

SECTION 15500 - HEATING, VENTILATING AND AIR CONDITIONING

PART 1 - GENERAL

1.01 CODES, ORDINANCES, AND PERMITS

- A. INSTALLATION OF SYSTEMS AND EQUIPMENT PROVIDED UNDER THIS SECTION SHALL BE DONE IN STRICT ACCORDANCE WITH MASSACHUSETTS DEPARTMENT OF PUBLIC SAFETY CODES, MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION, MASSACHUSETTS STATE BUILDING AND MECHANICAL CODE, AND CITY OR TOWN REGULATIONS HAVING JURISDICTION.
- B. ALL WORK, WHERE APPLICABLE, SHALL CONFORM TO NFPA CODES AND ALL MATERIAL SHALL BE U.L. APPROVED.
- C. ALL ELECTRICAL APPARATUS FURNISHED UNDER THIS SECTION SHALL BE APPROVED BY THE U.L. AND SHALL BE SO LABELED OR LISTED WHERE SUCH IS APPLICABLE. WHERE CUSTOM-BUILT EQUIPMENT IS SPECIFIED AND THE U.L. LABEL OR LISTING IS NOT APPLICABLE TO THE COMPLETED PRODUCT, ALL COMPONENTS USED IN THE CONSTRUCTION OF SUCH EQUIPMENT SHALL BE LABELED OR LISTED BY U.L. WHERE SUCH IS APPLICABLE TO THE COMPONENT

1.02 SHOP DRAWINGS

- A. SUBMIT SHOP DRAWINGS, ON E-BUILDER, FOR ALL EQUIPMENT SCHEDULED, CONTROLS, PIPING, VALVES, DUCT STANDARDS, ETC.

1.03 OPERATING AND MAINTENANCE INSTRUCTIONS

- A. FURNISH UPON COMPLETION OF ALL WORK, OPERATION AND MAINTENANCE DATA FOR ALL EQUIPMENT APPROVED UNDER THIS SECTION.

PART 2 - PRODUCTS

2.01 PIPE AND FITTINGS

- A. FURNISH AND INSTALL REFRIGERANT LINE SETS.
- B. DRAIN (D) AND COLD WATER MAKE-UP PIPING SHALL BE TYPE L HARD DRAWN COPPER, ASTM B88 WITH WROUGHT COPPER ANSI B16.22 FITTINGS. JOINTS SHALL BE SOLDERED, ASTM B32, WITH 95/5 SOLDER.

2.02 PIPE HANGERS, SUPPORTS, INSERTS

- A. CARPENTER AND PATTERSON, GRINNELL, CALCO, OR APPROVED EQUAL. FIGURE NUMBERS LISTED ARE CARPENTER AND PATTERSON NUMBERS.
- B. GENERAL: PIPING SYSTEMS SHALL BE SUPPORTED IN ACCORDANCE WITH ANSI B31.1 SO AS TO MAINTAIN REQUIRED PITCH OF LINES. PREVENT VIBRATION, AND PROVIDE FOR EXPANSION AND CONTRACTION MOVEMENT.
- C. PIPING HANGERS AND SUPPORTS SHALL BE FURNISHED AND INSTALLED FOR PIPING. PROVIDE ALL COMPONENTS (I.E., INSERTS, RODS, CLAMPS, HANGERS, WASHER, LOCK NUTS, ROLLERS, ETC.) NECESSARY FOR A COMPLETE INSTALLATION.
- D. HANGERS:
 - 1. HANGERS FOR HOT WATER SUPPLY (HWS), AND HOT WATER RETURN (HWR), HOT/CHILLED WATER SUPPLY PIPING (HCS) AND HOT/CHILLED RETURN WATER PIPING (HCR) PIPING SHALL BE FIGURE 100SH REFRIGERATION HANGER AND SHIELD.
 - 2. HANGERS FOR ALL OTHER PIPING SHALL BE FIGURE 1A BANDS.
 - 3. ALL HANGERS SHALL BE WITH SUPPORTING RODS AND NUTS. ROD SIZES SHALL BE AS FOLLOWS:

HANGERS FOR PIPES 4" AND LARGER	5/8"
HANGERS FOR PIPES 2-1/2" AND 3"	1/2"
HANGERS FOR PIPES 2" AND SMALLER	3/8"
 - 4. PIPE COVERING PROTECTION SADDLES SHALL BE SERIES 350 GALVANIZED STEEL AND SHALL BE FURNISHED FOR INSTALLATION AT EACH HANGER WHERE PIPES ARE INSULATED.
- E. UPPER ATTACHMENTS TO BUILDING STRUCTURE
 - 1. REINFORCED CONCRETE CONSTRUCTION: UPPER ATTACHMENT WELDED OR CLAMPED TO STEEL CLIP ANGLES WHICH ARE EXPANSION-BOLTED TO THE CONCRETE. EXPANSION BOLTING SHALL BE LOCATED SO THAT PIPING LOADS PLACE BOLTS IN SHEAR.
 - 2. STRUCTURAL FRAMING: UPPER ATTACHMENTS WELDED OR CLAMPED TO STRUCTURAL STEEL MEMBERS. ADDITIONAL STEEL MEMBERS MAY BE NECESSARY IN SOME SUPPORT LOCATIONS WHERE PIPING LOCATIONS DIFFER FROM THAT KNOWN ON CONTRACT DRAWINGS.
 - 3. SUBMIT DETAILS FOR APPROVAL.

2.03 SHEET METAL WORK

- A. FURNISH ALL SHEET METAL WORK AND ACCESSORIES SPECIFIED HEREIN.
- B. REFERENCES TO "DUCT MANUAL" HEREIN REFER TO THE LATEST EDITION OF THE HVAC DUCT CONSTRUCTION STANDARDS AS PUBLISHED BY THE SHEET METAL AND AIR CONDITIONING CONTRACTOR NATIONAL ASSOCIATION, INC (HEREINAFTER REFERRED TO AS SMACNA).
- C. ALL DUCTS SHALL BE OF GALVANIZED STEEL CONSTRUCTION AS SPECIFIED. PROPERLY STIFFENED TO PREVENT DRUMMING WHEN THE FANS ARE IN OPERATION.
- D. ALL GALVANIZED DUCT THICKNESSES SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF SMACNA FOR THE SERVICE INDICATED.
- E. SEAL ALL LOW PRESSURE DUCT JOINTS (CLASS B) AND MEDIUM PRESSURE DUCTS (CLASS A) WITH SEALANT AS MANUFACTURED BY MINNESOTA MINING COMPANY, FOSTER, GENERAL ELECTRIC, OR APPROVED EQUAL. EXCESS SEALANT MUST BE REMOVED IMMEDIATELY TO PROVIDE A NEAT APPEARANCE.
- F. ALL LOW PRESSURE DUCTS SHALL BE FABRICATED FOR 2 INCHES WATER GAUGE PRESSURE.
- G. FLEXIBLE CONNECTIONS SHALL BE 4" WIDE CONNECTIONS, IN ACCORDANCE WITH FIG. 2-19 OF THE DUCT MANUAL, CONSTRUCTED OF VENTGLASS HEAVY GLASS FABRIC DOUBLE COATED WITH NEOPRENE AND SHALL BE AS MANUFACTURED BY VENT FABRICS, INC. FLEXIBLE CONNECTIONS SHALL MEET THE REQUIREMENTS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS. EXTERIOR FLEXIBLE CONNECTION SHALL BE WEATHER TIGHT.
- H. HANGERS AND SUPPORTING SYSTEMS SHALL BE IN ACCORDANCE WITH FIGURE 4-1 THROUGH 4-8 AND TABLES 4-1 THROUGH 4-3 OF THE DUCT MANUAL.

2.04 DUCTWORK ACCESSORIES

- A. MANUAL VOLUME DAMPERS
 - 1. MANUAL VOLUME DAMPERS SHALL BE PROVIDED WHERE SHOWN ON THE DRAWINGS AT EVERY BRANCH TAKE OFF FROM THE MAIN DUCT, AND ELSEWHERE AS REQUIRED BY THE BALANCING CONTRACTOR, AND SHALL BE SINGLE OR MULTIPLE BLADE TYPE WITH BLADE BEARINGS, GALVANIZED STEEL INTERLOCKING BLADES AND A GALVANIZED STEEL FRAME. IN DUCTS OVER 15" DEEP PROVIDE MULTIPLE OPPOSED BLADE TYPE, GANG OPERATED DAMPERS WITH A MAXIMUM BLADE WIDTH OF 8". DAMPER BLADES SHALL BE FABRICATED OF 16 GAUGE STEEL WITH HEMMED EDGES, AND A MAXIMUM LENGTH OF 48". DAMPER OPERATING ROD SHALL BE FULL BLADE LENGTH EXTENDED THROUGH THE DUCT TO EXTERNALLY MOUNTED BEARING PLATES. ON INSULATED DUCTWORK, BEARING PLATES SHALL BE INSTALLED FLUSH WITH INSULATION FINISH AND FASTENED TO THE DUCT. OPERATING LEVER SHALL BE OF THE INDICATING TYPE WITH LOCKING QUADRANT.
- B. ACCESS DOORS
 - 1. IN DUCTWORK UP TO 2 INCH PRESSURE CLASS:
 - a. FRAME: 24 GAUGE GALVANIZED STEEL WITH SEAL.
 - b. DOOR: HINGED, WITH 24 GAUGE GALVANIZED STEEL EXTERIOR AND INTERIOR PANELS.
 - c. LOCKS: DOORS 16" AND UNDER, ONE LOCK DOORS OVER 16", TWO LOCKS.
 - d. SEALS: FOAM GASKET.

2.05 VIBRATION ISOLATION

- A. GENERAL
 - 1. ALL VIBRATION ISOLATORS SHALL BE THE PRODUCT OF A SINGLE APPROVED MANUFACTURER.
 - 2. MODEL NUMBERS THEREAFTER SPECIFIED ARE FROM MASON INDUSTRIES. OTHER EQUIVALENT UNITS BY CONSOLIDATED KINETICS, VIBRATION MOUNTINGS AND CONTROLS OR APPROVED EQUAL ARE ACCEPTABLE.
- B. ALL VIBRATION ISOLATORS FOR MECHANICAL EQUIPMENT HUNG IN CEILING SHALL BE SELECTED IN ACCORDANCE WITH THE WEIGHT DISTRIBUTION OF THE EQUIPMENT TO BE SERVED SO AS TO PRODUCE A UNIFORM DEFLECTION. DEFLECTIONS SHALL BE AS HEREINAFTER SPECIFIED.
- C. SUBMITTALS SHALL INCLUDE ALL SPRING DEFLECTIONS, SPRING DIAMETERS, SCALE DRAWINGS, ATTACHMENT DETAILS, AND RATED CAPACITY INDICATING ADEQUACY FOR EACH PIECE OF EQUIPMENT SERVED.

2.06 AIR OUTLETS

- A. SUPPLY AIR DEVICES: PRICE, TITUS OR METAL-AIRE. ALL AIR OUTLET FINISHES AND COLOR SHALL BE AS SELECTED BY THE ARCHITECT AND/OR ENGINEER.
 - 1. CEILING DIFFUSERS (SD): FURNISH AND INSTALL PRICE MODEL SMDA STEEL, AMDA ALUMINUM DIRECTIONAL LOUVERED FACE DIFFUSERS OF THE SIZES AND MOUNTING TYPES SHOWN ON THE PLANS AND AIR DISTRIBUTION SCHEDULE. DIFFUSERS SHALL CONSIST OF AN OUTER FRAME ASSEMBLY, WHICH FACILITATES MOUNTING IN THE APPLICATION SHOWN. A COLLAR THAT PROVIDES CONNECTION TO THE SQUARE (OR RECTANGULAR) DUCT SIZE INDICATED SHALL BE AN INTEGRAL PART OF THE FRAME ASSEMBLY. AN INNER CORE ASSEMBLY CONSISTING OF FIXED LOUVERS CAPABLE OF PRODUCING THE AIR FLOW DISCHARGE PATTERN INDICATED ON THE PLANS SHALL BE FULLY REMOVABLE FROM THE INSTALLED DIFFUSER FRAME FOR ACCESS TO ANY DAMPERS OR OTHER DUCTWORK COMPONENTS LOCATED IN OR NEAR THE DIFFUSER NECK. A SET OF ADJUSTMENT VANES SHALL BE PROVIDED ON EACH SIDE OF THE DIFFUSER TO ALLOW FOR FIELD ADJUSTMENT FROM HORIZONTAL TO VERTICAL AIR FLOW DISCHARGE. FINISH SHALL BE B12 WHITE POWDER OAT. PAINT FINISH SHALL PASS 500 HOURS OF SALT SPRAY EXPOSURE WITH NO MEASURABLE CREEP IN ACCORDANCE WITH ASTM D1654 AND 1000 HOURS WITH NO RUSTING OR BLISTERING AS PER ASTM D610 AND ASTM D714. SIZES AND CAPACITIES TO BE AS SCHEDULED ON THE CONTRACT DRAWINGS.
 - 2. SUPPLY REGISTERS (SR): HEAVY GAUGE STEEL CONSTRUCTIONS WITH 1-1/4" OVERLAP MARGIN, COUNTERSUNK SCREW HOLES AND MOUNTING SCREWS. SUPPLY REGISTERS SHALL ADJUSTABLE VERTICAL FACE BARS, 3/4" ON CENTER WITH REAR DIFFUSING VANES. PROVIDE WITH INTEGRAL OPPOSED BLADE DAMPER DESIGNED FOR CREW/DRIVER OPERATION.
 - 3. LINEAR DIFFUSERS (LD): SUPPLY AND INSTALL PRICE TBD/TBD2 SERIES OF T-BAR SUPPLY DIFFUSERS OF SIZES AND CAPACITIES AS SHOWN ON THE DRAWINGS. DIFFUSER SHALL HAVE 1" (25) SLOT AND 2 SLOTS MODELS, ON 2 SLOT MODEL, DIFFUSER SHALL BE SUPPLIED WITH AN EXTRUDED ALUMINUM CENTER-TEE PAINTED B12 WHITE & WHITE POWDER COAT. DIFFUSER SHALL FEATURE CURVED EXTRUDED ALUMINUM PATTERN CONTROLLERS, FACTORY INSTALLED FOR THE SPECIFIED AIR PATTERN. PATTERN CONTROLLERS SHALL BE CAPABLE OF FIELD ADJUSTMENT FOR HORIZONTAL AIR PATTERNS TOWARDS OR AWAY FROM THE INLET AND VERTICAL. PATTERN CONTROLLERS TO BE PAINTED BLACK. THE DIFFUSER PLENUM SHALL BE CONSTRUCTED OUT OF COATED STEEL. THE INTERIOR OF THE PLENUM SHALL BE FACTORY FINISHED IN MATTE BLACK.
- B. EXHAUST (ER) AND RETURN-AIR (RR) REGISTERS: PRICE, METAL-AIRE OR TITUS TYPE A70D OF SIMILAR MATERIAL AND CONSTRUCTION AS SUPPLY-AIR REGISTERS EXCEPT WITH HORIZONTAL FACE BARS FIXED AT 0 DEGREE ANGLE, WITH BAR SPACING 1/2" ON CENTER.
- C. AT ALL BRANCH TAKEOFFS AND WHERE INDICATED PROVIDE VANE DEFLECTORS (EXTRACTORS) BEHIND REGISTERS AND OMIT VOLUME DAMPER.
- D. PROVIDE DIFFUSER FRAME TYPE (LAY-IN, SURFACE MOUNT, SNAP-IN OR SPLINE) TO MATCH CEILING TYPE.

2.07 INSULATION

- A. SHALL BE PER SCHEDULE AND 2009 INTERNATIONAL ENERGY CODE.
- B. INTERIOR SUPPLY, RETURN AND OUTSIDE AIR DUCTWORK SHALL BE PROVIDED WITH FIBERGLASS DUCT WRAP WITH FSK FACING AND WITH AN R-5 MINIMUM INSULATION VALUE.
- C. EXTERIOR DUCTWORK SHALL BE PROVIDED WITH FIBERGLASS DUCT WRAP WITH FSK FACING AND WITH AN R-8 MINIMUM

2.08 DUCT LINER

- A. FURNISH AND INSTALL FLEXIBLE DUCT LINER INSULATION IN THE FOLLOWING LOCATIONS:
 - 1. GAS FURNACE - FIRST FIVE FEET OF THE SUPPLY DIFFUSERS.
- B. DUCT LINER SHALL BE FLEXIBLE, FABRICATED FROM GLASS FIBERS BONDED WITH THERMOSETTING RESIN. AIRSTREAM SURFACE TO BE PROTECTED WITH AN ACRYLIC SURFACE COATING THAT DOES NOT SUPPORT MICROBIAL GROWTH AS PER ASTM C1071 AND ASTM C1104.
- C. DUCT LINER TO BE 1 INCH THICK, 1-1/2" LB. PER CU.FT. DENSITY.

PART 3 - EXECUTION

- 3.01 GENERAL
 - A. INSTALL ALL ITEMS SPECIFIED UNDER PART 2 - PRODUCTS, ACCORDING TO THE APPLICABLE MANUFACTURER'S RECOMMENDATIONS AND SHOP DRAWINGS, THE DETAILS SHOWN ON THE DRAWINGS AND AS SPECIFIED UNDER THIS SECTION. PROVIDE ALL REQUIRED HANGERS AND SUPPORTS.

3.02 BALANCING, ADJUSTING, OPERATING, AND INSTRUCTIONS

- A. HVAC CONTRACTOR SHALL PROVIDE ADDITIONAL SHEAVES, DRIVES, BELTS, ETC. AS REQUIRED FOR BALANCING OF ALL FANS WITHIN THE SPECIFIED FAN HORSEPOWER AT NO EXTRA COST TO THE PROJECT.
- B. AIR SYSTEMS
 - 1. SYSTEMS SHALL BE ADJUSTED AND BALANCED SO THAT AIR QUANTITIES AT OUTLETS ARE AS INDICATED ON THE DRAWINGS AND SO THAT THE DISTRIBUTION FROM SUPPLY OUTLETS IS FREE FROM DRAFTS, AND UNIFORM OVER THE FACE OF EACH OUTLET.
 - 2. IF NECESSARY, PROVIDE AND INSTALL MOTOR SHEAVES FOR ROOF TOP UNITS AND AIR HANDLERS UNITS.
 - 3. ADJUSTMENTS SHALL BE MADE BY THE BALANCING COMPANY TO VOLUME DAMPERS AT AIR OUTLETS TO PRODUCE THE LEAST PRESSURE DROP CONSISTENT WITH VOLUME REQUIREMENTS.
 - 4. AFTER COMPLETION OF BALANCING AND ADJUSTING, SETTINGS OF DAMPERS, SHALL BE PERMANENTLY MARKED BY THE BALANCING COMPANY SO THAT THEY CAN BE RESTORED IF DISTURBED AT ANY TIME.
 - 5. DIRECT READING VELOCITY METERS MAY BE USED BY THE BALANCING COMPANY FOR COMPARATIVE ADJUSTMENT OF INDIVIDUAL OUTLETS, BUT AIR QUANTITIES IN DUCTS HAVE VELOCITY OF 1,000 FEET PER MINUTE OR GREATER, SHALL BE MEASURED BY MEANS OF PITOT TUBES AND INCLINED GAUGE MANOMETERS. INSTRUMENT TEST OPENING ENCLOSURES AS SPECIFIED SHALL BE PROVIDED AS REQUIRED.
 - 6. ADJUSTMENT OF THE TEMPERATURE CONTROLS SHALL BE COORDINATED BY THE PERSON IN CHARGE OF THE BALANCING AND ADJUSTING AND SHALL BE PERFORMED COINCIDENTAL THEREWITH. IN CONJUNCTION WITH THE AUTOMATIC TEMPERATURE CONTROL SYSTEM, SIMULATE A COMPLETE CYCLE OF OPERATION FOR EACH SYSTEM.
 - 7. AFTER COMPLETION OF THE TESTING, BALANCING AND ADJUSTING OF THE AIR SYSTEMS, SIX COPIES OF A REPORT SHOWING THE FOLLOWING INFORMATION SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL. THE REPORT SHALL BE ARRANGED AS FOLLOWS:
 - a. LOCATION OF EACH AIR OUTLET OR INLET.
 - b. DIMENSIONS OR SIZE OF EACH OUTLET OR INLET.
 - c. TYPE: DIFFUSER, GRILLE, REGISTER, SUPPLY, RETURN EXHAUST, AND AK VALUE FOR EACH.
 - d. CFM OF AIR AS INDICATED ON DRAWINGS FOR EACH OUTLET OR INLET.
 - e. CFM OF AIR AS MEASURED, AFTER EACH COMPLETE SYSTEM HAS BEEN BALANCED AND ADJUSTED, FOR EACH OUTLET OR INLET.
 - f. AFTER EACH COMPLETE SYSTEM HAS BEEN BALANCED AND ADJUSTED, THE TOTAL CFM AT FAN DISCHARGE, STATIC PRESSURE AT FAN OUTLET, TOTAL STATIC PRESSURE FOR APPARATUS, FAN SPEED, MOTOR AMPERAGE FOR EACH PHASE AND VOLTAGE SHALL BE LISTED.

PROGRAMMABLE THERMOSTAT SET-UP REQUIREMENTS

OPTION NO.	FUNCTION	OPTION VALUE	DEFAULT	DESCRIPTION
0	OPERATION MODE	0 = CONSTANT VOLUME (CV) 1 = HEAT PUMP (HP) 2 = VARIABLE-AIR-VOLUME (VAV)	0	CONFIGURES THE OPERATION MODE OF THE SENSOR. NOTE: TO ACCESS OPTION NUMBER "0" WITH THE CONFIGURATION SCREEN SHOWING, PRESS THE UP AND DOWN ARROWS SIMULTANEOUSLY FOR 2 SECONDS. OPTION NUMBER "0" WILL APPEAR ON THE DISPLAY.
1	MORNING WARM-UP	0 = DISABLED 1 = ENABLED	0	IF ENABLED, THE HEAT TURNS ON WHEN THE PROGRAM SWITCHES FROM UNOCCUPIED TO OCCUPIED AND THE ZONE TEMPERATURE IS 2°F (1.1°C) BELOW THE HEATING SETPOINT TEMPERATURE. THE HEAT TERMINATES AFTER 60 MINUTES REGARDLESS OF WHETHER THE SETPOINT HAS BEEN REACHED.
2	ECONOMIZER MINIMUM POSITION OVERRIDE DURING UNOCCUPIED PERIOD	0 = DISABLED 1 = ENABLED	1	IF ENABLED, THE MINIMUM POSITION OF THE ECONOMIZER DAMPER IS OVERRIDDEN DURING THE OCCUPIED PERIOD. NOTE: ON 24 HOUR STORES DISABLE, ON ALL OTHERS ENABLE
3	TEMPERATURE SCALE	0 = °F 1 = °F + 0.5 2 = °F + 0.1 3 = °C 4 = °C + 0.5 5 = °C + 0.1	0	DISPLAYS THE TEMPERATURE IN THE SELECTED FORMAT.
4	SUPPLY AIR TEMPERING	0 = DISABLED 1 = ENABLED	0	IF ENABLED, THIS SETTING SENDS THE TEMPERING SIGNAL TO THE UCP.
5	TIME CLOCK	0 = 12 HOUR 1 = 24 HOUR	0	• 0 SETS CLOCK TO 12-HOUR FORMAT WITH AM AND PM • 1 SETS CLOCK TO 24-HOUR MILITARY TIME.
6	SMART FAN	0 = DISABLED 1 = ENABLED	1	IF ENABLED, THE SUPPLY FAN OPERATES IN THE AUTO MODE DURING UNOCCUPIED PERIODS, REGARDLESS OF THE FAN SETTING.
7	COMPUTED RECOVERY	0 = DISABLED 1 = ENABLED	0	IF ENABLED, THIS OPTION OFFSETS THE SETPOINT TEMPERATURE AND STARTS THE SYSTEM BEFORE THE SCHEDULED OCCUPIED PERIOD TO EFFICIENTLY REACH THE OCCUPIED TEMPERATURE SETPOINT. THE TIME IS CALCULATED ON A RECOVERY RATE OF 6°F (3.3°C) PER HOUR. IF CONFIGURED FOR AN HP UNIT, OPTION 7 IS DISABLED FOR EMERGENCY HEAT PROGRAM.
8	PROGRAMMABLE DAYS PER WEEK	0 = 7 DAYS, (M,T,W,T,H,F,S,S) 1 = 5 + 1 DAYS (M-F, S-S) 2 = 5 + 2 DAYS (M-F, S-S) 3 = 1 DAY	0	• IF "0" IS SELECTED, ALL 7 DAYS TO BE PROGRAMMED DIFFERENTLY. • IF "1" IS SELECTED WEEK DAYS, SAT, AND SUN, CAN BE PROGRAMMED DIFFERENTLY FROM ONE ANOTHER. • IF "2" IS SELECTED, WEEK DAYS CAN BE PROGRAMMED ONE WAY AND SAT-SUN CAN BE PROGRAMMED ANOTHER WAY. • IF "3" IS SELECTED, ALL SEVEN DAYS ARE LIMITED TO BEING PROGRAMMED THE SAME WAY.
9	PROGRAMMABLE DAYS PER DAY	0 = DAY AND NIGHT 1 = MORNING, DAY, NIGHT 2 = MORNING, DAY, EVENING, NIGHT 3 = MORNING, DAY, NIGHT 4 = MORNING, DAY, EVENING, NIGHT	4	• IF "2" IS SELECTED, ONLY DAY AND NIGHT PERIODS CAN BE PROGRAMMED. • IF "3" IS SELECTED, ONLY MORNING, DAY AND NIGHT PERIODS CAN BE PROGRAMMED. • IF "4" IS SELECTED, MORNING, DAY AND NIGHT PERIODS CAN BE PROGRAMMED.
10	PROGRAMMABLE FAN OPERATION	0 = DISABLED 1 = ENABLED	0	IF ENABLED, THE SUPPLY FAN OPERATION CAN BE PROGRAMMED FOR 'ON' OR 'AUTO' OPERATION FOR EACH PROGRAMMED PERIOD.
11	REMOTE SENSOR INSTALLED	0 = NO 1 = YES	0	IF "YES" IS SELECTED, THE SPACE TEMPERATURE OF THE REMOTE SENSOR WILL APPEAR ON THE DISPLAY AND WILL BE COMMUNICATED TO THE UNIT CONTROLLER.
12	CHECK FILTER INTERVAL	0 = DISABLED 1 = NUMBER OF 1-DAY INCREMENTS	30	ADJUSTABLE IN 1-DAY INCREMENTS. THE CHECK FILTER SYMBOL FLASHES WHEN THE ACCUMULATED RUN TIME IS GREATER THAN THE PROGRAMMED SETTING.
13	DISPLAY ZONE TEMPERATURE	0 = NO 1 = YES	1	IF THE SENSOR IS IN A NORMAL RUNNING STATE OR IN TEMPORARY OCCUPANCY (TIMED OVERRIDE), THE ZONE TEMPERATURE APPEARS.
14	KEYPAD LOCKOUT	0 = DISABLED 1 = ENABLED	1	IF ENABLED, THE KEYPAD CAN BE LOCKED OUT.
15	DEFAULT TEMPORARY OVERRIDE TIMER SETTING	1, 2, 3, 4, 5 (HOURS)	3	SETS THE DEFAULT TEMPORARY OVERRIDE TIME IN HOURS.
16	ZONE TEMPERATURE CALIBRATION	DISPLAYS CURRENT TEMPERATURE READING WITH ANY OFFSETS: • 1 = -9.9°F (-5.5°C) • 100 = 0.0°F (0.0°C) • 199 = 9.9°F (9.9°C)	100 (0 OFFSET)	ALLOWS FOR FIELD CALIBRATION IN 0.1°F (0.6°C) INCREMENTS OF EITHER THE INTERNAL SENSOR ON THE SENSOR, OR THE REMOTE SENSOR IF USED. IMPORTANT: Apply power to the sensor for 60 minutes before calibrating.
17	BAUD RATE	0 = 1024 BAUD 1 = 1200 BAUD	1	SET TO "0" FOR 3-25 TON VOYAGER UNITS BUILT BEFORE JANUARY 1, 1996, THAT HAVE THE ORIGINAL UCP.
18	DEFAULT COOLING SET-POINT	45-98°F (7.2 - 36.7°C)	74	IF NO SETPOINT HAS BEEN PROGRAMMED OR THE PROGRAM IS LOST, THE VALUE THAT IS SET BECOMES THE OPERATION SETPOINT. NOTE: RTU SERVING COLD SECTION 70°F, OTHER 72°F
19	DEFAULT HEATING SET-POINT	43-96°F (6.1 - 35.6°C)	68	IF NO SETPOINT HAS BEEN PROGRAMMED OR THE PROGRAM IS LOST, THE VALUE THAT IS SET BECOMES THE OPERATION SETPOINT. NOTE: RTU SERVING COLD SECTION 66°F, OTHER 68°F
20	MINIMUM COOLING SET-POINT	45-98°F (7.2 - 36.7°C)	45	SETS THE MINIMUM PROGRAMMABLE COOLING TEMPERATURE SETPOINT. NOTE: RTU SERVING COLD SECTION 69°F, OTHER 71°F
21	MAXIMUM HEATING SET-POINT	43-96°F (6.1 - 35.6°C)	96	SETS THE MAXIMUM PROGRAMMABLE HEATING TEMPERATURE SETPOINT. NOTE: RTU SERVING COLD SECTION 67°F, OTHER 69°F
22	MINIMUM SET-POINT DEADBAND	0 = 2°F (1°C) 1 = 4°F (2°C) 2 = 5°F (3°C) 3 = 7°F (4°C) 4 = 8°F (5°C) 5 = 10°F (6°C)	0	SETS THE MINIMUM DIFFERENCE BETWEEN THE HEATING AND COOLING SETPOINTS.

Project Title:
Cumberland Farms
Store # 5613
512 Woodford Street

Portland, ME



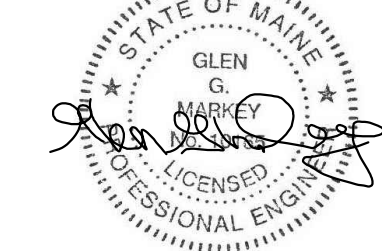
100 Crossing Blvd
Framingham, Ma
tel 508 270 1400

Architect



40 TREMONT STREET, SUITE 62
DUXBURY, MASSACHUSETTS 02332
PHONE: (781) 452-7121
FAX: (860) 264-1628
WEBSITE: www.phasezerodesign.com

Seal



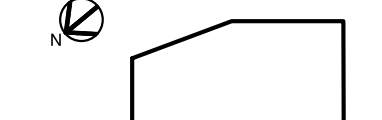
Consultant



Revisions

No.	Date	Issued for
11	11/22/13	90% Review Set
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Key Plan



Title
HVAC:
NOTES AND
SPECIFICATIONS

Date

Drawing No.

M0.3

Cumberland Farms
Project No. 2113119