# MECHANICAL SPECIFICATIONS:

## GENERAL

1. CONTRACTOR SHALL VISIT THE SITE TO DETERMINE PRE-EXISTING CONDITIONS AND ALL WORK NECESSARY, PRIOR TO BIDDING. VERIFY ALL MEASUREMENTS AND EXISTING CONDITIONS IN THE FIELD. GENERAL SCHEMATIC LAYOUT IS INDICATED; ALL OFFSETS, OBSTRUCTIONS, AND EXISTING CONFIGURATIONS AND CONSTRAINTS MUST BE FIELD VERIFIED.
2. OBTAIN NECESSARY PERMITS AND PAY ASSOCIATED FEES.
3. COORDINATE ANY SERVICE DISRUPTIONS WITH THE OWNER.
4. INSTALL ALL COMPONENTS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND ALL LOCAL CODES AND STANDARDS.
5. DRAWINGS ARE DIAGRAMMATIC ONLY; FIELD-VERIFY ALL EXISTING CONDITIONS. COORDINATE INSTALLATIONS WITH OTHER TRADES. COORDINATE ELECTRICAL POWER REQUIREMENTS FOR ALL MOTORS.
6. THE INTENTION OF THESE CONTRACT DOCUMENTS IS TO CALL FOR FINISHED WORK, FULLY TESTED AND READY FOR OPERATION. ANY COMPONENTS OR LABOR NOT MENTIONED IN THE CONTRACT DOCUMENTS BUT REQUIRED FOR FUNCTIONING SYSTEMS SHALL BE PROVIDED. SHOULD THERE APPEAR TO BE ANY DISCREPANCIES OR QUESTIONS OF INTENT, THE CONTRACTOR SHALL REFER THE MATTER TO THE ARCHITECT FOR DECISION BEFORE START OF ANY RELATED WORK.
7. PERFORM WORK IN ACCORDANCE WITH LOCAL CODES.
8. SEAL ALL DUCT AND PIPE PENETRATIONS WITH FIRE SEALANT.
9. OBSERVE THE OWNER'S CLEANLINESS PROTOCOLS.

## FIRE PROTECTION

1. OBTAIN ALL REQUIRED PERMITS AND APPROVALS FOR THE WORK. PERFORM ALL DESIGN, COORDINATION, INSTALLATION AND TESTING TO YIELD COMPLETE AND OPERATIONAL FIRE SPRINKLER SYSTEMS.
2. GENERATE AND SUBMIT SHOP DRAWINGS, (PLANS AND DETAILS) AND HYDRAULIC CALCULATIONS FOR REVIEW BY SMRT, THE OWNER, AND AUTHORITIES HAVING JURISDICTION. SUBMIT PROPOSED PRODUCT DATA ALONG WITH SHOP DRAWINGS FOR APPROVAL PRIOR TO COMMENCING WITH THE WORK.
3. DESIGNS, (DRAWINGS AND CALCULATIONS) TO BE STAMPED AND SIGNED BY A REGISTERED FIRE PROTECTION ENGINEER, (ME REGISTRATION).
4. SUBMIT RECORD DRAWINGS, CALCULATIONS, PRODUCT DATA AND MAINTENANCE DATA FOR THE WORK ONCE COMPLETE.
5. DESIGNS AND INSTALLATIONS SHALL COMPLY WITH THE 2006 INTERNATIONAL BUILDING CODE AND NFPA 13.
6. PERFORM A HYDRANT FLOW TEST TO SERVE AS THE BASIS FOR HYDRAULICALLY CALCULATED SYSTEM DESIGNS.
7. 2-INCH AND SMALLER PIPING TO BE SCHEDULE 40 STEEL WITH THREADED FITTINGS. 2-1/2-INCH AND LARGER PIPING TO BE SCHEDULE 10 STEEL WITH ROLLED GROOVE FITTINGS.
8. PROVIDE NEW SPRINKLER COVERAGE PER NFPA 13, LIGHT HAZARD OCCUPANCY. PROVIDE PIPED ARM-OVERS TO DROPS IN THE NEW CEILING.
9. NEW SPRINKLER HEADS TO BE RECESSED, QUICK RESPONSE TYPE WITH WHITE FINISH.
10. ALL SYSTEMS, TAMPER SWITCHES AND FLOW SWITCHS TO BE SUPERVISED BY THE EXISTING FACILITY FIRE ALARM SYSTEM. COORDINATE WITH ELECTRICAL CONTRACTOR.
12. INSTALLATIONS SHALL BE SEISMICALLY BRACED PER NFPA 13 AND THE INTERNATIONAL BUILDING CODE.
13. SYSTEM IMPAIRMENTS SHALL BE LIMITED TO FOUR HOURS OR LESS. BEFORE SHUTTING OFF A SECTION OF THE SPRINKLER SYSTEM TO MAKE SPRINKLER TIE-INS, NOTIFY THE LOCAL FIRE DEPARTMENT, PLAN THE WORK CAREFULLY, AND ASSEMBLE ALL MATERIALS TO ENABLE COMPLETION IN THE SHORTEST TIME POSSIBLE. WORK STARTED ON CONNECTIONS SHOULD BE COMPLETED WITHOUT INTERRUPTION AND PROTECTION RESTORED AS PROMPTLY AS POSSIBLE.
DURING THE IMPAIRMENT, PROVIDE EMERGENCY HOSE EXTINGUISHERS AND MAINTAIN EXTRA WATCH SERVICE IN THE AFFECTED AREAS.
14. THE EXISTING PREACTION SYSTEM VALVE AND RISER SHALL BE REMOVED. THE PIPE SERVING ANGIO ROOM B445 SHALL BE RECONNECTED TO THE WET PIPE SPRINKLER SYSTEM.

## METAL DUCTWORK

1. GALVANIZED STEEL DUCTWORK: ASTM A653 GALVANIZED STEEL SHEET, LOCK-FORMING QUALITY, AND G90 ZINC COATING. ALL DUCTWORK SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH SMACNA STANDARDS. CONSTRUCT DUCT SYSTEMS SO THAT LEAKAGE DOES NOT EXCEED ONE PERCENT OF THE TOTAL AIR QUANTITIES. SEAL ALL DUCT JOINTS WITH GASKETED CONNECTIONS, DUCTMATE, OR EQUAL.
2. PROVIDE VOLUME DAMPERS AT ALL BRANCH DUCTS.

## MECHANICAL INSULATION

1. ALL SUPPLY DUCTS SHALL BE EXTERNALLY INSULATED WITH FIBERGLASS DUCT WRAP EQUAL TO SCHULLER MICROLITE TYPE 75, ASTM C533, NONCOMBUSTIBLE BLANKET, 1-½" THICK.
2. ALL CHILLED WATER PIPING SHALL BE INSULATED WITH 1" THICK FIBERGLASS PIPE INSULATION WITH FSK JACKET AND VAPOR BARRIER.
3. ALL HOT WATER PIPING SHALL BE INSULATED WITH 1" THICK FIBERGLASS PIPE INSULATION WITH FSK JACKET.
4. ALL COOLING COIL CONDENSATE PIPING SHALL BE INSULATED WITH 1/2" FIBERGLASS INSULATION WITH FSK JACKET.

## PLUMBING FIXTURES

1. FIXTURES TO BE COMMERCIAL GRADE, LOW CONSUMPTION, AND ADA COMPLIANT WHERE INDICATED ON THE PLANS AND WHERE REQUIRED BY CODE.
2. PROVIDE ALL FIXTURES WITH STOP VALVES AND SUPPLIES AND FIXTURE TRAPS AS REQUIRED.
3. REFER TO ARCHITECTURAL DOCUMENTS FOR EXACT LOCATIONS AND MOUNTING HEIGHTS OF ALL PLUMBING FIXTURES.

## PLUMBING EQUIPMENT AND SPECIALTIES

1. CLEANOUTS SHALL BE COMMERCIAL GRADE BRASS. APPROVED MANUFACTURERS INCLUDE ZURN, WADE, J.R. SMITH, JOSAM, OR APPROVED EQUAL.
3. TRAP PRIME ALL FUNNEL DRAIN TRAPS REQUIRED FOR INDIRECT WASTE USING PRESSURE DIFFERENTIAL OR SIMILAR TYPE VALVES.
4. SHOCK ABSORBERS AND AIR CHAMBERS: PROVIDE WATER HAMMER ARRESTORS ON WATER SUPPLIES TO QUICK CLOSING SOLENOID VALVES. WHERE NOT PROVIDED, CONNECT TO FIXTURES USING AIR CHAMBERS.
5. PROVIDE ACCESS AND ACCESS PANELS TO PROVIDE ACCESSIBLE EQUIPMENT AND SPECIALTIES. WHERE NECESSARY, PROVIDE METAL UNITS WITH LOCKS. CONFIGURATION AND TRIM AS REQUIRED BY FINISH WALL SURFACE. APPROVED MANUFACTURERS INCLUDE KARP, MILCOR, NYSTROM, OR APPROVED EQUAL.

## PLUMBING PIPING

1. PROVIDE ALL PIPING COMPLETE WITH FITTINGS, VALVES, STRAINERS, MOTORIZED VALVE OPERATORS, STRAINERS, HANGERS, SUPPORTS, GUIDES, SLEEVES, AND ACCESSORIES.
2. ALL PRESSURIZED PIPING TO BE TESTED HYDROSTATICALLY TO 150 PSI OR 150% OF OPERATING PRESSURE, WHICHEVER IS GREATER, BUT NEVER EXCEED TEST PRESSURE ANSI B16.1 BASIS. TEST DURATION TO BE 2 HOURS WITH NO PRESSURE CHANGE CORRECTED FOR TEMPERATURE CHANGE.
3. DRAINAGE AND VENT PIPING SHALL BE TESTED. CAP ALL OUTLETS AND FILL PIPING SYSTEM TO OVERFLOWING FROM A POINT AT LEAST 10 FT ABOVE THE FLOOR. WATER LEVEL SHALL REMAIN CONSTANT THROUGHOUT A 2 HOUR TEST DURATION.
4. REPAIR OR REPLACE LEAKS OR DEFECTS WITHOUT ADDITIONAL COST.
5. PROVIDE DIELECTRIC FITTINGS WHERE DISSIMILAR METALS ARE TO BE JOINED.
6. PROVIDE ADEQUATE SUPPORT FOR PIPE AND CONTENTS TO PREVENT SAGGING, VIBRATION, OR SWAYING AND ALLOW FOR EXPANSION AND CONTRACTION. PROVIDE SUPPLEMENTAL STEEL AS REQUIRED WHERE STRUCTURE CANNOT SUPPORT POINT LOADS.
7. ALL EXPOSED PIPING PASSING THROUGH WALLS, FLOORS, CEILINGS, AND PARTITIONS SHALL BE PROVIDED WITH CHROME PLATED CAST BRASS ESCUTCHEONS HELD IN PLACE WITH SET SCREWS.
8. PROVIDE CONTINUOUS 1" FIBERGLASS INSULATION FOR ALL DOMESTIC HW PIPING. PROVIDE CONTINUOUS 1/2" FIBER-GLASS INSULATION FOR ALL DOMESTIC CW AND CD PIPING.
9. ALL INSULATION SHALL HAVE COMPOSITE FIRE AND SMOKE HAZARD RATINGS THAT SHALL NOT EXCEED A FLAME SPREAD OF 25 AND A SMOKE DEVELOPED RATING OF 50.
10. ABOVE GRADE SANITARY DRAINAGE AND VENT PIPING: HUBLESS CAST IRON SOIL PIPE AND FITTINGS WITH ANCON FOUNDRY HUSKY SERIES 4000 EXTRA WIDE HEAVY DUTY GASKETED HUBLESS COUPLINGS.
11. DOMESTIC CW AND HW PIPING SHALL BE COPPER, TYPE L, HARD DRAWN IN ACCORDANCE WITH ASTM B88, AND LEAD-FREE SOLDER JOINTS.
12. INSPECTIONS AND TESTS SHALL BE PERFORMED ON THE PIPING INSTALLATION AS REQUIRED BY CODE.
13. PITCH SANITARY DRAINAGE PIPING AT 1/4" PER FT. PITCH DOMESTIC CW, HW, AND VENT PIPING TOWARDS SOURCE.

## MEDICAL GAS AND VACUUM PIPING

1. PROVIDE ALL PIPING COMPLETE WITH FITTINGS, VALVES, HANGERS, SUPPORTS, GUIDES, SLEEVES, AND ACCESSORIES.
2. INSTALL ALL MEDICAL GAS PIPING TO NFPA 99, LEVEL 1 REQUIREMENTS.
3. PROVIDE DISS MEDICAL GAS OUTLETS AND ZONE VALVE BOX AS SHOWN ON THE DRAWINGS. ACCEPTABLE MANUFACTURERS ARE: AMICO, ALLIED, BEACON MEDAES, OR ENGINEER APPROVED EQUAL.
4. MEDICAL AIR AND OXYGEN PIPING SHALL BE TYPE "L" COPPER, CLEANED AND SEALED FOR OXYGEN SERVICE. MEDICAL VACUUM PIPING SHALL BE TYPE "L" COPPER.
5. ALL JOINTS SHALL BE BRAZED. BRAZING FILLER METALS SHALL BE AWS A5.8, BCUP SERIES ALLOYS. FLUX IS PROHIBITED UNLESS USED WITH BRONZE FITTINGS.
6. VALVES SHALL BE FACTORY CLEANED FOR OXYGEN SERVICE, EXCEPT FOR VALVES IN VACUUM PIPING.
7. ZONE VALVES: MSS SP-110, 3-PIECE-BODY, FULL-PORT COPPER-ALLOY BALL VALVE RATED FOR 300-PSIG MINIMUM WORKING PRESSURE; WITH CHROME-PLATED BRASS BALL, PTFE OR TFE SEATS, BLOWOUT-PROOF STEM, THREADED OR SOLDER-JOINT ENDS, AND HANDLE DESIGNED FOR QUARTER TURN BETWEEN OPENED AND CLOSED POSITIONS.
   A. INCLUDE UNION-TYPE BODY WITH BOLTED SWING-AWAY CENTER SECTION.
   B. INCLUDE FACTORY-INSTALLED ASTM B 819, TYPE K OR L, COPPER-TUBE EXTENSIONS WITH PRESSURE GAGE FOR PRESSURE SYSTEMS AND VACUUM GAGE FOR VACUUM SYSTEMS.

B. ZONE VALVE BOXES: FORMED STEEL FOR RECESSED MOUNTING, WITH HOLES FOR MEDICAL GAS PIPING AND ANCHORS. INCLUDE BOXES FOR SINGLE- OR MULTIPLE-VALVE INSTALLATION WITH PRESSURE GAGE AND IN SIZES TO PERMIT MANUAL OPERATION OF VALVES.
   A. INTERIOR FINISH: FACTORY-APPLIED WHITE ENAMEL.
   B. COVER PLATE: ANODIZED ALUMINUM WITH FRANGIBLE OR REMOVABLE WINDOWS.
   C. VALVE-BOX WINDOWS: CLEAR OR TINTED TRANSPARENT PLASTIC WITH LABELING THAT INCLUDES ROOMS SERVED, ACCORDING TO NFPA 99.

9. INTERRUPTION OF EXISTING MEDICAL GAS SERVICE:
   A. CONTRACTOR SHALL NOT INTERRUPT MEDICAL GAS SERVICE TO OCCUPIED FACILITIES. UNDER NO CONDITIONS SHALL MEDICAL GAS SERVICE VALVES (EXISTING OR NEW) BE CLOSED BY THE CONTRACTOR.
   B. OWNER SHALL BE RESPONSIBLE FOR ISOLATING PORTIONS OF EXISTING SYSTEMS AND CLOSING SERVICE VALVES AS REQUIRED; INCLUDING VERIFYING PROPER SERVICE VALVE OR ZONE VALVE LABELING, AND EXACT AREAS AND ROOMS CONTROLLED.
10. MEDICAL GAS SYSTEM ISOLATION:
   A. TOTAL ISOLATION BETWEEN NEW SYSTEMS AND EXISTING SYSTEMS SHALL BE MAINTAINED UNTIL ALL NEW PIPING IS TESTED FOR LEAKS AND TESTED FOR CROSS CONNECTIONS PER NFPA 99 BY THE CONTRACTOR.
11. ALL MEDICAL GAS AND VACUUM PIPING SHALL BE TESTED AND CERTIFIED AS REQUIRED IN NFPA 99.

## TERMINAL BOXES

1. PROVIDE AND INSTALL TERMINAL BOXES WITH HOT WATER REHEAT COILS AS SCHEDULED.
2. TERMINAL BOXES SHALL BE DOUBLE WALLED, WITH SOLID SHEET METAL INTERIOR LINER COVERING ALL INSULATION.
3. BASIS OF DESIGN: TRANE MODEL VCWF.

## INSTRUMENTATION AND CONTROLS

1. PROVIDE NEW DDC CONTROLS FOR THE CHILLER (CHILL-13), AHU (AHU-47), AND NEW VAV BOXES.
2. SEQUENCE OF OPERATION: REFER TO M-650 SERIES DRAWINGS.

## HUMIDIFIER

1. GENERAL:
   A. PROVIDE AND INSTALL HUMIDIFIER AS SCHEDULED.
   B. BASIS OF DESIGN: ARMSTRONG 9000 SERIES, SIZE 93.
2. UNIT
   A. MAXIMUM ALLOWABLE ABSORPTION DISTANCE IS 18 INCHES.
   B. MAINTAIN MINIMUM SPACE HUMIDITY AT 35%.
   C. HUMIDIFIER SHALL BE FACTORY INSTALLED IN THE AHU.

## UVC GERMICIDAL LIGHTS

1. GENERAL:
   A. PROVIDE AND INSTALL UVC LIGHTS AS SCHEDULED.
   B. BASIS OF DESIGN: STERIL-AIRE DE SERIES.
2. UNIT
   A. SEE DIV. 26 DRAWINGS FOR 115V POWER SUPPLY.
   B. FIELD INSTALL 8 INCHES DOWNSTREAM OF AHU-47 COOLING COIL.

## HYDRONIC PIPING

1. PROVIDE ALL PIPING COMPLETE WITH FITTINGS, VALVES, STRAINERS, MOTORIZED VALVE OPERATORS, STRAINERS, HANGERS, SUPPORTS, GUIDES, SLEEVES, AND ACCESSORIES.
2. ALL PRESSURIZED PIPING TO BE TESTED HYDROSTATICALLY TO 150 PSI OR 150% OF OPERATING PRESSURE, WHICHEVER IS GREATER, BUT NEVER EXCEED TEST PRESSURE ANSI B16.1 BASIS. TEST DURATION TO BE 2 HOURS WITH NO PRESSURE CHANGE CORRECTED FOR TEMPERATURE CHANGE.
3. REPAIR OR REPLACE LEAKS OR DEFECTS WITHOUT ADDITIONAL COST.
4. PROVIDE DIELECTRIC NIPPLES WHERE DISSIMILAR METALS ARE TO BE JOINED. DIELECTRIC UNIONS ARE NOT ACCEPTABLE.
5. PROVIDE ADEQUATE SUPPORT FOR PIPE AND CONTENTS TO PREVENT SAGGING, VIBRATION, OR SWAYING AND ALLOW FOR EXPANSION AND CONTRACTION. PROVIDE SUPPLEMENTAL STEEL AS REQUIRED WHERE STRUCTURE CANNOT SUPPORT POINT LOADS.
6. ALL INSULATION SHALL HAVE COMPOSITE FIRE AND SMOKE HAZARD RATINGS THAT SHALL NOT EXCEED A FLAME SPREAD OF 25 AND A SMOKE DEVELOPED RATING OF 50.
7. HYDRONIC PIPING SHALL BE COPPER, TYPE L, HARD DRAWN IN ACCORDANCE WITH ASTM B88, AND LEAD-FREE SOLDER JOINTS, OR THREADED STEEL.
8. INSPECTIONS AND TESTS SHALL BE PERFORMED ON THE PIPING INSTALLATION AS REQUIRED BY CODE.

## TESTING, ADJUSTING, AND BALANCING

1. TESTING AND BALANCING CONTRACT SHALL BE THROUGH THE GENERAL CONTRACTOR. SEE ARCHITECTURAL SPECIFICATIONS.
2. CONTRACTOR SHALL PROVIDE TESTING, ADJUSTING, AND BALANCING FOR ALL AIR SYSTEMS AND HYDRONIC SYSTEMS.
3. THE HOT LAB SHALL BE ADJUSTED TO 0.02" W.C. NEGATIVE PRESSURE IN RELATION TO THE CORRIDOR OUTSIDE THE ROOM.
4. ADJUST ALL AIRFLOWS TO PLUS/MINUS 5% OF VALUES SHOWN ON THE DRAWINGS.
5. TAB CONTRACTOR SHALL CONFIRM THAT ALL EQUIPMENT IS INSTALLED CORRECTLY AND STARTED UP CORRECTLY PRIOR TO BALANCING.
6. TAB CONTRACTOR SHALL CONFIRM THAT CONTROLS AND TERMINAL BOXES ARE CALIBRATED PRIOR TO BALANCING.
7. TAB CONTRACTOR SHALL SUBMIT A TAB REPORT AT THE COMPLETION OF WORK.

## MECHANICAL IDENTIFICATION

1. PROVIDE PIPE LABELS ON ALL PIPING. ALL MEDICAL GAS PIPING SHALL BE LABELED AS REQUIRED BY NFPA 99.
2. PROVIDE A TAG WITH "AHU-47" ON THE AIR HANDLING UNIT AND CHILL-13 ON THE CHILLER.
3. PROVIDE DUCT LABELS ON ALL SUPPLY, RETURN, AND EXHAUST DUCTWORK.
4. PROVIDE VALVE TAGS ON ALL VALVES. PROVIDE A VALVE TAG SCHEDULE.

## CUSTOM AIR HANDLING UNIT

1. GENERAL
   A. PROVIDE AND INSTALL A CUSTOM INDOOR AHU AS SCHEDULED.
   A. AHU BASIS OF DESIGN IS TRANE.
   B. UNIT SECTIONS SHALL BE SHIPPED BROKEN DOWN ACCORDING TO JOBSITE REQUIREMENTS.
   C. UNIT SECTIONS SHALL BE FACTORY SHRINK-WRAPPED PRIOR TO SHIPMENT.
2. UNIT CONSTRUCTION
   A. UNIT SHALL BE UL LISTED AS MANUFACTURED BY THE FACTORY.
   B. UNIT WALLS SHALL BE SOLID 2" DOUBLE WALL FOAM-INJECTED CONSTRUCTION. PANEL INSULATION SYSTEM SHALL PROVIDE A MINIMUM R-VALUE OF 12.5. INSULATION SHALL CONFORM TO NFPA 90A REQUIREMENTS.
   C. CASING SHALL BE SUPPORTED SUCH THAT THE MAXIMUM ALLOWABLE AIR LEAKAGE DOES NOT EXCEED 1% OF THE UNIT AIRFLOW. PANEL DEFLECTION SHALL NOT EXCEED L/200 OF A UNIT PER UNIT SPAN AT +/- 10" W.G. INTERNAL STATIC PRESSURE.
   D. INTERIOR AND EXTERIOR WALL PANELS SHALL BE CLEAR-COATED GALVANIZED STEEL.
   E. FLOOR SHALL BE A RIGID AND WATERTIGHT WALKING SURFACE. PROVIDE 1" DAMS AROUND FLOOR OPENINGS. THE WALKING SURFACE OF THE FLOOR IS CONSTRUCTED FROM 16 GAUGE CLEAR-COATED GALVANIZED STEEL CROSS MEMBERS. STRUCTURAL FRAMEWORK SHALL FULLY SUPPORT THE UNIT CASING AND ALL COMPONENTS SUCH THAT NO SECTION DEFLECTS MORE THAN 1/1000 DURING RIGGING OF THAT SECTION, WHERE L IS DEFINED AS THE DISTANCE BETWEEN LIFTING LUGS.
   F. INTERIOR AND EXTERIOR ROOF PANELS SHALL BE CLEAR-COATED GALVANIZED STEEL.
   G. DOORS SHALL BE SEALED WITH A SANTOPRENE BULB TYPE GASKET AROUND THE ENTIRE PERIMETER AND SHALL BE INSTALLED IN AN ALUMINUM EXTRUDED FRAME.
   H. INTERIOR AND EXTERIOR DOOR PANELS SHALL BE 18-GAGE CLEAR COATED GALVANIZED STEEL WITH A TRUE MECHANICAL THERMAL BREAK. FAN ACCESS DOORS SHALL BE TOOLED.
3. FACTORY-MOUNTED CONTROLS
   A. PROVIDE AIRFLOW MONITORING STATIONS ON THE OUTSIDE AIR INTAKE, SUPPLY FAN, AND RETURN FAN.
   B. PROVIDE FACTORY-MOUNTED FREEZESTAT ON THE STEAM COIL.
   C. PROVIDE VFD'S WITH MANUAL BYPASS SECTIONS FOR FIELD MOUNTING ON THE SA FAN AND RA FAN.

## MODULAR AIR-COOLED CHILLER

1. GENERAL
A. PROVIDE AND INSTALL A MODULAR AIR-COOLED CHILLER AS SCHEDULED.
B. AHU BASIS OF DESIGN IS MULTISTACK.
C. UNIT SECTIONS SHALL BE SHIPPED BROKEN DOWN ACCORDING TO JOBSITE REQUIREMENTS.
D. UNIT SECTIONS SHALL BE FACTORY SHRINK-WRAPPED PRIOR TO SHIPMENT.
E. UNIT SHALL BE ETL LISTED IN ACCORDANCE WITH UL STANDARD 1995, AND BEAR THE ASME UM STAMP ON ALL WATER TO REFRIGERANT HEAT EXCHANGERS.
F. MODULES SHALL BE SHIPPED WIRED AND CHARGED WITH REFRIGERANT.
G. ALL MODULES SHALL BE FACTORY RUN-TESTED PRIOR TO SHIPMENT.

2. UNIT CONSTRUCTION
A. EVAPORATORS: EACH EVAPORATOR SHALL BE A BRAZED-PLATE HEAT EXCHANGER CONSTRUCTED OF 316 STAINLESS STEEL, AND BE DESIGNED, TESTED AND STAMPED IN ACCORDANCE WITH ASME CODE FOR 360 PSIG WATER-SIDE WORKING PRESSURE.
   B. COMPRESSORS: EACH MODULE SHALL CONTAIN HERMETIC SCROLL COMPRESSOR(S) MOUNTED TO THE MODULE WITH RUBBER-IN-SHEAR ISOLATORS. EACH SYSTEM SHALL ALSO INCLUDE HIGH DISCHARGE PRESSURE AND LOW SUCTION PRESSURE SAFETY CUT-OUTS.
C. CONDENSER COILS: AIR-COOLED CONDENSER COILS SHALL HAVE ALUMINUM FINS MECHANICALLY BONDED TO COPPER TUBING. CONDENSERS SHALL HAVE INTEGRAL SUBCOOLING CIRCUITRY AND BE FACTORY LEAK-TESTED.
D. CONDENSER FANS: EACH MODULE SHALL CONTAIN DUAL CONDENSER FANS FOR EACH REFRIGERANT CIRCUIT. THESE FANS SHALL BE MULTI-BLADE VANE-AXIAL TYPE, MADE OF PLASTIC COMPOSITE MATERIAL FOR QUIET OPERATION. FANS SHALL BE DIRECT-DRIVEN AT A MAXIMUM RPM OF 1,150. ALL FAN MOTORS SHALL BE PRESSURE CONTROLLED AND SUITABLE FOR OUTDOOR USE.

3. CENTRAL CONTROL SYSTEM
A. SCHEDULING OF THE VARIOUS COMPRESSORS SHALL BE PERFORMED BY A MICROPROCESSOR-BASED CONTROL SYSTEM.

4. ACCESSORIES
A. PROVIDE OPTIONAL LOW AMBIENT CONTROL FOR OPERATION DOWN TO -20F.
B. PROVIDE OPTIONAL SINGLE POINT POWER CONNECTION WITH FACTORY MOUNTED DISCONNECT.
C. PROVIDE OPTIONAL PUMP MODULE WITH PUMPS SCHEDULED IN THE PUMP SCHEDULE.


144 Fore Street/P.O. Box 618
Portland, Maine 04104
tel. (207) 772-3846
fax. (207) 772-1670
www.smrtinc.com

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