

SEQUENCE OF OPERATION

HVAC SYSTEM DESIGN OVERVIEW

THE HVAC SYSTEM DESIGN CONSISTS OF NEW ONE (2) RTU-1 & 2, ONE PROP EXHAUST FAN, THREE CEILING FANS AND ONE ROOF FAN, ONE DEDICATED OUTSIDE AIR UNIT (DOAS), FOUR GAS UNIT HEATERS, SIX EXHAUST AIR CLEANERS, THREE ELECTRIC WALL HEATERS, MOTORIZED WALL LOUVER, WALL GREASE FAN, TYPE 1 HOOD AND MAKEUP AIR UNIT (MAU). THE RTUS AND DOAS ARE PACKAGED UNITS WITH AN ECONOMIZER, FILTERS, A SUPPLY FAN, DX COOLING COIL AND GAS HEAT. THE AHU IS A PACKAGED UNIT WITH GAS HEAT.

SYSTEM SET POINTS GENERALLY, NOMINAL SETPOINTS ARE -70 (ADJ.) FOR HEATING AND -75 (ADJ.) FOR COOLING.

PRIMARY SYSTEMS MODES:  
OCCUPIED MODE -  
OVERRIDE MODE

OCCUPIED (NORMAL) MODE (OC):

THIS BUILDING IS OCCUPIED 24 HOURS. THE PROPOSED BUILDING MANAGEMENT SYSTEM (BMS) IS BY CARRIER MODEL i-Vu FOR CONTROL OF HVAC SYSTEMS.

IF OUTDOOR AIR CONDITION (TEMPERATURE & RH) IS ABOVE RTU SUPPLY AIR TEMPERATURE SETPOINT (60°F(ADJ)) AND 80% RH, RTU WILL ENTER MECHANICAL COOLING MODE. IF OUTDOOR AIR CONDITION (TEMPERATURE & RH) IS BELOW RTU SUPPLY AIR TEMPERATURE SETPOINT (60°F (ADJ)) & 60% RH, RTU WILL ENTER ECONOMIZER MODE. (ENTHALPY CONTROL ECONOMIZER)

IN BOTH MECHANICAL COOLING MODE AND HEATING MODE, THE RTU SHALL MAINTAIN THE MINIMUM OUTSIDE AIR FLOW SETPOINT (CFM PER SCHEDULE).

IN MECHANICAL COOLING MODE, RTU WILL MODULATE OUTDOOR AIR DAMPER TO MINIMUM OUTDOOR AIRFLOW SETPOINT AS STATED ABOVE, AND RTU WILL MODULATE RETURN AIR DAMPER OPEN TO 100% LESS OUTSIDE AIR DAMPER POSITION. RTU FAN AND COMPRESSOR(S) SHALL BE RUNNING TO MAINTAIN SA DUCT AIR TEMPERATURE AT SETPOINT (55°F ADJUSTABLE).

RTU SUPPLY AIR SETPOINT IS RESET ACCORDING TO OUTSIDE AIR TEMPERATURE, WITH AN INITIAL RESET SCHEDULE AS FOLLOWS:

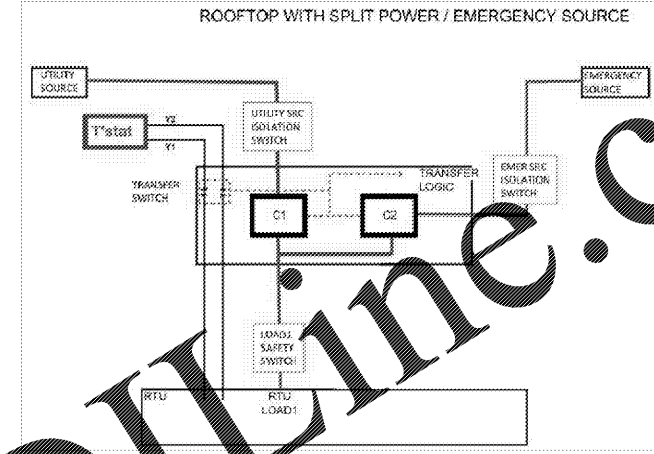
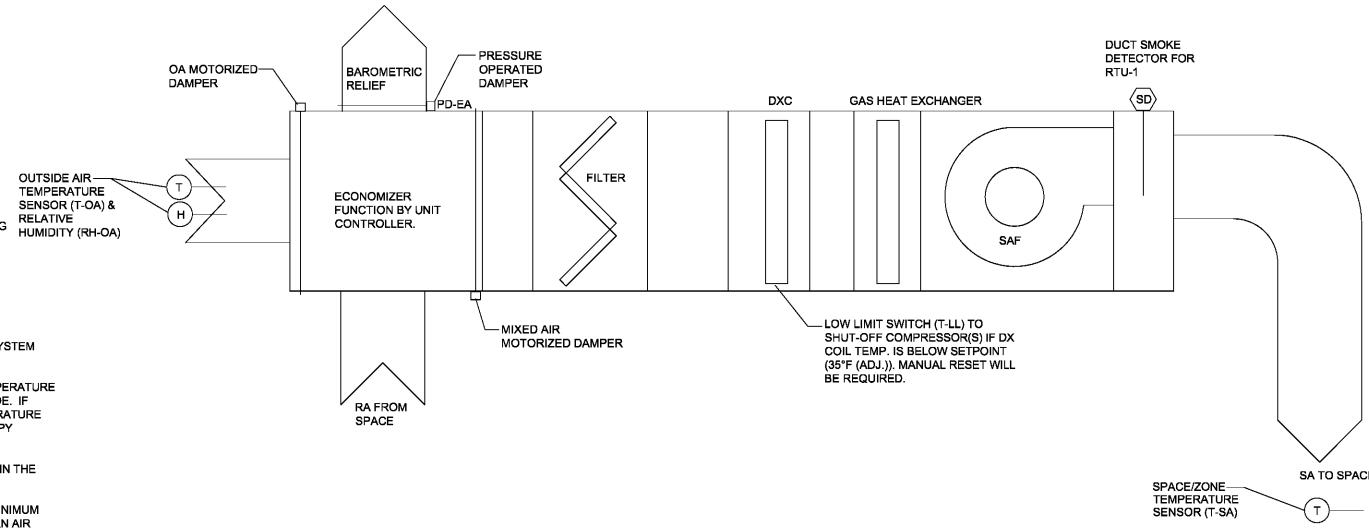
OAT	SAT STPT
105	50
95	50
85	52
75	55
65	60

IN ECONOMIZER MODE, RTU IS CONFIGURED TO DELIVER "FREE COOLING". RTU COMPRESSOR(S) ARE OFF. RTU OUTDOOR AIR DAMPER SHALL MAINTAIN THE SUPPLY AIR TEMPERATURE AT THE SUPPLY AIR TEMPERATURE SETPOINT. RTU IS NOT EQUIPPED WITH AN EXHAUST FAN. RELIEF DAMPER SHALL BE FULLY OPEN TO MAINTAIN THE BUILDING FROM OVER PRESSURIZATION DURING THE ECONOMIZER CYCLE.

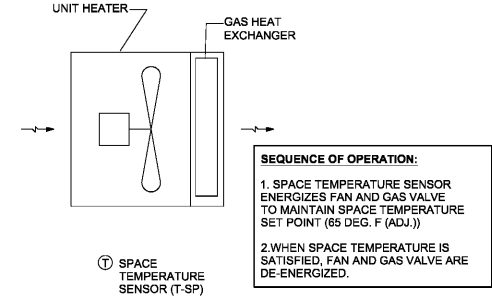
SAFETIES:

THE FOLLOWING SAFETIES SHALL BE MONITORED BY THE HVAC UNIT CONTROLS AND SHALL SHUT DOWN THE UNIT WHEN AN ALARM CONDITION IS ACTIVE. EACH SAFETY SHALL REQUIRE A MANUAL RESET:

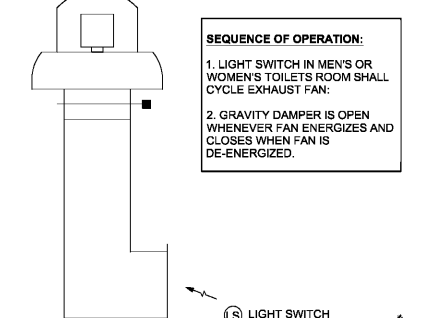
- A. SMOKE IS SENSED BY THE RETURN DUCT SMOKE DETECTOR FOR RTU-1.



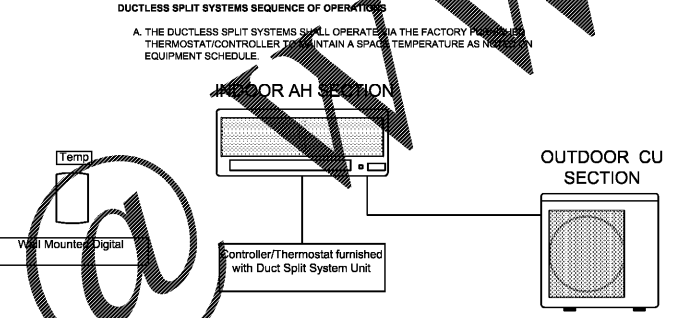
1 ROOFTOP UNIT WITH GAS HEAT CONTROL  
M700 SCALE: NONE



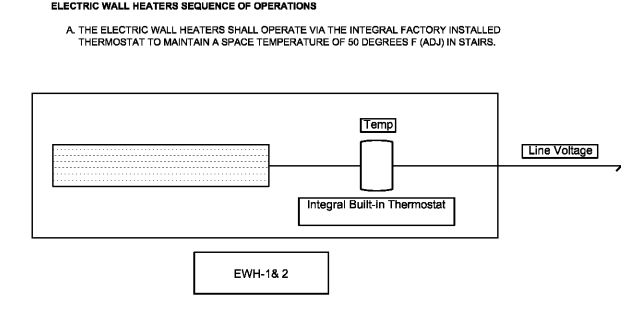
2 GAS UNIT HEATER CONTROL  
M700 SCALE: NONE



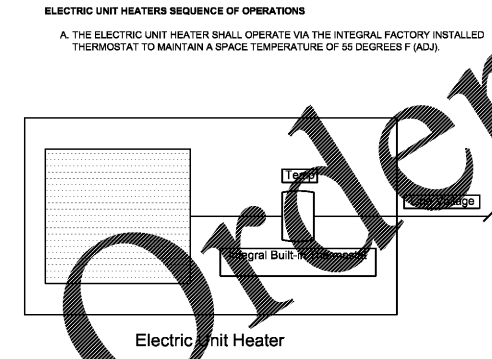
3 ROOF EXHAUST FAN CONTROL  
M700 SCALE: NONE



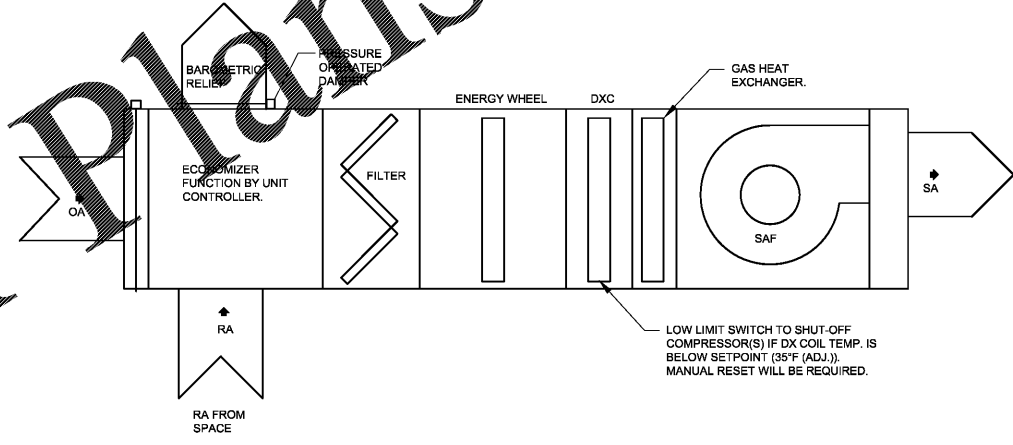
4 DUCTLESS SPLIT SYSTEM CONTROL  
M700 SCALE: NONE



5 ELECTRIC WALL HEATER CONTROL  
M700 SCALE: NONE



6 ELECTRIC UNIT HEATER CONTROL  
M700 SCALE: NONE



7 DEDICATED OUTDOOR AIR UNIT CONTROL  
M700 SCALE: NONE

SEQUENCE OF OPERATION  
OUTDOOR AIR SYSTEM (DOAS)

OCCUPIED (NORMAL) MODE (OC):  
THIS BUILDING IS OCCUPIED 24 HOURS. IN BOTH COOLING AND HEATING MODES, THE DOAS SHALL MAINTAIN THE OUTSIDE AIR FLOW SETPOINT (1550 CFM PER SCHEDULE) AND SETPOINTS ARE - 65 (ADJ.) FOR HEATING AND -78 (ADJ.) FOR COOLING.

COOLING - OCCUPIED OPERATION:  
IN COOLING MODE, THE OUTSIDE AIR DAMPER SHALL BE FULLY OPEN, SUPPLY AIR FAN RUNNING AND COMPRESSOR(S) ENERGIZED TO MAINTAIN PRESET TEMPERATURE OF THE SPACE. DOAS SHALL RUN CONTINUOUSLY DURING OCCUPIED HOURS. IF OUTDOOR AIR CONDITION (TEMPERATURE & RH) IS BELOW SUPPLY AIR TEMPERATURE SETPOINT (55°F) & 60% RH, DOAS WILL ENTER ECONOMIZER MODE.

HEATING - OCCUPIED OPERATION:  
IN HEATING MODE, THE OUTSIDE AIR DAMPER SHALL BE FULLY OPEN, SUPPLY AIR FAN RUNNING AND GAS HEAT IS ENERGIZED TO MAINTAIN PRESET TEMPERATURE TO THE SPACE. DOAS SHALL RUN CONTINUOUSLY DURING OCCUPIED HOURS.

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HIGHWAY  
ATLANTA, GEORGIA  
30364  
CLAYTON COUNTY  
FIRE DEPARTMENT

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TEL: 470.355.8884  
WWW.BOYEARCHITECTURE.COM



RELEASED FOR  
CONSTRUCTION  
100% CD  
DATE: 07/26/2018  
PROJECT NO: 2017017  
DRAWN BY: JS  
CHECKED BY: AG

MECHANICAL -  
SCHEMATICS

M700