

WRITTEN SPECIFICATION

Description

An Electric heating and ventilating unit(s), as indicated on the drawings shall be furnished. Orientation shall be horizontal (Down) (Side) discharge. Unit(s) shall be factory assembled, tested and shipped as a complete packaged assembly, for indoor or outdoor mounting, consisting of the following:

- Electric insert
- Centrifugal blower (forward-curved double width/double inlet)
- Motor starter with thermal overload protection
- Motor and drive assembly
- Airflow switch and blower interlock safety equipment
- Temperature control system
- Pre-piped and charged condenser(s)

Approvals

Unit(s) shall be factory tested, and the electric coil shall bear the UL / CSA label.

Construction

Housing: Unit housing shall be constructed of 20 Gauge G-90 galvanized steel. The wall panels and roof panels shall be fabricated by forming double-standing, self-locking seams that require no additional support. The floor and wall panels shall be caulked air tight with a silicone caulk. All casing panels shall be attached with sheet-metal screws or rivets, which can be removed to service large components in the field. The unit base shall be suitable for curb or flat mount. Housing construction should be suitable for outdoor or indoor installation.

An observation port shall be located on the exterior of the unit for observing the coil. All controls and electrical components shall be mounted within the control vestibule. The vestibule shall be an integral part of the unit, not extend outside the exterior casing of the unit, and not be exposed to the main air stream.

The vestibule full-size door shall provide easy access to the controls. The blower door shall provide easy access to the blower, motor, and drives. Access doors shall be provided on both ends of the unit providing full access to every part of the unit.

Base: The base shall be constructed of galvanized steel for improved rigidity. The base shall be structurally reinforced to accommodate the blower assembly and burner.

Blower: Blower(s) shall be forward-curved, centrifugal, Class I or II (depending on requirements of the application), double width, double inlet, and constructed of G-90 galvanized steel. Unit shall have a heavy-duty, solid-steel shaft. Wheels shall be balanced in two planes and done in accordance with AMCA standard 204-96, Balance Quality and Vibration Levels for Fans. The wheel blades shall be aerodynamically designed to minimize turbulence, increase efficiency, and reduce noise. The wheel blades shall be securely attached to the wheel inlet ring. The wheel shall be firmly attached to the fan shaft with set screws and keys. The blower assembly shall be isolated from the fan structure with vibration isolators.

Blower capacity shall be _____ CFM at 70 degrees F standard air, _____ external static pressure.

External Static is the sum of duct loss plus duct component static. Example: louvers, diffusers. All blowers shall be tested and set at rated speed after being installed in the factory-assembled unit.

Motor & Motor Compartment: Motors shall be heavy duty ball bearing type and furnished at the specified voltage, phase, and enclosure. Motor mounting plate shall be constructed of heavy gauge galvanized steel and shall be designed to provide easy adjustment of belt tension. Blower motor shall be suitable for operation on _____ volts, _____ cycle, _____ phase power. Blower motor shall be a _____ HP motor, Open Drip Proof.

Shaft & Bearings: shafts shall be precision ground and polished. Heavy duty, pre-lubricated bearings shall be selected for a minimum (L50) life in excess of 200,000 hours of operation at maximum cataloged operating speed. They shall be designed for, and individually tested, specifically for use in air handling applications.

Belts & Drives: Belts shall be oil and heat resistant, non-static, grip-notch type. Drives shall be cast type, precision machined and keyed, and securely attached to the fan and motor shafts. Fan operating speed shall be factory set using adjustable pitch motor pulleys. Blower drives shall be fully adjustable. All drives shall be a minimum of 2 grooves above 2 HP.

Cooling Equipment

Standard: All cooling equipment should conform to local code requirements. All gas manifold components shall be piped and wired at the factory.

Components Include:

- 14 SEER minimum condenser
- Thermal Expansion Valve
- Filter/Dryer
- Hard Start Kit for Condenser
- Insulated Suction Lines
- Multiple Stages where required
- Pre Charged System
- R-410A Refrigerant

SCR Electric Coil

Electric coils are controlled using SCR controls. SCR is a time proportioning type controller that modulates the heater and supplies the exact amount of power to match the heat demand.

The SCR electric coil shall be sized to provide an output of _____ KW.

The SCR electric heater shall be capable of heating the entire air supply from _____ F° to _____ F° (_____ degrees F temperature rise).

Rear access doors or a removable lid will provide complete access to the SCR electric coil.

Safety Controls

Standard:

- Motor starter with adjustable overloads
- Air-flow safety switch
- Blower interlock relay

- High-temperature limit switch
- Non-Fused Disconnect
- Casing insulation shall be 1" x 1.5# density with a foil face

Optional:

- Adjustable low temperature blower-safety control with bypass timer to shut down unit if discharge temperature drops below setting.
- Operating lights mounted in a remote-control panel to indicate power, heat ON, and blower ON.

Accessories

Inlet Dampers: Manufacturer shall provide and install on unit (when possible), a two-position, motor-operated damper with internal end switch; this energizes the blower-starter circuit when the damper is 80% open. Blades shall be a maximum of 6" wide 16 Gauge G-90 galvanized steel and shall be made to guarantee the absence of noticeable vibration at design air velocities. Damper blades to be mounted on friction-free synthetic bearings. Damper edges shall have PVC coated polyester fabric mechanically locked into the blade edge. Jamb seals to be flexible metal, compression type.

Filters: The filters shall be 2" thick, aluminum mesh, and coated with super-filter adhesive. Aluminum-mesh filters shall have aluminum frames; media to be layers of slit and expanded aluminum which vary in pattern to obtain maximum depth loading.

Filter Section: Shall be (insulated) (uninsulated) constructed of G-90 galvanized steel with filters supported by internal slides and with removable access panels. Filters shall be provided in a v-bank arrangement.

Fresh-Air Inlet Hood: Shall be constructed of G-90 galvanized steel with bird screen.

Fresh-Air Inlet Hood/Filter Combination: Shall be constructed of G-90 galvanized steel with bird screen and 2" washable filters supported by internal slides mounted in the inlet face of the hood. □

Discharge Diffusers: Shall be constructed of G-90 galvanized steel with horizontal and vertical blades capable of four-way diffusion.

Curb: 20" curb shall be constructed of 18 Gauge G-90 galvanized steel as a completed welded assembly.

Cooling Coil Section: Cooling coil section shall be bolted directly to the discharge of the blower section. Coil section to be designed to fit onto common curb with main unit. Base of coil section to be constructed the same as the main unit, with double pitch stainless steel drain pan for coil. Casing and roof to be 20 Gauge G-90 galvanized construction. Inside of section to be fully insulated with foil back insulation. DX or chilled water coil to meet scheduled requirements.

Temperature Control Systems

Discharge Air temperature controls shall be shipped as a standard feature on all electric heaters. Optional room controls shall be available.

BAS (Building Automation System) Control: For building exhaust-air replacement with modulated temperature control based off of BAS supplied 0-10 Vdc or 4-20mA input signal. Auxiliary contacts and relays provided for contractor in the field.

365 Day Programmable Thermostat: Thermostat contains both a modulating heat signal and up to 3 stages of cooling. Thermostat contains 4 programmable occupied times and set-points per day and up to 24 holiday schedules. Time of day auxiliary output can be used to drive external equipment based on occupied status.

Wiring and Electrical

The control circuit voltage shall be 115 volts. A control transformer shall be provided, when required. The control wiring shall be carried in wire channel or conduit. Wiring in control enclosures shall be in accordance with the National Electrical Code and the local code, as it may affect the installation. Motor starter shall be provided. Starter shall be line voltage, definite purpose type.

Each condenser shall have a separate circuit enabling the supply fan motor to accept signals from a VFD without interfering with condenser operation.

Unit(s) shall be complete with all items such as relays, starters, switches, safety controls, conduit and wire, as previously mentioned and as required for proper operation. All factory-mounted controls shall be factory prewired to the unit control panel.

Factory Tested

Unit(s) shall be operated, tested, and set at the factory using job-site conditions for electrical and gas input. All operating and safety controls shall be tested and set at the factory. Adjustable, or fixed sheaves, shall be set for proper RPM at specified conditions.

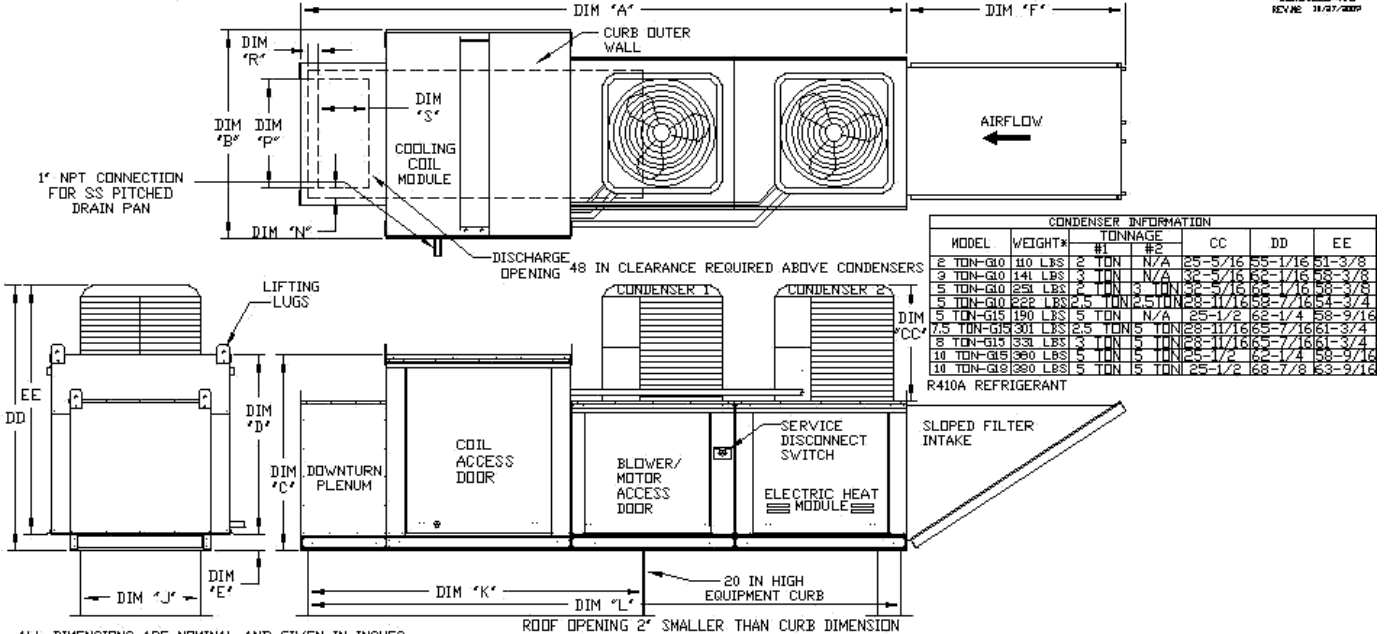
Service and Parts

The supplier shall furnish as built wiring connection and control-circuit diagrams, dimension sheets and a full description of the unit(s). Service manuals, showing service and maintenance requirements, shall be provided with each unit.

TYPICAL INSTALLATION

MODULAR OUTDOOR DOWN DISCHARGE ELECTRIC HEATER PACKAGED UNIT WITH COOLING AND INTAKE HOOD

REVISION 11/27/2009



CONDENSER INFORMATION						
MODEL	WEIGHT	TONNAGE		CC	DD	EE
		#1	#2			
E2-TON-G10	110 LBS	2 TON	N/A	25-5/16	55-1/16	51-3/8
E3-TON-G10	141 LBS	3 TON	N/A	32-5/16	62-1/16	58-3/8
E5-TON-G10	254 LBS	2 TON	3 TON	32-5/16	62-1/16	58-3/8
E5-TON-G10	222 LBS	2.5 TON	2.5 TON	28-1/16	58-7/16	54-3/4
E5-TON-G15	190 LBS	5 TON	N/A	25-1/2	62-1/4	58-9/16
E7.5-TON-G15	301 LBS	2.5 TON	5 TON	28-1/16	62-7/16	61-3/4
E8-TON-G15	331 LBS	3 TON	5 TON	28-1/16	62-7/16	61-3/4
E10-TON-G15	360 LBS	5 TON	5 TON	25-1/2	62-1/4	58-9/16
E10-TON-G18	380 LBS	5 TON	5 TON	25-1/2	68-7/8	63-9/16

R410A REFRIGERANT

ALL DIMENSIONS ARE NOMINAL AND GIVEN IN INCHES.

MODEL	WEIGHT	UNIT DIMENSIONS										CURB/RAIL		DISCHARGE OPENING			
		A	B	C	H	E	F	J	K	L	N	P	R	S			
E1-G10	985 LBS	135	39-3/8	42-3/4	39	3-3/4	44-3/8	81	71	131-5/8	3-9/16	13-7/8	1-13/16	11-1/2			
E2-G15	1350 LBS	149	49-3/8	47-3/4	44	3-3/4	53-5/8	31	79	145-5/8	4-5/16	22-3/8	1-9/16	18			
E3-G18	1620 LBS	154	54-3/8	56-3/8	51-1/8	5-1/4	51-5/8	35	84	150-5/8	5-5/16	22-3/8	1-1/2	18			

UNIT INFORMATION.

MODEL	TONNAGE RANGE		FILTER SIZE & QTY	MAX. FILTER VELOCITY
	MIN	MAX		
E1-G10	2 Ton	5 Ton	16"x20"x2" (3)	3600 CFM = 686 FPM
E2-G15	5 Ton	10 Ton	20"x25"x2" (3)	6500 CFM = 754 FPM
E3-G18	10 Ton	10 Ton	16"x20"x2" (6)	8000 CFM = 762 FPM

SUGGESTED SPECIFICATION