

1.1. REFERENCE STANDARDS

1.1.1. American National Standards Institute / Air Conditioning, Heating and Refrigeration Institute (ANSI/AHRI):

1.1.1.1. 440 08 Performance Rating of Room Fan Coils

1.1.2. Underwriters Laboratories, Inc. (UL):

1.1.2.1. 1995 05 Heating and Cooling Equipment

1.2. ELECTRIC UNIT HEATERS

1.2.1. Output: 2 kW to 60 kW.

1.2.2. Finish: epoxy-polyester powder coat. Color: almond

1.2.3. Cabinet construction: heavy-duty, 18-gauge steel cabinet, adjustable louvers and protective screen.

1.2.4. Fan motor: permanently lubricated ball bearing motor for long lasting operation. Thermal protection with automatic reset

1.2.5. Heating element: nickel-chrome element producing instant heat

1.2.6. Control: built-in thermostat

1.2.7. Installation: wall or ceiling-mounted with universal mounting bracket

1.2.8. Complete with local disconnect

1.2.9. Minimum distance from adjacent walls: 150 mm / 6 in. (2 to 30 kW units) – 300 mm / 12 in. (40 to 60 kW units)

1.2.10. Mounting heights: 2.1 m / 8 ft (2 to 10 kW units) – 3 m / 10 ft (15 to 30 kW units) – 5 m / 15 ft (40 to 60 kW units)

1.2.11. Warranty: 10 years for the element and 1 year for other components

1.3. HYDRONIC UNIT HEATERS

1.3.1. Casing

1.3.1.1. High quality, die formed, cold rolled steel, degreased, phosphatized, etched and finished in aluminium semi-gloss finish.

1.3.2. Coil

1.3.2.1. Aluminum plate fins on mechanically expanded copper tubes, welded to steel headers and tested with 200 PSIG air pressure under water.

1.3.3. Motors

1.3.4. Totally enclosed, with permanent split capacitor and thermally protected and permanently lubricated for a minimum of 20,000 hours. Motors or supports shall be resiliently mounted.



Mounted on formed, welded and plated heavy gauge wire support. Motors and blades shall be removable through fan opening.

1.3.5. Fans

1.3.5.1. Fan blades shall be aluminum and balanced.

1.3.6. Air Flow

1.3.6.1. Louver fins diffusers shall have individually adjustable blades for maximum air distribution flexibility.

1.4. WALL – MOUNTED ELECTRIC FORCED FLOW HEATERS

1.4.1. Output: 2 kW to 12 kW; configuration: single unit to triple unit.

1.4.2. Suitable for recessed or surface mount

1.4.3. Epoxy-polyester powder coat

1.4.4. Cabinet: stainless steel 20-gauge steel cabinet, 18-gauge steel grille. Top air intake with bottom air discharge

1.4.5. Fan motor: permanently lubricated ball bearing motor for long lasting operation. Thermal protection with automatic reset

1.4.6. Heating element: high quality nickel chrome element producing instant heat

1.4.7. Installation – wall mounted, recessed or surface mounted with surface adapter

1.4.8. Control: built-in thermostat

1.5. WALL - MOUNTED HYDRONIC FORCED FLOW HEATER

1.5.1. Cabinet

1.5.1.1. Heavy 16 gauge furniture steel with removable fronts to provide access to motor, blower and heating element. The cabinets are rust proofed and then finished with a prime coat followed by a factory enamel finish.

1.5.1.2. ½" flexible fiber glass duct liner on back and sides off external box (for recess arrangement only)

1.5.2. Coils

1.5.2.1. The heating coils are of 5/8" O.D. seamless copper tubes expanded into aluminum fins to form a permanent mechanical bond. Female pipe coil connections.

1.5.3. Blowers

1.5.3.1. The blowers consist of two double inlet type centrifugal aluminum fans mounted directly on a double ended motor shaft.



1.5.4. Hinged Access Door

1.5.4.1. Provides access to controls and valves.

1.5.5. Motors

1.5.5.1. Permanent split capacitor type. Steel shell, die cast aluminium shields, galvanized steel cradle. Resilient mount. Self aligning sleeve bearings, horizontal mount, class "B" insulation, thermally protected.

1.5.5.2. Speed Switch: Solid state three speed control with off position.

1.5.6. Filters

1.5.7. Filters in the cabinet heaters are removable without tools. Permanent type, made of durable aluminum which has an average arrestance of 61%.

1.5.8. Control

1.5.8.1. Fan control by air temperature. Return air sensor monitors incoming air to unit, starting blower, if the return air temperature drops below set point. Fan is turned off when room temperature is satisfactory.

1.6. ELECTRIC BASEBOARD HEATERS

1.6.1. Output: 0.5 kW to 2.5 kW.

1.6.2. finish: top quality 100% polyester paint, baked enamel, glossy finish. Colors: standard: white, almond.

1.6.3. Casing: 22-gauge steel casing able to support 22 kg in its center, 16-gauge steel connection boxes at each end. Diffuser located above the element in order to ensure good air diffusion. Steel end caps with soft, rounded corner

1.6.4. Floating in nylon sleeves at each end, eliminating expansion and contraction noises

1.6.5. Heating elements: single tubular, stainless steel sheathed element with boxed aluminum fins for improved heat dissipation securely fastened at its center, full-length thermal protection with automatic reset. Full-length wire way

1.6.6. BX & NMD cable clamps: mounting holes spaced at 1-inch intervals along the top and the bottom of the unit. Knockouts located at the back of the heater, and at each end

1.6.7. Control: built-in thermostat or wall thermostat (built-in relay installed in left end)

1.6.8. Installation: surface mount

1.6.9. Warranty: lifetime warranty for the element and 1 year for other components

1.7. HOT WATER BASEBOARD HEATERS

1.7.1. Enclosure

1.7.1.1. Enclosures are made of quality cold rolled steel, 16 gauge, formed and reinforced with top supports, degreased, phosphatized and coated inside and out with a corrosion

resistant tan primer.

- 1.7.1.2. Panels are manufactured in lengths of 600 mm to 2,400 mm in 150 mm increments. Enclosure complete with components for wall to wall installation, following the contour of the wall, complete with end caps, wall trim, concealed joiners, inside corners, outside corners, access doors and pipe covers as required. Joints and filler pieces to be recessed. Support rigidly top and bottom, on wall mounted brackets.

1.7.2. Heating Elements

- 1.7.2.1. Elements are seamless copper tube with aluminum fins. The tubes are expanded within the fins to obtain a permanent thermal bond between the two. These are manufactured in lengths of 350 mm to 2,000 mm in 150 mm increments.
- 1.7.2.2. The aluminum fins are square 100 mm x 100 mm (4" x 4"), min. 150 fins/meter (52 fins/linear foot) of heating element.
- 1.7.2.3. All tubes are manufactured to receive standard sweat fittings. The elements are designed for use at 150 deg.C (300 deg.F) entry water temperature maximum working conditions.

1.7.3. Accessories

- 1.7.3.1. End Piece: End pieces are used to close off enclosure ends when cabinets do not terminate on an adjacent wall. The end piece is manufactured with rounded corners and protrudes 1@ beyond enclosure to give a neat finished appearance.
- 1.7.3.2. Wall Trim: Joiners are manufactured to overlap enclosures and cover the gap between cabinet end and adjacent wall or columns. These are usually supplied in 4@, 5@, 6@ or 8@ lengths.
- 1.7.3.3. Concealed Joiner (Butt Joint): This piece fits between two enclosure lengths to give a clean hairline joint appearance to the installation.
- 1.7.3.4. Inside Corner: Inside corners are manufactured to overlap enclosures and are used when piping runs on two or more inside walls to meet heating requirements. These are usually supplied at 90 deg. angles, however may be modified to meet project conditions.
- 1.7.3.5. Outside Corner: Outside corners are manufactured to overlap enclosures and are used when piping runs on two or more outside walls to meet heating requirements. These are usually supplied at 90 deg. angles, however may be modified to meet project conditions.
- 1.7.3.6. Access Doors: Access doors are manufactured to permit access to valves or other controls located inside enclosure. Two types are available, factory installed 5@ x 7@ or field mounted 5@ x 7@ with frame. They are supplied as standard with a screw lock,



however a camlock type is also available. For field mounted access doors, the contractor is required to perforate the enclosure.

1.7.4. Control Valves - Wall Fin Heaters

1.7.4.1. Automatic control valves, unless otherwise specified, shall be globe type valves. Valves and actuators shall be ordered as one factory assembled and tested unit.

1.7.5. The water control valves shall be sized for a pressure drop of 6 ft. water column or as indicated on mechanical drawings.

1.7.6. Each automatic control valve must provide the design output and flow rates at pressure drops compatible with equipment selected.

1.7.7. Each automatic control valve must be suitable for the particular system working pressure.

1.7.8. Unless otherwise indicated, control valves for proportional operation shall have equal percentage characteristics.

1.7.9. Heating valves shall be normally open

