

Product Guide Specifications
Section _____

Unit Ventilator – Models MAUV/MAUH

Model Numbers:

MAUV (Vertical)

MAUH (Horizontal)

Size Range: 500 to 1500 Rated CFM Floor Units (Vertical)

750 to 2000 Rated CFM Ceiling (Horizontal)

Part 1— General

1.1 Section Includes

Magic Aire unit ventilators are designed for floor (vertical) or ceiling (horizontal) mounting. Units shall incorporate chilled water or direct expansion cooling and hot water, steam or electric heat as specified. Units are available with Direct Digital Controls (DDC) that provide stand-alone operation or can be incorporated into a LonWorks or BACNet network. Indoor air quality is assured with dehumidification and ventilation options.

1.2 Related Sections

Specifier Notes: Edit the following list as required for the project. List other sections with work directly related to the Unit Ventilators.

- a. Section _____ - Operation and Maintenance of HVAC Equipment
 - 1. Reference manufacturer's Installation and Operations Manual for complete instructions.

1.3 References

United Electric Company designs and builds its Magic Aire products to comply and perform to the following standards:

- a. Units shall be tested and certified in accordance with AHRI Standard 840.
- b. Unit shall be constructed and listed in accordance with ETL and ETL, Canada standards (ANSI/UL 1995-1999, second edition) (CAN/CSA C22.2 NO 2 36-95).
- c. Unit insulation and adhesive shall meet the requirements for flame spread rating of lower than 25 per ASTM E84 and smoke generation rating of lower than 50 per ASTM E84. Only closed cell insulation shall be used. The use of fiberglass insulation is not acceptable.
- d. Each coil shall be factory tested for leakage at 350-psig air pressure with coil submerged in water.

1.4 Submittals

Confirm product application requirements in sufficient detail to specify product as it is to be manufactured. Critical characteristics include:

- a. Family of Product
- b. CFM
- c. External Static Pressure (ESP) include dirty filter factor
- d. Elevation / Altitude

- e. Horizontal / Vertical
- f. Cooling: Chilled Water or DX = R410A
- g. Entering Water Temp and GPM
- h. DX: Sat Cond Temp, Sat Evap Temp, Entering DB/WB
- i. Heating: Hot Water / Steam / Electric Heat
- j. Heating: pre-heat or re-heat position
- k. Filter: Basic Throw-away, Renewable, Permanent
- l. Supply Voltage and phase
- m. Other items, unique requirements, or accessories

1.5 Delivery, Storage, Handling

- a. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly indicating manufacturer and material.
- b. Inspection: Inspect all items for transit damage or any indication of re-pack. Follow manufacturer directions for filing freight claims.
- c. Storage: Store materials in a dry, sheltered area, protected from damage and in accordance with manufacturer's instructions.
- d. Handling: Handle and lift products in accordance with manufacturer's instructions. Protect materials and finishes during handling and installation to prevent damage.

Part 2— Products

2.1 Manufacturer

- a. Basis of design Magic Aire (United Electric Company) Fan Coils, 501 Galveston Street, Wichita Falls, TX 76301. Phone (940) 397-2100. Web Site www.magicaire.com.
- b. Alternates are considered for approval if submitted in advance with complete ratings and accessory detail.

2.2 Unit Ventilator

The unit shall be a factory-assembled bolt-together unit ventilator. Contained within the unit enclosure shall be factory-installed motor, wiring, blowers, coil(s), bearing, outdoor/return air damper, optional face/bypass damper and optional controls. Unit shall have a draw-thru design for uniform air distribution across the coil and even discharge temperatures.

2.3 Construction and Components

2.3.1 Construction:

- a. Unit frame shall be constructed of 14 gauge galvanized steel components that form a rigid foundation and resist corrosion.
- b. Unit composed of three main sub-assembled modules: Blower Module, Coil Module and Damper Module. Modules shall be removable without disassembling the unit.
- c. Modules shall be externally insulated using at least 3/8" closed cell insulation.
- d. Unit back shall be insulated using at least 3/8" closed cell insulation.
- e. Exterior access panels shall be constructed of heavy gauge galvanized steel of at least 16 gauge material that have been cleaned and pretreated before painting to maximize corrosion resistance. Exterior service access panels shall be retained by tamper-resistant fasteners. Panels are electrostatically coated with polyester powder baked on textured paint.

MAUV (Vertical unit):

- a. Unit standard depth of 16 5/8 in. (21 7/8 in. depth optional), 30-in. tall cabinet with three standard 16-gauge exposed front panels, and service access panels with tamper-resistant hex socket head threaded fasteners and retainer chains for safety and ease of service. 14-gauge panels are optional.
- b. Cabinet models shall have standard textured baked powder finished panels. Cabinet tops shall be at least 16-gauge and charcoal bronze as standard with a steel bar-stock discharge grille. Optional Mesh Screen shall be available with spacing no more than .25" in order to prevent objects from entering unit (pencil proof). Optional textured baked power paint colors to match panels will be available for cabinet top. Unit top shall be easily removed for routine maintenance.
- c. External access panels shall be easily removed from outside of the unit for easy access to filters and routine maintenance. End panel corners shall be welded and ground smooth for appearance and durability.
- d. Unit shall include a leveling leg on each side of the bottom kick plate to compensate for floor irregularities.

MAUH (Horizontal unit):

- a. Rated 750 to 1500 CFM units shall have standard bar-stock steel linear discharge grille, anodized aluminum double deflection discharge grille, or discharge duct collar only.
- b. Rated 2000 CFM units shall have an anodized aluminum double deflection discharge grille or optional discharge duct collar.
- c. Unit shall have two hinged bottom access panels for easy access to filters and routine maintenance.
- d. Retaining chains shall be furnished for both panels to ensure maximum safety.

2.3.1 Components:

- a. Coils:
 1. Chilled water and combination chilled/hot water coils shall be constructed of mechanically expanded copper tubing, minimum wall 0.016 in. inside, aluminum fins, with a minimum thickness of 0.025 in. The fin surface shall be enhanced to the maximum degree by incorporated a raised lance design.
 2. Hot water coils shall be constructed of mechanically expanded copper tubing with a minimum wall of 0.016 in., inside aluminum fins shall have a minimum thickness of 0.045 in. Coils shall have a factory-mounted low limit (freezestat) device mounted on the leaving side of the heating coil. The device shall be single-pole, double-throw and shall activate at 38 F if the capillary device senses a temperature change along any 6 in. of the device.
 3. Direct expansion (DX) coils shall be furnished with a thermal expansion valve (TXV) sized to accommodate the condensing unit selected to meet the load.
 4. Steam coils shall be the freeze resistant double tube, distribution type utilizing a tube-in-tube design with a long life copper header. Non-distributing type coils are not acceptable. Ferrous materials in the header are also not acceptable.
 5. All coils shall be pressure tested at no less than 350 psig at the factory to ensure that they are leak tight.

6. Electric heat elements shall be the open wire type. They shall be mounted in individual heavy gauge galvanized steel frames and suspended in ceramic insulators.
 7. Dual capillary type thermal sensing elements, one automatic reset and one manual reset, shall be employed to protect the unit from overheating in the event of abnormal operation.
 8. Each circuit above 48 amps shall be protected by its own fuses rated for the duty and voltage to which they are applied
 9. The unit must be constructed such that troubleshooting or adjustment of the controls can be done while the unit is operating normally.
- b. Pipe Tunnel: Rated 500 to 1500 CFM vertical units and rated 750 to 1500 CFM horizontal units shall have an integral pipe tunnel that can be used for piping across the unit. This tunnel shall be insulated, with 3/8" closed cell insulation, from the unit and accessible from each end compartments to allow maximum flexibility of crossover piping installation.
- c. Drain Pans:
1. Unit drain pan shall be double sloped welded galvanized steel or stainless steel to prevent standing water.
 2. Drain pan will be coated to prevent external condensation during cooling.
 3. Drain connections shall be supplied on both ends of pan for field conversion of slope and drain hand connection if required.
 4. Drain pan slope shall be field convertible without removing the coil module.
 5. Heating only units shall come equipped with a double sloped drain pan for future cooling needs.
 6. Horizontal units shall have drain pan connection centerline located 4.5 in. above the bottom to provide easy piping to condensate disposal system.
- d. Fans and Motor:
1. Fan and motor assembly shall be direct driven. One end of drive shaft shall be mounted in a sleeve-type or ball bearing, with other end of shaft supported by motor bearings.
 2. Fan wheels shall be double-width, double-inlet with forward-curved blades, and shall operate at low speed. Fan wheels shall be large diameter (at least 8") for low speed, quiet operation and shall be constructed of high impact mineral filled polymer material (500-1500 CFM) Fan wheels shall be mounted on a hollow one piece steel shaft.
 3. Fan wheels shall be statically and dynamically balanced.
 4. Fan (blower) housings shall be constructed from heavy-gauge steel and mounted to a heavy-gauge galvanized steel fan deck.
 5. To prevent vibration transmission to the unit frame, motor and shaft bearing shall be resiliently mounted. The drive shaft shall be connected to motor with a flexible coupling.
 6. Fan motors shall be mounted outside of the airstream on a heavy-gauge steel partition and removable without removing the blower module.
 7. Standard shall be supplied with permanently split capacitor (PSC) multi-tap

transformer motors. Units that are used in high-static applications or that require higher efficiency shall be supplied with 3-speed, 120, 240 or 277 volt, single-phase, 60 Hz, electronically commutated motors (ECM). Units without controls shall be supplied with permanently split capacitor (PSC) multi-tap transformer motors. All motors shall have integral high temperature reset and shall be protected with cartridge-type fuse(s).

e. Filters:

1. Unit shall be supplied with a one piece 1-in. throwaway filter. The unit shall be capable of incorporating a 2 in. filter. For even loading, filter shall be positioned to filter mixed outdoor and return air.
2. Filter track shall be field adjustable to accept 1-in. or 2-in. permanent or renewable media replacement filters.
3. (UPDATE WITH PERM / REN. INFO AS OPTIONAL.)

f. Dampers:

1. Unit shall contain a single outdoor-air/return-air damper with a continuous seal the length of the damper. The Damper shall be constructed of extruded aluminum that has an integral curved web to afford maximum rigidity. External closed cell insulation shall be applied. The damper assembly shall include an anti-draft plate to prohibit outdoor air from penetrating the classrooms through the damper assembly.
2. A single face and bypass damper with a continuous seal the length of the damper constructed of extruded aluminum shall be available.

g. Controls and Safeties:

1. The manufacturer shall furnish, install, wire and factory test a complete control package suitable for the unit type(s) selected. The control package shall be capable of stand-alone operation and shall have all of the necessary sensors and accessories to monitor, control and ensure complete and safe operation of the unit.
2. The minimum position of the outdoor-air/ return-air actuator shall be adjustable by the installing contractor and/or the owner/ operator.
3. ASHRAE Cycles II shall be available.

h. Special Features:

1. Cabinet full adapter back shall be available with an open space behind the back of cabinet for piping and electrical conduits. Cabinet will be properly gusseted to support the top of unit over the false back area.
2. Valve package options shall include all valves required for both 2-way and 3-way cooling and heating applications. Valve package options shall include wye strainers, flow setters, P/T (pressure/temperature) ports, ball valve and unions. The valve package shall include all valves required to match to the ASHRAE II control cycle.
3. Optional End panels with cutouts to match adapter backs or custom needs. End panels shall be available in 1 in. standard sizes with 2"-4" sizes available.
4. Sub bases shall be available as an option for vertical units in sizes 2" to 12".

5. Utility Cabinets shall be available to install along side of the vertical units. The cabinets will be available for in 16 5/8" and 21 7/8" depths and 12", 18", and 24" widths. The cabinets shall be available with colors to match unit cabinet and top.
6. A dual mount Wall Stat shall be provided with units containing factory supplied DDC Controls and be capable of wall mounting.
7. Units shall be capable of accepting a field installed CO2 sensor with the factory installed IAQ DDC Control packages.
8. Outdoor Air Louvers shall be available in vertical and horizontal blade styles. Options shall include with and without decorative lattice.
9. Trim flanges shall be available for horizontal units.
10. Touch-up paint shall be available to match cabinet color.
11. Architectural accessories shall be available to install together with vertical units. Cabinets in standard sizes 2' to 5' available with custom options.

See your local Magic Aire Representative for the following accessory specifications:

1. Storage Cabinets
2. Filler Sections
3. Corner Sections
4. Draft Stop Enclosures
5. Pipe Enclosures