# section 23 8051

# SPLIT SYSTEM cooling only UNITS

## PART 1 GENERAL

1.1 System Description

A. Cooling and heating split system with modulating capacity compressorunit.

B. The system shall consist of a series of an outdoor unit, indoor unit, and controls system.

1.2 Quality Assurance

A. The units shall be listed by Electrical Laboratories (ETL) and bear the ETL label.

B. All wiring shall be in accordance with the National Electrical Code (N.E.C.).

C. A full charge of R-410A for the condensing unit only shall be provided in the condensing unit.

D. Basis of Design: Daikin. Mitsubishi, LG, or Carrier, are approved manufacturer’s as long as all costs associated with any change to refrigerant lines, branch controllers, or electrical due to system variation are covered by alternate approved manufacturer.Alternate approved system shall cover all costs associated with any change to refrigerant lines, condensate routing, branch controllers, or electrical due to system variation.

E. See section 23 2300 Refrigerant Piping for other requirements.

1.3 Delivery, Storage and Handling

A. Unit shall be stored and handled according to the manufacturer’s recommendation.

## PART 2 WARRANTY

2.1 wARRANTY

A. The units shall be covered by the manufacturer’s limited warranty for a period of one (1) year from date of installation.

B. In addition the compressor shall have a manufacturer’s limited warranty for a period of six (6) years from date of installation.

C. If, during this period, any part should fail to function properly due to defects in workmanship or material, it shall be replaced or repaired at the discretion of the manufacturer.

D. This warranty shall not include labor.

## PART 3 PRODUCTS

3.1 Outdoor Unit

A. General: The outdoor unit shall be used specifically with indoor components manufactured by the same manufacturer. The outdoor units shall be equipped with multiple circuit boards that interface to the controls system and shall perform all functions necessary for operation. Each outdoor unit module shall be completely factory assembled, piped and wired and run tested at the factory.

1. Outdoor unit shall have a sound rating no higher than 60 dB(A).

2. The outdoor unit shall have an accumulator as required with refrigerant level sensors and controls.

3. The outdoor unit shall have a high pressure safety switch, over-current protection, crankcase heater and DC bus protection.

4. Provide with service valves and charging ports.

5. The outdoor unit shall be capable of operating in cooling mode down to 45°F ambient temperature, without additional low ambient controls.

6. The outdoor unit shall not cease operation in any mode based solely on outdoor ambient temperature.

7. The outdoor unit shall have a high efficiency oil separator plus additional logic controls to ensure adequate oil volume in the compressor is maintained.

B. Unit Cabinet: The casing(s) shall be fabricated of galvanized steel, bonderized and finished. Units cabinets shall be able to withstand 960 hours per ASTM B117 criteria for seacoast protected models.

C. Fan:

1. Each outdoor unit module shall be furnished with one direct drive, variable speed propeller type fan. The fan shall be factory set for operation under 0 in. WG external static pressure, but capable of normal operation under a maximum of 0.24 in. WG external static pressure via dipswitch.

2. All fan motors shall have inherent protection, have permanently lubricated bearings, and be completely variable speed.

3. All fan motors shall be mounted for quiet operation.

4. All fans shall be provided with a raised guard to prevent contact with moving parts.

5. The outdoor unit shall have vertical discharge airflow.

D. Refrigerant R410A refrigerant shall be required.

E. Coil:

1. The outdoor coil shall be of nonferrous construction with lanced or corrugated plate fins on copper tubing.

2. The coil fins shall have a factory applied corrosion resistant blue-fin finish.

3. The coil shall be protected with an integral metal guard.

4. Refrigerant flow from the outdoor unit shall be controlled by means of an inverter driven compressor.

F. Compressor:

1. Each outdoor unit module shall be equipped with one inverter driven scroll hermetic compressor. Non inverter-driven compressors shall not be allowed.

2. A crankcase heater(s) shall be factory mounted on the compressor(s).

3. The outdoor unit compressor shall have an inverter to modulate capacity. The capacity shall be completely variable with a turndown of at least 19% of rated capacity, depending upon unit size.

4. The compressor will be equipped with an internal thermal overload.

5. The compressor shall be mounted to avoid the transmission of vibration.

G. Electrical:

1. See electrical drawings for power requirement.

2. The outdoor unit shall be controlled by integral microprocessors.

3. The control circuit between the indoor units, branch controller and the outdoor unit shall be 24VDC completed using a 2-conductor, twisted pair shielded cable to provide total integration of the system.

3.2 Indoor unit

A. Non-Ducted Wall Mounted Indoor Section:

1. The unit shall be completely factory assembled and tested. Included in the unit is factory wiring, piping, electronic proportional expansion valve, control circuit board, fan motor thermal protector, flare connections, condensate drain pan, condensate drain pump, self-diagnostics, auto-restart function, 3-minute fused time delay, and test run switch.

2. Indoor unit and refrigerant pipes will be charged with dehydrated air prior to shipment from the factory.

3. Both refrigerant lines shall be insulated from the outdoor unit.

6. The indoor units shall be equipped with a condensate pan and condensate pump. The condensate pump provides up to 21” of lift

7. The return air shall be filtered by means of a washable long-life filter with mildew proof resin. Provide two sets to allow owner change-out without washing filter in unit.

B. Control: Provide with factory approved or factory installed integration to allow monitoring of the temperatures by the BAS. See “Controls” for additional requirements.

C. Electrical: See electrical drawings for power equipment.

## Part 4 Controls

4.1 Electrical Characteristics

A. General: The control shall operate at 24VDC. Controller power and communications shall be via a common non-polar communications bus.

B. Wiring:

1. Control wiring shall be installed in a system daisy chain configuration from indoor unit to ME remote controller to indoor unit, to the BC controller (main and subs, if applicable) and to the outdoor unit. Control wiring to remote controllers shall be run from the indoor unit terminal block to the controller associated with that unit.

2. Control wiring for schedule timers, system controllers, and centralized controllers shall be installed in a daisy chain configuration from outdoor unit to outdoor unit, to system controllers, to the power supply.

C. Wiring type: Wiring shall be 2-conductor (16 AWG), twisted shielded pair, stranded wire.

4.2 Mounted sensor

A.Wired controller unit with room temperature sensor.

4.3 EQUIPMENT INSTALLATION

A. All mechanical equipment shall be supported and seismically anchored on leveled, flashed and counterflashed curbs anchored to resist seismic forces and suitable for the roof construction. Minimum curb height shall be 12" above the roof unless indicated otherwise on the Drawings. Flashing into the roof is specified in another Section.

B. Manufacturer's Field Service: Once Control Contractor has installed DDC at each unit engage a factory authorized service representative to inspect field assembled components and equipment installation to include electrical and piping connections. Report results to A/E in writing. Inspection must include a complete startup checklist to include (as a minimum) the Completed Start-Up Checklists as found in manufacturer's IOM. Do not start unit until both factory technician and DDC technician have approved installation.

C. Engage a factory authorized service representative to perform startup service. Start-up shall be scheduled so DDC Contractor is present.

D. Engage a factory authorized service representative to train owner's maintenance personnel to adjust, operate and maintain the entire Package Roof Top unit. Refer to Division 1 Section Closeout Procedures and Demonstration and Training.

END OF SECTION 23 8051