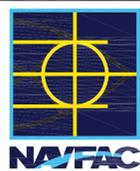


FAN SCHEDULE					
UNIT No.	EF-1	EF-2	EF-3	EF-4	EF-5
LOCATION	143 - ELECTRICAL	133 - MECHANICAL	309 - MECHANICAL	308 - ELECTRICAL	202 - OPEN OFFICE
DESCRIPTION	INLINE	INLINE	INLINE	INLINE	INLINE
SERVICE	EXHAUST	EXHAUST	EXHAUST	EXHAUST	EXHAUST
FAN DATA					
FAN AIRFLOW (cfm)	265	1,820	545	265	75
STATIC PRESSURE (in wg)	0.5	0.5	0.5	0.5	0.5
DRIVE	DIRECT	DIRECT	DIRECT	DIRECT	DIRECT
WHEEL TYPE	BI	BI	BI	BI	BI
MOTOR DATA					
MOTOR POWER (hp)	1/6	1/2	1/6	1/6	100 W
MOTOR SPEED (rpm)	1,725	1,725	1,725	1,725	1,725
NEMA MOTOR STARTER	0	0	0	0	00
VOLTS	115	115	115	115	277
PHASE	1	1	1	1	1
HERTZ	60	60	60	60	60
FULL LOAD AMPERAGE (A)	3.4	6.2	3.4	3.4	N/A
REMARKS					
1. PROVIDE FAN WITH INTEGRAL LOW LEAKAGE AUTOMATIC DAMPER (3 CFM/SF AT 1" W.G.) 2. STARTER AND DISCONNECT SHALL BE PROVIDED AND WIRED BY DIVISION 26. 3. PROVIDE SPEED CONTROLLER FOR DIRECT DRIVE FANS.					

DUCTLESS SPLIT SCHEDULE		
INDOOR UNIT No.	DSS-A-1	DSS-B-1
COUPLED WITH OUTDOOR UNIT No.	CU-A-1	CU-B-1
LOCATION	138 - TELECOM	310 - TELECOM
FAN COIL CONFIGURATION	WALL MOUNTED	WALL MOUNTED
FAN DATA		
AIRFLOW @ HIGH SPEED (cfm)	795	795
NUMBER OF SPEEDS	3	3
NUMBER OF MOTORS	1	1
MOTOR POWER	36V DC	36V DC
COOLING DATA		
AMBIENT O.A. TEMP. (°F)	93	93
CAPACITY (Btu/hr)	33,000	33,000
MOISTURE REMOVAL (p/yr)	3	3
FILTER DATA		
TYPE	PERMANENT CLEANABLE	PERMANENT CLEANABLE
INDOOR UNIT ELECTRICAL DATA		
NEMA MOTOR STARTER SIZE	00	00
VOLTS	208	208
PHASE	1	1
HERTZ	60	60
MINIMUM CIRCUIT AMPACITY (A)	1	1
REMARKS		
1. PROVIDE WALL MOUNTED HARD-WIRED CONTROLLER. 2. PROVIDE CONDENSATE PUMP FOR INDOOR UNIT. 3. PROVIDE HI-WALL-MOUNT INDOOR UNIT. 4. INDOOR UNIT POWERED BY OUTDOOR UNIT.		

AIR DISTRIBUTION DEVICE SCHEDULE								
UNIT No.	S1	S2	R1	T1	T2	E1	E2	E3
SERVICE	SUPPLY	SUPPLY	RETURN	TRANSFER	TRANSFER	EXHAUST	EXHAUST	EXHAUST
DUTY	STD	STD	STD	STD	STD	STD	STD	STD
NECK SIZE (in)	A=6" (0-155 CFM)	A=8"x8" (AS NOTED)	A=22"x22" (AS NOTED)	A=6"x6"	A=22"x22"	A=6"x6" (0-130 CFM)	A=6"x6"	A=6"x6"
	B=8" (160-280 CFM)			B=8"x8"		B=8"x8" (135-255 CFM)	B=24"x14" (AS NOTED)	
	C=10" (285-435 CFM)			C=10"x10"		C=10"x10" (260-375 CFM)		
	D=12" (440-550 CFM)			D=12"x12"		D=12"x12" (380-570 CFM)		
	E=14" (555-750 CFM)			E=18"x18"		E=18"x18" (575-1350 CFM)		
				F=22"x22"		F=22"x22" (1355-1985 CFM)		
THROW PATTERN	ADJUSTABLE	ADJUSTABLE	N/A	N/A	N/A	N/A	N/A	N/A
LOCATION	CEILING	SIDEWALL	CEILING	CEILING	SIDEWALL	CEILING	SIDEWALL	CEILING
TYPE	3 CONE DIFFUSER	LOUVERED	LOUVERED	PERFORATED	LOUVERED	PERFORATED	LOUVERED	LOUVERED
SHAPE	SQUARE	RECTANGULAR	SQUARE	SQUARE	RECTANGULAR	SQUARE	RECTANGULAR	RECTANGULAR
MATERIAL	ALUMINUM	ALUMINUM	ALUMINUM	ALUMINUM	ALUMINUM	ALUMINUM	ALUMINUM	ALUMINUM
FRAME	LAY-IN	SURFACE	LAY-IN	LAY-IN	SURFACE	LAY-IN	SURFACE	SURFACE
FINISH	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE	WHITE
REMARKS:			INCLUDE WITH A MERV 8 FILTER					
NOTE: INSULATE DIFFUSER BACKPANS WITH 1" FIBERGLASS INSULATION.								

BUILDING AIR BALANCE SCHEDULE			
TOTAL SUPPLY AIR	TOTAL OUTSIDE AIR	TOTAL EXHAUST AIR	BUILDING PRESSURE
21,035 CFM	6,350 CFM	5,515 CFM	+835 CFM (+13%)
NOTE: THIS CALCULATION DOES NOT INCLUDE ELECTRICAL, MECHANICAL, AND COMM ROOMS.			

DATE	
DESCRIPTION	
SYN	
	
	
	
APPROVED FOR COMMANDER NAVFAC ACTIVITY ALEX WOOD alex.wood@comcom.mil SATISFACTORY TO DATE MM/DD/YY DES GRB DRW GRB CHK MCM PA/DM SGL / CGF BRANCH MANAGER RSC CHIEF ENG/ARCH BGA FIRE PROTECTION DPS DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND NAVAL FACILITIES ENGINEERING COMMAND MID-ATLANTIC NORTH CAROLINE IPT JACKSONVILLE, NC MCB CAMP LEJEUNE P1396 - SOF INTEL OPS EXPANSION SCHEDULES	
SCALE: AS NOTED EPROJCT NO.: 1333294 CONSTR. CONTR. NO. 140085-10-D-5301 NAVFAC DRAWING NO. 12688108 SHEET 161 OF 206 M-601 DRAWFORM REVISION: 10 MARCH 2009	

ENERGY RECOVERY UNIT SCHEDULE - 1 OF 2

INDOOR UNIT No.	ERU-1	ERU-2
EQUIPMENT COUPLED WITH	CU-1	CU-2
LOCATION	133 - MECHANICAL	309 - MECHANICAL
SUPPLY FAN DATA		
AIRFLOW (cfm)	4,600	1,750
EXTERNAL STATIC PRESSURE (in wg)	1.5	1.5
TOTAL STATIC PRESSURE (in wg)	4.2	4.6
WHEEL TYPE	PLUG	PLUG
MOTOR DATA		
POWER (hp)	5	3
SPEED (rpm)	1,800	1,800
VOLTS	460	460
PHASE	3	3
HERTZ	60	60
FULL LOAD AMPERAGE (A)	6.7	4.2
MINIMUM CIRCUIT AMPACITY (A)	8.4	5.2
MAXIMUM OVER CURRENT PROTECTION (A)	15.0	15.0
EXHAUST FAN DATA		
AIRFLOW (cfm)	3,940	1,575
EXTERNAL STATIC PRESSURE (in wg)	1.0	0.75
TOTAL STATIC PRESSURE (in wg)	2.5	2.2
MOTOR DATA		
POWER (hp)	3.0	1.5
SPEED (rpm)	1,800	1,800
VOLTS	460	460
PHASE	3	3
HERTZ	60	60
FULL LOAD AMPERAGE (A)	4.2	2.2
MINIMUM CIRCUIT AMPACITY (A)	5.2	2.8
MAXIMUM OVER CURRENT PROTECTION (A)	15.0	15.0
WHEEL ENTERING CONDITIONS - COOLING SEASON		
OUTSIDE AIR TEMP (°F db)	93	93
OUTSIDE AIR TEMP (°F wb)	79	79
EXHAUST AIR TEMP (°F db)	75	75
EXHAUST AIR TEMP (°F wb)	64	64
LEAVING AIR TEMP (°F db)	70	70
ERU EFFECTIVNESS (%)	75	75
WHEEL ENTERING CONDITIONS - HEATING SEASON		
OUTSIDE AIR TEMP (°F db)	23	23
OUTSIDE AIR TEMP (°F wb)	11	11
EXHAUST AIR TEMP (°F db)	70	70
EXHAUST AIR TEMP (°F wb)	53	53
LEAVING AIR TEMP (°F db)	70	70
ERU EFFECTIVNESS (%)	75	75

ENERGY RECOVERY UNIT SCHEDULE - 2 OF 2

UNIT No.	ERU-1	ERU-2
FAN AIRFLOW (cfm)	4,600	1,750
ENTHALPY WHEEL DATA		
MOTOR DATA		
POWER (hp)	0.25	0.25
VOLTS	115	115
PHASE	1	1
HERTZ	60	60
FULL LOAD AMPERAGE (A)	1.9	0.7
MINIMUM CIRCUIT AMPACITY (A)	2.30	0.9
MAXIMUM OVER CURRENT PROTECTION (A)	15.0	15.0
COOLING COIL DATA		
COIL FACE VELOCITY (FPM)	476	410
SENSIBLE CAPACITY (Btu/hr)	135,180	54,630
TOTAL CAPACITY (Btu/hr)	239,000	97,000
SENSIBLE HEAT RATIO	0.56	0.57
EAT (°F db)	80.6	81.5
EAT (°F wb)	69.6	70.4
LAT (°F db)	54.7	54.5
LAT (°F wb)	53.7	54.0
ELECTRIC HEATING DATA		
EAT (°F db)	23	23
LAT (°F db)	73	73
INPUT (KW)	75.0	35.0
CONTROL	PROPORTIONAL/SCR	PROPORTIONAL/SCR
VOLTS	460	460
PHASE	3	3
HERTZ	60	60
FULL LOAD AMPERAGE (A)	94.3	44.1
MINIMUM CIRCUIT AMPACITY (A)	94.3	55.1
MAXIMUM OVER CURRENT PROTECTION (A)	125.0	60.0
PRE FILTER DATA		
PRE FILTER MERV RATING	8	8
PRE FILTER THICKNESS (in)	2	2
FINAL FILTER DATA		
FINAL FILTER MERV RATING	13	13
FINAL FILTER THICKNESS (in)	4	4
REMARKS		
1. WHERE FANS ARE COUPLED WITH VFD's, PROVIDE FANS THAT OPERATE IN THE STABLE RANGE FROM MINIMUM TO MAXIMUM AIRFLOW.		
2. PROVIDE UNIT HEAT PUMP AND HOT GAS REHEAT.		
3. VFD WITH DISCONNECT PROVIDED BY DIVISION 23 AND WIRED BY DIVISION 26.		
4. PROVIDE 3000 HOUR SALT SPRAY CORROSION PROTECTION. UNIT CAPACITY SHALL BE RATED WITH THE SUPPLIED COATING.		

DX CONDENSING UNIT SCHEDULE

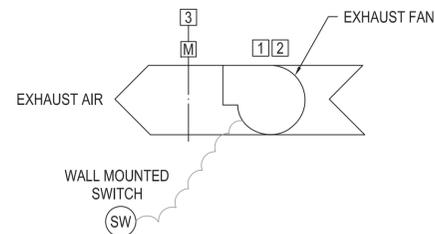
OUTDOOR UNIT No.	CU-1	CU-2
EQUIPMENT COUPLED WITH	ERU-1	ERU-2
LOCATION	GRADE	GRADE
NOMINAL TONNAGE	30	10
COMPRESSOR DATA		
REFRIGERANT TYPE	R-410A	R-410A
COMPRESSOR TYPE	SCROLL	SCROLL
NUMBER OF COMPRESSORS	2	2
CONDENSER DATA		
NUMBER OF FANS	3	1
POWER EACH (HP)	1	1
SPEED EACH (rpm)	1,140	1,100
UNIT ELECTRICAL DATA		
NEMA MOTOR STARTER SIZE	2	1
VOLTS	460	460
PHASE	3	3
HERTZ	60	60
MINIMUM CIRCUIT AMPACITY (A)	63.0	20.1
MAXIMUM OVERCURRENT PROTECTION (A)	70	25
REMARKS:		
1. PROVIDE STANDARD ALUMINUM FIN/COPPER TUBE COILS WITH POST DIP EPOXY PROCESS COATING OR COPPER/FIN TUBE FOR THE CONDENSING UNITS AND AIR HANDLING UNITS.		
2. PROVIDE 3000 HOUR SALT SPRAY CORROSION PROTECTION. UNIT CAPACITY SHALL BE RATED WITH THE SUPPLIED COATING.		
3. PROVIDE LOW AMBIENT COOLING TO 30°F.		
4. DISCONNECT SHALL BE PROVIDED AND WIRED BY DIVISION 26.		
5. PROVIDE UNIT WITH MODULATING COMPRESSOR.		

DUCTWORK CONSTRUCTION AND LEAKAGE TESTING SCHEDULE

SYSTEM	DUCT PRESSURE CLASS				RECTANGULAR		RETURN / OUTSIDE AIR		DUCT TEST PRESSURE: INCHES OF WATER COLUMN
	SUPPLY DUCT	RETURN DUCT	EXHAUST DUCT	OUTSIDE AIR DUCT	DUCT CLASS SEAL	DUCT LEAK CLASS	DUCT CLASS SEAL	DUCT LEAK CLASS	
ENERGY RECOVERY UNIT	2	-	-	-	A	12	-	-	2
CONSTANT VOLUME	-	-2	-	-	-	-	A	12	2
	-	-	-2	-	A	12	-	-	2
	-	-	-	-1	-	-	A	24	1
EXHAUST DUCT	-	-	-1	-	A	24	-	-	1
VRF DUCT	1	-	-	-	A	24	-	-	1
	-	-1	-	-	-	-	A	24	1

- NOTES:
- TEST ALL DUCT IN ACCORDANCE WITH UFGS 23 05 93, TESTING, ADJUSTING, AND BALANCING FOR HVAC AND THE PROCEDURES IN SMACNA HVAC AIR DUCT LEAKAGE TEST MANUAL.
 - EACH PIECE OF AIR MOVING EQUIPMENT ON THE PROJECT MUST BE SHOWN IN THE SCHEDULE AND THE REQUIRED PRESSURE CLASS, DUCT SEAL CLASS, DUCT LEAK CLASS, AND TEST PRESSURE MUST BE INDICATED. DUCT SEAL CLASS A IS REQUIRED ON ALL DUCT SYSTEMS.

DATE	
DESCRIPTION	
SYN	
  	
APPROVED	
FOR COMMANDER NAVFAC	
ACTIVITY	
ALEX WOOD	alex.wood@comcom.mil
SATISFACTORY TO	DATE MM/DD/YY
DES GRB	DRW GRB
CHK MCM	
PM/DM	SGL / CGF
BRANCH MANAGER	RSC
CHIEF ENG/ARCH	BGA
FIRE PROTECTION	DPS
DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND NAVAL FACILITIES ENGINEERING COMMAND MID-ATLANTIC NAVAL STATION NORFOLK, NORFOLK, VA JACKSONVILLE, NC MCB CAMP LEJEUNE P1396 - SOF INTEL OPS EXPANSION SCHEDULES	
SCALE:	AS NOTED
EPROJECT NO.:	1333294
CONSTR. CONTR. NO.	N40085-10-D-5301
NAVFAC DRAWING NO.	12688112
SHEET	165 OF 206
M-605	
DRAWFORM REVISION: 10 MARCH 2009	

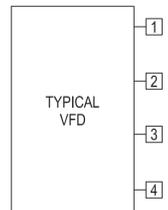


THE EXHAUST FAN SHALL BE INTERLOCKED WITH THE EXHAUST DAMPER. WHEN THE WALL MOUNTED SWITCH IS TURNED ON, THE FAN SHALL BE ENERGIZED AND THE DAMPER SHALL OPEN. WHEN THE SWITCH IS TURNED OFF, THE FAN SHALL BE DE-ENERGIZED AND THE DAMPER SHALL CLOSE.

UPON A SIGNAL FROM THE BAS SYSTEM, THE EXHAUST FAN SHALL SHUTDOWN.

RESTROOM EXHAUST FAN

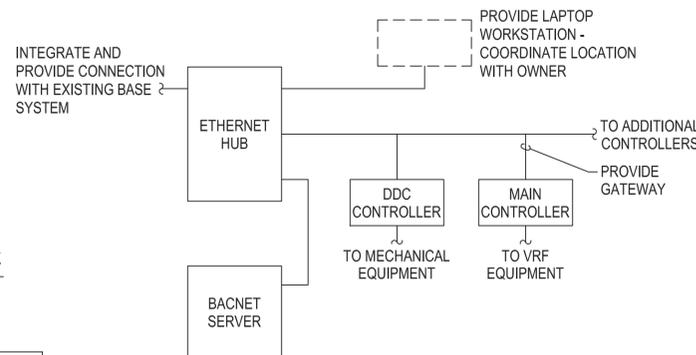
SCALE: NONE



TYPICAL VFD CONTROL POINTS SCHEMATIC

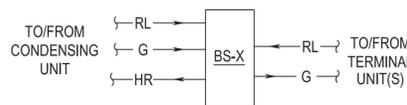
SCALE: NONE

NOTE: CONTROL POINTS DETAIL FOR VFD PERTAINS TO PUMP VFD'S.



DDC SYSTEM ARCHITECTURE

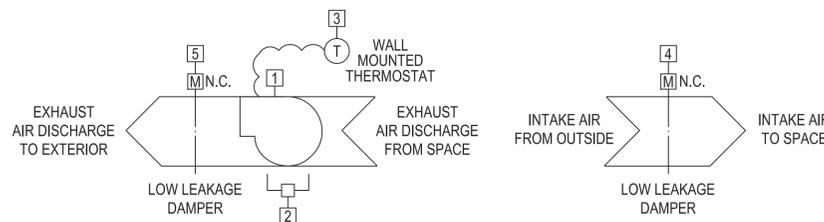
SCALE: NONE



BRANCH SELECTOR UNIT

SCALE: NONE

THE UNIT SHALL POLL THE DOWNSTREAM UNITS AND DETERMINE WHETHER HEATING OR COOLING IS REQUIRED. THE ELECTRONIC EXPANSION VALVE SHALL OPERATE TO PROVIDE HEATING OR COOLING TO THE DOWNSTREAM UNITS. THE BRANCH SELECTOR UNITS SHALL SEND A SIGNAL TO THE OUTDOOR CONDENSER UNIT.



MECHANICAL/ELECTRICAL ROOM EXHAUST FAN

SCALE: NONE

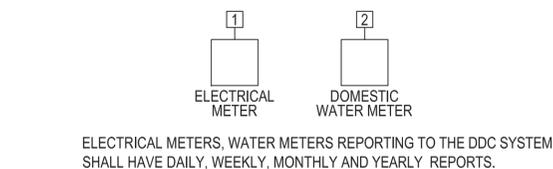
THE EXHAUST FAN SHALL BE CONTROLLED BY A WALL MOUNTED SPACE THERMOSTAT TO MAINTAIN A MAXIMUM SPACE TEMPERATURE OF 80°F. ON A RISE IN SPACE TEMPERATURE ABOVE 80°F (ADJ), THE FAN SHALL START AND ASSOCIATED MOTORIZED DAMPER IN OUTSIDE AIR AND EXHAUST AIR DUCTWORK SHALL OPEN. ON A FALL IN SPACE TEMPERATURE BELOW 80°F (ADJ), THE FAN SHALL STOP AND ASSOCIATED MOTORIZED DAMPER IN OUTSIDE AIR AND EXHAUST AIR DUCTWORK SHALL CLOSE.

UPON ACTIVATION OF THE ZONE OVERRIDE, THE TEMPERATURE SETPOINT SHALL BE DECREASED TO 75°F (ADJ.) FOR A PERIOD OF 2 HOURS (ADJ.)

UPON A SIGNAL FROM THE BAS SYSTEM, THE EXHAUST FAN SHALL SHUTDOWN.

CONTROL POINTS LIST

TAG	NAME/FUNCTION	AI	AO	DI	DO	REMARKS
1	FAN START/STOP				•	
2	CURRENT SENSING RELAY			•		
3	SPACE TEMPERATURE SENSOR	•				
4	OUTSIDE AIR DAMPER				•	
5	EXHAUST AIR DAMPER				•	
6	ZONE OVERRIDE				•	

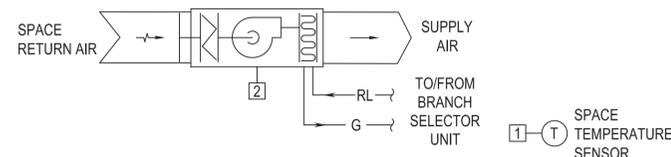


GENERAL BUILDING DDC CONTROL INFORMATION

SCALE: NONE

CONTROL POINTS LIST

TAG	NAME/FUNCTION	AI	AO	DI	DO	REMARKS
1	ELECTRICAL METER	•				
2	DOMESTIC WATER METER	•				



TYPICAL VARIABLE REFRIGERANT FAN COIL UNIT

SCALE: NONE

SEQUENCE OF OPERATION:

UNOCCUPIED MODE

UNIT SHALL START AND FUNCTION AS IN THE OCCUPIED MODE TO MEET THE UNOCCUPIED SETPOINT. FAN SHALL CYCLE WITH DEMAND.

OCCUPIED MODE

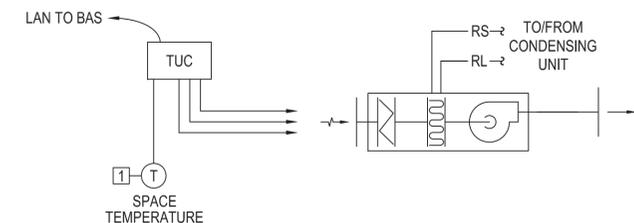
FAN SHALL START PRIOR TO START OF ENERGY RECOVERY UNIT. FAN SHALL RUN DURING OCCUPIED MODE. UPON A CALL FOR CONDITIONING BY THE SPACE TEMPERATURE SENSOR, THE FAN COIL UNIT HEAT PUMP COIL SHALL ACTIVATE TO MAINTAIN THE DESIRED SPACE SETPOINT TEMPERATURE (ADJUSTABLE ±2 F BY OCCUPANT).

FAN SPEED SHALL BE CONTROLLED BY THE TEMPERATURE SENSOR FAN SPEED CONTROLLER.

OUTSIDE AIR SHALL PROVIDED BY THE ENERGY RECOVERY UNIT.

CONTROL POINTS LIST

TAG	NAME/FUNCTION	AI	AO	DI	DO	REMARKS
1	SPACE TEMPERATURE	•				
2	TROUBLE ALARM				•	



DUCTLESS SPLIT SYSTEM UNIT

SCALE: NONE

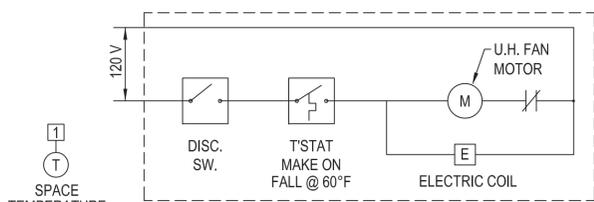
OCCUPIED MODE:

UNIT SHALL OPERATE UNDER LOCAL CONTROL BY MANUFACTURER-PROVIDED WIRELESS CONTROLLER. BUILDING AUTOMATION SYSTEM SHALL MONITOR ROOM TEMPERATURE.

ON A RISE IN SPACE TEMPERATURE ABOVE 72°F (ADJ), SUPPLY FAN SHALL BE ENERGIZED AND DX COIL SHALL ENERGIZE TO MAINTAIN SPACE TEMPERATURE. ON A DROP IN TEMPERATURE BELOW SPACE TEMPERATURE SETPOINT, THE SUPPLY FAN AND REFRIGERATION SYSTEM SHALL DE-ENERGIZE. ON A RISE IN SPACE TEMPERATURE ABOVE 80°F (ADJ) AN ALARM SHALL BE SENT TO THE BAS SYSTEM.

CONTROL POINTS LIST

TAG	NAME/FUNCTION	AI	AO	DI	DO	REMARKS
1	SPACE TEMPERATURE SENSOR	•				



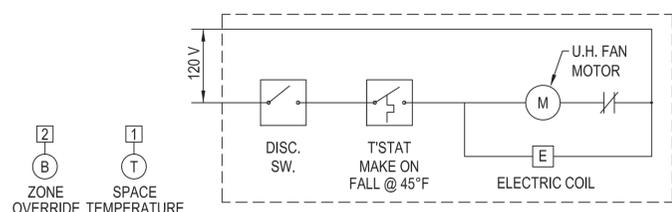
ENTRY CORRIDOR UNIT HEATER CONTROL

SCALE: NONE

THE UNIT HEATER SHALL BE CONTROLLED BY A UNIT MOUNTED SPACE THERMOSTAT. ON A FALL IN SPACE TEMPERATURE BELOW 60°F, THE UNIT HEATER SHALL BE ENERGIZED. ON A RISE IN SPACE TEMPERATURE ABOVE 65°F (ADJ), THE UNIT HEATER SHALL BE DE-ENERGIZED.

CONTROL POINTS LIST

TAG	NAME/FUNCTION	AI	AO	DI	DO	REMARKS
1	SPACE TEMPERATURE SENSOR	•				



MECHANICAL/ELECTRICAL ROOM UNIT HEATER CONTROL

SCALE: NONE

THE UNIT HEATER SHALL BE CONTROLLED BY A UNIT MOUNTED SPACE THERMOSTAT TO MAINTAIN A MINIMUM SPACE TEMPERATURE OF 45°F (ADJ). ON A FALL IN SPACE TEMPERATURE BELOW 45°F, THE UNIT HEATER SHALL BE ENERGIZED. ON A RISE IN SPACE TEMPERATURE ABOVE 50°F (ADJ), THE UNIT HEATER SHALL BE DE-ENERGIZED.

UPON ACTIVATION OF THE ZONE OVERRIDE, THE TEMPERATURE SETPOINT SHALL BE INCREASED TO 65°F (ADJ.) FOR A PERIOD OF 2 HOURS (ADJ.)

CONTROL POINTS LIST

TAG	NAME/FUNCTION	AI	AO	DI	DO	REMARKS
1	SPACE TEMPERATURE SENSOR	•				
2	ZONE OVERRIDE				•	

APPROVED: [Signature]

FOR COMMANDER NAVFAC

ACTIVITY: ALEX WOOD alex.wood@com.navy.mil

SATISFACTORY TO: DATE MM/DD/YY

DES GRB / DRW GRB / CHK MCM

PM/DM SGL / CGF

BRANCH MANAGER: RSC

CHIEF ENG/ARCH: BGA

FIRE PROTECTION: DPS

NAVAL FACILITIES ENGINEERING COMMAND

NAVAL FACILITIES ENGINEERING COMMAND MID-ATLANTIC

NAVAL STATION NORFOLK NORFOLK, VA

JACKSONVILLE, NC

DEPARTMENT OF THE NAVY

NAVAL FACILITIES ENGINEERING COMMAND

NORTH CAROLINA IPT

MCB CAMP LEJEUNE

P1396 - SOF INTEL OPS EXPANSION

CONTROLS

SCALE: AS NOTED

EPROJECT NO.: 1333294

CONSTR. CONTR. NO. N40085-10-D-5301

NAVFAC DRAWING NO. 12688115

SHEET 168 OF 206

M-701

DRAWFORM REVISION: 10 MARCH 2009

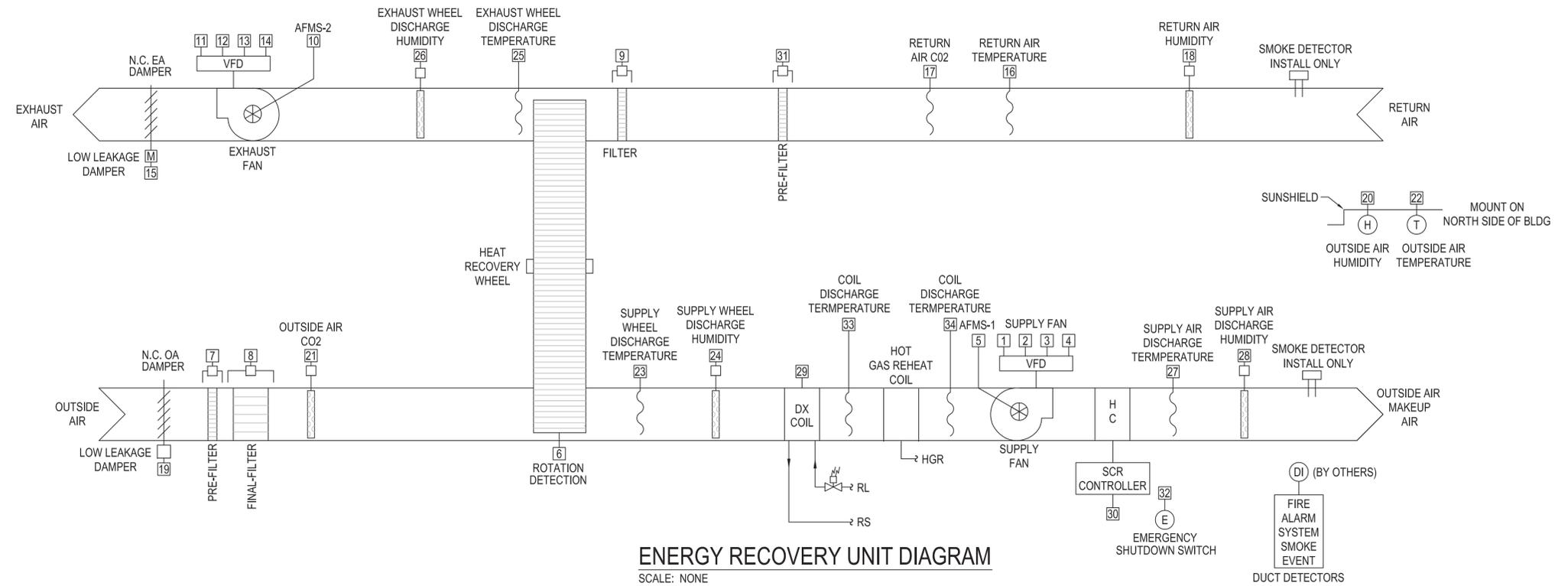
1

2

3

4

5



ENERGY RECOVERY UNIT DIAGRAM
SCALE: NONE

SPACE CARBON DIOXIDE SENSOR
SCALE: NONE RM 106, 123, 127 AND 205
WHEN THE CO2 LEVEL IN THE CONFERENCE ROOM IS 10% ABOVE SETPOINT 700 PPM (ADJUSTABLE) AN ALARM SHALL BE SENT TO THE BAS SYSTEM.

CONTROL POINTS LIST						
TAG	NAME/FUNCTION	AI	AO	DI	DO	REMARKS
1	SPACE CARBON DIOXIDE SENSOR	•				

UNOCCUPIED CYCLE:
THE UNIT SHALL REMAIN OFF WITH THE OUTSIDE AIR DAMPER FULLY CLOSED.

THE REFRIGERATION SYSTEM SHALL REMAIN DE-ENERGIZED AT ALL TIMES DURING THE UNIT UNOCCUPIED CYCLE WHILE THE FAN IS OFF.

OCCUPIED MODE OF OPERATION:

THE ERU SHALL OPERATE WITH 100% OUTSIDE AIR DURING THE OCCUPIED CYCLE. THE ERU SUPPLY AIR DISCHARGE TEMPERATURE SENSOR SHALL MAINTAIN A CONSTANT SUPPLY AIR DISCHARGE TEMPERATURE, 70°F (ADJ) THROUGH THE DIGITAL CONTROLLER BY MODULATING IN SEQUENCE THE DX COIL AND THE ELECTRIC HEATING COIL WITHOUT REQUIRING SIMULTANEOUS HEATING AND COOLING AS FOLLOWS: WHEN THE OUTSIDE AIR TEMPERATURE IS LESS THAN 55°F (ADJ), MODULATE THE DX COIL TO MAINTAIN 70°F. WHEN THE OUTSIDE AIR IS AT OR ABOVE 55°F, MODULATE THE HGRH COIL TO MAINTAIN 70°F. IF THE SUPPLY AIR TEMPERATURE IS UNABLE TO BE MAINTAIN 70°F (ADJ) AFTER 5 MINUTES (ADJ), THE ELECTRIC SHALL MODULATE TO MAINTAIN 68°F (ADJ). IF THE EXHAUST AIR HUMIDITY IS ABOVE 55% RH (ADJ.), THE COMPRESSOR SHALL MODULATE TO 100%, THE HGRH SHALL MAINTAIN THE SUPPLY AIR TEMPERATURE SETPOINT (70°F, ADJ.). ONCE THE EXHAUST AIR HUMIDITY FALLS BELOW 50% RH (ADJ) THE UNIT SHALL REVERT TO NORMAL OPERATION.

A HIGH STATIC PRESSURE LIMIT (4" WC ADJ) AT THE DISCHARGE OF THE SUPPLY FAN SHALL SERVE AS A SAFETY TO STOP THE FAN IF ITS SETTING IS EXCEEDED. A LOW STATIC PRESSURE SENSOR AT THE INLET OF THE EXHAUST FAN SHALL LIKEWISE STOP THE EXHAUST FAN IF ITS PRESSURE SETTING IS EXCEEDED (2" WC ADJ). THE SUPPLY AND EXHAUST FANS SHALL BE INTERLOCKED SO THAT IF ONE SHUTS DOWN AS A RESULT OF A SAFETY, THE OTHER SHALL LIKEWISE SHUT DOWN. A CURRENT SENSOR AT THE SUPPLY AND EXHAUST FANS SHALL SERVE TO PROVIDE THE DIGITAL CONTROLLER PROOF OF FAN OPERATION. IF EITHER FAN FAILS TO OPERATE, AN ALARM MESSAGE SHALL BE SENT TO THE DIGITAL CONTROLLER. THE SUPPLY AND EXHAUST FAN SHALL SLOWLY BE BROUGHT UP TO OVER 30 SECONDS (ADJ.).

GENERAL (ALL MODES OF OPERATION):
AN ALARM SHALL BE GENERATED IF THE SUPPLY AIR TEMPERATURE IS ABOVE 75°F (ADJ) OR BELOW 65°F (ADJ). THE UNIT SHALL STOP AND ALARM SENT TO THE BAS IF THE SUPPLY AIR TEMPERATURE IS BELOW 40°F (ADJ).

A DIFFERENTIAL PRESSURE SWITCH INSTALLED ACROSS THE FILTER BANK SHALL SEND AN ALARM TO THE DIGITAL CONTROLLER IF THE FILTERS ARE FULLY LOADED (DIRTY; BASED ON MANUFACTURER'S CATALOGED DATA).

ON A FAN SHUTDOWN OR FAILURE TO OPERATE, THE SYSTEM SHALL REVERT TO THE UNOCCUPIED MODE OF OPERATION. ALL OF THE DAMPERS SHALL SHUT. AN ALARM SHALL BE SENT TO THE DIGITAL CONTROLLER.

THE HEAT RECOVERY WHEEL HAS AN INTEGRATED ERU CONTROL PANEL WHICH WILL MONITOR AND CONTROL THE ROTATIONAL SPEED OF THE WHEEL TO MAINTAIN MAXIMUM EFFECTIVENESS. DURING PERIODS WHEN OPERATION OF THE WHEEL WOULD BE DETRIMENTAL TO SYSTEM PERFORMANCE (SUCH AS WHEN THE ECONOMIZER CYCLE CAN BE UTILIZED), THE WHEEL SHALL BE ROTATED SLOWLY TO FLUSH THE WHEEL. DURING PERIODS WHEN THE OUTSIDE AIR TEMPERATURE IS VERY LOW, THE WHEEL SPEED SHALL BE VARIED TO MINIMIZE THE POTENTIAL FOR FROST FORMATION ON THE WHEEL. AN AUDIBLE AND VISUAL ALARM SHALL BE PROVIDED IF THE WHEEL IS STOPPED WHEN COMMANDED TO RUN. THE ALARM SHALL BE SENT TO THE BAS AND EMCS.

WHEN THE HVAC SHUTDOWN SWITCH IS ACTIVATED, THE SUPPLY AND EXHAUST FANS SHALL BE DE-ENERGIZED, THE DAMPERS IN THE SUPPLY AND EXHAUST DUCTS SHALL FULLY CLOSE AND ALL DEVICES (DAMPERS, VALVES, ETC.) SHALL GO TO THEIR UNOCCUPIED MODE POSITION AND AN ALARM SHALL BE SENT TO THE DIGITAL CONTROLLER.

WHEN THE DISCHARGE AIR TEMPERATURE EXCEEDS THE DESIGN DEWPOINT, 55°F, BY 5°F AN ALARM SHALL BE SENT TO THE BAS SYSTEM.

WHEN THE CO2 LEVEL IN THE EXHAUST AIR SYSTEM IS 10% ABOVE SETPOINT, 650 PPM (ADJ.) AN ALARM SHALL BE SENT TO THE BAS SYSTEM.

UPON THE DETECTION OF COMBUSTION PRODUCTS IN THE AIR STREAM, THE UNIT SHALL STOP AND AN ALARM SHALL BE SENT TO THE DIGITAL CONTROLLER.

ALL ERU ALARMS SHALL PROVIDE AUDIBLE AND VISUAL INDICATION AND SEND A SIGNAL TO THE BAS AND THE EMCS.

CONTROL POINTS LIST						
TAG	NAME/FUNCTION	AI	AO	DI	DO	REMARKS
1	SUPPLY FAN FEEDBACK - DRIVE % SPEED	•				
2	SUPPLY FAN SPEED CONTROL		•			
3	SUPPLY FAN DRIVE STATUS			•		
4	SUPPLY FAN START/STOP				•	
5	SUPPLY AIR FLOW	•				
6	ENTHALPY WHEEL ROTATION DETECTION			•		
7	PRE-FILTER DIFFERENTIAL PRESSURE			•		
8	FINAL FILTER DIFFERENTIAL PRESSURE			•		
9	EXHAUST FILTER DIFFERENTIAL PRESSURE			•		
10	EXHAUST AIR FLOW	•				
11	EXHAUST FAN FEEDBACK - DRIVE % SPEED	•				
12	EXHAUST FAN SPEED CONTROL		•			
13	EXHAUST FAN DRIVE STATUS			•		
14	EXHAUST FAN START/STOP				•	
15	EXHAUST AIR DAMPER				•	
16	RETURN AIR TEMPERATURE	•				
17	RETURN AIR CO2	•				
18	RETURN AIR HUMIDITY	•				
19	OUTSIDE AIR DAMPER				•	
20	OUTSIDE AIR HUMIDITY	•				
21	OUTSIDE AIR CO2	•				
22	OUTSIDE AIR TEMPERATURE	•				
23	SUPPLY WHEEL DISCHARGE TEMPERATURE	•				
24	SUPPLY WHEEL DISCHARGE HUMIDITY	•				
25	EXHAUST WHEEL DISCHARGE TEMPERATURE	•				
26	EXHAUST WHEEL DISCHARGE HUMIDITY	•				
27	SUPPLY AIR DISCHARGE TEMPERATURE	•				
28	SUPPLY AIR DISCHARGE HUMIDITY	•				
29	COOLING STAGE				•	
30	HEATING ENABLE				•	
31	PRE-FILTER DIFFERENTIAL PRESSURE			•		
32	HVAC EMERGENCY SHUTDOWN SWITCH				•	
33	COOLING COIL DISCHARGE TEMPERATURE	•				
34	HGRH COIL DISCHARGE TEMPERATURE	•				

APPROVED: [Signature]

FOR COMMANDER NAVFAC

ACTIVITY: ALEX WOOD alex.wood@navfac.mil

SATISFACTORY TO DATE MM/DD/YY

DES GRB DRW GRB CHK MCM

BRANCH MANAGER RSC

CHIEF ENGR/ARCH BGA

FIRE PROTECTION DPS

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND MID-ATLANTIC
NORTH CAROLINE IPT
MCB CAMP LEJEUNE
JACKSONVILLE, NC

P1396 - SOF INTEL OPS EXPANSION

CONTROLS

SCALE: AS NOTED
EPROJECT NO.: 1333294
CONSTR. CONTR. NO. N40085-10-D-5301
NAVFAC DRAWING NO. 12688116
SHEET 169 OF 206
M-702
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