

H . V . A . C . S P E C I F I C A T I O N S :

- H. FINISH:
- 1) TYPE F-1: FITTING COVER, MOLDED WHITE PVC JACKET, UL CLASS 1, MAXIMUM PERMEANCE 0.05 SIMILAR TO MANVILLE ZESTRON.
 - 2) TYPE F-2: WHITE VAPOR BARRIER COATING WITH 10X10 OR 20X20 MESH WHITE GLASS, POLYESTER OR NYLON CLOTH REINFORCING MEMBRANE, MINIMUM 31 MIL DRY FILM THICKNESS, SIMILAR TO FOSTER TITE-FIT, UL LABEL.
 - 3) TYPE F-4: ALUMINUM JACKETING WITH MINIMUM 0.016 IN. WALL THICKNESS AND LONGITUDINAL JOINTS WITH LOCK SEAMS.
 - 4) TYPE F-6: ALL PURPOSE JACKET WITH LONGITUDINAL TAPE STRIPPING TO PROTECT INSULATION, SIMILAR TO JOHNS MANVILLE APJ.
12. PIPING - GENERAL REQUIREMENTS
- A. COMPLETE WITH: PIPE, FITTINGS, VALVES, STRAINERS, MOTORIZED VALVE OPERATORS, STRAINERS, HANGERS, SUPPORTS, GUIDE, SLEEVES, AND ACCESSORIES. ALL WATER AND STEAM PIPING TO BE MINIMUM 3/4".
- B. ALL ITEMS SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITIONS OF THE FOLLOWING CODES AND STANDARDS:
- 1) AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME).
 - 2) AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM).
 - 3) AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI).
 - 4) MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTING INDUSTRY (MSS).
- C. ALL PRESSURIZED PIPING TO BE TESTED HYDROSTATICALLY TO 300 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. REPAIR OR REPLACE LEAKS OR DEFECTS WITHOUT ADDITIONAL COST.
- D. PROVIDE DIELECTRIC FITTINGS WHERE DISSIMILAR METALS ARE TO BE JOINED.
- E. PIPE SUPPORTS:
- 1) 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.
 - 2) HORIZONTAL PIPING TO BE SUPPORTED BY FORGED STEEL ADJUSTABLE GLEYSIS TYPE HANGER. MAXIMUM SPACING AS FOLLOWS:
 - a. STEEL 1 IN. AND SMALLER: 7 FT.
 - b. STEEL 1-1/4 IN. AND LARGER: 10 FT.
 - c. COPPER 3 IN. AND SMALLER: 7 FT.
 - d. ADDITIONAL SUPPORTS AT CHANGES IN DIRECTION, RUNOUTS, AND CONCENTRATED LOADS DUE TO VALVES, ETC.
 - 3) VERTICAL PIPING:
 - a. BASE ELBOW SUPPORT WITH BEARING PLATE ON STRUCTURAL SUPPORT.
 - b. GUIDES AT EVERY SECOND FLOOR (SPACING NOT TO EXCEED 25 FT).
 - c. TOP SUPPORT HANGER OR SADDLE IN HORIZONTAL CONNECTION WITH PROVISIONS FOR EXPANSION.
 - d. INTERMEDIATE STEEL RISER CLAMP SUPPORT BOLTED AND WELDED TO PIPE BEARING ON STRUCTURAL STEEL OR BEARING PLATE AT FLOOR.
- F. PIPING, VALVES AND FITTINGS TO BE INSULATED:
- 1) LOW TEMPERATURE PIPING SYSTEMS - 40 TO 100 DEG F INCLUDING:
 - a. CHILLED WATER SUPPLY AND RETURN.
 - b. HOT WATER SUPPLY AND RETURN.
 - c. CONDENSATE DRAIN PIPING.
 - 2) LOW TEMPERATURE HOT PIPING SYSTEMS - 100 TO 250 DEG F INCLUDING:
 - a. HEATING HOT WATER SUPPLY AND RETURN.
- G. INSTALLATION:
- 1) BEFORE APPLYING INSULATION ALL PRESSURE AND LEAK TESTS SHALL BE COMPLETED AND APPROVED.
 - 2) ALL INSULATION SHALL BE BUTTED FIRMLY TOGETHER. PROVIDE 2 IN. LAMP STRIPS AT ALL SEAMS SECURED WITH ADHESIVE. USE VAPOR BARRIER TAPE AND VAPORSEAL ADHESIVE WHERE REQUIRED. STAPLES NOT PERMITTED. REFRIGERANT PIPING INSULATION SHALL HAVE MITERED FITTINGS.
 - 3) ALL INSULATION AND VAPOR BARRIERS SHALL BE CONTINUOUS PASSING THROUGH SLEEVES, HANGERS, ETC., OR OTHER OPENINGS. PROVIDE SADDLES OR SHIELDS FOR PROTECTION.
 - 4) INSULATION FOR STRAINERS OR OTHER FITTINGS OR ACCESSORIES REQUIRING SERVICING OR INSPECTION SHALL HAVE INSULATION REMOVABLE AND REPLACEABLE WITHOUT DAMAGE.
13. LOW TEMPERATURE WATER SYSTEMS, -20 TO 200 DEG F OPERATING TEMPERATURES.
- A. PIPE: STEEL IN ACCORDANCE WITH ASTM A53 OR A120, WITH SCHEDULE 40 WALL THICKNESSES TO 10 IN.
- 1) RUNOUTS TO EQUIPMENT AND COILS: COPPER, TYPE L, HARD DRAWN IN ACCORDANCE WITH ASTM B88.
- B. FITTINGS:
- 1) 2 IN. AND SMALLER: 300 CWP CAST IRON THREADED FITTINGS SHALL BE IN ACCORDANCE WITH ANSI B16.4. CAST IRON FLANGED FITTINGS SHALL BE IN ACCORDANCE WITH ANSI B16.1.
 - 2) 2-1/2 IN. AND LARGER WELDED: BUTT WELD FITTINGS SAME WEIGHT AS PIPING AND IN ACCORDANCE WITH ANSI B16.4.
 - 3) COPPER: WROUGHT COPPER, SOLDERED, 95/5TA, ANSI B16.22.
- C. VALVES:
- 1) PROVIDE BALL VALVES FOR PIPING 4 IN. AND SMALLER.
 - a. 4 IN. AND SMALLER BALL VALVES TO SHALL BE PROVIDED WITH STAINLESS STEEL BALL, STEM AND SEAT RING, THE BUSHING AND SEAT RING GASKET. BALL VALVES INSTALLED IN COPPER SYSTEMS SHALL HAVE BRONZE BODIES. BALL VALVES SHALL BE RATED FOR A MINIMUM OF 275 PSI AT 100 DEGREES F. BALL VALVES USED FOR THROTTLING (1" AND SMALLER) SHALL BE PROVIDED WITH A LOCKING BALANCING STOP.
 - 2) GATE VALVES:
 - a. 4-1/2 IN. AND LARGER: IRON BODY, BRONZE MOUNTED, SOLID WEDGE OS&Y RISING SPINDLE FLANGED. 125 LB MSP. JENKINS FIG. 651-C.
 - 2) GLOBE VALVES:
 - a. 4-1/2 IN. AND LARGER: REGRIND-RENEW, IRON BODY, LEVEL BRONZE DISC AND SEAT RING OS&Y FLANGED, 125 LB MSP JENKINS FIG. 613-C.
 - 3) SILENT CHECK VALVES, SPRING LOADED, GLOBE TYPE, FLANGED: TO 300 PSIG CHECK VALVES SHALL BE IRON BODY, BRONZE TRIM. SIMILAR TO MUESSCO TYPE 103AP OR 107-AP.
 - 4) LUBRICATED PLUG VALVES:
 - a. SCREWED ENDS UP TO 2 IN., FLANGED 2-1/2 IN. AND LARGER.
 - b. SYSTEM LESS THAN 100 PSIG, VALVE SHALL BE MINIMUM 200 LB WOG CLASS CAST IRON BODY. ROCKWELL-NORDSTROM NUMBERS 114, 115, 105 AND 149.
 - 5) Y-TYPE STRAINERS:
 - a. PROVIDE SCREWED ENDS TO 2 IN. AND FLANGED 2-1/2 IN. AND LARGE WITH BODY AS FOLLOWS: TO 300 CWP CLASS, CAST IRON.
 - b. SCREENS TO BE 316 STAINLESS STEEL.
 - c. PROVIDE SCREWED WITH FACED CAP, STRAIGHT THREAD AND GASKET, SIMILAR TO MUELLER STEAM SPECIALTY MUESSCO NO. 11. PROVIDE FLANGED WITH BOLTED COVER SIMILAR TO MUELLER STEAM SPECIALTY MUESSCO NO. 751 OR NO. 752.
- D. PROVIDE 1/2 IN. DRAIN VALVE WITH CAPPED HOSE CONNECTION AT ALL LOW POINTS. PROVIDE 3/4 IN. GATE VALVE TO DRAIN SYSTEMS IN EQUIPMENT ROOMS.
- E. PROVIDE MANUAL AIR VENTS LINE SIZE AIR CHAMBER WITH 1/2 IN. GLOBE VALVE AT ALL HIGH POINTS AND WHERE FLOW DIRECTION CHANGES FROM HORIZONTAL TO DOWNWARD.
- F. PITCH WATER PIPING EXCEPT AS NOTED:
- 1) UP TO 1 IN.: 1 IN. IN 40 FT.
 - 2) 1-1/2 IN. AND LARGER: 1 IN. IN 100 FT.
14. EQUIPMENT
- 1) BOILER:
- 1) General:
 - a. CONTRACTOR SHALL SUPPLY AND INSTALL PUMP-MOUNTED BOILER MODEL NUMBER, SIZE, INPUT, OUTPUT OPERATING WEIGHTS AND QUANTITIES AS SHOWN IN THE SCHEDULE ON THE MECHANICAL PLAN.
 - b. THE UNIT SHALL BE DESIGN CERTIFIED TO COMPLY WITH THE CURRENT EDITION OF THE HARMONIZED ANSI Z21.10.3 / CSA 4.3 STANDARD FOR GAS BOILERS, AND SHALL BE DESIGN CERTIFIED FOR BOTH INDOOR AND OUTDOOR USE.
 - c. THE UNIT SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE ASME BOILER & PRESSURE VESSEL CODE, SECTION IV REQUIREMENTS FOR 160 PSI WORKING PRESSURE, AND SHALL BEAR THE ASME "H" STAMP.
 - d. THE UNIT SHALL BE CONSTRUCTED TO COMPLY WITH THE EFFICIENCY REQUIREMENTS OF THE LATEST EDITION OF ASHRAE STANDARD 90.1
 - e. THE STANDARD UNIT SHALL MEET THE REQUIREMENTS OF THE LATEST EDITION OF THE ASME CSD-1 STANDARD.
 - f. THE NEW YORK CITY MEA NUMBER SHALL BE 196-03 E
- 2) HEAT EXCHANGER:
- a. THE HEAT EXCHANGER SHALL BE A STRAIGHT TUBE DESIGN WITH TEN 7/8" INNER DIAMETER INTEGRAL FINNED COPPER TUBES.
 - b. THE TUBES SHALL BE ROLLED DIRECTLY INTO GLASS-LINED CAST IRON HEADERS, RATED FOR 160 PSI WORKING PRESSURE.
 - c. THE HEAT EXCHANGER SHALL BE A LOW WATER VOLUME DESIGN.
 - d. ALL GASKETS SHALL BE NON-METALLIC, OUTSIDE THE JACKET, AND SEPARATED FROM THE COMBUSTION CHAMBER BY AT LEAST 3.5" TO ELIMINATE DETERIORATION FROM HEAT.
 - e. HEADERS SHALL HAVE COVERS PERMITTING VISUAL INSPECTION AND CLEANING OF ALL INTERNAL SURFACES.
 - f. THE HEAT EXCHANGER SHALL HAVE A TEN YEAR WARRANTY.
- 3) PUMP:
- a. THE HEATER SHALL COME COMPLETE WITH A VOLTAGE-MOUNTED PUMP SIZED TO PROVIDE THE CORRECT HEATER FLOW RATE, FOR THE HEATER AND 30 FEET OF FULL-SIZED PIPING.
 - b. EACH UNIT SHALL HAVE A PUMP TIME DELAY. THE PUMP TIME DELAY SHALL BE ADJUSTABLE FROM 20 SECONDS TO 10 MINUTES FOR CONTINUED PUMP CIRCULATION AFTER THE CALL FOR HEAT HAS BEEN SATISFIED, TO REMOVE RESIDUAL HEAT FROM THE UNITS COMBUSTION CHAMBER.
- 4) BURNERS:
- a. THE BURNERS SHALL BE MULTI-PORT DESIGN, AND SHALL BE CONSTRUCTED OF HIGH TEMPERATURE STAINLESS STEEL.
 - b. THE BURNERS SHALL BE DESIGNED TO MIX AIR AND GAS, AND BURN CLEANLY WITH NOX EMISSIONS NOT EXCEEDING 10PPM.
 - c. BURNERS SHALL BE IN EASILY-REMOVABLE BURNER TRAY ASSEMBLIES WITH NO MORE THAN 4 BURNERS PER TRAY.
 - d. THE UNIT SHALL HAVE MULTIPLE GAS TRAINS, SUCH THAT EACH GAS TRAIN SHALL HAVE A MAXIMUM INPUT OF 399,000 BTU/HR.
 - e. EACH GAS TRAIN SHALL HAVE A GAS SHUTOFF VALVE AND MAIN GAS VALVE WITH BUILT-IN REDUNDANT VALVE SEATS AND GAS REGULATOR.
 - f. UNIONS SHALL BE USED BEFORE AND AFTER EACH MAIN GAS VALVE, TO PERMIT EASY REMOVAL OF THE EACH GAS VALVE, GAS TRAIN AND BURNER TRAY ASSEMBLY FROM THE FRONT OF THE UNIT.
- 5) COMBUSTION CHAMBER:
- a. THE COMBUSTION CHAMBER SHALL BE LINED WITH LIGHTWEIGHT, CERAMIC FIBERBOARD INSULATION TO RETAIN HEAT, AND SHALL BE APPROVED FOR SERVICE TEMPERATURES OF NOT LESS THAN 2000°F.
 - b. THE OUTER JACKET SHALL BE A UNITIZED SHELL FINISHED WITH ACRYLIC THERMO-SET PAINT BAKED AT NOT LESS THAN 325°F.
 - c. THE FRAME SHALL BE CONSTRUCTED OF GALVANIZED STEEL FOR STRENGTH AND PROTECTION.
 - d. CHAMBER SHALL INCLUDE A SIGHT GLASS FOR VIEWING FLAME.
 - e. HEATERS SHALL HAVE A FORGED DRAFT DESIGN AND SHALL MEET A MINIMUM 85% STEADY STATE COMBUSTION EFFICIENCY.
- 6) VENTING:
- a. THE UNIT SHALL BE DESIGNED FOR VERTICAL VENTING WITH STANDARD B-VENT AS A FAN-ASSISTED CATEGORY I APPLIANCE, AND FOR HORIZONTAL VENTING AS A CATEGORY III APPLIANCE AND SHALL NOT REQUIRE AN EXTERNAL DRAFT HOOD.
 - b. THE UNIT SHALL ACCEPT DUCTED COMBUSTION AIR, OR SHALL BE ABLE TO PULL COMBUSTION AIR FROM THE ROOM.
 - c. VENT AND DUCTED COMBUSTION AIR SHALL EACH BE ABLE TO BE PIPED TO EITHER THE TOP OR THE BACK OF THE UNIT, IN ANY COMBINATION.
 - d. CHANGING FROM TOP-TO-BACK OR FROM BACK-TO-TOP PIPING ORIENTATION SHALL BE EASILY ACCOMPLISHED IN THE FIELD.
 - e. THE HEATER SHALL BE PROVIDED WITH AN INTEGRAL, WASHABLE COMBUSTION AIR FILTER. THE AIR FILTER SHALL PROVIDE 85% ARRESTENCE TO PROTECT THE BURNERS AND BLOWER(S) FROM DEBRIS. THE AIR FILTER SHALL BE CONSTRUCTED OF OPEN-CELL POLYURETHANE FOAM.
- 7) CONTROLS:
- a. TEMPERATURE CONTROL SHALL BE AN ELECTRONIC PID TEMPERATURE CONTROL WITH LCD AND TOUCHPAD AND SHALL CONTROL THE BOILER STAGE FIRING.
 - b. THE HEATER SHALL HAVE CONNECTIONS FOR AN EXTERNAL STAGING CONTROL, AND A SELECTOR SWITCH TO ENABLE THE USER TO CHOOSE BETWEEN THE BOILER'S STAGING CONTROL OR A FIELD-SUPPLIED STAGING CONTROL, WITHOUT BYPASSING ANY OF THE HEATER'S SAFETY CONTROLS.
- 8) APPROVED MANUFACTURERS:
- a. LAARS (BASIS OF DESIGN)
 - b. LOCHINVAR
 - c. BURNHAM.
- 9) CENTRIFUGAL INLINE DIRECT DRIVE FAN (TX-1):
- 1) DUCT MOUNTED SUPPLY, EXHAUST OR RETURN FANS SHALL BE OF CENTRIFUGAL, DIRECT DRIVEN IN-LINE TYPE.
 - 2) THE FAN HOUSING SHALL BE OF THE SQUARE DESIGN, CONSTRUCTED OF HEAVY GAUGE GALVANIZED STEEL AND SHALL INCLUDE SQUARE DUCT MOUNTING COLLARS.
 - 3) FAN CONSTRUCTION SHALL INCLUDE TWO REMOVABLE ACCESS PANELS LOCATED PERPENDICULAR TO THE MOTOR MOUNTING PANEL. THE ACCESS PANELS MUST BE SUFFICIENT SIZE TO PERMIT EASY ACCESS TO ALL INTERIOR COMPONENTS.
 - 4) THE FAN WHEEL SHALL BE CENTRIFUGAL BACKWARD INCLINED, CONSTRUCTED OF ALUMINUM AND SHALL INCLUDE A WHEEL CONE CAREFULLY MATCHED TO THE INLET CONE FOR PRECISE RUNNING TOLERANCES. WHEELS SHALL BE STATICALLY AND DYNAMICALLY BALANCED.
 - 5) MOTORS SHALL BE PERMANENTLY LUBRICATED AND CAREFULLY MATCHED TO THE
- FAN LOADS. MOTORS SHALL BE READILY ACCESSIBLE FOR MAINTENANCE.
- 6) A NEMA 1 DISCONNECT SWITCH SHALL BE PROVIDED AS STANDARD, EXCEPT WITH EXPLOSION RESISTANT MOTORS. WHERE DISCONNECTS ARE OPTIONAL, FACTORY WIRING SHALL BE PROVIDED FROM MOTOR TO THE HANDY BOX.
- 7) ALL FANS SHALL BEAR THE AMCA CERTIFIED RATINGS SEAL FOR BOTH SOUND AND AIR PERFORMANCE.
- 8) EACH FAN SHALL BEAR A PERMANENTLY AFFIXED MANUFACTURER'S NAMEPLATE CONTAINING THE MODEL NUMBER AND INDIVIDUAL SERIAL NUMBER FOR FUTURE IDENTIFICATION.
- 9) MOTOR TO BE A DC ELECTRONIC COMMUTATION TYPE MOTOR (ECM) SPECIFICALLY DESIGNED FOR FAN APPLICATIONS. AC INDUCTION TYPE MOTORS ARE NOT ACCEPTABLE. EXAMPLES OF UNACCEPTABLE MOTORS ARE: SHADED POLE, PERMANENT SPLIT CAPACITOR (PSC), SPLIT PHASE, CAPACITOR START AND 3 PHASE INDUCTION TYPE MOTORS. MOTORS SHALL BE PERMANENTLY LUBRICATED WITH HEAVY DUTY BALL BEARINGS TO MATCH THE FAN LOAD AND PRE-WIRED TO THE SPECIFIC VOLTAGE AND PHASE. INTERNAL MOTOR CIRCUITRY SHALL CONVERT AC POWER SUPPLIED TO THE FAN TO DC POWER TO OPERATE THE MOTOR. MOTOR SHALL BE SPEED CONTROLLABLE DOWN TO 20% OF FULL SPEED (80% TURNDOWN). SPEED SHALL BE CONTROLLED BY EITHER A POTENTIOMETER DIAL MOUNTED AT THE MOTOR OR BY A 0-10 VDC SIGNAL. MOTOR SHALL BE A MINIMUM OF 85% EFFICIENT AT ALL SPEEDS.
- 10) ACCEPTABLE MANUFACTURERS:
- a. GREENHECK (BASIS OF DESIGN).
 - b. LOREN COOK.
 - c. APPROVED EQUAL
- B) SPLIT SYSTEM HEAT PUMP CONDENSER (ACCU-C):
- 1) GENERAL:
 - a. THE OUTDOOR UNIT SHALL BE COMPLETELY FACTORY ASSEMBLED, PIPED AND WIRED. EACH UNIT SHALL BE RUN TESTED AT THE FACTORY PRIOR TO SHIPMENT. THE TABLE BELOW SHOWS THE AVAILABLE OUTDOOR AND INDOOR COMBINATIONS.
 - 2) UNIT CABINET:
 - a. THE CASING SHALL BE FABRICATED OF GALVANIZED STEEL, BONDERIZED, FINISHED WITH AN ELECTROSTATICALLY APPLIED, THERMALLY FUSED ACRYLIC OR POLYESTER POWDER COATING FOR CORROSION PROTECTION. ASSEMBLY HARDWARE SHALL BE CADMIUM PLATED FOR WEATHER RESISTANCE.
 - b. CABINET COLOR SHALL BE MUNSELL BY 7.0/1.1.
 - c. TWO (2) MILD STEEL MOUNTING FEET, TRAVERSE MOUNTED ACROSS THE CABINET BASE PAN, WELDED MOUNT, PROVIDING FOUR (4) SLOTTED MOUNTING HOLES SHALL BE FURNISHED. ASSEMBLY SHALL WITHSTAND LATERAL WIND GUST UP TO 155 MPH TO MEET APPLICABLE WEATHER CODES.
 - 3) FAN:
 - a. THE UNIT SHALL BE FURNISHED WITH A DIRECT DRIVE, HIGH PERFORMANCE PROPELLER TYPE FAN.
 - b. THE CONDENSER FAN MOTOR SHALL BE A VARIABLE SPEED, DIRECT CURRENT (DC) MOTOR AND SHALL HAVE PERMANENTLY LUBRICATED BEARINGS.
 - c. FAN SPEED SHALL BE SWITCH AUTOMATICALLY ACCORDING TO THE NUMBER OF OPERATING INDOOR UNITS AND THE COMPRESSOR OPERATING FREQUENCY.
 - d. THE FAN MOTOR SHALL BE MOUNTED WITH VIBRATION ISOLATION FOR QUIET OPERATION.
 - e. THE FAN SHALL BE PROVIDED WITH A RAISED GUARD TO PREVENT CONTACT WITH MOVING PARTS.
 - f. THE OUTDOOR UNIT SHALL HAVE HORIZONTAL DISCHARGE AIRFLOW.
 - 4) COIL:
 - a. THE OUTDOOR UNIT COIL SHALL BE OF NONFERROUS CONSTRUCTION WITH LANCED OR CORRUGATED PLATE FINS ON COPPER TUBING.
 - b. THE COIL SHALL BE PROTECTED WITH AN INTEGRAL GUARD.
 - c. REFRIGERANT FLOW FROM THE OUTDOOR UNIT TO THE INDOOR UNITS SHALL BE INDEPENDENTLY CONTROLLED BY MEANS OF INDIVIDUAL ELECTRONIC LINEAR EXPANSION VALVES FOR EACH INDOOR UNIT.
 - d. OUTDOOR UNIT SHALL BE PRE-CHARGED WITH SUFFICIENT R-410A REFRIGERANT TO SATISFY THE OUTDOOR UNIT COIL AND COMPRESSOR.
 - e. ALL REFRIGERANT LINES BETWEEN OUTDOOR AND INDOOR UNITS SHALL BE OF ANNEALED, REFRIGERATION GRADE COPPER TUBING, ARG TYPE, MEETING ASTM B280 REQUIREMENTS, INDIVIDUALLY INSULATED IN TWIN-TUBE, FLEXIBLE, CLOSED-CELL, CFC-FREE (OZONE DEPLETION POTENTIAL OF ZERO), ELASTOMERIC MATERIAL FOR THE INSULATION OF REFRIGERANT PIPES AND TUBES WITH THERMAL CONDUCTIVITY EQUAL TO OR BETTER THAN 0.27 BTU-INCH/HOUR PER SQ FT / °F, A WATER VAPOR TRANSMISSION EQUAL TO OR BETTER THAN 0.03 PERM-INCH AND SUPERIOR FIRE RATINGS SUCH THAT INSULATION WILL NOT CONTRIBUTE SIGNIFICANTLY TO FIRE AND UP TO 1" THICK INSULATION SHALL HAVE A FLAME-SPREAD INDEX OF LESS THAN 25 AND A SMOKE-DEVELOPMENT INDEX OF LESS THAN 50 AS TESTED BY ASTM E 84 AND CAN / ULG 5-102.
 - f. ALL REFRIGERANT CONNECTIONS BETWEEN OUTDOOR AND INDOOR UNITS SHALL BE FLARE TYPE.
 - 5) COMPRESSOR:
 - a. THE COMPRESSOR SHALL BE A HIGH PERFORMANCE, HERMETIC, INVERTER DRIVEN, VARIABLE SPEED, SCROLL TYPE MANUFACTURED BY MITSUBISHI ELECTRIC CORPORATION.
 - b. THE COMPRESSOR MOTOR SHALL BE DIRECT CURRENT (DC) TYPE EQUIPPED WITH A FACTORY SUPPLIED AND INSTALLED INVERTER DRIVE PACKAGE.
 - c. THE OUTDOOR UNIT SHALL BE EQUIPPED WITH A SUCTION SIDE REFRIGERANT ACCUMULATOR.

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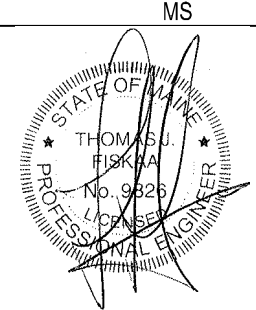
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Drawing Title
H.V.A.C. SPECIFICATIONS
SHEET 2 OF 3

Project No.	Drawn By	Date	Scale
15.102.00			---
Seal	MS	Floor(s)	



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