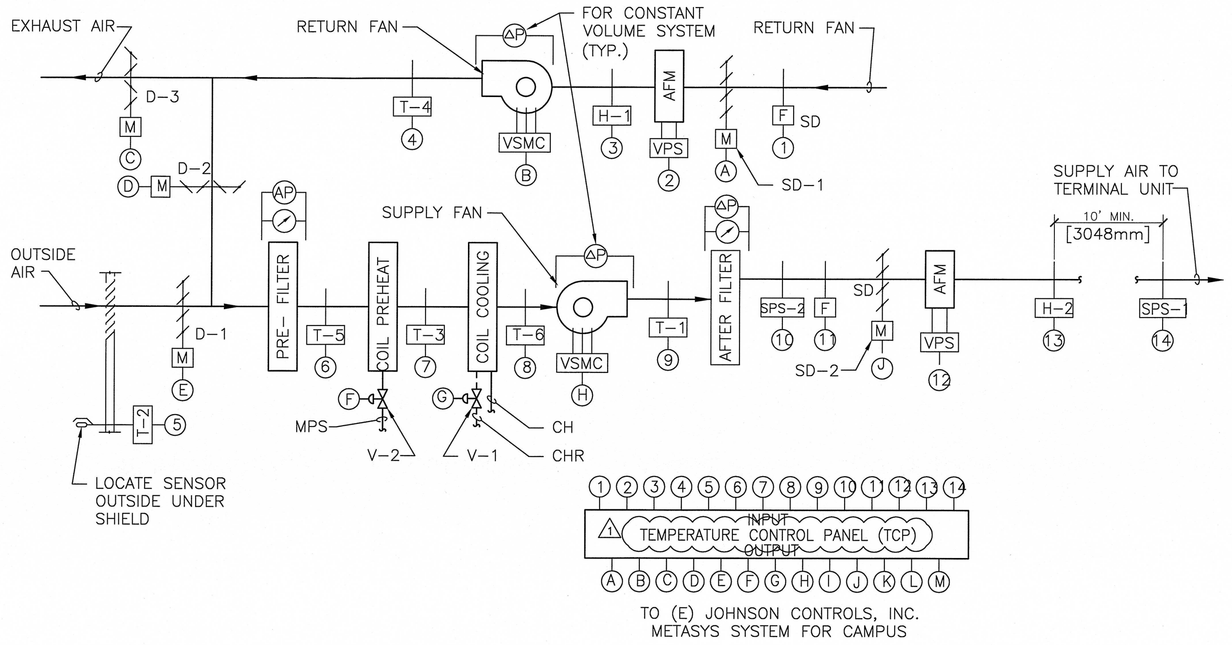

VARIABLE AIR VOLUME AIR HANDLING UNIT WITH ECONOMIZER CONTROL DIAGRAM

(AHU-7, 10 & 14)

SEQUENCE OF OPERATION FOR VARIABLE AIR VOLUME AIR HANDLING UNIT WITH ECONOMIZER

1. GENERAL

1.1 UNIT IS NORMALLY STARTED AND STOPPED BY THE (TCP) OR REMOTELY AT THE ECC. H-O-A SWITCH SHALL BE KEPT IN THE "AUTO" POSITION. "HAND" AND "OFF" POSITIONS SHALL BE USED ONLY FOR MAINTENANCE. WHEN THE UNIT IS "OFF" D-1, D-3, SD-1 AND SD-2 SHALL BE FULLY CLOSED. WHEN THE UNIT IS "ON" D-1, SD-1 AND SD-2 SHALL BE FULLY OPEN. D-2 AND D-3 SHALL MODULATE IN ACCORDANCE WITH THE FOLLOWING SEQUENCE:

2. TEMPERATURE CONTROL

2.1 SUPPLY AIR TEMPERATURE, SENSED BY T-1, SHALL BE MAINTAINED AT SETPOINT VIA (TCP) BY MODULATING V-1 OR D-2 AND D-3 OR V-2 IN SEQUENCE.

2.2 WHEN THE TEMPERATURE OF THE OUTSIDE AIR, SENSED BY T-2, IS ABOVE 85°F [29.4°C], THE (TCP) SHALL PREVENT THE MODULATION OF D-2 AND D-3 AND SHALL ASSUME THE MINIMUM OUTSIDE AIR POSITION (D-2 FULLY OPENED AND D-3 FULLY CLOSED). THE (TCP) SHALL MODULATE V-1 TO MAINTAIN THE SUPPLY AIR TEMPERATURE, SENSED BY T-1.

2.3 WHEN THE TEMPERATURE OF THE OUTSIDE AIR, SENSED BY T-2, IS BETWEEN 65°F [18.3°C] AND THE SUPPLY AIR TEMPERATURE SENSED BY T-1, DAMPER D-2 SHALL FULLY CLOSE AND D3 SHALL BE FULLY OPEN (MAXIMUM OUTSIDE AIR POSITION). THE (TCP) SHALL MODULATE V-1 TO MAINTAIN THE SUPPLY AIR TEMPERATURE, SENSED BY T-1.

2.4 WHEN THE TEMPERATURE OF THE OUTSIDE AIR, SENSED BY T-2, IS BELOW THE SUPPLY AIR TEMPERATURE, SENSED BY T-1, DAMPERS D-2 AND D-3 SHALL MODULATE TO MAINTAIN THE SCHEDULED SUPPLY AIR TEMPERATURE. IF D-2 IS OPEN AND D-3 IS CLOSED TO MINIMUM OUTSIDE AIR, V-2 SHALL MODULATE OPEN TO MAINTAIN THE SUPPLY AIR TEMPERATURE, SENSED BY T-1.

3. AIR FLOW CONTROL

3.1 THE SUPPLY AIR FLOW SHALL BE CONTROLLED BY THE (TCP) MODULATING THE SUPPLY FAN VARIABLE SPEED MOTOR CONTROLLER (VSMC) TO MAINTAIN 1.0" [25mm] OF DUCT STATIC PRESSURE (FIELD ADJUSTABLE), SENSED BY SPS-1. SEE FLOOR PLANS FOR LOCATION OF SPS-1.

3.2 THE (TCP) USING TOTAL SUPPLY AIR AND RETURN AIR FLOW SIGNALS, SHALL RESET THE RETURN AIR FAN VSMC TO MAINTAIN A CONSTANT AIR FLOW DIFFERENCE BETWEEN THE SUPPLY AIR AND THE RETURN AIR EQUAL TO MINIMUM OUTSIDE AIR.

3.3 THE (TCP) USING HIGH PRESSURE SENSOR SPS-2 LOCATED AT THE SUPPLY FAN DISCHARGE, SHALL PREVENT THE SUPPLY FAN FROM DEVELOPING OVER 3" [76mm] OF STATIC PRESSURE (FIELD ADJUSTABLE). IF STATIC PRESSURE AT SPS-2 DOES EXCEED 3" [76mm] THE SUPPLY AIR FAN SHALL STOP.

4. FREEZE PROTECTION

4.1 IF THE AIR TEMPERATURE AS SENSED BY T-3 FALLS BELOW 45°F [7°C], AN ALARM SIGNAL SHALL INDICATE AT THE (TCP) AND ECC. IF THIS TEMPERATURE FALLS BELOW 40°F [4.4°C], THE SUPPLY AND RETURN FANS SHALL SHUT DOWN AND A CRITICAL ALARM SHALL INDICATE AT THE TCP AND ECC.

5. AUTOMATIC SHUTDOWN/RESTART

5.1 WHEN SMOKE IS DETECTED BY DUCT SMOKE DETECTOR, (FSD) THE SUPPLY AND RETURN FANS SHALL SHUT "OFF" AND AN ALARM SIGNAL SHALL BE TRANSMITTED TO THE FIRE ALARM SYSTEM. ALL SMOKE DAMPERS IN THE SUPPLY AND RETURN DUCTS SHALL CLOSE.

5.2 EXHAUST FANS SERVING AREA OF THE SUPPLY FAN SHALL CONTINUE TO RUN. SUPPLY AND RETURN FANS SHALL RESTART AND SMOKE DAMPERS SHALL OPEN WHEN FIRE ALARM CIRCUIT IS RESET.

6. EMERGENCY CONSTANT SPEED OPERATION

6.1 UPON FAILURE OF THE VSMC, THE SUPPLY AND RETURN FANS SHALL BE STARTED/STOPPED MANUALLY AT THE (TCP) OR THE ECC THROUGH THE BY-PASS STARTER. FANS SHALL THEN BE OPERATED AT CONSTANT SPEED.

7. CONTRACTOR

7.1 CONTROLS SHALL BE JOHNSON CONTROLS, INC. TO MATCH EXISTING. ONLY AUTHORIZED JCI CONTRACTORS SHALL INSTALL THIS WORK.

7.2 CONTRACTOR SHALL PROVIDE POWER, WIRING, CONDUIT, ETC. AS REQUIRED FOR CONTROLS WORK.

7.3 SEE SPECIFICATIONS SECTION 23 09 23 FOR ADDITIONAL REQUIREMENTS.

SCALE: 3/4"=1'-0" 1/2"=1'-0" 1/4"=1'-0" 1/8"=1'-0"

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K.F. DAVIS ENGINEERING, INC
530 LA GONDA WAY, SUITE E
DANVILLE, CA 94526

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