

GUIDE SPECIFICATIONS: mini-Might™ 1-3 Ton 2x4 Ceiling A/C's

1.0 GENERAL

1.1 SUMMARY

These specifications describe requirements for an air conditioning system. The system shall be designed to maintain temperature and relative humidity conditions within the room. The manufacturer shall design and furnish all equipment to be fully compatible with heat dissipation requirements of the site.

The system shall be manufactured by Skil-aire, a division of Tithe Corporation, in Baltimore, Maryland U.S.A. The system may be approved and label by Underwriters Laboratories, Inc. (UL). The system may be New York City MEA (MEA-386-90-E) and Chicago Code Approved.

1.2 DESIGN REQUIREMENTS

The environmental control system shall be a Skil-aire factory assembled mini-Might™ model ceiling mounted system. The evaporator section shall be specifically designed for above ceiling installation.

The system shall have a total cooling capacity of _____ BTUH and a sensible cooling capacity of _____ BTUH based on an entering air temperature of _____ °F DB and _____ °F WB. The unit shall be supplied with _____ volt, _____ phase, _____ Hz electrical service. The system model number shall be _____.

2.0 PRODUCTS

2.1 STANDARD FEATURES / ALL SYSTEMS

2.1.1 CABINET

The cabinet and access panels shall be fabricated from sturdy 16-gauge galvanized sheet metal. The panels shall be lined with 1/2" 2 lb. density insulation. Removable side doors shall provide ease of installation, service and maintenance. (In most instances, units can be serviced in place, while in operation.) A stainless steel drain pan with dual condensate drain connections shall be provided. Quick adjusting external hanger brackets with vibration isolators shall simplify installation on hanger rods by providing easy leveling, smooth operation, reduced noise and component wear.

2.1.2 AIR DISTRIBUTION

The blower shall be double-inlet, dynamically balanced blower with multiple forward curved blades, self-aligning sleeve bearings, and lifetime lubrication. The blower motor shall be permanent-split capacitor, high efficiency type. Air delivery shall be _____ CFM. System shall be suitable for plenum or ducted air distribution.

2.1.3 EVAPORATOR AIR PATTERN - SPOT COOLER

The system shall be a spot-cooler configuration with factory provided bottom supply and return grille assembly for field installation.

2.1.4 FILTERS

The filters shall be rated not less than 20% efficiency based on ASHRAE Dust Weight Arrestance Test. They shall be removable without shutting down the system.

2.1.5 ELECTRICAL CIRCUITS

The control panel shall be pre-wired to include all contactors, fuses, relays, control transformers and capacitors necessary for complete operation. Terminal blocks shall be provided for power and control connections. Units shall be supplied with on/off control.

2.1.6 DigiSkil-100: REMOTE WALL MOUNTED DIGITAL THERMOSTAT

A DigiSkil-100 model remote wall mounted single stage heat / cool non-programmable thermostat with digital display shall be factory provided for field installation. The thermostat shall include FAN AUTO-ON and COOL-OFF-HEAT selector switches.

2.2 DIRECT EXPANSION SYSTEM COMPONENTS

2.2.1 EVAPORATOR COILS

The evaporator coil shall be quality construction of seamless drawn rifled copper tube, mechanically bonded to tempered aluminum laced fins with galvanized coil end plates. The coil shall have _____ sq. ft. face area, _____ rows deep. The coil shall be factory pressure tested. The refrigeration system shall be sealed prior to shipment. The angle placement in cabinet permits maximum coil sizes and the most efficient airflow. An externally equalized thermostatic expansion valve shall control refrigerant flow. The coil shall be provided with a stainless steel drain pan covering the entire coil area.

2.2.2 COMPRESSORS

The compressor shall be a full hermetic type mounted on vibration isolators and located in a separate compartment out of the evaporator air stream to facilitate servicing while equipment is operating. The compressor shall be complete with reversible positive oil pump, charging and service ports, internal spring isolation, and discharge gas vibration eliminator.

2.2.3 REFRIGERATION CIRCUIT

The refrigeration circuit shall be pre-piped with type "L" refrigerant copper tubing. The refrigeration system shall include but not be limited to: expansion valve with external equalizer and rapid bleed-through capacity. Features shall include filter dryer, sight glass, pressure fittings and high pressure/low pressure safety cutouts.

2.3 CHILLED WATER SYSTEMS

2.3.1 CHILLED WATER COIL

The chilled water coil shall be of quality construction of seamless drawn rifled copper tube, mechanically bonded to tempered aluminum laced fins with galvanized coil end plates. The coil shall be factory pressure tested. The coil shall be sized to provide high sensible cooling. The coil shall be designed with a minimum of _____ sq. ft. face area, _____ rows deep and have a maximum face velocity of _____ FPM at _____ CFM. The coil shall be controlled by a factory installed 2-way chilled water control valve. The coil shall be designed to distribute water into the entire coil face area. The coil shall be supplied with _____ °F entering water temperature with a _____ °F temperature rise. The coil shall require _____ GPM of chilled water and the pressure drop shall not exceed _____ PSI. The entire coil assembly shall be mounted in a stainless steel condensate drain pan.

2.4 STANDARD FEATURES – INDIVIDUAL SYSTEMS

2.4.1 AIR COOLED SYSTEMS

2.4.1.1 INDOOR, INTEGRAL OR REMOTE, AIR COOLED CENTRIFUGAL BLOWER CONDENSING UNIT (D & BU models)

The condensing unit shall be a direct driven, centrifugal blower type. The condenser coil shall be constructed of copper tubes and aluminum fins. The condensing unit shall be sized for full heat of rejection at 95°F ambient and be capable of operation to _____ °F. The condensing unit shall be factory tested, charged with refrigerant, sealed and be capable of being connected to the evaporator section directly when the units are close coupled or using pre-charged refrigerant lines sets when the condensing unit is mounted remote from the evaporator.

2.4.1.2 OUTDOOR, REMOTE PROPELLER FAN, AIR COOLED CONDENSING UNIT (FU models)

The remote air cooled condensing unit shall be a direct drive, propeller fan type arranged for vertical air discharge. The condensing unit shall be sized for full heat of rejection at 95°F ambient and be capable of operation to _____ °F. The condenser coil constructed of copper tube and aluminum fins. The coil shall be factory tested, and refrigeration system sealed prior to shipment. The condenser motor shall have permanently lubricated bearings and inherent internal overload protection.

2.4.2 WATER COOLED CONDENSERS (MWC models)

Water cooled systems shall have a coaxial, counter flow liquid condenser with adjustable 2-way water regulating valve to maintain head pressure with condenser water flow. The maximum operating pressure shall not exceed 150 psig. per circuit. The unit shall require _____ GPM of _____ °F water and have a maximum pressure drop of _____ PSI.

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2.4.3 GLYCOL COOLED CONDENSER (MGC models)

Glycol cooled systems shall have a coaxial, counter flow liquid condenser with adjustable 2-way glycol regulating valve to maintain head pressure with condenser glycol flow. The maximum glycol operating pressure shall not exceed 150 psig per circuit. The unit shall require ____ GPM of ____ °F, ____ % ethylene glycol and have a maximum pressure drop of ____ PSI.

2.4.4 DRY COOLER & SIMPLEX PUMP PACKAGE (FCPP models)

The drycooler shall be complete with field mounted expansion tank and aquastat to control fan motor operation. The coil shall have seamless copper tubes bonded to aluminum fins for high transfer efficiency. The motor(s) shall have permanently lubricated bearings with inherent overload protection on 1 Phase motors and three coil overloads on 3 Phase motors.

The pump package shall include controls to operate the drycooler and the pump. The pump package shall be enclosed in a weatherproof housing. The pump shall be rated for ____ GPM at ____ Ft. of head, and operate on ____ volt, ____ PH, 60 Hz.

2.5 OPTIONS

2.5.1 DUCTED EVAPORATOR AIR PATTERN

The system shall be designed for ducted evaporator return and supply air. Factory provided duct flanges shall be provided for ease of field duct connection.

2.5.2 AIR COOLED CONDENSER - LOW AMBIENT CONTROL

2.5.2.1 0°F AMBIENT - FAN CYCLING (D, FU & BU Models)

Condenser fan cycling controls shall be factory provided for field installation to allow for low ambient condenser operation to 0°F.

2.5.2.2 LOW AMBIENT DAMPER (D, BU Centrifugal Blower Condensers Only)

A low ambient inlet damper shall be provided for the condenser section to allow operation to 0°F. The damper shall include an actuator that is controlled directly by the condensed liquid line pressure. The damper shall be field mounted with all control piping furnished by the contractor.

2.5.2.3 -30°F FLOODED CONDENSER (D, FU & BU Models)

A flooded condenser system shall be provided to allow for low ambient condenser operation to -30°F. The flooded system shall include a factory installed liquid refrigerant receiver and head pressure control valve.

2.5.3 WATER / GLYCOL COOLED CONDENSER REGULATING VALVES (MWC & MGC Models)

System head pressure shall be controlled by a factory provided ____ -way water / glycol regulating valve rated for ____ psig w.w.p. 2-way valves shall be factory installed, while 3-way valves shall be field installed. (2-way & 3-way valves rated for 150 or 350 psig are optionally available.)

2.5.4 CONTROL OPTIONS

2.5.4.1 DigiSkil-200: 7-Day Programmable Wall Mounted Digital Heat / Cool Thermostat

A DigiSkil-200 model remote wall mounted deluxe 7-day programmable heat pump ready thermostat with digital display shall be factory provided for field installation. The thermostat shall include FAN AUTO-ON, COOL-OFF-HEAT-EM (emergency heat), SET and PROG/MAN selector switches.

2.5.4.2 MicroSkil-100: Microprocessor Temperature Humidity Controller with Alarms

The system shall be provided with a MicroSkil-100 model Microprocessor based Temperature and Humidity controller with Alarms. Centered in the remote wall mounted controller shall be a graphic LCD display with characters to show the operating mode, time, set points and actual readings. The temperature and humidity sensors shall be internal to the remote display. The controller shall be capable of three different set points: normal, temporary and night per day, 7 days per week.

The controller shall include the following visual and audible alarm indications (if applicable):

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- High and Low Temperature
- High and Low Humidity
- Dirty Filter
- Sensor Failure
- Common Alarm Failure

The controller shall include the following system operations (if applicable):

- Fan - continuous or on demand
- Auto-restart upon power loss
- Remote stop/start connection
- Short cycle protection
- Cold start time delay
- Heat pump operation with aux. heat

2.5.5 REHEAT OPTIONS

2.5.5.1 ELECTRIC REHEAT

The electric reheat shall include factory mounted nichrome open wire elements, contactors and limit controls. The electric element shall be UL approved. The electric heat shall have a capacity of _____ BTU/H and a KW rating of ____ KW.

2.5.5.2 HOT GAS REHEAT

The hot gas reheat coil shall have copper tubes and aluminum fins with capacity of _____ BTU/H with ____ PSIG steam. The system shall be factory pre-piped hot gas regulating control valve.

2.5.5.3 STEAM REHEAT

The steam reheat coil shall have copper tubes and aluminum fins with capacity of _____ BTU/H with ____ PSIG steam. The system shall be factory pre-piped with a 2-way control valve.

2.5.5.4 HOT WATER REHEAT

The hot water reheat coil shall have copper tubes and aluminum fins with a capacity of _____ BTU/HR when supplied with ____ °F entering water temperature, ____ GPM at ____ PSI pressure drop. The control shall be factory pre-piped with a 2-way control valve.

2.5.6 STEAM GENERATING HUMIDIFIER

The humidification system shall be an electrode canister type, complete with fill valve, drain valve, adjustable humidity output, and automatic flush cycle. Humidification shall be in the coil bypass to provide maximum humidification efficiency. The humidifier shall be producing _____ lbs/hr.

2.5.7 CONDENSATE PUMP

The condensate pump shall have the capacity of ____ GPH at ____ Ft. of head. It shall be complete with integral float switch, pump and motor assembly, check valve and reservoir.

2.5.8 HOT GAS BYPASS

A hot gas bypass system shall be factory installed to provide capacity modulation.

2.6.9 MAIN POWER NON-FUSED DISCONNECT

A main power non-fused disconnect shall be factory provided for field installation.

2.6.10 FIRESTAT

The firestat shall immediately shut down the environmental control system when activated. The firestat shall be mounted with sensing element in the return air duct, and wired by installing contractor to unit control panel.

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2.6.11 SMOKE DETECTOR

The smoke detector shall immediately shut down the environmental control system when activated. The smoke detector shall be mounted in the return air duct by the installing contractor and wired to the unit control panel.

2.6.12 REFRIGERANT LINE-SETS (MAC-() / FU & BU models)

The condensing unit shall be factory tested, charged with refrigerant, sealed and be capable of being connected to the evaporator section directly when the units are close coupled or using pre-charged refrigerant lines sets when the condensing unit is mounted remote from the evaporator.

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