

# Guide Specifications

## High Static Hydronic Ducted Fan Coils

### HVAC Guide Specifications

Size Range: 3,600 to 71,000 BTU/H, Nominal Cooling

5,000 to 127,000 BTU/H, Nominal Heating

Polar Air Models: PDWD-V/P-X/Y-AECM

#### **Part 1 — GENERAL INFORMATION**

##### **1.1 UNIT DESCRIPTION**

Concealed ceiling mounted, chilled or chilled and hot water coil, suitable for installation with duct. Appropriate for connection to air-to-water or water-to-water heat pumps, boilers, and chillers with water supply temperatures up to 180 °F.

##### **1.2 QUALITY ASSURANCE**

Unit shall be certified by ETL. Each coil shall be factory tested for leakage by water pressure test at 500 psi for 3 minutes. Completed unit shall be air tested for leakage at 116 psi for 3 minutes. The maximum working pressure is 300 psi. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation. Insulation shall be rated to UL94VO. All equipment wiring shall comply with NEC requirements. Fan coils shall meet compliance requirements of ETL, ISO9001, and CE. All claims of capacity and sound performance shall be verified by an internationally recognized third-party testing agency.

##### **1.3 DELIVERY, STORAGE, AND HANDLING**

Unit shall be stored and handled per manufacturer's instructions.

##### **1.4 WARRANTY (See Appendix A).**

#### **Part 2 — PRODUCTS EQUIPMENT AND CONFIGURATION**

##### **A: General**

Indoor, concealed ceiling mounted, horizontal, 2 or 4 pipe console fan coil unit complete with cooling coil or cooling and heating coils. Unit shall include EC fan motor with on-off 3 speeds or modulating speed, single point primary electrical power connection (unless provided with optional electric heater), NPT, integral controller, heating, cooling, and entering coil air temperature sensors, transformer, capable of operating and capable of

accommodating integrated, factory installed condensate pump. 2 control methods will be available as I type full unit control or W type flexi unit control with 24Vac/12Vac transformer for external thermostat. Infra-red receiver display for remote control, valves, and electric heater shall be available as optional items.

##### **B: Unit Casing**

Outer casing shall be constructed of galvanized steel panels with powder finish. Inner casing shall be constructed of galvanized steel panels. Casing shall be double skin with inner high pressure PU foam insulation, resistant to rust, corrosion, chemical agents, solvents, aliphatic compounds and alcohols. The casing shall be provided with thermal and acoustical internal insulation and mounting holes.

##### **C: Drain Pan**

Condensate drain pan shall be constructed of electrostatic coating steel. Stainless steel pan shall be available as an option.

##### **D: Coil**

1. Standard unit shall be equipped with a cooling coil for installation in a 2 pipe system.
2. Additional coil shall be provided for installation in a 4 pipe system.
3. Cooling coils shall be 3, 4 and 6 rows selected to meet project requirements.
4. Heating coils shall be 2 rows, independently circuited specifically designed for hot water application.
5. Coils shall be TP2 seamless copper tubes 3/8" outside diameter, mechanically expanded into corrugated hydrophilic coating aluminum fins for a permanent primary to secondary surface bond. Fin spacing shall be 12.7 fins per". Coil connectors shall be 3/4" male NPT.
6. Each coil shall be provided with factory installed manual air vent and water purge valve.

##### **E: Insulation**

5/8" thick NBR plastic foam for coil top panel. 1/4" thick NBR plastic foam for drain pan.

##### **F: Motors**

1. Fan coils shall be provided with high efficiency EC motors provided with thermal overload protection and sealed, permanently lubricated bearings. Motors shall be controlled via a factory

installed electronic controller. Motors shall constant torque, permanent magnet, brushless DC motor with 3 speed or variable speed modulation functionality.

2. Fan motor shall be IP40 Class B.

#### **G: Fan Section**

The fan section shall include 2 galvanized steel centrifugal fans consisting of forward curved, double air inlet blades directly attached to the EC motor. Fans shall be statically and dynamically balanced.

#### **H: Control Options**

Controllers shall provide on-off or modulating fan control, integral condensate pump control, and auxiliary electric heater control. Controls shall include coil temperature sensors which will allow fans to operate when coil is chilled (during cooling mode) and heated (during heating mode) and provide alarm configurations.

1. I Type Controller (Modbus): Intelligent control board is controlled via Infra-red handset and/or Intelligent wired wall pad, is field programmable and easy to be configured through the wired wall pad or open Modbus protocol with VAV and VAV control logics, provides variable speed indoor fan control, integrates with Intelligent modulating valves to allow Auto Dynamic Balancing and Intelligent Constant Delta T management systems. It controls 2-pipe, 2-pipe with electric heater (optional), 2-pipe with 6-way valve (optional) and 4-pipe systems. Controller shall be capable of changing temperature settings, fan speed and other control functions using either infrared wireless handset or programmable wired wall pad. Controller shall provide coil freeze and overheat protection using factory installed sensors, occupancy or economy mode contacts, auto restart, and error diagnostics.
2. W control box: Microprocessor controller shall be suitable to use with standalone 24 VAC thermostat or 0-10 VDC signal from external source. Controller shall be capable of providing on-off or modulating 0-10 VDC signal for water control valve(s), optional drain pump control, zone control product operation and control of optional electric heater. Controller will provide simplified error diagnostics.

#### **I: Condensate Pump and Float Switch (Optional)**

Fan coil units shall be available with factory-installed condensate pumps and float switches controlled by onboard controllers.

#### **J: Filters**

Nylon Filters shall be 1" thick. 1" MERV 8 or 2" MERV 14 filter shall be offered as an option.

#### **K: Electrical Requirements**

Unit shall be available for 110-120V/1ph/60Hz (PDWB-Y-AECM) or 208-240V/1ph/60Hz (PDWB-X-AECM) power supply.

#### **L: Electric Heat Module (Optional)**

Removable module included PTC type stainless steel electric heaters shall be provided with thermal protection switches. Heater Modules shall be suitable for factory or field installation and controlled via onboard controller.

#### **M: Disconnect Switch**

Factory installed disconnect switch shall be located outside the electric box of the unit and shall be sized for the full load ampere of the unit to enable the unit to be disconnected from the power supply prior to any maintenance.

#### **N: Safety Ratings and Performance Verification**

Fan Coil Unit shall be ETL Listed. Performance shall be confirmed by accepted third party (AHRI for performance or Eurovent for performance and sound).

#### **O: Wall Mounted Wired Pad**

A wired wall pad for communication shall be available as an optional accessory for the 'I' controller.

#### **P: Infrared Remote Handset**

An infrared handset for remote communication shall be available as an optional accessory for the 'I' controller.

#### **Q: Thermostat**

A thermostat shall be available as an optional accessory for the "W" controller.

### **Part 3 – MAINTENANCE**

Maintenance access shall be done by removal of cabinet for all unit components.

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