100% OA VARIABLE VOLUME AHU, WITH VIFB STEAM HEAT CONTROL DIAGRAM

SEQUENCE OF OPERATION

100% OA VARIABLE VOLUME AHU. WITH VIFB STEAM HEAT CONTROL DIAGRAM

NOTE: ALL SETPOINTS DESCRIBED IN THE SEQUENCE WILL BE ADJUSTABLE BY SYSTEM OPERATORS. (CREATE REQUIRED VIRTUAL POINTS). APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL FAN MOTOR CONTROL SWITCHES SHALL BE IN 'AUTO' POSITION.

SYSTEM OFF:

1. WHEN THE UNIT IS "OFF", THE SUPPLY FAN SHALL BE OFF, THE OUTSIDE AIR AND SMOKE DAMPERS SHALL CLOSE AFTER A 15 SECOND TIME DELAY, THE FACE & BYPASS DAMPER SHALL BE OPEN TO THE COIL, COOLING COIL CONTROL VALVE SHALL BE CLOSED. THE HUMIDITY ISOLATION AND CONTROL VALVE SHALL BE CLOSED. THE STEAM HEATING CONTROL VALVE SHALL BE UNDER THE CONTROL OF THE HEATING COIL DISCHARGE AIR TEMPERATURE SENSOR AT ALL TIMES MAINTAINING A SETPOINT OF 50 DEG. F.

SYSTEM ON:

- UNIT SHALL OPERATE 7-DAYS A WEEK 24-HOUR A DAY AND SHALL BE CAPABLE OF BEING OVERRIDDEN FROM THE BAS.
- WHEN THE UNIT IS INDEXED TO START THE OUTSIDE AIR (ES1) AND SMOKE DAMPERS (ES2) SHALL BE FULLY OPEN. DAMPER LIMIT SWITCHES (ES1 AND ES2) SHALL PREVENT FAN OPERATION UNTIL DAMPERS REACH THEIR FULL OPEN POSITION. THE SUPPLY FAN SHALL BE STARTED AT THE VARIABLE FREQUENCY DRIVES MINIMUM OUTPUT AND BE SLOWLY RAMPED UP TO SET POINT OVER A 120 SECOND PERIOD.

DISCHARGE AIR CONTROL:

- THE DISCHARGE AIR TEMPERATURE SENSOR SHALL MODULATE THE HEATING VALVE,
 COOLING VALVE AND THE FACE AND BYPASS DAMPER TO MAINTAIN A DISCHARGE
 AIR SETPOINT OF 55 DEG. F.
- 5. WHEN THE OUTDOOR AIR TEMPERATURE IS ABOVE 55 DEG. F. THE HEATING VALVE SHALL BE CLOSED, THE FACE AND BYPASS DAMPER SHALL BE OPEN TO THE COIL AND THE COULING VALVE SHALL MODULATE OPEN TO MAINTAIN DISCHARGE AIR SETPOINT.
- 6. WHEN THE OUTDOOR AIR TEMPERATURE IS BELOW 55 DEG, F. THE COOLING VALVE SHALL BE CLOSED AND THE STEAM HEATING COLL CONTROL VALVE SHALL MODULATE TO MAINTAIN DISCHARGE AIR SETPOINT ABOVE 42° F, BELOW 40° F THE HEATING COIL. CONTROL VALVE SHALL BE PULL OPEN AND THE FACE AND BYPASS DAMPER SHALL MODULATE TO MAINTAIN DISCHARGE AIR SETPOINT. THE HEATING COIL AIR TEMPERATURE SENSOR SHALL ACT AS A LOW LIMIT AND NOT ALLOW THE HEATING COIL DISCHARGE TEMPERATURE TO FALL BELOW 45 DEG. F.(ADJ)

HUMIDIFIER CONTROL

- 7. WHEN THE SYSTEM IS CALLING FOR HEATING THE HUMIDIFIER SHALL BE ENABLED AND THE ISOLATION YALVE SHALL BE OPENED THOUGHT THE DDC, ON A CALL FOR HUMIDIFICATION THE DDC SHALL MODULATE DUCT HUMIDIFIER CONTROL VALVE TO MAINTAIN SPACE HUMIDITY SEPTONIT, THE SETPONT SHALL BE RESET, 30% RH WHEN OAT IS 55 DEGREES AND 25% WHEN OAT IS 35 DEGREES. A DDC DISCHARGE HUMIDITY SENSOR SHALL BE USED TO PREVENT HUMIDITY LEVELS FROM EXCEEDING 90% RH
- 8. HUMIDIFIER OPERATION SHALL BE HARDWIRED INTERLOCKED TO PREVENT OPERATION WHEN AHU IS NOT IN OPERATION AND A HARDWIRED HIGH LIMIT SHALL PROVIDE OVERRIDE CONTROL WHEN 95% RH SETPOINT IS REACHED

SUPPLY FAN SPEED CONTROL

- 9. THE STATIC PRESSURE SENSOR (LOCATED 2/3 DOWN STREAM OF THE MAIN SUPPLY DUCT) SHALL MODULATE THE SUPPLY FAN VARIABLE FREQUENCY DRIVES (THRU HARDWIRE CONNECTION) TO MAINTAIN THE SUPPLY STATIC PRESSURE SETPOINT, A DDC DISCHARGE STATIC PRESSURE SENSOR SHALL BE USED TO PREVENT THE SYSTEM FROM EXCEED THE DESIGNED PRESSURE MAXIMUM (MAXIMUM DETERMINED BY ALF FIRM), THE CONTROL SETPOINT SHALL BE Q.25 LESS THE DESIGNED MAXIMUM, A HARDWIRED DPS SWITCH SHALL BE USED TO PREVENT FAN OPERATION ONCE DESIGNED PRESSURE IS EXCEEDED. A PANEL MOUNT IF AN OPERATION ONCE DESIGNED PRESSURE IS EXCEEDED. A PANEL MOUNT PLOT LIGHT SHALL BE USED FOR LOCAL INDICATION THAT THE DPS HAS TRIPPED.
- 10.FAN INLET AIR FLOW MONITORING STATION SHALL BE USED TO MONITOR SUPPLY FAN CFM DELIVERY.

SAFETIE

- 11.THE SMOKE DETECTOR SHALL STOP THE SUPPLY FAN AND CLOSE THE OUTDOOR AND SMOKE ISOLATION DAMPERS THROUGH THE FIRE ALARM SYSTEM WHEN SMOKE IS DETECTED.
- 12.FREEZE STAT ALARM SHALL ANNUNCIATE AT THE BAS, MANUAL RESET OF THE FREEZE STAT SHALL BE REQUIRED BEFORE AIR HANDLING UNIT RESTARTS. A PANEL MOUNT PILOT LIGHT SHALL BE USED FOR LOCAL INDICATION THAT THE FREEZE STAT HAS TRIPPED.
- 13.WHEN ANY SAFETY DEVICE TRIPS/ACTIVATION ALL CONTROL DEVICES SHALL FAIL TO THE NORMAL FAIL SAFE POSITIONS

ALARMING NORMA

- DISCHARGE AIR TEMPERATURE (+/- 5 DEGREES OF SETPOINT)
- DUCT STATIC PRESSURE (+/- 25% OF SETPOINT)
- HIGH DISCHARGE STATIC PRESSURE ALARM
- DISCHARGE HUMIDITY HIGH LIMIT (90%)
- FREEZESTAT
- FILTER STATUS

"ENHANCED" 24/7

SUPPLY FAN FAILURE

DATE 9/10/10 DRAWN

Infrastructure Planning and Facilities

MICHIGAN STATE

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SLE VOLUME DIAGRAM

A VARIABLE

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REVISION 7/11/16 RLANDRUM

DETAIL NO. XXXXXX—XX

