SECTION 15738 - SPLIT-SYSTEM HEAT PUMPS

PART 1 - GENERAL

1.1 SUMMARY

A. SECTION INCLUDES SPLIT-SYSTEM HEAT-PUMP UNITS CONSISTING OF SEPARATE EVAPORATOR-FAN AND COMPRESSOR-CONDENSER COMPONENTS.

1.2 ACTION SUBMITTALS

A. PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED.

1.3 INFORMATIONAL SUBMITTALS

A. WARRANTY: SAMPLE OF SPECIAL WARRANTY.

1.4 CLOSEOUT SUBMITTALS

A. OPERATION AND MAINTENANCE DATA.

1.5 QUALITY ASSURANCE

A. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.

B. ASHRAE COMPLIANCE:

1. FABRICATE AND LABEL REFRIGERATION SYSTEM TO COMPLY WITH ASHRAE 15, "SAFETY STANDARD FOR REFRIGERATION SYSTEMS."
2. ASHRAE COMPLIANCE: APPLICABLE REQUIREMENTS IN ASHRAE 62.1, SECTION 4 - "OUTDOOR AIR QUALITY," SECTION 5 - "SYSTEMS AND EQUIPMENT," SECTION 6 - " PROCEDURES," AND SECTION 7 - "CONSTRUCTION AND SYSTEM START-UP."

C. ASHRAE/IESNA COMPLIANCE: APPLICABLE REQUIREMENTS IN ASHRAE/IESNA 90.1.

1.6 WARRANTY

A. SPECIAL WARRANTY: MANUFACTURER'S STANDARD FORM IN WHICH MANUFACTURER AGREES TO REPAIR OR REPLACE COMPONENTS OF SPLIT-SYSTEM AIR-CONDITIONING UNITS THAT FAIL IN MATERIALS OR WORKMANSHIP WITHIN SPECIFIED WARRANTY PERIOD.

1. WARRANTY PERIOD:

A. FOR COMPRESSOR: FIVE YEAR(S) FROM DATE OF SUBSTANTIAL COMPLETION.
B. FOR PARTS: ONE YEAR(S) FROM DATE OF SUBSTANTIAL COMPLETION.
C. FOR LABOR: ONE YEAR(S) FROM DATE OF SUBSTANTIAL COMPLETION.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. BASIS-OF-DESIGN PRODUCT: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCT INDICATED ON DRAWINGS OR COMPARABLE PRODUCT BY ONE OF THE FOLLOWING:

1. CARRIER CORPORATION; HOME COMFORT AND HVAC BUILDING & INDUSTRIAL SYSTEMS.
2. LENNOX INTERNATIONAL INC.
3. TRANE; A BUSINESS OF AMERICAN STANDARD COMPANIES.
4. YORK; A JOHNSON CONTROLS COMPANY.

2.2 INDOOR UNITS (5 TONS OR LESS)

A. FLOOR-MOUNTED, EVAPORATOR-FAN COMPONENTS:

1. CABINET: ENAMELED STEEL WITH REMOVABLE PANELS ON FRONT AND ENDS IN COLOR SELECTED BY ARCHITECT.

A. INSULATION: FACED, GLASS-FIBER DUCT LINER.
B. DRAIN PANS: STAINLESS STEEL OR PLASTIC, WITH CONNECTION FOR DRAIN; INSULATED.

2. REFRIGERANT COIL: COPPER TUBE, WITH MECHANICALLY BONDED ALUMINUM FINS AND THERMAL-EXPANSION VALVE. COMPLY WITH ARI 210/240.
3. ELECTRIC COIL: HELICAL, NICKEL-CHROME, RESISTANCE-WIRE HEATING ELEMENTS; WITH REFRACTORY CERAMIC SUPPORT BUSHINGS, AUTOMATIC-RESET THERMAL CUTOUT, BUILT-IN MAGNETIC CONTACTORS, MANUAL-RESET THERMAL CUTOUT, AIRFLOW PROVING DEVICE, AND ONE-TIME FUSES IN TERMINAL BOX FOR OVERCURRENT PROTECTION.
4. FAN: DIRECT DRIVE, CENTRIFUGAL.
5. FAN MOTORS:

A. VARIABLE SPEED ECM TYPE.

6. AIR FILTRATION SECTION:

A. GENERAL REQUIREMENTS FOR AIR FILTRATION SECTION:

1) COMPLY WITH NFPA 90A.
2) MINIMUM ARRESTANCE: ACCORDING TO ASHRAE 52.1 AND MERV ACCORDING TO ASHRAE 52.2.
3) FILTER-HOLDING FRAMES: ARRANGED FOR FLAT OR ANGULAR ORIENTATION, WITH ACCESS DOORS ON BOTH SIDES OF UNIT.

FILTERS SHALL BE REMOVABLE FROM ONE SIDE OR LIFTED OUT FROM ACCESS PLENUM.

B. EXTENDED-SURFACE, DISPOSABLE PANEL FILTERS:

1) FACTORY-FABRICATED, DRY, EXTENDED-SURFACE TYPE.
2) THICKNESS: 2 INCHES.

2.3 OUTDOOR UNITS (5 TONS OR LESS)

A. AIR-COOLED, COMPRESSOR-CONDENSER COMPONENTS:

1. CASING: STEEL, FINISHED WITH BAKED ENAMEL, WITH REMOVABLE PANELS FOR ACCESS TO CONTROLS, WEEP HOLES FOR WATER DRAINAGE, AND MOUNTING HOLES IN BASE. PROVIDE BRASS SERVICE VALVES, FITTINGS, AND GAGE PORTS ON EXTERIOR OF CASING. PROVIDE LOUVERED FACE COIL GUARDS.
2. COMPRESSOR: HERMETICALLY SEALED WITH CRANKCASE HEATER AND MOUNTED ON VIBRATION ISOLATION DEVICE. COMPRESSOR MOTOR SHALL HAVE THERMAL- AND CURRENT-SENSITIVE OVERLOAD DEVICES, START CAPACITOR, RELAY, AND CONTACTOR.

A. COMPRESSOR TYPE: SCROLL.
B. VARIABLE SPEED COMPRESSOR MOTOR WITH MANUAL-RESET HIGH-PRESSURE SWITCH AND AUTOMATIC-RESET LOW-PRESSURE SWITCH. DUAL COMPRESSORS MAY BE PROVIDED IN LIEU OF VARIABLE SPEED COMPRESSORS.
C. REFRIGERANT CHARGE: R-410A.
D. REFRIGERANT COIL: COPPER TUBE, WITH MECHANICALLY BONDED ALUMINUM FINS AND LIQUID SUBCOOLER. COMPLY WITH ARI 210/240.

3. HEAT-PUMP COMPONENTS: REVERSING VALVE AND LOW-TEMPERATURE-AIR CUTOFF THERMOSTAT.
4. FAN: ALUMINUM-PROPELLER TYPE, DIRECTLY CONNECTED TO MOTOR.
5. MOTOR: PERMANENTLY LUBRICATED, WITH INTEGRAL THERMAL-OVERLOAD PROTECTION.
6. LOW AMBIENT KIT: PERMITS OPERATION DOWN TO 45 DEG F.
7. MOUNTING BASE: POLYETHYLENE.

2.4 ACCESSORIES

A. CONTROL EQUIPMENT AND SEQUENCE OF OPERATION ARE SPECIFIED IN SECTION 15900 "HVAC INSTRUMENTATION AND CONTROLS" AND SECTION 15940 "SEQUENCE OF OPERATION."

B. AUTOMATIC-RESET TIMER TO PREVENT RAPID CYCLING OF COMPRESSOR.

PART 3 - EXECUTION

3.1 INSTALLATION

A. INSTALL UNITS LEVEL AND PLUMB.

B. INSTALL GROUND-MOUNTED, CONDENSER SECTION SECURED TO CONCRETE PAD WITH FOUR 1/4” STAINLESS STEEL TAP-CON ANCHORS.

C. INSTALL GROUND-MOUNTED, COMPRESSOR-CONDENSER COMPONENTS ON POLYETHYLENE MOUNTING BASE.

D. INSTALL ROOF-MOUNTED, COMPRESSOR-CONDENSER COMPONENTS ON EQUIPMENT SUPPORTS SPECIFIED IN SECTION 07720 "ROOF ACCESSORIES." ANCHOR UNITS TO SUPPORTS WITH REMOVABLE, CADMIUM-PLATED FASTENERS.

3.2 CONNECTIONS

A. PIPING INSTALLATION REQUIREMENTS ARE SPECIFIED IN OTHER SECTIONS. DRAWINGS INDICATE GENERAL ARRANGEMENT OF PIPING, FITTINGS, AND SPECIALTIES.

B. WHERE PIPING IS INSTALLED ADJACENT TO UNIT, ALLOW SPACE FOR SERVICE AND MAINTENANCE OF UNIT.

C. DUCT CONNECTIONS: DUCT INSTALLATION REQUIREMENTS ARE SPECIFIED IN SECTION 15815 "METAL DUCTS." DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF DUCTS. CONNECT SUPPLY AND RETURN DUCTS TO SPLIT-SYSTEM AIR-CONDITIONING UNITS WITH FLEXIBLE DUCT CONNECTORS. FLEXIBLE DUCT CONNECTORS ARE SPECIFIED IN SECTION 15820 "DUCT ACCESSORIES."

3.3 FIELD QUALITY CONTROL

A. PERFORM TESTS AND INSPECTIONS.

B. TESTS AND INSPECTIONS:

1. LEAK TEST: AFTER INSTALLATION, CHARGE SYSTEM AND TEST FOR LEAKS. REPAIR LEAKS AND RETEST UNTIL NO LEAKS EXIST.
2. OPERATIONAL TEST: AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, START UNITS TO CONFIRM PROPER MOTOR ROTATION AND UNIT OPERATION.
3. TEST AND ADJUST CONTROLS AND SAFETIES. REPLACE DAMAGED AND MALFUNCTIONING CONTROLS AND EQUIPMENT.

C. REMOVE AND REPLACE MALFUNCTIONING UNITS AND RETEST AS SPECIFIED ABOVE.

D. PREPARE TEST AND INSPECTION REPORTS.

END OF SECTION 15738