SEQUENCE OF OPERATION (RTU–7)

VARIABLE VOLUME AIR HANDLER SEQUENCE OF OPERATION

A. GENERAL:
1. THE UNIT SHALL START THROUGH THE BAS SYSTEM PROVIDED THE SAFETIES HAVE BEEN SATISFIED.
2. BAS PROGRAMMING SHALL DEFINE OCCUPIED AND UNOCCUPIED SCHEDULING.
3. IN THE EVENT THAT THE UNIT IS DISABLED THE OUTSIDE AIR DAMPER SHALL CLOSE AND AN ALARM SHALL BE INDICATED AT THE USER WORKSTATION.

B. OCCUPIED PERIODS: SYSTEM SUPPLY FAN SHALL RUN CONTINUOUSLY AND MODULATE TO MAINTAIN DUCT STATIC PRESSURE SETPOINT. EXHAUST FAN SHALL MODULATE TO MAINTAIN BUILDING PRESSURE AT SETPOINT.

C. UNOCCUPIED PERIODS: SYSTEM SUPPLY FAN SHALL CYCLE TO MAINTAIN THE SPACE SET POINTS, AS INDICATED BELOW, IN EACH OF THE SPACES SERVED. THE SYSTEM SHALL PROVIDE AN ADJUSTABLE ANTI–SHORT CYCLE TIMER TO MAINTAIN A MINIMUM RUNTIME TO PREVENT EXCESSIVE FAN STARTS/STOPS.
1. DURING UNOCCUPIED PERIODS THE OUTDOOR AIR (OA) DAMPER SHALL CLOSE AND THE RETURN AIR DAMPER SHALL OPEN.
2. DURING THE UNOCCUPIED PERIOD THE SPACE SET POINTS SHALL BE RESET TO 60 DEGREES F DURING THE HEATING SEASON AND 85 DEGREES F DURING THE COOLING SEASON.

D. OPTIMUM START/STOP: THE SYSTEM FANS SHALL BE STARTED/STOPPED BASED ON THE OCCUPANCY SCHEDULE, WHICH SHALL BE ADJUSTABLE BY OPTIMUM START AND STOP CALCULATIONS. THE TEMPERATURE AT THE END OF THE OCCUPIED PERIOD WILL BE ALLOWED TO DRIFT A MAXIMUM OF 2F ABOVE OR BELOW TEMPERATURE SET POINT. HEATING AND COOLING COIL VALVES SHALL BE CLOSED. THE SUPPLY FAN WILL CONTINUE TO OPERATE. HISTORICAL PERFORMANCE DATA SHALL BE USED TO DETERMINE HOW QUICKLY THE SPACE HEATS OR COOLS AND WILL START THE SYSTEM AS LATE AS POSSIBLE IN THE MORNING TO ACHIEVE OCCUPIED TEMPERATURE SETPOINT. HISTORICAL DATA WILL ALSO DETERMINE THE EARLIEST POSSIBLE TIME THE SYSTEM CAN STOP TO ALLOW THE MAXIMUM TEMPERATURE DRIFT.

E. MORNING WARM UP: THE UNIT SHALL OPERATE IN THE MORNING WARM–UP MODE WHEN THE RETURN AIR TEMPERATURE IS BELOW THE WARM–UP MODE SET POINT, 68 DEG F (ADJ.), AS MEASURED BY THE RETURN DUCT TEMPERATURE SENSOR.
1. THE OA DAMPER AND RELIEF AIR DAMPER SHALL CLOSE TO 0% AND THE RETURN AIR DAMPER SHALL OPEN TO 100%.
2. THE GAS HEAT SHALL MODULATE TO MAINTAIN A SUPPLY AIR TEMPERATURE OF 85 DEG F (ADJ.).
3. ALL VAV BOXES SHALL OPEN TO 100% UNTIL OCCUPIED SET POINT TEMPERATURE IS ESTABLISHED. AS ZONES REACH OCCUPIED MODE SET POINT THEY WILL MODULATE CLOSED TO PREVENT OVERHEATING.
4. THE VAV ELECTRIC REHEAT COILS START AT 100% CAPACITY. AS THE ZONE REACHES OCCUPIED SETPOINT THE ELECTRIC REHEAT COIL SHALL MODULATE TO PREVENT OVERHEATING.
5. UPON SWITCHING BACK TO NORMAL OPERATION AFTER MORNING WARM UP PROVIDE A 15 MIN(ADJ.) DELAY ON THE ECONOMIZER ENABLE SIGNAL TO ALLOW THE DISCHARGE AIR TEMPERATURE TO REDUCE TO NORMAL OPERATING DISCHARGE TEMPERATURE.

F. MORNING COOL DOWN: THE UNIT SHALL OPERATE IN THE MORNING COOL DOWN MODE WHEN THE RETURN AIR TEMPERATURE IS ABOVE THE COOL DOWN MODE SET POINT, 75 DEG F (ADJ.), AS MEASURED BY THE RETURN AIR DUCT TEMPERATURE SENSOR.
1. THE OA DAMPER AND RELIEF AIR DAMPER SHALL CLOSE TO 0% AND THE RETURN AIR DAMPER SHALL OPEN 100%.
2. THE DX COOLING SYSTEM SHALL STAGE TO MAINTAIN A SUPPLY AIR TEMPERATURE OF 55 DEG F (ADJ.).
3. ALL VAV BOX DAMPERS SHALL OPEN TO 100% UNTIL OCCUPIED SET POINT TEMPERATURE IS ESTABLISHED. AS ZONES REACH OCCUPIED MODE SET POINT THEY WILL MODULATE CLOSED TO PREVENT OVER COOLING.

G. SUPPLY FAN CONTROL: THE UNIT SUPPLY FAN SPEED SHALL MODULATE TO MAINTAIN A SUPPLY DUCT STATIC PRESSURE BETWEEN 0.5" W.G. AND THE MAXIMUM STATIC PRESSURE DETERMINED FROM THE SYSTEM TAB (ADJ.)
1. THE STATIC PRESSURE SET POINT SHALL BE RESET TO MAINTAIN THE VAV BOX CFM REQUIRING THE MOST STATIC PRESSURE AT 90% OPEN.
2. ALL VAV BOX DAMPER POSITIONS SHALL BE CONTINUOUSLY POLLED TO DETERMINE THE VAV BOX THAT IN THE MOST OPEN.
3. THE STATIC PRESSURE SENSOR SHALL BE LOCATED AS SHOWN ON MECHANICAL DRAWINGS BUT NOT LESS THAN ¼ OF THE DISTANCE OF THE LONGEST SUPPLY DUCT RUN.
4. FINAL STATIC PRESSURE SET POINT SHALL BE DETERMINED DURING TESTING AND BALANCING OF THE SYSTEM.
5. AIRFLOW SHALL BE MONITORED USING THE PIEZOMETER AIRFLOW STATION ON THE FAN INLET. THE AIRFLOW STATION SHALL BE USED TO BALANCE TOTAL AIR FLOW AS SCHEDULED.

H. EXHAUST FAN CONTROL: THE SYSTEM EXHAUST FAN SHALL OPERATE WHEN THE SUPPLY FAN IS PROVEN ON. THE EXHAUST FAN SPEED SHALL MODULATE TO MAINTAIN THE BUILDING STATIC PRESSURE SETPOINT (0.02", ADJ.).

I. ECONOMIZER CONTROL: ECONOMIZER CYCLE OPERATION SHALL BE INTEGRATED WITH MECHANICAL COOLING TO ACT AS THE FIRST STAGE OF COOLING. MIXED AIR LOW LIMIT SHALL PREVENT THE MIXED AIR FROM DROPPING BELOW 45 DEG F.
1. THE ECONOMIZER CYCLE SHALL BE ENABLED WHEN THE OUTSIDE AIR ENTHALPY IS LESS THAN 28 BTU/LB (ADJ.) (ASSUMING SPACE CONDITIONS OF 75 DEG F AND 50% RH) AND THE OUTSIDE AIR TEMPERATURE IS LESS THAN 70 DEG F.
2. IF EITHER OR BOTH OF THE OUTSIDE AIR CONDITIONS ARE ABOVE THESE PARAMETERS THE ECONOMIZER MODE WILL BE DISABLED. WHEN THE ECONOMIZER MODE IS DISABLED THE OUTDOOR AIR DAMPER SHALL MODULATE TO MAINTAIN THE MINIMUM OUTDOOR AIR VOLUME.
3. OUTDOOR AIR DAMPER SHALL MODULATE BETWEEN MINIMUM POSITION AND 100% OPEN TO MAINTAIN SUPPLY AIR TEMPERATURE SET POINT. (ADJ.).
4. THE RETURN AIR DAMPER SHALL OPERATE IN INDIRECT PROPORTION WITH THE OUTSIDE AIR DAMPER.
5. ALL DAMPERS SHALL OPERATE ON THEIR OWN P–I–D LOOP CONTROL.
6. IF THE DISCHARGE AIR TEMPERATURE RISES ABOVE THE SET POINT BY 1.5F FOR 5 MIN. AND THE OUTSIDE DAMPER IS 100% OPEN, DX COOLING SHALL BE ENABLED.

G. VENTILATION CONTROL: THE MINIMUM OUTSIDE AIR DAMPER POSITION SHALL BE DYNAMIC AND ESTABLISHED BY THE MINIMUM REQUIRED OUTSIDE AIR AS READ BY THE AIRFLOW MONITORING STATION LOCATED AT THE OUTSIDE AIR INLET.

H. SUPPLY AIR TEMPERATURE CONTROL:
1. SUPPLY AIR TEMPERATURE SHALL BE 55 DEG F WHEN THE OUTDOOR TEMPERATURE IS GREATER THAN 70 DEG F.
2. SUPPLY AIR TEMPERATURE SHALL BE RESET UPWARD PROPORTIONALLY BETWEEN 55 DEG F (ADJ.), WHEN THE OUTDOOR TEMPERATURE IS EQUAL TO 70 DEG F, AND 65 DEG F WHEN THE OUTDOOR TEMPERATURE IS 40 DEG F.
3. SUPPLY AIR TEMPERATURE SHALL BE 65 DEG F WHEN THE OUTDOOR TEMPERATURE IS BELOW 40 DEG F.
4. THE SUPPLY TEMPERATURE SHALL BE THE OUTPUT OF A SLOW REVERSE–ACTING PI LOOP THAT MAINTAINS THE COOLING LOOP OF THE ZONE SERVED BY THE AIR HANDLING SYSTEM WITH THE HIGHEST COOLING LOOP AT A SET POINT OF 90%
5. WHEN SUPPLY AIR TEMPERATURE RISES ABOVE SET POINT, THE DX COOLING SYSTEM SHALL MODULATE TO MAINTAIN SET POINT.
6. WHEN THE SUPPLY AIR TEMPERATURE DROPS BELOW THE SET POINT, THE GAS HEAT SHALL MODULATE TO MAINTAIN SET POINT.
7. THE GAS HEAT SHALL BE DISABLED ABOVE OA TEMPERATURES OF 50 DEG F (ADJ.).

M. SAFETY DEVICES:
1. SMOKE DETECTORS LOCATED IN THE SUPPLY AND RETURN DUCTS SHALL STOP THE UNIT FANS AND CLOSE THE OUTSIDE AIR DAMPER IF SMOKE IS DETECTED.
2. DUCT HIGH STATIC PRESSURE SENSOR SHALL DISABLE UNIT FANS WHEN MEASURED PRESSURE EXCEEDS 6" W.C. (ADJ.).

N. OTHER DEVICES AND ALARMS:
1. FAN AND STATUS SHALL BE DETERMINED BY CURRENT SENSING DEVICE. GENERATE ALARM AT USER WORKSTATION IN THE EVENT OF FAN FAILURE.
2. IF THE OUTSIDE AIR QUANTITY IS 10% LESS THAN THE REQUIRED DESIGN MINIMUM OUTSIDE AIR FLOW AN ALARM SHALL BE GENERATED AT THE OPERATOR WORKSTATION.

O. THE FOLLOWING POINTS SHALL BE AVAILABLE FOR MONITORING AT THE USER WORKSTATION.
1. OUTSIDE AIR TEMPERATURE
2. MIXED AIR TEMPERATURE
3. DISCHARGE AIR TEMPERATURE
4. OUTSIDE AIRFLOW
5. RETURN AIR HUMIDITY LEVEL
6. SUPPLY FAN SPEED
7. OUTSIDE AIR DAMPER POSITION
8. RETURN DAMPER POSITION
9. BUILDING PRESSURE
10. SUPPLY DUCT STATIC PRESSURE
11. SUPPLY DUCT STATIC PRESSURE SETPOINT
12. AIR HANDLER INTERNAL TEMPERATURE / MIXED AIR TEMPERATURE

P. REQUIRED TREND LOG REPORTS (7–DAY MINIMUM WITH 5 MIN. INTERVALS)
1. OUTSIDE AIR TEMPERATURE
2. OUTSIDE AIR %RH
3. BUILDING STATIC PRESSURE
4. OUTSIDE AIR FLOW QUANTITY
5. MIXED AIR TEMPERATURE
6. SUPPLY AIR TEMPERATURE

SINGLE DUCT VARIABLE AIR VOLUME BOX SEQUENCE OF OPERATION

1. VAV CONTROL: DUAL TEMPERATURE THERMOSTAT SET AT 75°F (ADJUSTABLE) MAINTAINS CONSTANT SPACE TEMPERATURE BY MODULATING THE VARIABLE AIR VOLUME DAMPER OPERATOR. ON A RISE OF TEMPERATURE ABOVE THE COOLING SET POINT (75°F ADJUSTABLE), THE VAV TERMINAL UNIT SHALL MODULATE TO ITS MAXIMUM CFM. AS THE TEMPERATURE DROPS BELOW THE COOLING SET POINT, THE TERMINAL UNIT SHALL MODULATE TO ITS MINIMUM CFM. AS THE SPACE TEMPERATURE CONTINUES TO FALL TO THE HEATING SET POINT (70°F ADJUSTABLE), THE ELECTRIC COIL SHALL MODULATE TO MAINTAIN THE SPACE TEMPERATURE SETPOINT. IF ELECTRIC DUCT COILS CANNOT MAINTAIN SPACE TEMPERATURE SETPOINT, THE ELECTRIC BASEBOARD HEATERS (WHERE APPLICABLE) SHALL BE ENERGIZED AS THE SECOND STAGE OF HEAT. ELECTRIC BASEBOARD HEATERS SHALL BE DISABLED AT OUTDOOR AIR TEMPERATURE GREATER THAN 50 DEG F, ADJ.

2. VAV CONTROL WITH CO2 MONITORING: SEQUENCE FOR HEATING AND COOLING SHALL BE AS DESCRIBED ABOVE. HOWEVER, UPON AN INCREASE IN CO2, THE VARIABLE AIR VOLUME DAMPER SHALL MODULATE OPEN TO ITS MAXIMUM POSITION TO MAINTAIN CO2 LEVEL LEVEL BELOW 1000 PPM.

A1	VAV AIR HANDLER SEQUENCE OF OPERATION
NOT TO SCALE	

SEQUENCE OF OPERATION (RTU'S–1,2,3,4,5,6&8)

CONSTANT VOLUME AIR HANDLER SEQUENCE OF OPERATION

A. GENERAL: THE SYSTEM SHALL START THROUGH THE BAS SYSTEM PROVIDED THE SAFETIES HAVE BEEN SATISFIED. THE START/STOP CONTROL OF FANS SHALL BE BASED ON A USER DEFINED OCCUPANCY SCHEDULE. THE SYSTEM START/STOP SHALL INCORPORATE AN OPTIMUM STAR/STOP ROUTINE AUTOMATICALLY CALCULATING THE HEAT UP OR COOL DOWN TIME FOR THE SPACES SERVED AND SHALL PROVIDE THE SPACES AT THE PROPER TEMPERATURE WHEN THE AREA REACHES THE OCCUPIED PERIOD.

B. OCCUPIED PERIODS: WHEN THE AHU IS IN THE OCCUPIED MODE, THE SUPPLY FAN SHALL OPERATE CONTINUOUSLY, THE DX COOLING SHALL CYCLE, THE GAS HEAT AND OUTSIDE/RETURN DAMPERS SHALL MODULATE IN SEQUENCE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE.

C. UNOCCUPIED PERIODS: WHEN THE AHU IS IN THE NIGHT SETBACK MODE, THE SUPPLY FAN AND GAS HEAT SHALL CYCLE TO MAINTAIN THE UNOCCUPIED HEATING SETPOINT. THE SUPPLY FAN AND DX COOLING SHALL CYCLE TO MAINTAIN THE UNOCCUPIED COOLING SETPOINT AND THE OUTSIDE AIR DAMPERS SHALL BE CLOSED.

D. WARM–UP: WHEN THE AHU IS IN THE UNOCCUPIED TO OCCUPIED WARM UP MODE, THE SUPPLY FAN SHALL OPERATE, THE OUTSIDE AIR DAMPER SHALL BE CLOSED AND THE DX COOLING SHALL BE OFF. THE RETURN DAMPER SHALL BE OPEN AND THE GAS HEAT SHALL STAGE/MODULATE TO ACHIEVE THE OCCUPIED SET POINT.

E. COOL DOWN: WHEN THE AHU IS IN THE UNOCCUPIED TO OCCUPIED COOL DOWN MODE, THE SUPPLY FAN SHALL OPERATE AND THE OUTSIDE AIR DAMPER SHALL BE CLOSED. FOR OUTSIDE AIR CONDITIONS THAT ARE SUITABLE FOR FREE COOLING, THE OUTSIDE AIR DAMPER AND RETURN AIR DAMPER SHALL MODULATE TO MAINTAIN THE DISCHARGE AIR SET POINT TO OBTAIN THE OCCUPIED SPACE SENSOR SET POINT. WHEN THE UNIT IS IN THE FREE COOLING MODE OF OPERATION THE DX COOLING SHALL BE OFF. WHEN THE OUTSIDE AIR CONDITIONS ARE NOT SUITABLE FOR FREE COOLING THE DX CONDENSING UNIT SHALL CYCLE TO MEET THE OCCUPIED SET POINT.

F. COOLING: AS THE RETURN AIR TEMPERATURE OR THE SPACE SENSOR REQUIRE COOLING THE UNIT SHALL ENTER THE COOLING MODE OF OPERATION. THE BAS SHALL COMPARE THE RETURN AIR TEMPERATURE AND THE OUTSIDE AIR TEMPERATURE AND EVALUATE THE SUITABILITY OF FREE COOLING. IF THE OUTSIDE AIR IS SUITABLE FOR FREE COOLING, ACTIVATE THE FIRST STAGE OF COOLING BY MODULATING OPEN THE OUTSIDE AND RETURN AIR DAMPERS BEYOND TO A MAXIMUM OF 100% OUTSIDE AIR. THE BAS SHALL MAINTAIN A SUPPLY AIR TEMPERATURE RESET TO THE COOLING SET POINT IN THE SPACE. WHEN THE OUTSIDE AIR IS NO LONGER SUITABLE FOR FREE COOLING OR THE RETURN AIR AND SPACE TEMPERATURES CONTINUE TO RISE, THE UNIT SHALL ENTER THE SECOND STAGE OF COOLING MODE. THE SECOND STAGE OF COOLING SHALL MODULATE THE OUTSIDE AIR DAMPER TO THE MINIMUM AIR FLOW AND ENERGIZE THE DX COOLING SYSTEM. THE DX CONDENSING UNIT SHALL CYCLE TO MAINTAIN THE SPACE SET POINT.

G. HEATING: IN THE HEATING MODE THE AHU SHALL OPERATE WITH THE OUTSIDE AIR DAMPER IN THE MINIMUM POSITION AND THE RETURN DAMPER AT THE HEATING AIRFLOW POSITION. THE GAS HEAT SHALL STAGE/MODULATE TO MAINTAIN THE SPACE SET POINT. ELECTRIC BASEBOARD HEATERS SHALL OPERATE WHEN THE ROOFTOP UNIT IS IN HEATING MODE. ELECTRIC BASEBOARD HEATERS SHALL BE DISABLED AT OUTDOOR AIR TEMPERATURE GREATER THAN 50 DEG F, ADJUSTABLE.

H. VENTILATION: DURING THE OCCUPIED MODE, THE OUTSIDE AIR DAMPER SHALL BE SET TO MAINTAIN THE SCHEDULED MINIMUM QUANTITY OF OUTSIDE AIR INTO THE UNIT.

G. ECONOMIZER CONTROL: ECONOMIZER CYCLE OPERATION SHALL BE INTEGRATED WITH MECHANICAL COOLING TO ACT AS THE FIRST STAGE OF COOLING. MIXED AIR LOW LIMIT SHALL PREVENT THE MIXED AIR FROM DROPPING BELOW 45 DEG F.
1. THE ECONOMIZER CYCLE SHALL BE ENABLED WHEN THE OUTSIDE AIR ENTHALPY IS LESS THAN 28 BTU/LB (ADJ.) (ASSUMING SPACE CONDITIONS OF 75 DEG F AND 50% RH) AND THE OUTSIDE AIR TEMPERATURE IS LESS THAN 70 DEG F.
2. IF EITHER OR BOTH OF THE OUTSIDE AIR CONDITIONS ARE ABOVE THESE PARAMETERS THE ECONOMIZER MODE WILL BE DISABLED. WHEN THE ECONOMIZER MODE IS DISABLED THE OUTDOOR AIR DAMPER SHALL MODULATE TO MAINTAIN THE MINIMUM OUTDOOR AIR VOLUME.
3. OUTDOOR AIR DAMPER SHALL MODULATE BETWEEN MINIMUM POSITION AND 100% OPEN TO MAINTAIN SUPPLY AIR TEMPERATURE SET POINT. (ADJ.)
4. THE RETURN AIR DAMPER SHALL OPERATE IN INDIRECT PROPORTION WITH THE OUTSIDE AIR DAMPER.
5. ALL DAMPERS SHALL OPERATE ON THEIR OWN P–I–D LOOP CONTROL.
6. IF THE DISCHARGE AIR TEMPERATURE RISES ABOVE THE SET POINT BY 1.5F FOR 5 MIN. AND THE OUTSIDE DAMPER IS 100% OPEN, DX COOLING SHALL BE ENABLED.

G. SUPPLY AIR TEMPERATURE CONTROL:
1. SUPPLY AIR TEMPERATURE SHALL BE RESET BETWEEN 55 DEG F AND 85 DEG F BY A SLOW–ACTING PI LOOP BASED ON DIFFERENCE BETWEEN SPACE TEMPERATURE AND SPACE TEMPERATURE SETPOINT.
2. WHEN SUPPLY AIR TEMPERATURE RISES ABOVE SETPOINT, THE COOLING SYSTEM SHALL STAGE TO MAINTAIN SETPOINT.
3. WHEN SUPPLY AIR TEMPERATURE FALLS BELOW SETPOINT, THE GAS HEATER SHALL STAGE/MODULATE TO MAINTAIN SETPOINT.

M. SAFETY DEVICES:
1. SMOKE DETECTORS LOCATED IN THE SUPPLY AND RETURN DUCTS SHALL STOP THE UNIT FANS AND CLOSE THE OUTSIDE AIR DAMPERS IF SMOKE IS DETECTED.

N. OTHER DEVICES AND ALARMS:
1. FAN AND STATUS SHALL BE DETERMINED BY CURRENT SENSING DEVICE. GENERATE ALARM AT USER WORKSTATION IN THE EVENT OF FAN FAILURE.
2. IF THE OUTSIDE AIR QUANTITY IS 10% LESS THAN THE REQUIRED DESIGN MINIMUM OUTSIDE AIR FLOW AN ALARM SHALL BE GENERATED AT THE OPERATOR WORKSTATION.

O. THE FOLLOWING POINTS SHALL BE AVAILABLE FOR MONITORING AT THE USER WORKSTATION.
1. OUTSIDE AIR TEMPERATURE
2. OUTSIDE AIR %RH
3. MIXED AIR TEMPERATURE
4. DISCHARGE AIR TEMPERATURE
5. RETURN AIR HUMIDITY LEVEL
6. SUPPLY FAN STATUS
7. OUTSIDE AIR DAMPER POSITION
8. RELIEF AIR DAMPER POSITION
9. RETURN DAMPER POSITION

P. REQUIRED TREND LOG REPORTS (7–DAY MINIMUM WITH 5 MIN. INTERVALS)
1. OUTSIDE AIR TEMPERATURE
2. OUTSIDE AIR %RH
3. MIXED AIR TEMPERATURE
4. SUPPLY AIR TEMPERATURE
5. ROOM TEMPERATURE

E9	CONSTANT VOLUME HANDLER SEQUENCE OF OPERATION
NOT TO SCALE	

SEQUENCE OF OPERATION

A. FAN CONTROLS SHALL BE STAND–ALONE.
B. THE FAN SHALL START WHEN THE ROOM TEMPERATURE RISES ABOVE SETPOINT 90°F (ADJ)
C. ON A DROP IN TEMPERATURE OF 5°F (ADJ), THE FAN SHALL STOP.

D9	EXHAUST FAN SEQUENCE OF OPERATION (EF–2)
NOT TO SCALE	

SEQUENCE OF OPERATION

A. CABINET UNIT HEATERS SHALL BE CONTROLLED THROUGH THE BAS SYSTEM.
B. THE FAN SHALL START AND THE ELECTRIC HEATING ELEMENT SHALL BE TURNED ON WHEN THE ROOM TEMPERATURE FALLS BELOW HEATING SETPOINT (65°F, ADJ.).
C. ON A RISE IN TEMPERATURE OF 5°F (ADJ), THE FAN SHALL STOP AND THE HEATING ELEMENT SHALL BE TURNED OFF.
D. CABINET UNIT HEATERS SHALL BE DISABLED WHEN RTU–4 IS IN COOLING MODE.
E. CABINET UNIT HEATERS SHALL BE DISABLED WHEN OUTDOOR AIR TEMPERATURE IS GREATER THAN 50°F, (ADJ).

D13	CABINET UNIT HEATER SEQUENCE OF OPERATION
NOT TO SCALE	

SEQUENCE OF OPERATION

A. THE FAN SHALL BE CONTROLLED BY THE BAS SYSTEM
B. THE FAN SHALL OPERATE DURING OCCUPIED HOURS AND RUN ONCE AN HOUR FOR 15 MINUTES DURING UNOCCUPIED HOURS
C. A CURRENT SWITCH SHALL INITIATE AN ALARM TO THE OPERATOR'S CENTRAL WORKSTATION IN THE EVENT THE FAN FAILS TO OPERATE

A9	EXHAUST FAN SEQUENCE OF OPERATION (EF–1)
NOT TO SCALE	

SEQUENCE OF OPERATION

A. FAN CONTROLS SHALL BE STAND–ALONE.
B. THE MAKE–UP AIR MOTOR–OPERATED DAMPER SHALL OPEN AND THE FAN SHALL START WHEN THE ROOM TEMPERATURE RISES ABOVE SETPOINT 90°F (ADJ)
C. ON A DROP IN TEMPERATURE OF 5°F (ADJ), THE FAN SHALL STOP AND THE MOTOR–OPERATED DAMPER SHALL CLOSE.

A13	EXHAUST FAN SEQUENCE OF OPERATION (EF–3)
NOT TO SCALE	

NOTE:

1. SEE SHEET M–001 FOR LEGEND AND ABBREVIATIONS.

REV.	DESCRIPTION	DATE
1	CONFORMED SET	4–21–15
0	ISSUED FOR CONSTRUCTION	3–3–15

CONFORMED SET
4–21–15

CURRENT ISSUE STATUS:

STATE OF MAINE
CALEB J. MILLIKEN
No. 12274
LICENSED
PROFESSIONAL ENGINEER
4/21/15

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SHEET TITLE:			
SCALE:	NOT TO SCALE	DATE:	3–3–15
PROJECT MANAGER:	JLH	GRAPHIC SCALE:	0" 1"
JOB CAP/DRAWN:	CAH/KPB		
A/E OF RECORD:	CJM	SHEET No.	M–651
SMRT CAD FILE:	M–651–14199		
PROJECT No.	14199–00		

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