AIRTHERM
A Mestek Company

UNITAIRE IV FAN COIL SPECIFICATION

MODELS

□ **FETF**	□ **FEFF**	□ **WETB**	□ **WEFB**	□ **SETF**	□ **FDTF**
□ **RETF**	□ **REFF**	□ **FRFF**	□ **WRFF**	□ **WTFF**	□ **LEFF**
□ **FFFF**	□ **WFFF**	□ **FSFF**	□ **WSFF**	□ **LETF**	□ **CRFR**
□ **FCTF**	□ **LCTF**	□ **CEFR**	□ **CEFB**	□ **CRFB**	
□ **CPFR**	□ **CPFB**	□ **CCFR**	□ **CRBR**	□ **CRBB**	

Part 2 - Products

2.1 MANUFACTURER

Airtherm Model

□ 2.2 FAN COIL UNIT GENERAL

□ A. Room fan coils shall have the capacities shown on the plans. Capacities shall be certified under Industry Room Fan Coil Air Conditioner Certification Program in accordance with AHRI Standard 440-2008.

□ B. Fan coil units shall contain components and sizes as shown on the drawings/schedules and shall be suitable for indoor installation as required.

C. Each unit and all accessories shall be factory-assembled and tested prior to shipment.

D. Coils shall be constructed in a water and airtight manner. Coils and valve assemblies shall be factory-tested for leakage.

E. Fan coil unit shall be provided with a single-point electrical connection. Electrical components shall be in accordance with UL & NEC.

F. Unit serial numbers shall be permanently fixed to the unit.

2.3 UNIT CONSTRUCTION

A. Basic unit:

1. The basic unit chassis shall be constructed of galvanized steel and insulated to meet the AHRI Fan-Coil Industry test standard for insulation efficiency. The coil, motor speed control, electric junction box, primary and auxiliary drain pans, motor board, motor(s), and fan(s) shall be included in the basic unit.

□ B. Cabinet Construction:

□ 1. Cabinets are constructed with minimum eighteen 18-gauge galvanized steel fronts and tops, sixteen □ 16-gauge steel end panels or **(fourteen □ 14-gauge steel construction)**. Front and discharge panels are insulated with 1/2", 2 lb. density glass fiber matt faced or optional 1/2" foil faced or 1/2" closed cell insulation.

□ 2. Cabinet parts are cleaned through a biodegradable single step process called plasticization, which removes surface products through evaporation before powder coating.

□ 3. The cabinet finish shall be powder coat painted of colors selected from standard color charts, chosen by the architect.

4. Cabinets have 9" end pockets on both sides. Vertical model top panels are provided with two die-formed flush, hinged access doors.

5. Vertical model front panels are one piece, secured to the unit.

6. Horizontal model bottom panels are built with a continuous hinge along the width of the unit.

7. Front panels for Model FRFF, WRFF, FTFF, WTFF, FFFF, WFFF, FSFF and WSFF shall be provided with a hinged front inlet grille, and two die-formed flush hinged access doors for fan control and piping access.
8. Cabinet options:
   - **a.** **Optional** decorator colors are available as submitted by architect,
   - □ **b.** **Optional** 16-gauge steel painted cabinet, or 14-gauge steel painted cabinet, 14-gauge front panel-models FRFF, WRFF, FTFF, WTFF, FFFF, WFFF, FSFF and WSFF.
   - □ **c.** **Optional** □ 2", □ 4" or □ 6" rear cabinet extension.
   - □ **d.** **Optional** 16-gauge steel front panel for models FRFF, WRFF, FTFF, WTFF, FFFF, WFFF, FSFF and WSFF.
   - □ **e.** **Optional** tamper proof access doors shall be provided.
   - □ **f.** **Optional** leveling bolts shall be provided.
   - **g.** **Optional** oversized □ LH end pocket-not available for sizes 101 and 121, oversized □ RH end pocket-(not available for sizes 101 and 121).
   - **h.** **Optional** vibration isolator grommets in mounting holes.
   - □ **i.** **Optional** insulated plenum-models CPFR and CPFB.
   - □ **j.** **Optional** duct collars **–** 1" outlet duct collar – models CEFR, CEFB and vertical cabinet models, 1" inlet duct collar – model CEFR, □ 6" round O.D. air inlet duct collar – models CEFB, CPFB and CRFB.
   - □ **k.** **Optional** Wall Boxes – are weather proof with louvered intake, interior insect screens and moisture eliminators. They are painted with clear lacquer. Aluminum 25%.
   - **l.** **Optional** Discharge Grilles **–** for models FETF and WETB units, □ 4-way steel adjustable, □ 4-way aluminum, 2-way aluminum adjustable, □ liniar extruded aluminum.
   - **m.** **Optional** Inlet Grilles – extruded aluminum linear inlet grille – for models FETF, FDTF and SETF units. □ Anodized □ Painted Black

2.4 Fan section:

A. Centrifugal forward curve:
   a. All fans shall meet the airflow, static pressure and brake horsepower performance specified on the mechanical equipment schedule. Fan assemblies shall be designed for industrial applications.
   b. Fan wheels shall be centrifugal forward curve type, dynamically balanced. Fan housing shall be constructed of galvanized steel with streamlined air inlets.
   - □ **c.** **Optional** aluminum wheel shall be provided in lieu of standard material.
     Sizes: □ 02 □ 03 □ 04 □ 06 □ 08 □ 10 □ 12

2.5 Motor:

A. Motor and fan(s) shall be mounted on a removable galvanized steel motor-board assembly. Motors shall be resilient mounted, permanent split capacitor, tap wound for 3-speed, with integral thermal overload protection and automatic reset, for 115/60/1. Minimum power factor shall be .96. Motors shall be permanently lubricated sealed bearing type.

- □ **B.** **Optional** power sources with step down transformers for □ 208/230 or □ 277/1 power supply.
- □ **C.** **Optional** Motor cord quick disconnect.
- □ **D.** **Optional** high static motors shall be provided to meet the performance requirements by the specifying entity.
- □ **E.** **Optional** fan motors shall be brushless DC ECM (electronically commutated motor) with permanently lubricated ball bearings, designed for single-phase 120V 60 Hz input power with alternate voltage options being converted with an optional autoformer.
  a. Motor shall be furnished with an □ interface control board capable of operating control valves and dampers in accordance with thermostat settings independently of a building management system and provide adjustable settings for idle airflow, full cooling airflow, and full heating airflow. Interface board shall ramp the fan motor up from idle flow to cooling or heating airflow setting over a period of two minutes. As the cooling or heating load is satisfied the fan motor will ramp back down to the idle airflow over a period of two minutes.

2.6 Coils:

A. All hydronic coils shall meet or exceed all capacities specified on the mechanical schedule for the project. Coil shall be mounted in the unit for (horizontal) or (vertical) airflow. Maximum air velocity through active coil area shall not exceed 500 FPM. Air seal shall be provided to prevent air bypassing the coils.

B. Cooling coils shall be 5/8" O.D. seamless copper tubes mechanically bonded to aluminum fins. The entire coil assembly must be factory tested with 300 PSIG air pressure when the coil is submerged in warm water. It shall have a maximum working pressure of 200 PSIG. Each coil shall be provided with a manual air vent.

□ C. Auxiliary heating coil shall be constructed of 1/2" O.D. seamless copper tubes mechanical bonded to aluminum fins. The coils shall be tested at 300 PSIG air pressure under warm water, and shall have a maximum working pressure of 200 PSIG. Each coil shall be provided with a manual air vent.

□ D. Electric heating elements shall conform to the requirements of Underwriters' Laboratories, Inc. (U.L.) and the National Electric Code (NEC), and shall be UL listed for zero clearance to combustible surfaces. Electric heating elements shall be constructed of Nikrothal NXT resistance wire with surface temperatures at least 30% below allowable operating temperature. Each electric heating element shall be mounted to a continuous heavy gauge galvanized steel plate. The plate shall be independent of the fan deck, and shall be insulated with 1/2". 2 lb. density glass fiber insulation. Electric heating elements shall be located in the pre-heat position. Electric heating elements shall be non-accessible to room occupants. The fan coil unit deck shall be removable for access to the electric heating element without disconnecting the element wiring. Units equipped with electric heating elements shall include as standard a unit mounted linear limit primary safety control and fusible link secondary safety device, control box with solid cover, terminal board, and filed wiring terminals.

□ **E.** **Optional**: automatic air vent – in lieu of manual air vent, 1-row auxiliary water heating coil-left or right hand connection, 1-row auxiliary steam heating coil-left or right hand connection.

2.7 Filters:

A. Filters shall be 1" throwaway, MERV 7 and be provided on all models except CCFR.

□ **B.** **Optional** Filter shall be a 1" Aluminum mesh cleanable filter.

2.8 Drain Pan:

A. Drain pan shall be the full length of the coil, valves and piping connections, to collect all water condensing on or dripping from any item within the unit enclosure or casing.

B. Vertical models shall have an externally insulated galvanized steel drip shield mounted beneath the coil surface to direct condensate from the coil to a galvanized steel or optional 304 stainless steel drain trough. Drain surfaces shall be separate from the motor board assembly, and shall carry condensate directly into a molded plastic auxiliary drain pan.

C. Horizontal model shall be built with single piece galvanized steel, combination primary and auxiliary drain pan with external urethane foam insulation. The drain pan shall slope in a minimum of two (2) directions. The coil and return bends shall be mounted over the primary drain pan.

□ **D.** **Optional** 304 stainless steel drain pan shall be provided on horizontal models,

□ **E.** **Optional** 16-gauge stainless steel drain trough shall be provided on vertical models,

2.9 Controls:

A. Each unit shall be supplied with an electric junction box located on the side opposite the piping. This location may vary depending on control requirements.

B. A multi-speed switch shall be furnished for remote mounting with ceiling models. Mounting for vertical models shall be on the opposite the piping, subject to control requirements.

C. Exposed wiring shall be in flexible conduit. Unit mounted electrical devices shall be pre-wired to junction box. (Units may be specified to comply with Underwriters' Laboratories standard No. 883 for room fan coil units as an option.

□ **D.** **Optional** Power disconnect, □ electric heat fused disconnect (30 amp), non-fused disconnect switch (20 amp) or □ toggle operated fused quick disconnect switch.

E. **Optional** Speed switch – unit mounted 3-speed switch – horizontal models, omit 3-speed switch.

□ F. An interface board shall be provided with the optional brushless DC ECM operated fan, to terminate and control thermostat and control valves and dampers. The control board will have thermostat wiring terminals, isolated heating and cooling valve terminals and terminals for damper control. Adjustment shall be provided on the board to set the idle speed, full cooling and full heating speeds, without the use of a service tool or computer. The controller will ramp the brushless DC ECM from idle to full speed over a period of two minutes.

□ G. Transformer for 24VAC shall be provided with the brushless DC ECM option to power the interface board.

H. **Optional** Valve packages – shall be furnished by Airtherm and mounted at the factory. □ 2-way, □ 2-way with bleed, □ 3-way.

□ **I.** **Optional** Thermostats – shall be furnished by Airtherm.

□ **J.** **Optional** DDC Controls – Units shall have factory installed and wired DDC Control System which are furnished by others. The DDC Control System shall be able to operate in a standalone mode independent of a higher level building automation and communicate with either or both Lon Works network and BACnet communication protocol. See DDC controls specification section as they must comply with the other project specification sections.

2.10 Dampers

A. Vertical models

□ 1. Manual dampers – □ 0%-25% back inlet, □ 0%-25% bottom inlet.

□ 2. Automatic dampers motor and linkage by others (not available on units with electric heat) □ 0%-25% back inlet, □ 0%-25% bottom inlet.

□ 3. Motorized dampers □ 0%-25% back inlet, □ 0%-25% bottom inlet.

B. Horizontal models

□ 1. Motorized damper 0%-25% back inlet.

2.11 Noise and Vibration:

A. Sound Power Level:

Fan coil unit sound power level data shall be submitted to the mechanical and acoustical engineers for review.

2.12 Limited Warranty:

A. Products manufactured by AIRTHERM are warranted against defect in material or workmanship for a period of one (1) year from the date of shipment.

Part 3 - <u>EXECUTION</u>

3.1 Installation:

1. Fan Coil Mounting

a. Unit shall be installed level.

b. Refer to Structural/Mechanical drawings for mounting details.

3.2 Testing and Adjusting

1. Install fan coil unit components in accordance with manufacturer's printed instructions.
2. Start-up and adjust completed fan coil units to insure proper operation.
3. Provide operational test to demonstrate proper operation and adequate capacity at completion of balancing and adjusting.
4. Do not operate fan coils for any purpose, temporary or permanent until:
   a. Ductwork is clean
   b. Filters are in place
   c. Fan has been run under observation.