	Y_2
103C	34	21⅝	12⅜	25⅜	6¾	5⅛	23⅝	31⅜	28½	35¾	25½	15¾	22½
104C	40	24⅝	12⅜	31⅜	6¾	5⅛	26⅝	37⅜	34½	41¾	20½	15¾	23
106C	50	27⅞	12⅜	41⅜	6¾	5⅛	29⅞	47⅜	44½	51¾	22¼	15¾	27¼
206C	69	21⅝	12⅜	60⅜	6¾	5⅛	23⅝	66⅜	63½	—	16½	15¾	22½
108C	48	36⅝	18⅜	39⅜	6¾	5⅛	38⅝	45⅜	42½	49¾	26	21¾	33½
209C	83	24⅝	12⅜	74⅜	6¾	5⅛	26⅝	80⅜	77½	—	20½	15¾	23
111C	63	36⅝	18⅜	54⅜	6¾	5⅛	38⅝	60⅜	57½	64¾	26	21¾	33½
114D	78	36⅝	18⅜	69⅜	6¾	5⅛	38⅝	75⅜	72½	79¾	26	21¾	33½
117D	93	36⅝	18⅜	84⅜	6¾	5⅛	38⅝	90⅜	87½	94¾	26	21¾	33½
122D	97	43⅝	24⅛	88⅜	8½	6⅞	45⅝	94⅜	91½	98¾	23	27½	32½
128D	120	43⅝	24⅛	111⅜	8½	6⅞	45⅝	117⅜	114½	121¾	23	27½	32½
134D	120	43⅝	24⅛	111⅜	8½	6⅞	—	—	114½	121¾	23	27½	32½
137D	119⅜	55⅛	31⅞	112⅜	8½	6⅞	—	—	117⅞	117⅞	25½	35¼	39⅝
141D	119⅜	63⅜	39⅝	112⅜	8½	6⅞	—	—	117⅞	117⅞	21⅛	43	47½
150D	119⅜	73⅛	39⅝	112⅜	8½	6⅞	—	—	117⅞	117⅞	25½	43	47½
164D	119⅜	91⅛	47⅝	112⅜	8½	6⅞	—	—	117⅞	117⅞	27⅛	51	55½
172D	119⅜	91⅛	47⅝	112⅜	8½	6⅞	—	—	117⅞	117⅞	21⅛	51	55½

*Clearance required for filter removal
P_1 is used with horizontal units P_2 is used with vertical units.

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Figure 45A. Face & Bypass Damper Section

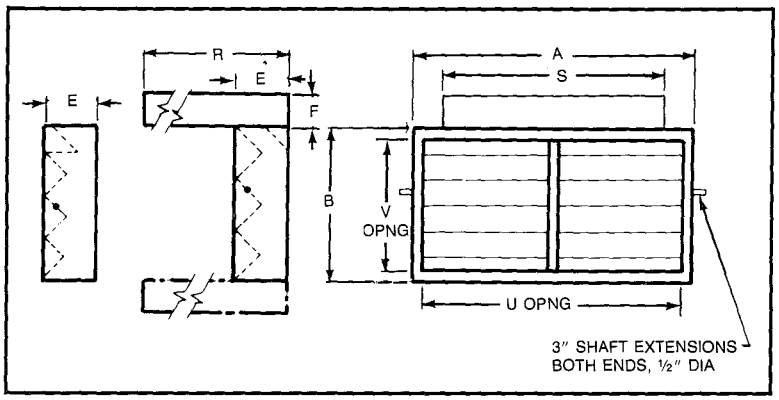


Figure 45B. Access/Spacer Section

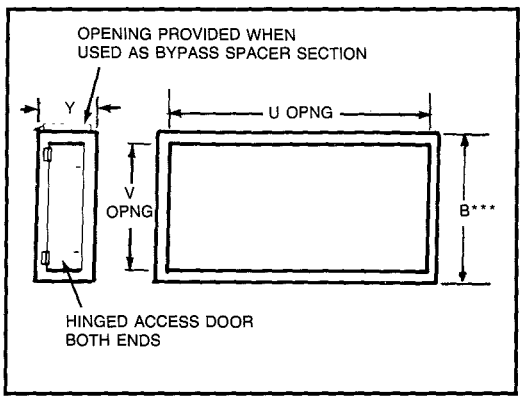


Table 48.

UNIT SIZE	A	B	INTERNAL BYPASS			EXTERNAL BYPASS								ACCESS SPACER		
			E	U	V	E	F	R1*	R2**	R3†	S	U	V	U	V	Y
103C	34	21 5/8	6 3/4	29 7/8	18 1/4	7 7/8	6	21	36 7/8	—	33 5/8	29 7/8	17 3/8	29 7/8	17 1/2	18
104C	40	24 5/8	8	35 7/8	21 1/4	8 1/8	6 5/8	21 7/8	37 3/4	—	39 5/8	35 7/8	20 3/8	35 7/8	20 1/2	18
106C	50	27 7/8	9	45 7/8	24 1/2	9 1/8	7 1/8	23 1/2	39 3/8	—	49 5/8	45 7/8	23	45 7/8	23 3/4	18
206C	69	21 5/8	6 3/4	64 7/8	18 1/4	7 7/8	6	21	—	—	68 5/8	64 7/8	17 3/8	64 7/8	17 1/2	18
108C	48	36 5/8	9	43 7/8	33 1/4	11	9 5/8	27 3/4	43 5/8	—	47 5/8	43 7/8	30 7/8	43 7/8	32 1/2	18
209C	83	24 5/8	8	78 7/8	21 1/4	8 1/8	6 5/8	21 7/8	—	—	82 5/8	78 7/8	20 3/8	78 7/8	20 1/2	18
111C	63	36 5/8	9	58 7/8	33 1/4	11	9 5/8	27 3/4	43 5/8	—	62 5/8	58 7/8	30 7/8	58 7/8	32 1/2	18
117C	93	36 5/8	9	88 7/8	33 1/4	11	16 7/8	—	—	9 5/8	92 5/8	88 7/8	30 7/8	88 7/8	32 1/2	18
122C	97	43 5/8	8 1/4	92 7/8	40 1/4	13 3/8	14 5/8	—	—	11 1/4	96 5/8	92 7/8	37 3/4	92 7/8	39 1/2	18
128C	120	43 5/8	8 1/4	115 7/8	40 1/4	13 3/8	18 5/8	—	—	11 1/4	119 5/8	115 7/8	37 3/4	115 7/8	39 1/2	18
137D	119 3/8	55 1/8	10	116 3/4	52 1/2	18	15 1/8	40	58 1/2	71 3/4	110 3/8	116 3/4	50 1/8	116 3/4	52 1/2	18
141D	119 3/8	63 3/8	9 5/8	116 3/4	60 3/4	19 3/8	16 3/4	43	61 3/8	73 1/8	110 3/8	116 3/4	57	116 3/4	60 3/4	19 5/8
150D	119 3/8	73 1/8	10	116 3/4	70 1/2	21 1/2	20	48 3/8	66 3/4	75 1/4	110 3/8	116 3/4	67 5/8	116 3/4	70 1/2	22 7/8
164D	119 3/8	91 1/8	10	116 3/4	88 1/2	27 5/8	24 3/8	59	77 3/8	81 3/8	110 3/8	116 3/4	86 3/4	116 3/4	88 1/2	27 3/8
172D	119 3/8	99 1/8	—	—	—	27 5/8	24 3/8	—	77 3/8	—	110 1/4	116 3/4	94 3/4	116 3/4	96 1/2	27 3/8

High Pressure Only (see Table 49 for Low and Medium Pressure Units)

*SEASONVENT **SEASONMASTER †High Pressure SEASONMASTER
***Add 1 5/8" to "B" dimension for height of access sections, unit sizes 137 thru 172.

Figure 45C. Face & Bypass Damper Section (For Low & Medium Pressure, 114D thru 134D Only)

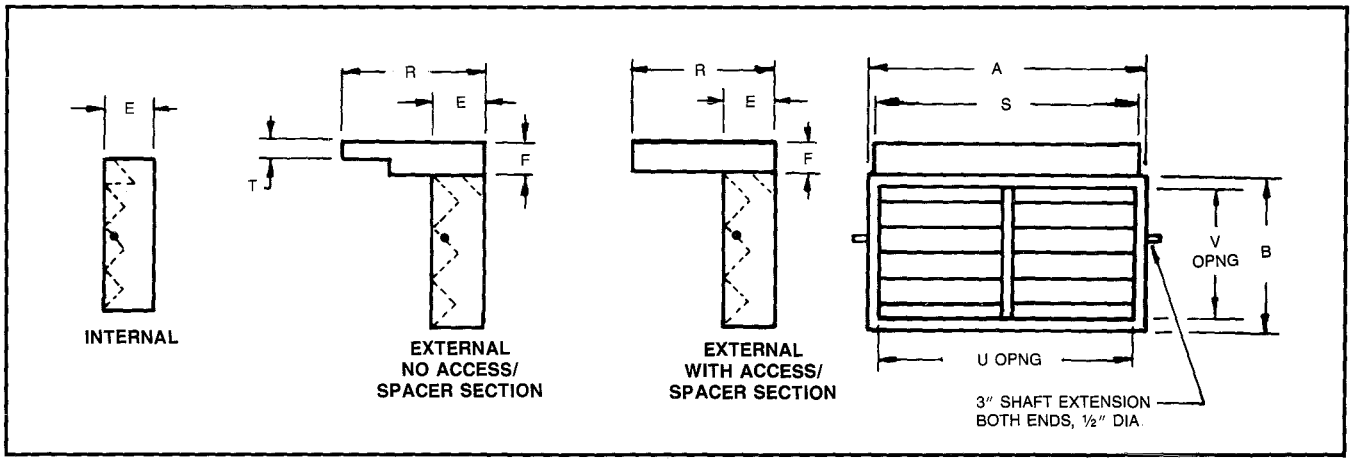


Table 49.

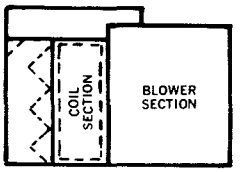
UNIT SIZE	A	B	INTERNAL BYPASS			EXTERNAL BYPASS								ACCESS/SPACER		
			E	U	V	E	F	R1*	R2**	S	T	U	V	U	V	Y
114D	78	36 5/8	9	73 7/8	33 1/4	11	17	27 3/4	43 5/8	77 5/8	9 5/8	73 7/8	30 7/8	73 7/8	32 1/2	18
117D	93	36 5/8	9	88 7/8	33 1/4	11	17	27 3/4	43 5/8	92 5/8	9 5/8	88 7/8	30 7/8	88 7/8	32 1/2	18
122D	97	43 5/8	8 1/4	92 7/8	40 1/4	13 3/8	14 5/8	32 1/4	47 5/8	96 5/8	11 1/4	92 7/8	37 3/4	92 7/8	39 1/2	18
128D	120	43 5/8	8 1/4	115 7/8	40 1/4	13 3/8	18 5/8	32 1/4	47 5/8	119 5/8	11 1/4	115 7/8	37 3/4	115 7/8	39 1/2	18
134D	120	51	—	—	—	13 3/8	11 1/4	—	47 5/8	119 5/8	—	115 7/8	45 1/8	115 7/8	46 7/8	18

* SEASONVENT **SEASONMASTER

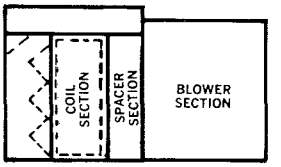
ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS ARE AVAILABLE UPON REQUEST.

Bypass Section Application Data

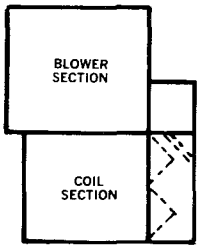
1. For fan discharge arrangements, see page 21.
2. Internal bypass available on units with small face area coils only.
3. Application limitations for unit sizes 103 through 128 are as shown below.



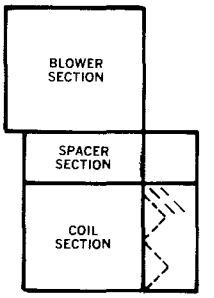
Arrangement available with all fan discharges except 5 and 6. The mounting holes on the blower section cannot be used to support the unit.



Arrangement available with all fan discharges.



Arrangement available with 5 and 6 fan discharges, 1 fan discharge with left-hand air intake, and 2 fan discharge with right-hand air intake.



Arrangement available with fan discharge arrangements 1, 2, 5 and 6.

Optional Access Doors

Figure 46A. Fan Section

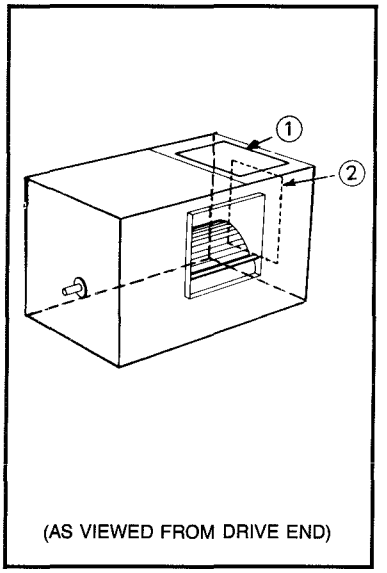


Figure 46B. Coil Sections

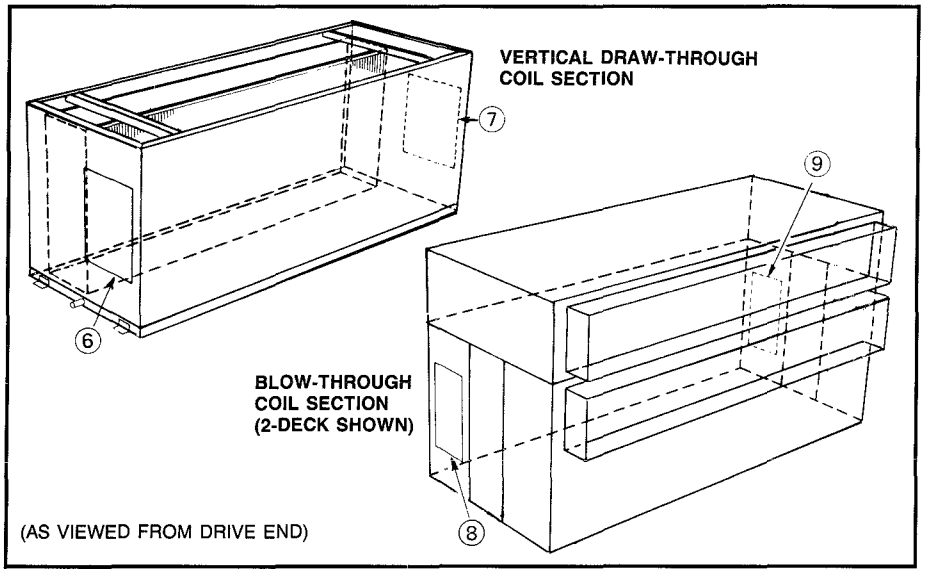


Figure 46C. Access Door Size

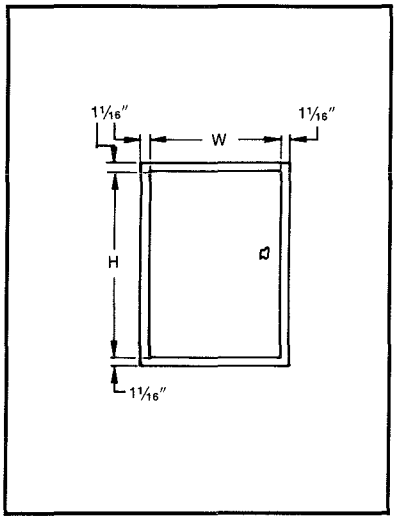


Table 50A.

DOOR SIZE	W	H
A	8	9
B	12	24
C	18	24
D	Hinged Access Panel	

NOTES:
Y= Door access panel not available at this location.

*High pressure units have "A" size doors at ② ⑧ and ⑨ locations only.

**When door is required in this position, standard 36″ × 48″ door will be supplied.

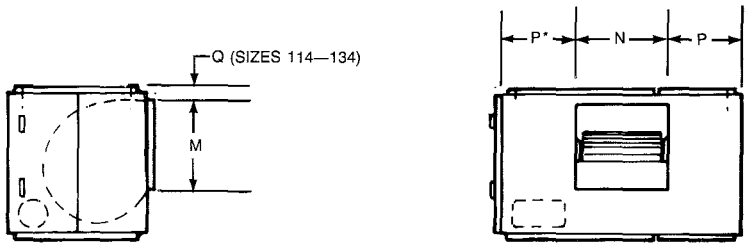
ALL DIMENSIONS ARE APPROXIMATE
CERTIFIED DRAWINGS AVAILABLE
UPON REQUEST

Table 50B.

UNIT SIZE	DOOR SIZE BY LOCATION					
	①	②*	⑥	⑦	⑧*	⑨*
103	A	A	Y	Y	Y	Y
104	A	A	Y	Y	Y	Y
106	A	B	Y	Y	D	D
206	A	A	Y	Y	Y	Y
108	A	C	B	B	D	D
209	A	A	Y	Y	Y	Y
111	B	C	B	B	D	D
114	B	C	B	B	D	D
117	C	C	B	B	D	D
122	C	C	C	C	D	D
128	C	C	C	C	D	D
134	C	C	C	C	D	D
137	C	**	C	C	B	B
141	C	**	C	C	B	B
150	C	**	C	C	B	B
164	C	**	C	C	C	C
172	C	**	C	C	C	C

Fan Outlet Dimensional Data (Sizes 114D thru 172D)

Figure 47.



NOTE: *Dimension is 40¼" for unit sizes 137 through 172 (drive side of unit).

Table 51A. Fan Outlet Dimensions (Unit Sizes 114D thru 128D)

UNIT SIZE	FAN SIZE	BLOWER DISCHARGE PANEL DIMENSIONS									
		FIXED MOUNT					SPRING MOUNT				
		M	N		P		M	N		P	
			FC	AF	FC	AF		FC	AF	FC	AF
114	STD.	23⅜	25⅞	29½	33 9/16	31¾	26⅝	29¼	32¾	31⅞	30⅛
	OPT.	26½	28 3/16	32¼	32⅜	30⅜	29⅞	31 9/16	35 5/16	30¾	28¾
117	STD.	23⅜	25⅞	29½	33 9/16	31¾	26⅝	29¼	32¾	31⅞	30⅛
	OPT.	26½	28 3/16	32¼	32⅜	30⅜	29⅞	31 9/16	35 5/16	30¾	28¾
122	STD.	26½	28 3/16	32¼	34 7/16	32⅜	29⅞	31 9/16	35 5/16	32¾	30¾
	OPT.	28¾	31½	35 11/16	32¾	30 11/16	32	34½	38¾	31¼	29⅛
128/134	STD.	28¾	31½	35 11/16	44⅛	42 3/16	32	34½	38¾	42¾	40⅝
	OPT.	31¾	34¾	39⅝	42⅝	40 3/16	35	37⅞	42 11/16	41 1/16	38⅝

Table 51B. Discharge Opening — "Q" Dimension (Unit Sizes 114D thru 128D)

UNIT SIZE	FAN SIZE	DISCHARGE OPENING "Q" DIMENSION				
		Top Horiz. / Upblast Front / Upblast Rear		Bottom Horizontal		Downblast
		FIXED MOUNT	SPRING MOUNT	FIXED MOUNT	SPRING MOUNT	FIXED MOUNT
114	STD.	4¼	2 11/16	8	6⅜	9 7/16
	OPT.	4¼	2 11/16	7¾	6⅛	7⅝
117	STD.	4¼	2 11/16	8	6⅜	9 7/16
	OPT.	4¼	2 11/16	7¾	6⅛	7⅝
122	STD.	4¼	2 11/16	7¾	6⅛	8 15/16
	OPT.	4¼	2 11/16	5 13/16	4¼	6 7/16
128/134	STD.	5	2 11/16	5	4¼	9⅛
	OPT.	2 11/16	2 11/16	2 11/16	4¼	6¾

Table 51C. Fan Outlet Dimensions (Unit Sizes 137D thru 172D)

UNIT SIZE	FAN TYPE	STANDARD FAN SIZE			OPTIONAL FAN SIZE		
		M	N	P	M	N	P
137	FC & AF	38¾	41½	40¼	42	45½	36¼
141	FC & AF	42	45½	36¼	46½	49½	32¼
150	FC & AF	46½	49½	32¼	50½	54¾	27
164	FC & AF	50½	54¾	27	55½	60	21¾
172	FC & AF	50½	54¾	27	55½	60	21¾

ALL DIMENSIONS ARE APPROXIMATE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

Engineering guide specifications
Blow-through units

1. **GENERAL** — Furnish and install where shown on the plans, McQuay central station air handlers. Sizes, types and performance shall be as indicated in the unit schedule. Each unit shall be complete with factory furnished components as shown on the plans. Unit performance shall be substantiated by computer generated output.

   Cabinets shall be of sectionalized construction and all sheetmetal parts, including accessories, shall be fabricated of continuous galvanized steel. Access shall be provided to the interior of the unit.

2. **BLOWER SECTION**

   Low and Medium Pressure — Fans shall be (forward curved) (airfoil) DWDI type with galvanized steel scroll housing. Unit sizes 114 through 172 shall have optional factory installed 2″ deflection, internally mounted, spring vibration isolation under the fan and motor base.

   High Pressure — Fans shall be airfoil DWDI type with galvanized steel scroll housing. The fan section shall be an independent section joined to companion sections with factory furnished 30 oz. neoprene coated, glass fiber flexible connector.

   All fans shall be dynamically balanced before and after being installed in the fan cabinet section. Fan cabinet shall be (internally insulated with 1-inch thick neoprene coated glass fiber) (uninsulated). Fan shaft shall be solid steel with all fan wheels over 12″ in diameter keyed to the shaft. Maximum fan rpm shall be well below the first critical speed. Bearings shall be self-aligning, grease lubricated ball type. All bearings shall be equipped with lubrication fittings. Motors shall be _____ V, _____ Hz, _____ P, _____ base, _____ bearings, _____ type with minimum horsepower as tabulated in the unit schedule. Motors shall be located as shown on the plans.

3. **(ZONE DAMPERS) (DOUBLE DUCT COLLAR)**

   Low and Medium Pressure — Shall be provided by the unit manufacturer. Zone dampers shall be low leak type with bronze end seals and side seals on the hot and cold decks. Hot, cold (and bypass) damper blades shall be positively locked in position to a common shaft with a rotation angle of 90 degrees, requiring only one actuator per zone. Damper rods shall rotate in bronze bushings.

   High Pressure — Shall be provided by the unit manufacturer.Dampers shall be provided with neoprene gasketed metal stops around the entire perimeter of each blade. Zone damper blades shall be positively locked to the shafts. Damper rods shall rotate in nylon bushings.

4. **COOLING COIL SECTION** — Shall be fabricated of continuous galvanized steel. All cooling coil section panels shall be internally insulated with 1-inch thick neoprene coated glass fiber insulation [covered by (solid)(perforated) liners]. Coil section shall include a condensate drain pan. All coils shall be arranged within the coil section for horizontal airflow. Where multiple cooling coils are used in a single unit, intermediate drain pans shall be provided. Coil headers and refrigerant distributors shall be completely enclosed within the insulated casing with only connections extended through the cabinet. Cooling coil sections shall be designed with air diffuser plates to assure proper air distribution across the face of the coil. Balance plates shall be furnished when required. The hot and cold deck partitions shall be insulated.

5. **DRAIN PAN**

   Low and Medium Pressure — The drain pan shall have drain connections at both ends and shall be of double pan construction with the inner pan covered with a heavy coat of mastic and thermally isolated from the exterior casing with 1-inch insulation.

   High Pressure — The drain pan shall be internally insulated with ½-inch, closed cell polyurethane, overcoated with mastic.

6. **COILS** — All coils shall be per the schedule. Coil performance data shall be certified in accordance with Air Conditioning and Refrigeration Institute (ARI) Standard 410 where applicable. Coil performance shall be substantiated by computer generated output data.

7. **CHILLED WATER COILS** — Cooling coils shall be designed for use with chilled water and shall be circuited drainable with a vent connection at the highest point and a drain connection at the lowest point. Coil headers shall be copper with steel male pipe connections.

8. **REFRIGERANT COILS** — Cooling coils shall be designed for use with Refrigerant _____. Sweat type copper suction connections shall be located at the bottom of the suction headers for gravity oil drainage. [Coils shall be circuited for (interlaced) (face control) (row control) capacity reduction.]

9. **STEAM COILS** — Steam coils shall be furnished as indicated on the unit schedule. Coil shall be pitched in the unit to assure positive condensate drainage. Orifice baffle plate shall be provided in the supply header to ensure proper diffusion of entering steam.

10. **WATER HEATING COILS** — Water heating coils shall be furnished as indicated on the unit schedule.

11. **FILTER SECTION** — Furnish factory built (flat) (angular) (heavy-duty) filter section complete with filters as specified herein. The filter area shall be specified on the unit schedule. Angular and heavy-duty filter sections shall have hinged access doors on both ends.

12. **FILTERS** — Filters shall be (throwaway) (permanent) (high velocity) (pleated) type _____.

13. **(COMBINATION ANGULAR FILTER/MIXING BOX) (MIXING BOX ONLY)** — Mixing box and dampers shall be furnished where shown on plans. Dampers shall be arranged so that the fresh air and the return airstreams merge when entering the mixing box. Blades shall be parallel acting and interconnected. Damper rods shall rotate in nylon bushings.

    Both sets of dampers shall be low leak, airfoil type with a leakage rate of less than two-tenths of one percent leakage at two inches total static pressure differential. Leakage rates must be tested in accordance with test procedures outlined in the Air Movement and Controls Association (AMCA) Standard 500-83.

Engineering guide specifications
Draw-through units

1. **GENERAL** — Furnish and install where shown on the plans, McQuay central station air handlers. Sizes, types and performance shall be as indicated in the unit schedule. Each unit shall be complete with factory furnished components as shown on the plans. Unit performance shall be substantiated by computer generated output.
   Cabinets shall be of sectionalized construction and all sheetmetal parts, including accessories, shall be fabricated of continuous galvanized steel. Access shall be provided to the interior of the unit.

2. **BLOWER SECTION**
   Low and Medium Pressure — Fans shall be (forward curved) (airfoil) DWDI type with galvanized steel scroll housing. Unit sizes 114 through 172 shall have optional factory installed 2″ deflection, internally mounted, spring vibration isolation under the fan and motor base.
   High Pressure — Fans shall be airfoil DWDI type with galvanized steel scroll housing. The fan section shall be an independent section joined to companion sections with factory furnished 30 oz. neoprene coated, glass fiber flexible connector.

   All fans shall be dynamically balanced before and after being installed in the fan cabinet section. Fan cabinet shall be (internally insulated with 1-inch thick neoprene coated glass fiber) (uninsulated). Fan shaft shall be solid steel with all fan wheels over 12″ in diameter keyed to the shaft. Maximum fan rpm shall be well below the first critical speed. Bearings shall be self-aligning, grease lubricated ball type. All bearings shall be equipped with lubrication fittings. Motors shall be _____ V, _____ Hz, _____ P, _____ base, _____ bearings, _____ type with minimum horsepower as tabulated in the unit schedule. Motors shall be located as shown on the plans.

3. **COOLING COIL SECTION** — Shall be fabricated of continuous galvanized steel. All cooling coil section panels shall be internally insulated with 1-inch thick neoprene coated glass fiber insulation. Coil section shall include a condensate drain pan. All coils shall be arranged within the coil section for horizontal airflow. Where multiple cooling coils are used in a single unit, intermediate drain pans shall be provided. Coil headers and refrigerant distributors shall be completely enclosed within the insulated casing with only connections extended through the cabinet. (Connections for MSL-190 single and staggered coil sections terminate within the cabinet.)

4. **DRAIN PAN**
   Low and Medium Pressure — The drain pan shall have drain connections at both ends and shall be of double pan construction with the inner pan covered with a heavy coat of mastic and thermally isolated from the exterior casing with 1-inch insulation.
   High Pressure — The drain pan shall be internally insulated with ½-inch, closed cell polyurethane, overcoated with mastic.

5. **COILS** — All coils shall be per the schedule. Coil performance data shall be certified in accordance with Air Conditioning and Refrigeration Institute (ARI) Standard 410 where applicable. Coil performance shall be substantiated by computer generated output data.

6. **CHILLED WATER COILS** — Cooling coils shall be designed for use with chilled water and shall be circuited drainable with a vent connection at the highest point and a drain connection at the lowest point. Coil headers shall be copper with steel male pipe connections.

7. **REFRIGERANT COILS** — Cooling coils shall be designed for use with Refrigerant _____. Sweat type copper suction connections shall be located at the bottom of the suction headers for gravity oil drainage. [Coils shall be circuited for (interlaced) (face control) (row control) capacity reduction.]

8. **STEAM COILS** — Steam coils shall be furnished as indicated on the unit schedule. Coil shall be pitched in the unit to assure positive condensate drainage. Orifice baffle plate shall be provided in the supply header to ensure proper diffusion of entering steam.

9. **WATER HEATING COILS** — Water heating coils shall be furnished as indicated on the unit schedule.

10. **FILTER SECTION** — Furnish factory built (flat) (angular) (heavy-duty) filter section complete with filters as specified herein. The filter area shall be specified on the unit schedule. Angular and heavy-duty filter sections shall have hinged access doors on both ends.

11. **FILTERS** — Filters shall be (throwaway) (permanent) (high velocity) (pleated) type _____.

12. **(COMBINATION ANGULAR FILTER/MIXING BOX) (MIXING BOX ONLY)** — Mixing box and dampers shall be furnished where shown on plans. Dampers shall be arranged so that the fresh air and the return airstreams merge when entering the mixing box. Blades shall be parallel acting and interconnected. Damper rods shall rotate in nylon bushings.
    Both sets of dampers shall be low leak, airfoil type with a leakage rate of less than two-tenths of one percent leakage at two inches total static pressure differential. Leakage rates must be tested in accordance with test procedures outlined in the Air Movement and Controls Association (AMCA) Standard 500-83.

13. **FACE AND BYPASS DAMPERS** — Face and bypass dampers shall be furnished where shown on plans. Face dampers shall be opposed acting. Damper rods shall rotate in nylon bushings.

Air handler computer selection program

To provide optimal air handler unit selection, McQuay provides ARI certified microcomputer air handler selection capability. The computer program will select the most economical unit size and coils to meet the specification. Both draw-through and blow-through unit designs in low, medium and high pressure configurations are included in the program. The program can select a wide variety of coils including chilled and hot water, chilled and hot water with glycol, steam and direct expansion. The coil selection portion of the program is ARI certified for those coils which fall within the ARI certification program.

To operate the MS-85™ software the user needs a microcomputer using MS/DOS with 256K. McQuay will provide the software to run the air handler selection program.

For special application needs, McQuay's mainframe computer can select coils involving very high or low temperatures, special heat transfer fluids, heat reclaim coils and condenser coils.

Contact your nearest McQuay representative for a copy of the MS-85™ software or for an air handler selection that meets the most exacting specifications.

Contact your McQuay representative today!

SnyderGeneral Corporation 13600 Industrial Park Blvd., P.O. Box 1551, Minneapolis, MN 55440 (612) 553-5330