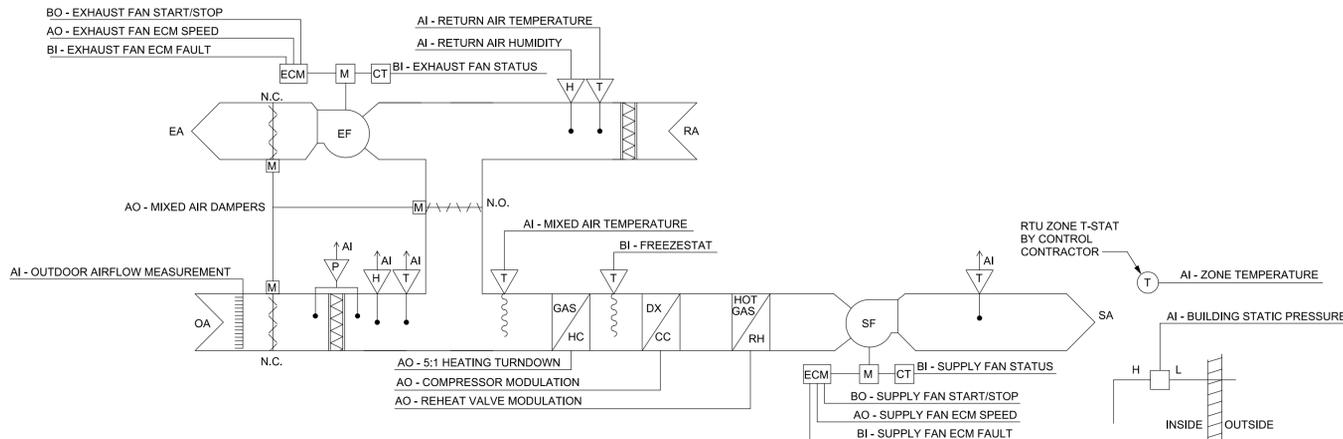


POINT NAME	SYSTEM SUMMARY						SOFTWARE POINTS	TREND	ALARM	SHOW ON GRAPHIC
	AI	AO	BI	BO	AV	BV				
EXHAUST FAN START/STOP				X				X	X	
EXHAUST FAN ECM SPEED		X						X	X	
EXHAUST FAN ECM FAULT		X						X	X	
EXHAUST FAN STATUS			X					X	X	
RETURN AIR TEMPERATURE	X							X	X	
RETURN AIR HUMIDITY	X							X	X	
MIXED AIR DAMPERS	X	X						X	X	
OUTDOOR AIRFLOW MONITORING STATION	X							X	X	
MIXED AIR TEMPERATURE	X							X	X	
FREEZESTAT			X					X	X	X
FILTER DIFFERENTIAL PRESSURE	X							X	X	
OUTSIDE AIR TEMPERATURE	X							X	X	
OUTSIDE AIR HUMIDITY	X							X	X	
5:1 HEATING TURNDOWN		X						X	X	
COMPRESSOR MODULATION		X						X	X	
REHEAT VALVE MODULATION		X						X	X	
SUPPLY FAN START/STOP				X				X	X	
SUPPLY FAN ECM SPEED		X						X	X	
SUPPLY FAN ECM FAULT		X						X	X	
SUPPLY FAN STATUS		X						X	X	
DISCHARGE AIR TEMPERATURE	X							X	X	
ZONE TEMPERATURE	X							X	X	
BUILDING STATIC PRESSURE	X			X				X	X	
HIGH ZONE TEMP								X		
LOW ZONE TEMP								X		
HIGH DISCHARGE AIR TEMP								X		
LOW DISCHARGE AIR TEMP								X		
FILTER CHANGE REQUIRED								X		
HIGH MIXED AIR TEMP								X		
LOW MIXED AIR TEMP								X		
HIGH RETURN AIR HUMIDITY								X		
LOW RETURN AIR HUMIDITY								X		
HIGH RETURN AIR TEMP								X		
LOW RETURN AIR TEMP								X		



ROOFTOP UNIT CONTROLS SEQUENCE:

RUN CONDITIONS - SCHEDULED:
THE UNIT SHALL RUN ACCORDING TO A USER DEFINABLE TIME SCHEDULE IN THE FOLLOWING MODES:

OCCUPIED MODE:

1. A 75 DEG. F (ADJ.) COOLING SETPOINT.
2. A 70 DEG. F (ADJ.) HEATING SETPOINT.
3. A 55% (ADJ.) RELATIVE HUMIDITY SETPOINT.

UNOCCUPIED MODE (NIGHT SETBACK):

1. AN 85 DEG. F (ADJ.) COOLING SETPOINT.
2. A 55 DEG. F (ADJ.) HEATING SETPOINT.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

1. HIGH ZONE TEMP: IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).
2. LOW ZONE TEMP: IF THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).

EMERGENCY SHUTDOWN:

THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING AN EMERGENCY SHUTDOWN SIGNAL.

FREEZE PROTECTION:

THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A FREEZESTAT STATUS.

AHU OPTIMAL START:

THE UNIT SHALL START PRIOR TO SCHEDULED OCCUPANCY BASED ON THE TIME NECESSARY FOR THE ZONES TO REACH THEIR OCCUPIED SETPOINTS. THE START TIME SHALL AUTOMATICALLY ADJUST BASED ON CHANGES IN OUTSIDE AIR TEMPERATURE AND ZONE TEMPERATURES.

SUPPLY FAN:

THE SUPPLY FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES. TO PREVENT SHORT CYCLING, THE SUPPLY FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.

THE UNIT CONTROLLER SHALL PROPORTIONAL CONTROL THE ECM MOTORS ON THE SUPPLY FAN BASED ON SPACE TEMPERATURE. THE UNIT CONTROLLER SHALL INCREASE / DECREASE THE SPEED OF THE SUPPLY FAN IN ORDER TO MAINTAIN THE SPACE TEMPERATURE WITHIN ITS SETPOINT AND DEADBAND.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

1. SUPPLY FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
2. SUPPLY FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
3. SUPPLY FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

EXHAUST FAN:

THE EXHAUST FAN SHALL RUN WHENEVER THE SUPPLY FAN RUNS.

THE UNIT CONTROLLER SHALL PROVIDE BUILDING STATIC PRESSURE CONTROL. THE UNIT CONTROLLER SHALL PROVIDE PROPORTIONAL CONTROL OF THE EXHAUST FANS IN RELATION TO THE SUPPLY AIR FAN AIRFLOW TO MAINTAIN THE ADJUSTABLE BUILDING PRESSURE SETPOINT.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

1. EXHAUST FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
2. EXHAUST FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
3. EXHAUST FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

SUPPLY AIR TEMPERATURE SETPOINT - FIXED:

THE CONTROLLER SHALL MONITOR THE SUPPLY AIR TEMPERATURE AND SHALL MAINTAIN FIXED SUPPLY AIR TEMPERATURE SETPOINTS AS FOLLOWS:

1. COOLING: THE SETPOINT SHALL BE 55 DEG. F (ADJ.).
2. HEATING: THE SETPOINT SHALL BE 95 DEG. F (ADJ.).

COOLING:

THE CONTROLLER SHALL MEASURE THE SUPPLY AIR TEMPERATURE AND MODULATE THE COMPRESSOR TO MAINTAIN ITS COOLING DISCHARGE SETPOINT.

THE COOLING SHALL BE ENABLED WHENEVER:

1. OUTSIDE AIR TEMPERATURE IS GREATER THAN 60 DEG. F (ADJ.).
2. AND THE ECONOMIZER IS DISABLED OR FULLY OPEN.
3. AND THE SUPPLY FAN STATUS IS ON.
4. AND THE HEATING IS NOT ACTIVE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

1. HIGH DISCHARGE AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS 5 DEG. F (ADJ.) GREATER THAN SETPOINT.

DEHUMIDIFICATION:

THE CONTROLLER SHALL MONITOR THE RETURN AIR RELATIVE HUMIDITY AND SHALL OVERRIDE THE COOLING SEQUENCE TO MAINTAIN RETURN AIR RELATIVE HUMIDITY SETPOINT.

DEHUMIDIFICATION SHALL BE ENABLED WHENEVER THE SUPPLY FAN STATUS IS ON.

THE CONTROLLER WILL MODULATE THE HOT GAS REHEAT COIL TO MAINTAIN THE DISCHARGE AIR TEMPERATURE.

GAS HEATING STAGES:

THE CONTROLLER SHALL MEASURE THE SUPPLY AIR TEMPERATURE AND STAGE THE HEATING TO MAINTAIN ITS HEATING SETPOINT. TO PREVENT SHORT CYCLING, THERE SHALL BE A USER DEFINABLE (ADJ.) DELAY BETWEEN STAGES, AND EACH STAGE SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.

THE HEATING SHALL BE ENABLED WHENEVER:

1. OUTSIDE AIR TEMPERATURE IS LESS THAN 65 DEG. F (ADJ.).
2. AND THE SUPPLY FAN STATUS IS ON.
3. AND THE COOLING IS NOT ACTIVE.

THE HEATING SHALL RUN FOR FREEZE PROTECTION WHENEVER:

1. SUPPLY AIR TEMPERATURE DROPS FROM 40 DEG. F (ADJ.) TO 35 DEG. F (ADJ.).
2. AND THE SUPPLY FAN STATUS IS ON.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

1. LOW DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS 5 DEG. F (ADJ.) LESS THAN SETPOINT.

ECONOMIZER:

THE CONTROLLER SHALL MEASURE THE MIXED AIR TEMPERATURE AND MODULATE THE ECONOMIZER DAMPERS IN SEQUENCE TO MAINTAIN A SETPOINT 2 DEG. F (ADJ.) LESS THAN THE SUPPLY AIR TEMPERATURE SETPOINT. THE OUTSIDE AIR DAMPERS SHALL MAINTAIN A MINIMUM AIRFLOW OF THE FOLLOWING WHENEVER OCCUPIED:

1. RTU-CAFE: 1100 CFM.
1. OUTSIDE AIR TEMPERATURE IS LESS THAN 65 DEG. F (ADJ.).
2. AND THE OUTSIDE AIR ENTHALPY IS LESS THAN 22 BTU/LB (ADJ.).
3. AND THE OUTSIDE AIR TEMPERATURE IS LESS THAN THE RETURN AIR TEMPERATURE.
4. AND THE OUTSIDE AIR ENTHALPY IS LESS THAN THE RETURN AIR ENTHALPY.
5. AND THE SUPPLY FAN STATUS IS ON.

THE ECONOMIZER SHALL BE ENABLED WHENEVER:

THE ECONOMIZER SHALL CLOSE WHENEVER:

1. MIXED AIR TEMPERATURE DROPS FROM 40 DEG. F TO 35 DEG. F (ADJ.)
2. OR THE FREEZE STAT IS ON.
3. OR ON LOSS OF SUPPLY FAN STATUS.

THE OUTSIDE AND EXHAUST AIR DAMPERS SHALL CLOSE AND THE RETURN AIR DAMPER SHALL OPEN WHEN THE UNIT IS OFF. IF OPTIMAL START IS AVAILABLE THE MIXED AIR DAMPER SHALL OPERATE AS DESCRIBED IN THE OCCUPIED MODE EXCEPT THAT THE THE OUTSIDE AIR DAMPER SHALL MODULATE TO FULLY CLOSED.

MINIMUM OUTSIDE AIR VENTILATION - AIRFLOW MONITORING STATION:
THE AIRFLOW MONITORING STATION SHALL CONTROL THE OUTSIDE AIR DAMPERS TO MAINTAIN A MINIMUM OUTDOOR AIRFLOW DURING BUILDING OCCUPIED HOURS AND BE CLOSED DURING UNOCCUPIED HOURS.

FILTER DIFFERENTIAL PRESSURE:

THE CONTROLLER SHALL MONITOR THE FILTER DIFFERENTIAL PRESSURE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

1. FILTER CHANGE REQUIRED: FILTER DIFFERENTIAL PRESSURE EXCEEDS USER DEFINABLE AMOUNT (ADJ.).

MIXED AIR TEMPERATURE:

THE CONTROLLER SHALL MONITOR THE MIXED AIR TEMPERATURE AND USE AS REQUIRED FOR ECONOMIZER CONTROL.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

1. HIGH MIXED AIR TEMP: IF THE MIXED AIR TEMPERATURE IS GREATER THAN 90 DEG. F (ADJ.).
2. LOW MIXED AIR TEMP: IF THE MIXED AIR TEMPERATURE IS LESS THAN 45 DEG. F (ADJ.).

RETURN AIR HUMIDITY:

THE CONTROLLER SHALL MONITOR THE RETURN AIR HUMIDITY AND USE AS REQUIRED FOR ECONOMIZER OR HUMIDITY CONTROL.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

1. HIGH RETURN AIR HUMIDITY: IF THE RETURN AIR HUMIDITY IS GREATER THAN 70% RELATIVE HUMIDITY (ADJ.).
2. LOW RETURN AIR HUMIDITY: IF THE RETURN AIR HUMIDITY IS LESS THAN 35% RELATIVE HUMIDITY (ADJ.).

RETURN AIR TEMPERATURE:

THE CONTROLLER SHALL MONITOR THE RETURN AIR TEMPERATURE AND USE AS REQUIRED FOR SETPOINT CONTROL OR ECONOMIZER CONTROL.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

1. HIGH RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS GREATER THAN 90 DEG. F (ADJ.).
2. LOW RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS LESS THAN 45 DEG. F (ADJ.).

DISCHARGE AIR TEMPERATURE:

THE CONTROLLER SHALL MONITOR THE DISCHARGE AIR TEMPERATURE.

1 VAV ROOFTOP UNIT (RTU-CAFE), GAS HEATING, DX COOLING, ECONOMIZER SEQUENCE OF OPERATION

SCALE: NOT TO SCALE

UNIT FAN SHALL RUN CONTINUOUSLY TO PROVIDE REQUIRED VENTILATION. A TEMPERATURE LIMITING PROGRAMMABLE THERMOSTAT SHALL CONTROL VALVE OPERATION WHEN THERE IS A CALL FOR COOLING OR HEATING.

2 DUAL TEMP FAN COIL SEQUENCE OF OPERATIONS.

SCALE: NOT TO SCALE



DATE: 9/17/2009
REVISION:

PROJECT NO: 200905
DESIGNED BY: CDM
DRAWN BY: WRW
CHECKED BY: RGA
SCALE: AS NOTED
NOTES:

MECHANICAL CONTROLS

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