ROOFTOP UNIT CONTROL MATRIX

CONTROL FEATURE	UNITS	RTU-1 SETPOINT OR Y/N	RTU-2 SETPOINT OR Y/N	NOTES
SETPOINTS				
COOLING - OCCUPIED SETPOINT	°F	75	75	
COOLING - UNOCCUPIED SETPOINT	°F	80	80	
DEAD BAND - MINIMUM HEATING AND COOLING TEMPERATURE SETPOINT DIFFERENCE	°F	5	5	
HEATING - OCCUPIED SETPOINT	°F	70	70	
HEATING - UNOCCUPIED SETPOINT	°F	60	60	
PROGRAMMED CONTROL FEATURES				
HVAC SYSTEM OCCUPIED/UNOCCUPIED MODE - PROGRAMMABLE THERMOSTAT		Y	Y	B
DEMAND CONTROL VENTILATION - CO2 SENSOR FEEDBACK	PPM	1,000	N	B
EQUIPMENT ACCESSORIES AND CONTROL MODULES				
OUTSIDE AIR DAMPER - MOTOR OPERATED (MODULATING)		Y	Y	L
INTEGRATED ECONOMIZER - DRY BULB TEMPERATURE ENABLE	°F	65	65	E
ECONOMIZER FAULT DETECTION AND DIAGNOSTICS (FDD) SYSTEM		Y	Y	F, G
RELIEF - BAROMETRIC DAMPER		N	Y	
RELIEF - CONSTANT VOLUME POWERED EXHAUST FAN		Y	N	
COOLING COIL (DX - STAGED)		Y	Y	M
HEATING COIL (NATURAL GAS)		Y	Y	M
SUPPLY FAN CONTROL METHOD				
ON DURING OCCUPIED HOURS		Y	Y	
OPTIMUM START SEQUENCE		Y	Y	
SAFETIES, INTERLOCKS, AND ALARMS				
GAS VALVE SAFETY		Y	Y	F
SUPPLY AIR SMOKE DETECTOR - SAFETY SHUTDOWN		Y	Y	B
RETURN AIR SMOKE DETECTOR - SAFETY SHUTDOWN		Y	Y	B
LOW LIMIT FREEZESTAT - FREEZE PROTECTION SAFETY SHUTDOWN		Y	Y	F

DIV. 23 CONTRACTOR SHALL PROVIDE CONTROL PANEL(S), WIRING, THERMOSTAT(S), TEMPERATURE SENSOR(S), HUMIDISTAT(S), AND/OR CO2 SENSOR(S) WHERE SHOWN ON THE DRAWINGS AND AS REQUIRED TO FACILITATE THE SCHEDULED CONTROL MODULES AND SEQUENCES OF OPERATION. EACH UNIT SHALL CONTROL BASED ON ITS OWN INTERNAL SAFETIES, TIME DELAYS, AND SEQUENCES UNLESS NOTED OTHERWISE. COORDINATE WITH OWNER FINAL BUILDING AND EQUIPMENT SCHEDULES DURING STARTUP.

NOTES:

B. DIVISION 23 CONTRACTOR SHALL PROVIDE DEVICE. REFER TO SPECIFICATIONS FOR DEVICE REQUIREMENTS.
E. THE FOLLOWING SENSORS SHALL DETERMINE ECONOMIZER ON POINT. REFERENCE SPECIFICATIONS FOR DEVICE REQUIREMENTS.
   OUTSIDE AIR TEMPERATURE; DIVISION 23 PROVIDED AS PART OF ECONOMIZER CONTROL MODULE.
   RETURN AIR TEMPERATURE; DIVISION 23 PROVIDED AS PART OF ECONOMIZER CONTROL MODULE.
F. DEVICE SHALL BE FACTORY MOUNTED AND PRE-WIRED FOR OPERATION SUBJECT TO THE ONBOARD CONTROLLER.
G. PROVIDE UNIT WITH AN FDD SYSTEM CONSISTING OF PERMANENTLY INSTALLED OUTSIDE AIR, SUPPLY AIR, AND RETURN AIR TEMPERATURE SENSORS. THE UNIT CONTROLLER SHALL AT A MINIMUM BE CAPABLE OF PROVIDING SYSTEM STATUS OF ECONOMIZER, COMPRESSOR, HEATING, MIXED AIR LOW LIMIT ALARM, AND SENSOR VALUES. EACH OPERATING MODE SHALL BE CAPABLE OF INDEPENDENTLY OPERATING FOR TESTING. THE SYSTEM SHALL REPORT FAULTS TO AN APPLICATION ACCESSIBLE BY SERVICE PERSONNEL. THE FOLLOWING FAULTS SHALL BE DETECTED: AIR TEMPERATURE SENSOR FAILURE, ECONOMIZER ENABLED/DISABLED WHEN ECONOMIZER SHOULD BE OFF/ON, RESPECTIVELY, DAMPER NOT MODULATING, AND EXCESS OUTSIDE AIR.
L. EQUIPMENT MANUFACTURER SHALL PROVIDE MODULATING DAMPER AND CONTROLS CAPABLE OF ADJUSTING THE DAMPER POSITION BASED ON DEMAND CONTROL VENTILATION TO MAINTAIN
   THE SCHEDULED OUTSIDE AIR AS SHOWN ON THE DRAWINGS. DIV. 23 CONTRACTOR SHALL COORDINATE DAMPER POSITION SETPOINTS IN FIELD DURING TESTING AND BALANCING TO MAINTAIN MINIMUM VENTILATION WHEN NOT IN ECONOMIZER. DAMPER SHALL BE CLOSED DURING UNOCCUPIED HOURS.
M. UNITARY CONTROLLER SHALL MODULATE AND/OR CYCLE SUPPLY FAN SPEED SETTING AND COIL CAPACITY STAGES SUBJECT TO THE INTERNAL SAFETIES AND SEQUENCES TO MAINTAIN SCHEDULED SETPOINTS.

ROOFTOP UNIT SCHEDULE (DX COOLING/NATURAL GAS HEAT) {NEW UNIT BY LANDLORD}

MARK	MANUFACTURER	MODEL	NOMINAL TONS	SUPPLY FAN				COOLING COIL								HEAT EXCHANGER				MIN O/A CFM	ABS MIN O/A	ELECTRICAL				WEIGHT (LBS)	NOTES
				FAN TYPE	CFM	MIN HP	ESP (IN)	REFR TYPE	TH (MBH)	SH (MBH)	EAT DB	EAT WB	LAT DB	LAT WB	MIN EFF (EER)	MIN NO STAGES	MIN OUT (MBH)	NOM INPUT (MBH)	MIN EFF (%)	MIN NO STAGES			MCA	MOCP	V/PH	DISC TYPE		
RTU-1	LENNOX	LGH072	6	CAV	1,900	2.00	0.8	R-410a	64.8	44	77.6	64.4	56.6	53	12	1	71.8	86	80	1	445	215	37	50	208/3	NF	915	ALL
RTU-2	LENNOX	LGH036	3	CAV	900	0.5	0.6	R-410a	21.4	17.9	74	61.6	55.7	53.4	12.7	1	34.0	65	80	1	60	-	23	30	208/3	NF	750	ALL

MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND MODEL NUMBERS ONLY. REVIEW THE COMPLETE DESCRIPTION, NOTES AND SPECIFICATIONS TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFACTURERS LISTED ARE THE BASIS FOR THE DESIGN.

NOTES:

A. REFER TO ROOFTOP UNIT CONTROL MATRIX FOR CONTROL FEATURES, MODULES, AND ACCESSORIES THAT SHALL BE PROVIDED WITH THE EQUIPMENT.
B. FOR NATIONAL ACCOUNTS PRICING AND ORDERING INFORMATION CONTACT DAVID EBNER AT LENNOX PHONE #1-612-860-5933 OR DAVE.EBNER@LENNOXIND.COM
C. EQUIPMENT SIZED FOR LOCAL AMBIENT TEMPERATURE.
E. PROVIDE 2 INCH, 30% EFFICIENT PLEATED THROWAWAY AIR FILTERS.
F. SPECIFIED FAN ESP ACCOUNTS FOR DUCT LOSSES EXTERNAL TO UNIT.
G. SPECIFIED FAN TSP INCLUDES EXTERNAL DUCT AND INTERNAL FILTER, COIL AND CASING LOSSES. FILTER LOSS IS AT MAXIMUM 400 FPM.
H. PROVIDE MANUFACTURER'S STANDARD INSULATED ROOF CURB WITH MINIMUM HEIGHT OF 14 INCHES.
J. DISCONNECT SWITCH FURNISHED BY ELECTRICAL CONTRACTOR.
K. STARTERS FOR ALL MOTORS SHALL BE FURNISHED INTEGRAL WITH UNIT.
L. COORDINATE SIZE OF CONDUCTOR TERMINATION LUGS WITH CONDUCTOR SIZES SHOWN ON ELECTRICAL DRAWINGS.
M. PROVIDE DUPLEX RECEPTACLE MOUNTED ON UNIT FOR FIELD WIRING.
N. COOLING COIL LAT IS LEAVING AIR TEMPERATURE OF COIL.
O. SELECT EQUIPMENT FOR ELEVATION OF 1000 FEET ABOVE SEA LEVEL.
P. PROVIDE HEATER TO MEET OR EXCEED SCHEDULED MINIMUM MBH OUTPUT. NOMINAL INPUT IS BASED ON LISTED MANUFACTURER'S STANDARD PRODUCT. COORDINATE EQUIPMENT CHANGEOUT WITH PLUMBING CONTRACTOR IF DIFFERENT FROM THAT SCHEDULED. MEET MINIMUM EFFICIENCY SCHEDULED.
Q. ABS. MIN. O/A IS THE ABSOLUTE MINIMUM OUTSIDE AIR CFM USING VENTILATION RESET OR DEMAND CONTROL VENTILATION.

FAN SCHEDULE

MARK	SERVICE (EA, RA, SA)	MANUFACTURER	MOUNTING	MODEL	CFM	ESP (IN)	DRIVE (BELT/DIRECT)	MIN. HP	FAN RPM	VFD (Y/N)	ELECTRICAL V/PH	ELECTRICAL DISC. BY	ELECTRICAL STARTER BY	NOTES
EF-1	EA	GREENHECK	ROOF	G-10-VG	150	0.3	DIRECT	1/10	1580	N	120/1	DIV 26	DIV 26	A-C

NOTES:

A. PROVIDE WITH MINIMUM 9" HIGH ROOF CURB, BIRD SCREEN AND BACKDRAFT DAMPER.
B. DIVISION 26 CONTRACTOR TO FURNISH DISCONNECT SWITCH.
C. DIVISION 26 CONTRACTOR SHALL INTERLOCK FAN OPERATION WITH TIMECLOCK/CONTACTOR TO RUN CONTINUOUSLY DURING OCCUPIED HOURS.

GRILLE, REGISTER AND DIFFUSER SCHEDULE

MARK	MANUFACTURER	MODEL	FACE TYPE	MOUNTING LOCATION	FACE SIZE (IN)	MAX. NC	MAX. PRESS. DROP (IN. W.C.)	NOTES
CSD1	TITUS	OMNI	PLAQUE	CEILING	24X24	30	0.1	A-H
CSD2	TITUS	OMNI	PLAQUE	CEILING	12X12	30	0.1	A-H
CRG1	TITUS	PAR	PERFORATED	CEILING	24X24	30	0.1	A,D,F,H
CEG1	TITUS	PAR	PERFORATED	CEILING	12X12	30	0.1	A,C,D,E,F,H

NOTES:

A. NECK SIZE SHOWN ON DRAWINGS.
B. 4-WAY THROW PATTERN UNLESS OTHERWISE SHOWN ON DRAWINGS.
C. BRANCH DUCT SIZE SHALL BE SAME AS NECK SIZE UNLESS OTHERWISE SHOWN ON DRAWINGS.
D. BAKED ENAMEL FINISH, WHITE TO MATCH CEILING COLOR.
E. PROVIDE NECK FOR DUCT CONNECTION.
F. FRAME TYPE TO MATCH CEILING CONSTRUCTION, COORDINATE WITH ARCHITECTURAL REFLECTED CEILING PLAN.
G. PROVIDE BORDER TYPE TO MATCH CEILING CONSTRUCTION WITH CONCEALED MOUNTING, AND INSULATED PLENUM WITH NECK.
H. STEEL CONSTRUCTION.

PROJECT DESIGN CONDITIONS

SPACE SERVED	SUMMER MAXIMUM TEMPERATURE	SUMMER MAXIMUM RH %	WINTER MINIMUM TEMPERATURE	WINTER MINIMUM RH%
OUTSIDE AIR	96.6F	50%	19.5F	20%
SALES	76F	50%	69F	NA
OFFICE	76F	50%	69F	NA

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MARK DATE DESCRIPTION

SHEET TITLE
MECHANICAL SCHEDULES

PROJECT NUMBER
201701.4.056
SHEET AUTHOR
MEC
CHECKED BY
ASK
DATE
JANUARY 5, 2017

SHEET NUMBER
M-3

RMTA.BIZ

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