

## **Mechanical Specifications Cabinet Unit Heater**

### **General**

Furnish and install Cabinet Unit Heaters where indicated on the plans and in the specifications, with required mounting components and accessories. All units shall be capable of meeting or exceeding the scheduled capacities for heating and air delivery. Units shall be ETL certified for the United States and Canada in compliance with UL/ANSI Standard 1995 and CSA C22.2 No. 236-95.

### **Construction**

All unit chassis shall be fabricated of 20-gauge galvanized steel panels. [Insulation must meet all requirements of ASTM C1071 (including C665), UL 181 for erosion, and carry a 25/50 rating for flame spread/smoke developed per ASTM E-84, UL 723 and NFPA 90A.]

All exposed units shall have exterior front, top and end panels fabricated of not less than 16-gauge cold rolled steel [14-gauge steel]. The front panel shall be attached with tamper-proof Allen-head quarter turn fasteners to allow for easy removal and access for service. The front panel shall be hinged providing full swing through 90° including removable safety chain(s) to prevent the panel from swinging fully open accidentally (RC, RFRC, RRC). Side panels shall be removable for access to controls and piping within the end pockets, if required. End pockets shall be no less than 8" [extended end pockets shall be no less than 14"] in width, located on both sides of the unit.

[Provide a grille in the return air opening (RF, RFI, RS, RSI).]

All exposed units shall include a recessed stamped louver discharge grille. Louver discharge grille shall be reverse stamped, leaving a smooth exterior surface. [Provide an architectural aluminum double deflection discharge grille with a powder coated paint finish to match cabinet color. Liquid coat paint shall not be acceptable.] [Provide an architectural aluminum bar grille.]

Louvered panel shall be supplied with two flush, hinged access doors with slotted cam-lock fasteners. [tamper-proof Allen-head security quarter turn fasteners.]

Recessed units shall be provided with a wall/ceiling seal assembly. The assembly shall provide a finished appearance to the wall/ceiling.

All ducted units shall have a minimum 1" duct collar on the discharge or return.

- Option: Adjustable leveling legs, two on each base leg, shall be provided where indicated on drawings or schedules (RF, RFI, RS, RSI).

### **Painted finish**

All painted cabinet exterior panels shall be finished with a standard ivory epoxy powder coat paint. Optional colors can be selected from the Zehnder Rittling Color Chart. Liquid coat paint shall not be acceptable. Custom colors are also available with the submission of a color chip for color match.

### **Power**

Units shall not exceed scheduled power consumption.

### **Fan and motor**

Unit fan shall be dynamically balanced, forward curved, DWDI centrifugal type constructed of galvanized steel for corrosion resistance. Motors shall be permanent split-capacitor [electronically commutated high-efficiency, programmable brushless DC], totally enclosed, tap wound for 3-speed, permanently lubricated sleeve bearing, type with automatic reset integral thermal overload protection. High static motors are available for ducted applications. Shaded pole motors are not acceptable. Single speed motors are not acceptable. Prior to shipping, all motors shall be assembled, factory tested and installed in the unit

The fan/motor assembly shall be removable and serviceable through the front panel. Each fan/motor assembly shall be fastened by no more than 4 screws. [The motors shall have quick connects to allow service and removal without the need for tools.]

### **Coils**

All cooling and heating coils shall optimize rows to meet the specified capacity. Coils shall have ½" OD seamless copper tubes and shall be mechanically expanded to provide an efficient, permanent bond between the tube and aluminum fin. Minimum copper tube thickness shall be 0.016".

Fins shall have high efficiency aluminum surface optimized for heat transfer, air pressure drop and carryover. Minimum fin thickness shall be 0.0045". Lanced fins shall not be acceptable.

All coils shall be tested at 350 PSIG air pressure under water, and rated for a maximum 300 PSIG working pressure at 200°F. Coils shall be circuited for counter flow to maximize unit efficiency.

All water coils shall be designed to connect with ½" nominal pipe connections.

Coil casing shall be fabricated from galvanized steel [stainless steel].

Steam coils shall be standard single tube steam type suitable for temperatures above 35°F and 15 PSIG steam pressure.

All water coils shall be provided with a manual air vent [automatic air vent] fitting to allow for coil venting.

## Filters

All units shall be furnished with a minimum 1" nominal glass fiber throwaway [1" pleated MERV 7] [1" cleanable aluminum mesh] filter. Filters shall be tight fitting to prevent air bypass. Filters shall be easily removable from the return air opening without the need for tools, unless there is an inlet louvered return provided.

## Electrical

Units shall be furnished with single point power connection. Provide an electrical control board for motor and other electrical terminations using spade connectors. Provide a 3-speed fan control switch with off, high, medium and low speeds.

- Option: Provide 24 VAC fan relays with 40 VA transformer as integral part of control board. Fan relays designed to operate in conjunction with factory provided [field provided] 24 V thermostat. Fan relays designed to accept 120, 208, 220, 230, or 277 V input power.
- Relays shall operate with generic non-digital [digital, non-programmable] [digital, programmable] thermostat designed to control up to three independently energized fan speeds.
- Option: Provide a line voltage wall thermostat, shipped loose for remote mounting. Adjustable setpoint dial included.
- Option: Provide a remote bulb return air thermostat mounted in the end pocket with remote bulb temperature sensor within the air stream, regulating room air temperature by measuring the return air temperature. Adjustable setpoint dial included.
- Option: Provide a line voltage aquastat, shipped loose for remote mounting on the incoming supply piping. Adjustable setpoint dial included.
- Option: Provide a service disconnect switch to isolate power from the unit during maintenance.
- Option: Provide a manual motor starter to provide overload protection for the motor.
- Option: Provide a ground fault circuit interrupter (GFCI).
- Option: Provide a power supply cord to enable powering of unit from wall outlet.
- Primary internal wiring and testing shall be conducted at the factory. All units shall be shipped with wiring diagrams.

## Piping packages

Provide a standard factory assembled valve piping package to consist of a 2 or 3-way, on/off, motorized electric control valve and two ball isolation valves.

Control valves shall be piped normally closed to the coil. Control valves shall be wired to junction box or unit mounted thermostat, when provided, through quick connects to allow service and replacement of valves. Maximum entering water temperature on the control valve shall be 200°F, and maximum operating pressure shall be 300 PSIG.

- Option: Unions shall be provided to allow easy removal of piping package from unit without the need for brazing or cutting pipe.
- Option: Provide 3-wire floating point modulating control valve (fail-in-place), in lieu of standard 2-position control valve with factory assembled valve piping package.
- Option: Provide proportional 0-10 VDC modulating control valve, in lieu of standard 2-position control valve with factory assembled valve piping package.

- Option: Provide high pressure close-off actuator for 2 or 3-way on/off control valve. Maximum close-off pressure is 75 PSIG.
- Option: Provide an adjustable flow control device for each piping package.
- Option: Provide a fixed flow control device for each piping package.
- Option: Provide pressure-temperature ports (P/T) for each piping package to allow measurement across the coil.

Piping packages shall be completely factory assembled including interconnecting pipe, factory tested for leaks and shipped loose for field installation.

- Option: Piping package will be shipped factory installed.

### **Outside air damper**

Provide a manual [two position motorized] outside air single blade damper integral to the unit. [A synchronous motor interlocked with the fan shall open the outside air damper automatically when the fan starts. If there is a loss in power or the blower stops, the damper shall return to a closed position.]

- Option: Provide aluminum outside air wall box with integral insect screen and weep holes for field installation.

Units shall be manufactured in accordance with ISO 9001:2008 standards established and maintained by Zehnder Rittling.