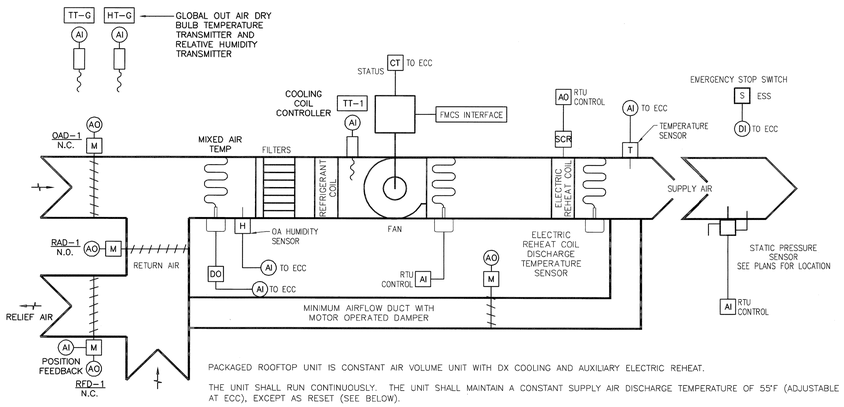


PACKAGED ROOFTOP UNIT IS CONSTANT AIR VOLUME UNIT WITH DX COOLING AND AUXILIARY ELECTRIC REHEAT.

THE UNIT SHALL RUN CONTINUOUSLY. THE UNIT SHALL MAINTAIN A CONSTANT SUPPLY AIR DISCHARGE TEMPERATURE OF 55°F (ADJUSTABLE AT ECC), EXCEPT AS RESET (SEE BELOW).

THE UNIT REFRIGERANT COIL SHALL MAINTAIN DISCHARGE TEMPERATURE OF 55°F. ELECTRIC HEATING COIL SHALL SERVE AS SUPPLEMENTAL HEATING. WHEN DISCHARGE TEMPERATURE DOWNSTREAM OF REFRIGERANT COIL IS LESS THAN 55°F, SCR CONTROLLER SHALL MODULATE ELECTRIC HEATING COIL TO MAINTAIN SUPPLY AIR DISCHARGE TEMPERATURE SETPOINT OF 55°F.

ECONOMIZER – WHEN THE OUTSIDE AIR TEMPERATURE, SENSED BY TT-G, IS ABOVE 60°F (ADJUSTABLE), THE DDC SHALL MODULATE RFD-1 AND RAD-1 TO NORMAL POSITIONS. OAD-1 SHALL BE IN MINIMUM POSITION. WHEN THE OUTSIDE AIR TEMPERATURE, IS BELOW 58°F (ADJUSTABLE), THE MIXED AIR TEMPERATURE SENSOR SHALL MODULATE THE OA DAMPER, THE RA DAMPER AND THE RELIEF AIR DAMPER TO PROVIDE THE REQUIRED SUPPLY AIR TEMPERATURE PER THE ACTIVE RESET SCHEDULE.

SUPPLY AIR TEMPERATURE RESET – SUPPLY AIR DISCHARGE TEMPERATURE SHALL RESET BASED ON THE OUTSIDE AIR TEMPERATURE AND THE AIR DAMPER POSITION OF TERMINAL UNIT FS2-2. IF OUTSIDE AIR TEMPERATURE IS <40°F (ADJ) AND AIR DAMPER OF TERMINAL UNIT IS IN THE MINIMUM POSITION, SUPPLY AIR DISCHARGE TEMPERATURE SHALL BE MAINTAINED AT 65°F.

WHEN IN THE DX COOLING MODE AND THE SUPPLY AIRFLOW ACROSS THE COOLING COIL DROP AND THE REFRIGERANT PRESSURE IN THE COIL DROPS, THE MINIMUM AIRFLOW DAMPER SHALL BE SLOWLY OPENED TO PROVIDE ADEQUATE AIRFLOW.

WHEN RUNNIG ON ECONOMIZER OR DX COOLING, AND THE DUCT STATIC PRESSURE RISES TO SETPOINT, SLOWLY OPEN THE MINIMUM AIRFLOW DAMPER TO PROVIDE ADEQUATE AIRFLOW THROUGH THE UNIT.

THE MANUFACTURER'S HOTGAS BYPASS (AND CONTROLLER) SHALL MODULATE THE REFRIGERANT FLOW AS REQUIRED, TO MINIMIZE COMPRESSOR CYCLING AND IMPROVE DEHUMIDIFICATION.

DDC POINT LIST

DESCRIPTION	DESCRIPTION	DIGITAL IN	DIGITAL OUT	ANALOG IN	ANALOG OUT	INSTRUCTIONS
SUPPLY FAN						
SUPPLY AIR TEMPERATURE	SUPPLY TEMP			ADTS		
SPACE TEMPERATURE						
SPACE HUMIDITY	SPACE HUMIDITY			RHS		
SUPPLY DUCT STATIC PRESSURE	DUCT DIFFERENTIAL STATIC PRESSURE			DDP		
HEATING COIL VALVE	REHEAT COIL VALVE				HV	
COOLING COIL VALVE (DX STAGE 1)	COOLING COIL VALVE				CV	
FIRE ALARM INTERLOCK	FIRE ALARM INTERLOCK				FA	
EMERGENCY STOP SWITCH	EMERGENCY STOP SWITCH	ESS				

D1 PACKAGED ROOF MOUNTED HEAT PUMP (21-RTU2)

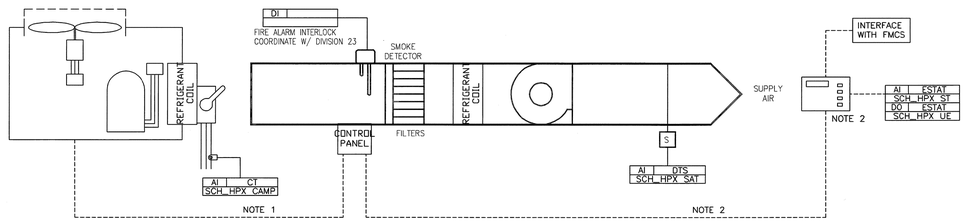
SCALE: NONE

SEQUENCE OF OPERATION

SPLIT SYSTEM – AIR CONDITIONING UNIT (21-SSAH1, 2, 3, 4)

THE FAN SHALL STAGE THE COOLING CYCLE TO MAINTAIN SPACE TEMPERATURE 75°F (ADJUSTABLE) 24 HRS/DAY.

DEFROST CYCLE SHALL OPERATE PER FACTORY RECOMMENDATION.

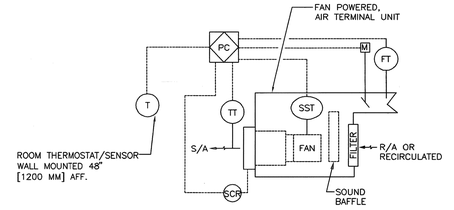


NOTES

1. SPLIT SYSTEM AIR CONDITIONING UNITS SHALL COME WITH INTERNAL FACTORY CONTROLS. FACTORY CONTROLS SHALL BE PROVIDED WITH A GATEWAY TO PROVIDE ALL OBJECT PROPERTIES AND READ/WRITE ABILITY VIA ECC.
2. THE SYSTEM SHALL BE ABLE TO OPERATE UNDER STAND-ALONE MODE. MECHANICAL CONTRACTOR SHALL PROVIDE CONTROLLERS FOR THE SYSTEM. IN THE EVENT OF A NETWORK COMMUNICAITON FAILURE, OR THE LOSS OF ANY OTHER CONTROLLER, THE CONTROL SYSTEM SHALL CONTINUE TO OPERATE INDEPENDENTLY. FAILURE OF THE EOC SHALL HAVE NO EFFECT ON THE FIELD CONTROLLERS, INCLUDING THOSE INVOLVED WITH GLOBAL STRATEGIES.

D4 SPLIT SYSTEM – AIR CONDITIONING UNIT

SCALE: NONE



NOTES:

A. THE SERIES FAN SHALL RUN CONTINUOUSLY. THE SPACE TEMPERATURE SHALL BE MAINTAINED BETWEEN 70° (ADJ) AND 75°F (ADJ) BY MODULATING PRIMARY AIR VOLUME AND ELECTRIC REHEAT SCR CONTROLLER IN SEQUENCE.

B. UPON FALL IN SPACE TEMPERATURE THE PRIMARY AIR DAMPER SHALL MODULATE TO PRESET MINIMUM AIR VOLUME. UPON FURTHER FALL IN SPACE TEMPERATURE BELOW 70° F THE SCR CONTROLLER SHALL REGULATE ELECTRIC HEAT TO MAINTAIN SET POINT WITHIN ±.5° (ADJ). THE TOLERANCE RANGE OF ± .5° F HAS BEEN SELECTED TO PREVENT VALVE HUNTING.

C. THE REVERSE SHALL OCCUR ON A RISE IN SPACE TEMPERATURE.

D8 SERIES FAN POWERED AIR TERMINAL UNIT CONTROL DIAGRAM

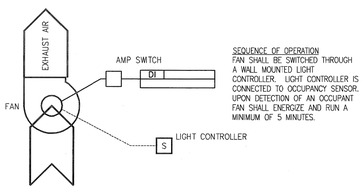
SCALE: NONE

VA CAD DETAIL #: SD233600-03.DWG

POINT LIST

FAN CONTROL - SWITCHES

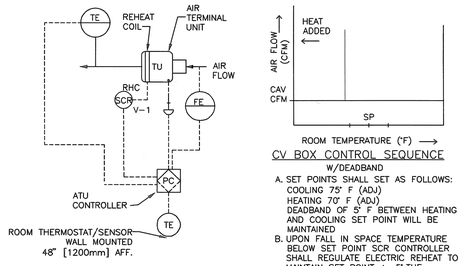
DESCRIPTION	NAME	DESCRIPTION	DIGITAL IN	DIGITAL OUT	ANALOG IN	ANALOG OUT	INSTRUCTIONS
FAN PROOF	SCE_UNIT FP	FAN PROOF	AMP				CONNECT TO INDICATE MOTOR STATUS.



SEQUENCE OF OPERATION
FAN SHALL BE SWITCHED THROUGH A WALL MOUNTED LIGHT CONTROLLER. LIGHT CONTROLLER IS CONNECTED TO OCCUPANCY SENSOR. UPON DETECTION OF AN OCCUPANT FAN SHALL ENERGIZE AND RUN A MINIMUM OF 5 MINUTES.

F2 SWITCH CONTROLLED EXHAUST FAN (21-EF13)

SCALE: NONE



CV BOX CONTROL SEQUENCE
W/DEADBAND

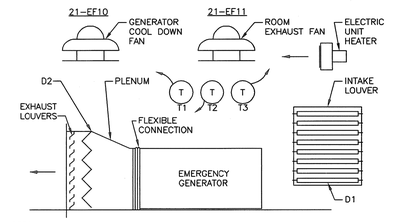
A. SET POINTS SHALL SET AS FOLLOWS:
COOLING 75° F (ADJ)
HEATING 70° F (ADJ)
DEADBAND OF 5° F BETWEEN HEATING AND COOLING SET POINT WILL BE MAINTAINED

B. UPON FALL IN SPACE TEMPERATURE BELOW SET POINT SCR CONTROLLER SHALL REGULATE ELECTRIC REHEAT TO MAINTAIN SET POINT ± .5°,THE ADJUSTABLE TOLERANCE OF ± 0.5° HAS BEEN SELECTED TO PREVENT VALVE HUNTING.

C. THE REVERSE SHALL OCCUR ON RISE IN SPACE TEMPERATURE.

F6 CONSTANT VOLUME AIR TERMINAL UNIT CONTROL DIAGRAM

SCALE: NONE



NOTES

1. PROVIDE ONE WALL MOUNTED THERMOSTAT (T1) FOR UNIT HEATER (21-EUH9). UPON FALL IN SPACE TEMPERATURE BELOW 55°F (ADJ), UNIT HEATER SHALL BE ENERGIZED. UNIT HEATER SHALL RUN UNTIL SPACE TEMPERATURE IS 60°F (ADJ). AFTER SETPOINT IS REACHED, UNIT HEATER SHALL BE DE-ENERGIZED. INTERLOCK UNIT HEATER WITH GENERATOR; DE-ENERGIZE UNIT HEATER WHEN GENERATOR IS RUNNING.
2. PROVIDE ONE WALL MOUNTED THERMOSTAT (T2) FOR ROOM EXHAUST FAN (21-EF11). UPON RISE IN SPACE TEMPERATURE ABOVE 95°F (ADJ), MOTOR OPERATED DAMPER, D1, SHALL OPEN AND ROOM EXHAUST FAN SHALL BE ENERGIZED. ROOM EXHAUST FAN SHALL SHALL RUN UNTIL SPACE TEMPERATURE REACHES 90°F (ADJ). AFTER SETPOINT IS REACHED, EXHAUST FAN SHALL BE DE-ENERGIZED AND D1 SHALL CLOSE. INTERLOCK ROOM EXHAUST FAN WITH GENERATOR; DE-ENERGIZE ROOM EXHAUST FAN WHEN GENERATOR IS RUNNING.
3. UPON START SIGNAL FROM ANY GENERATOR, MOTOR OPERATED DAMPERS (D1 AND D2) SHALL OPEN. IF MOTOR OPERATED DAMPER FAILS TO OPEN, FAILURE SIGNAL SHALL BE SENT TO THE ECC AND THE GENERATOR ANNUNCIATOR.
4. AFTER GENERATOR IS DE-ENERGIZED, MOTOR OPERATED DAMPER, D2, SHALL CLOSE AND GENERATOR COOL DOWN FAN 21-EF10 SHALL BE ENERGIZED. PROVIDE ONE WALL MOUNTED THERMOSTAT (T3) FOR GENERATOR COOL DOWN FAN. GENERATOR COOL DOWN FAN SHALL RUN UNTIL ROOM TEMPERATURE FALLS BELOW 80°F. AFTER ROOM SETPOINT IS REACHED GENERATOR COOL DOWN FAN SHALL BE DE-ENERGIZED AND MOTOR OPERATED DAMPER(S) D1 SHALL BE CLOSED.

F8 EMERGENCY GENERATOR ROOM CONTROLS

SCALE: NONE

VA CAD DETAIL #: SD233100-07.DWG

100% CONSTRUCTION DOCUMENTS

REVISION NO.	REVISION DESCRIPTION	By	Date

Revisions

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1. MEDICAL DIRECTOR	6. OPERATIONS SERVICE LINE MANAGER
2. ASSOCIATE DIRECTOR	7. INFECTION CONTROL MANAGER
3. CHIEF OF STAFF	8. SAFETY MANAGER
4. ASSOC. DIRECTOR	9. GENERAL ENGINEER
5. SERVICE LINE MGRS.	10. COTR

Drawing Title: MECHANICAL CONTROL DIAGRAMS

Project Title: REPLACE BOILER PLANT/ COGEN/CHP

Date: APRIL 10, 2012

Project Number: 544-11-101

*BUILDING IS FULLY SPRINKLERED *

Drawn | Building Number: 21 | AutoCAD File Name

Checked | Reviewed | Const. Contract No.

DRAWING No.: MP704

Veterans Affairs