

SEQUENCES OF OPERATION:

GENERAL SCOPE OF WORK:

THE TEMPERATURE CONTROL WORK ON THIS PROJECT SHALL BE FIELD INSTALLED AND SHALL MATCH EXISTING HOSPITAL BUILDING AUTOMATION SYSTEM. THE BAS SHALL BE A FULLY DISTRIBUTED DDC SYSTEM WITH ELECTRONIC ACTUATION. AREAS FOR CONTROL PANEL INSTALLATION HAVE BEEN INDICATED ON "M" DRWGS. NOTIFY ARCHITECT BEFORE BID DATE IF OTHER AREAS ARE REQUIRED FOR INSTALLATION.

GENERAL SYSTEM STARTUP:

THE HVAC SYSTEM, INCLUDING TERMINAL EQUIPMENT, AIR HANDLING UNITS, AND EXHAUST FANS, SHALL BE CYCLED THROUGH THE ACTION OF THE DDC SYSTEM AS DESCRIBED HEREIN. SUBMIT PROPOSED SEQUENCE OF OPERATION, POINTS LIST AND SCHEMATIC BEFORE BID DATE FOR EQUIPMENT NOT SHOWN HEREIN.

EXHAUST FANS:

CENTRALLY CONTROLLED:
SHALL ENERGIZE UPON COMMAND FROM DDC SYSTEM. OWNER SHALL DETERMINE FINAL SCHEDULE.

FIRE ALARM SYSTEM TIE-IN:

IF AN ALARM IS GENERATED BY THE BUILDING FIRE ALARM SYSTEM, THE BUILDING DDC SYSTEM SHALL DE-ENERGIZE THE AIR HANDLING EQUIPMENT. THE ELECTRICAL CONTRACTOR SHALL BRING WIRE TO THE DDC PANEL. TEMPERATURE CONTROL CONTRACTOR SHALL WIRE-IN FIRE ALARM SYSTEM AND PROGRAM DDC.

		POINTS LIST				
LOCATION	SYSTEM/POINT	DO	DI	AO	AI	COMMENTS
MECH LEVEL	LOUVER OA DAMPER	•				
	LOUVER OA DAMPER OPEN PROOF		•			
ROOF	EXHAUST FAN START/STOP	•				
	EXHAUST FAN LOW PRESSURE				•	PRESSURE SENSOR

AHU-121

THE VARIABLE VOLUME, 100% OUTSIDE AIR, AIR HANDLING UNIT CONSISTS OF AN OUTDOOR AIR MEASURING STATION, PRE-FILTER, STEAM PREHEAT COIL, CHILLED WATER COOLING COIL, SUPPLY FAN WITH VARIABLE FREQUENCY DRIVE AND STEAM HUMIDIFIER (ALTERNATE). THE UNIT IS DDC CONTROLLED USING ELECTRIC ACTUATION.

THE AIR HANDLING UNIT IS SCHEDULED FOR AUTOMATIC OPERATION AND SHALL RUN CONTINUOUSLY.

TEMPERATURE CONTROL

WHEN THE AIR HANDLING UNIT IS OPERATING, THE PREHEAT AND COOLING COILS SHALL OPERATE TO MAINTAIN A CONSTANT DISCHARGE AIR TEMPERATURE OF 55°F (ADJUSTABLE). THIS SETPOINT SHALL AUTOMATICALLY ADJUST TO SATISFY THE WARMEST ROOM IN THE SERVICE AREA. UNDER NO CIRCUMSTANCES SHALL THE TEMPERATURE ADJUSTMENT UNDERMINE PROPER HUMIDITY CONTROL.

HUMIDITY CONTROL (ALTERNATE)

WHEN THE AIR HANDLING UNIT IS OPERATING, THE HUMIDIFIER VALVE MODULATES TO MAINTAIN THE SUPPLY AIR HUMIDITY SET POINT OF 30% (ADJUSTABLE). THE UNIT SHALL OPERATE THE COOLING COIL TO A MAXIMUM HUMIDITY SET POINT OF 55% (ADJUSTABLE). HUMIDIFIER VALVE MODULATES CLOSED IF SUPPLY AIR HUMIDITY LEVELS EXCEED SET POINT.

SUPPLY DUCT AND BUILDING PRESSURIZATION CONTROL

THE SUPPLY FAN VARIABLE FREQUENCY DRIVE MODULATES TO MAINTAIN A CONSTANT DUCT STATIC PRESSURE OF 1.5 INCHES (ADJ.) OF WATER AS SENSED AT LEAST TWO-THIRDS OF THE WAY DOWNSTREAM OF THE SUPPLY FAN IN THE LONGEST OR MOST CRITICAL DUCT. UPON STARTUP, THE SUPPLY FAN SHALL RAMP TO THE DESIRED STATIC PRESSURE SET POINT. UPON SHUTDOWN OF THE AIR HANDLING SYSTEM, THE SUPPLY FAN VARIABLE FREQUENCY DRIVE IS STOPPED AND THE SPEED SIGNAL SHALL GO TO ZERO SPEED.

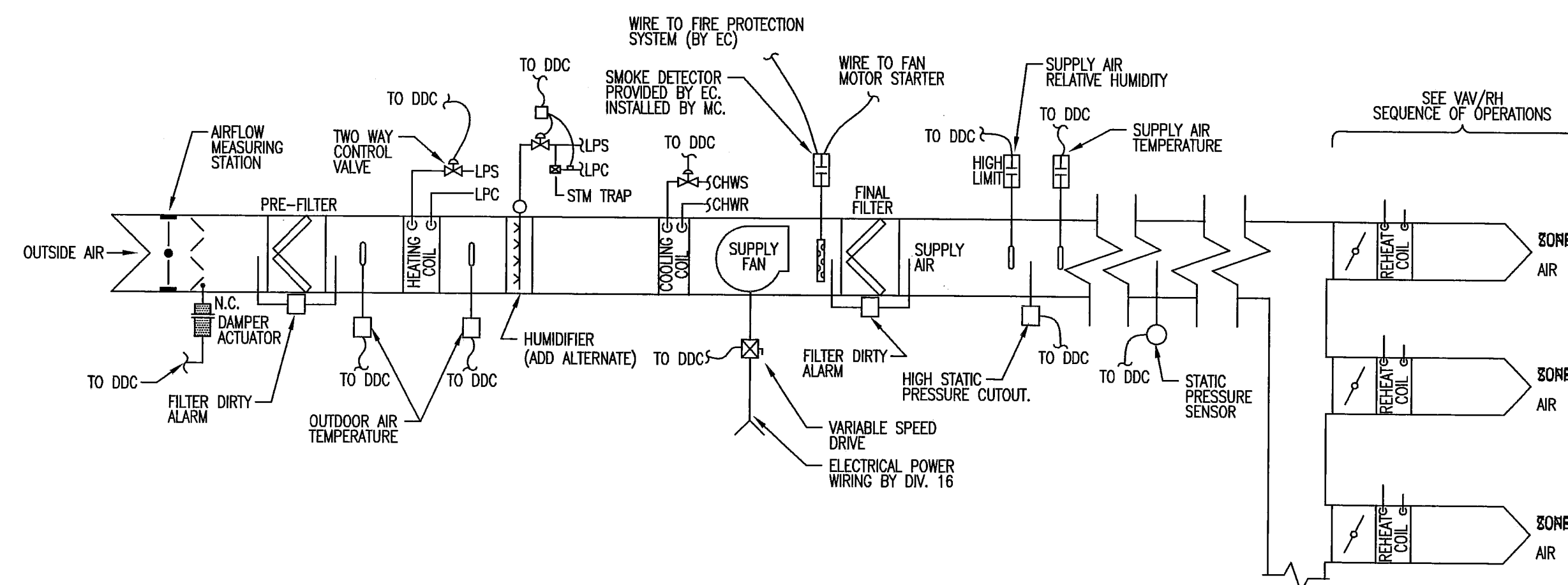
SAFETY

DISCHARGE HIGH STATIC CUTOUT, SMOKE DETECTORS IN THE SUPPLY AIR STREAM, AND SUPPLY FAN VFD FAULT ALARM DE-ENERGIZE THE SUPPLY FAN UPON ACTIVATION. WHEN THE OAT IS LESS THAN 45 DEGREES F, THE HEATING COIL VALVE MODULATES TO MAINTAIN THE MIXED AIR TEMPERATURE AT 45 DEGREES F. WHEN THE OAT IS 45 DEGREES F OR ABOVE, THE HEATING COIL VALVE CLOSES. ALL OTHER DAMPERS AND VALVES POSITION TO THEIR NORMAL POSITION AFTER THE FANS ARE DE-ENERGIZED.

A LOW TEMPERATURE DETECTOR IN THE DISCHARGE OF THE HEATING COIL DE-ENERGIZES THE SUPPLY FAN WHEN TEMPERATURES BELOW 38 DEGREES F ARE SENSED. THE HEATING COIL VALVE MODULATES TO MAINTAIN THE MIXED AIR TEMPERATURE AT 45 DEGREES F. ALL OTHER DAMPERS AND VALVES POSITION TO THEIR NORMAL POSITION AFTER THE FANS ARE DE-ENERGIZED.

CURRENT SENSORS ARE INSTALLED ON THE LOAD SIDE OF THE SUPPLY FAN VFD. THE DDC SYSTEM USES THE SENSORS TO CONFIRM THE FANS ARE IN THE DESIRED STATE (I.E. ON OR OFF) AND GENERATES AN ALARM IF STATUS DEVIATES FROM DDC START/STOP CONTROL. THE DDC SYSTEM GENERATES A VFD TROUBLE ALARM INDEPENDENT FROM THE FAN STATUS.

		POINTS LIST				
SYSTEM/POINT	DO	DI	AO	AI	COMMENTS	
COOLING COIL VALVE			•			
HEATING COIL VALVE			•			
HUMIDIFIER VALVE			•		(ALTERNATE)	
SUPPLY FAN VARIABLE FREQUENCY DRIVE			•			
SUPPLY FAN			•			
OUTDOOR AIR TEMPERATURE	•					
SPACE TEMPERATURE				•		
SUPPLY AIR RELATIVE HUMIDITY				•		
SUPPLY AIR STATIC PRESSURE				•		
SUPPLY AIR TEMPERATURE				•		
AIRFLOW MEASURING STATION				•		
FILTER DIRTY ALARMS		•				
HIGH STATIC PRESSURE CUTOUT		•				
LOW TEMPERATURE DETECTION THERMOSTAT		•				
SUPPLY FAN PROOF		•				
SUPPLY FAN VFD ALARM		•				
SUPPLY SMOKE DETECTOR		•				
AIRFLOW MEASURING STATION HI ALARM		•				
AIRFLOW MEASURING STATION LOW ALARM		•				
LOW PRESSURE CONDENSATE TEMPERATURE				•	INSTALL SENSOR JUST DOWNSTREAM OF TRAP.	



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N.T.S. CS-01

VAV TERMINAL W/ HOT WATER REHEAT

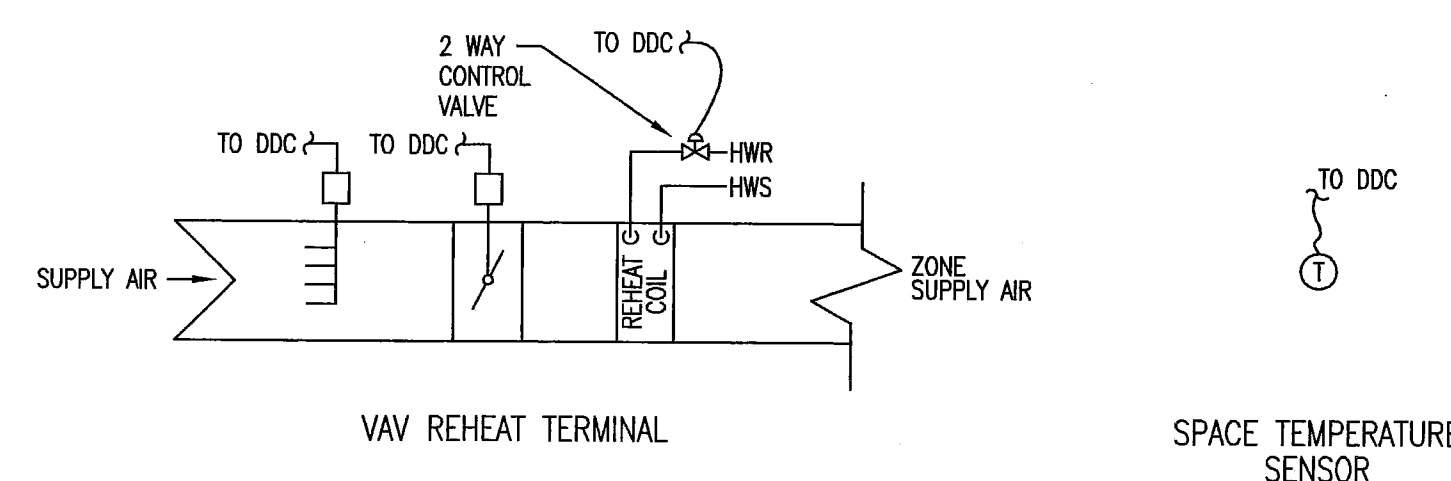
GENERAL ZONE CONTROL

DEDICATED, SINGLE SENSOR ZONES SHALL BE CONTROLLED FROM SENSORS AS SHOWN ON "M" DRAWINGS. THE VARIABLE VOLUME (VAV) TERMINAL UNIT IS CONTROLLED INDEPENDENT OF SYSTEM PRESSURE FLUCTUATIONS BY AN APPLICATION SPECIFIC DDC CONTROLLER USING ELECTRIC ACTUATION. THE SPACE SERVED BY THE VAV TERMINAL UNIT IS CONTROLLED IN OCCUPIED AND UNOCCUPIED MODES AS FOLLOWS:

OCCUPIED ZONE CONTROL

THE VAV TERMINAL UNIT IS CONTROLLED BETWEEN MAXIMUM AND MINIMUM SUPPLY AIR VOLUME SETTINGS. THE CONTROLLER MONITORS THE ROOM TEMPERATURE SENSOR AND AIR VELOCITY SENSOR AND MODULATES THE SUPPLY AIR DAMPER IN SEQUENCE WITH THE REHEAT VALVE TO MAINTAIN THE ROOM TEMPERATURE AT SET POINT.

		POINTS LIST				
SYSTEM/POINT	DO	DI	AO	AI	COMMENTS	
REHEAT VALVE			•			
SUPPLY AIR DAMPER			•			
SPACE TEMPERATURE				•		
SUPPLY AIR VOLUME				•		



A1 VAV/REHEAT TERMINAL UNITS

N.T.S. CS-05



ARCHITECTS
INTERIORS
PLANNERS

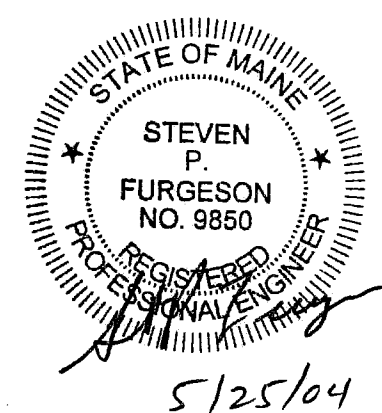
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RENOVATIONS TO
RICHARD'S 4th FLOOR
INTERMEDIATE CARE
UNITS

MAINE MEDICAL CENTER
Portland, Maine

Scale: NONE
Project Number: 02-021
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Revisions:



CONSTRUCTION
DOCUMENTS



MECHANICAL CONTROLS
CAD FILE 25486M008

M-5