

REVISIONS				
SYM	DESCRIPTION	PREPARED BY	DATE	APPROVED

CONTINUATION OF CONTROL SEQUENCE:

GENERAL CONTROL NOTES

(1) SEE SHEET M9-1 FOR ALL GENERAL CONTROL NOTES.

(2) SEE SHEET M9-1 FOR CONTROL LEGEND.

TERMINAL UNIT CONTROL:
GENERAL

THE TERMINAL UNIT CONTROLS SHALL BE FACTORY INSTALLED AND SHALL BE COMPATIBLE WITH THE DDC SYSTEM FURNISHED. ALL TERMINAL UNITS SERVED BY ONE AIR HANDLING UNIT SHALL BE CONNECTED BACK TO THAT AIR HANDLING UNIT DDC PANEL. THE UNIT SHALL BE CAPABLE OF MAINTAINING THE AIR FLOWS AS INDICATED ON THE TERMINAL UNIT SCHEDULE FROM MINIMUM TO MAXIMUM AIR FLOWS. ALL TERMINAL UNITS SHALL BE INTERFACED WITH THE DDC SYSTEM CENTRAL PROCESSOR SO THAT SPACE TEMPERATURES AND AIR FLOWS MAY BE READ AND RESET FROM THE CENTRAL PROCESSOR. EACH TERMINAL UNIT SHALL BE CAPABLE OF MORNING WARM-UP AND COOL-DOWN OPERATION, NIGHT TEMPERATURE SETBACK OPERATION AND TIMED OVERRIDE OPERATION DURING UNOCCUPIED PERIODS OF OPERATION. SEE TIMED OVERRIDE CONTROLS ON SHEET M9-3. THE TERMINAL UNITS SHALL OPEN TO 100% AIR FLOW ANY TIME THAT THE SUPPLY FAN VFD IS PLACED IN THE MANUAL BY-PASS POSITION.

VAV (VARIABLE AIR VOLUME) W/ HEAT

A SPACE TEMPERATURE SENSOR SHALL MODULATE THE AIR FLOW FROM THE MAXIMUM TO THE MINIMUM AIR FLOW TO MAINTAIN SET POINT OF 21° C. WHEN THE MINIMUM AIR FLOW SET POINT IS REACHED AND ON A FURTHER FALL IN SPACE TEMPERATURE THE TERMINAL UNIT HOT WATER VALVE SHALL MODULATE TO MAINTAIN SPACE TEMPERATURE.

CV (CONSTANT AIR VOLUME) W/ HEAT

THE UNIT SHALL BE SAME AS VAV W/ HEAT ABOVE EXCEPT CONTROLS SHALL BE SET FOR CONSTANT VOLUME AIR FLOW.

VAV (VARIABLE AIR VOLUME) COOL ONLY

A SPACE TEMPERATURE SENSOR SHALL MODULATE THE AIR FLOW FROM THE MAXIMUM TO THE MINIMUM AIR FLOW TO MAINTAIN SET POINT OF 21° C.

COMPUTER ROOM (2D-04) CONTROL: TERMINAL UNIT 2UU & AC-5

AC-5 SHALL BE PROVIDED WITH A MICROPROCESSOR CONTROL SYSTEM. IN ADDITION TO CONTROLLING ROOM TEMPERATURE IT SHALL ALSO CONTROL ROOM HUMIDIFICATION AND DEHUMIDIFICATION. AC-5 AND ACCU-5 SYSTEM SHALL PROVIDE SUPPLEMENTAL COOLING AND COOLING WHEN AHU-2 SYSTEM IS OFF. TERMINAL UNIT 2-UU SHALL BE CONTROLLED SAME AS VAV WITH HEAT ABOVE EXCEPT AS HEREIN MODIFIED. WHEN AHU-2 IS IN OPERATION, AC-5 & ACCU-5 SHALL CYCLE ONLY WHEN T.U. 2-UU AIR FLOW IS AT 100% OF ITS MAXIMUM DESIGN AIR FLOW CAPACITY AND T.U. 2-UU SPACE TEMPERATURE RISES ABOVE THE THERMOSTAT SET POINT TEMPERATURE OF 23° C. WHEN THE SPACE TEMPERATURE DROPS BELOW THE THERMOSTAT SET POINT AC-5 AND ACCU-5 SHALL BE DEENERGIZED. WHEN AHU-2 IS OFF AC-5 AND ACCU-5 SHALL OPERATE THROUGH T.U. 2-UU THERMOSTAT CONTROL AS FOLLOWS: WHEN SPACE TEMPERATURE RISES ABOVE 23° C. AC-5 AND ACCU-5 SHALL CYCLE TO MAINTAIN SPACE TEMPERATURE. WHEN ROOM TEMPERATURE IS SATISFIED THEN AC-5 AND ACC-5 SHALL STOP.

A CONDENSATE SENSOR/SWITCH SHALL BE MOUNTED IN THE UNIT DRAIN PAN SO THAT IT WILL ALARM THE DDC SYSTEM IF CONDENSATE OVERFLOWS THE DRAIN PAN.

AC-1 THROUGH AC-4 CONTROL:

A CONDENSATE SENSOR/SWITCH SHALL BE MOUNTED IN THE UNIT DRAIN PAN SO THAT IT WILL ALARM THE DDC SYSTEM IF CONDENSATE OVERFLOWS THE DRAIN PAN.

THE FOLLOWING CONTROLS ARE NOT THROUGH THE DDC SYSTEM:

AC-1 THROUGH AC-4 CONTROL:

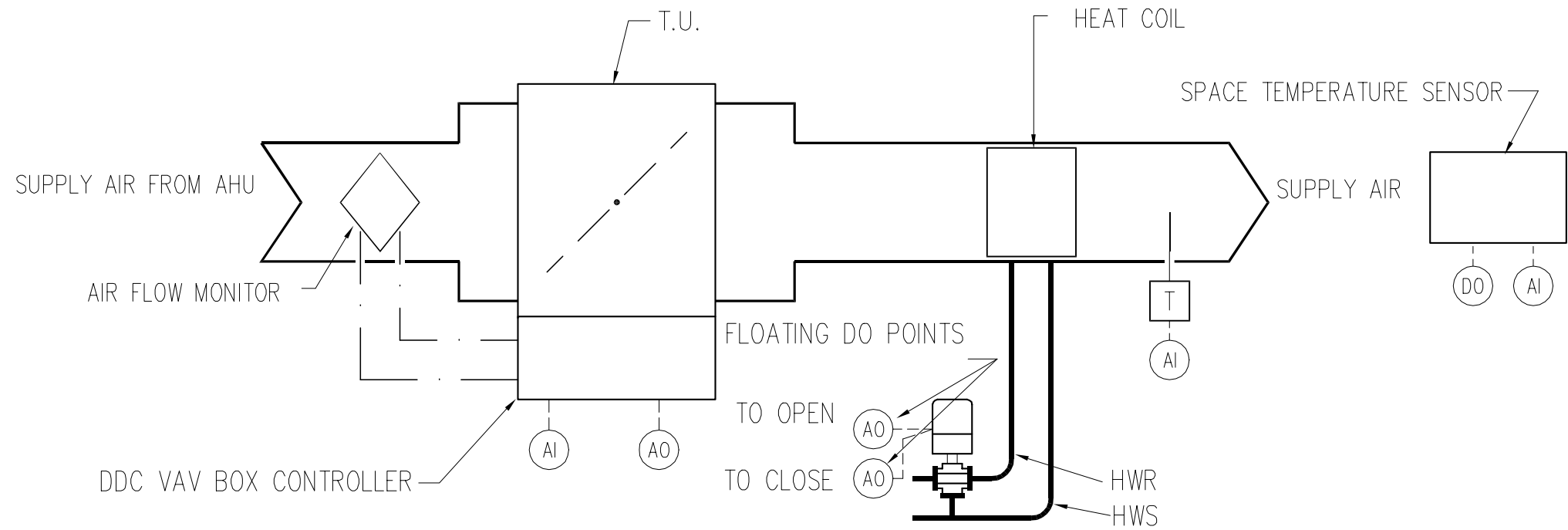
AC-1 THROUGH AC-5 SHALL BE CAPABLE OF CONTINUOUS OPERATION AND ARE NOT CONTROLLED THROUGH THE DDC SYSTEM. A SPACE THERMOSTAT SHALL CYCLE AC UNIT AND ITS RESPECTIVE ACCU TO MAINTAIN SPACE TEMPERATURE.

SUPPLY FAN SF-1 CONTROL:

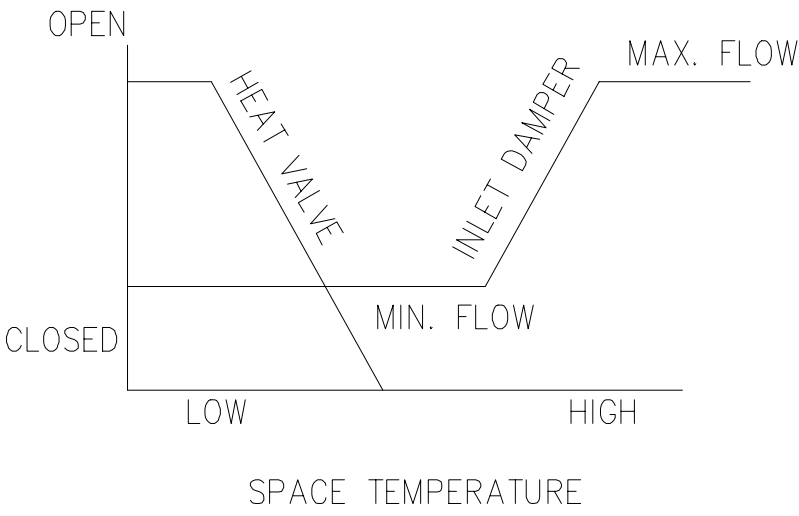
FAN CONTROLLED BY SPACE THERMOSTATS SHALL START WHEN SPACE TEMPERATURE RISES ABOVE 27 °C SET POINT AND STOP WHEN TEMPERATURE FALLS BELOW 27 °C SET POINT. DAMPER SHALL OPEN WHEN FAN STARTS AND CLOSE WHEN FAN STOPS.

EXHAUST FANS EF-3 THROUGH EF-7 CONTROL

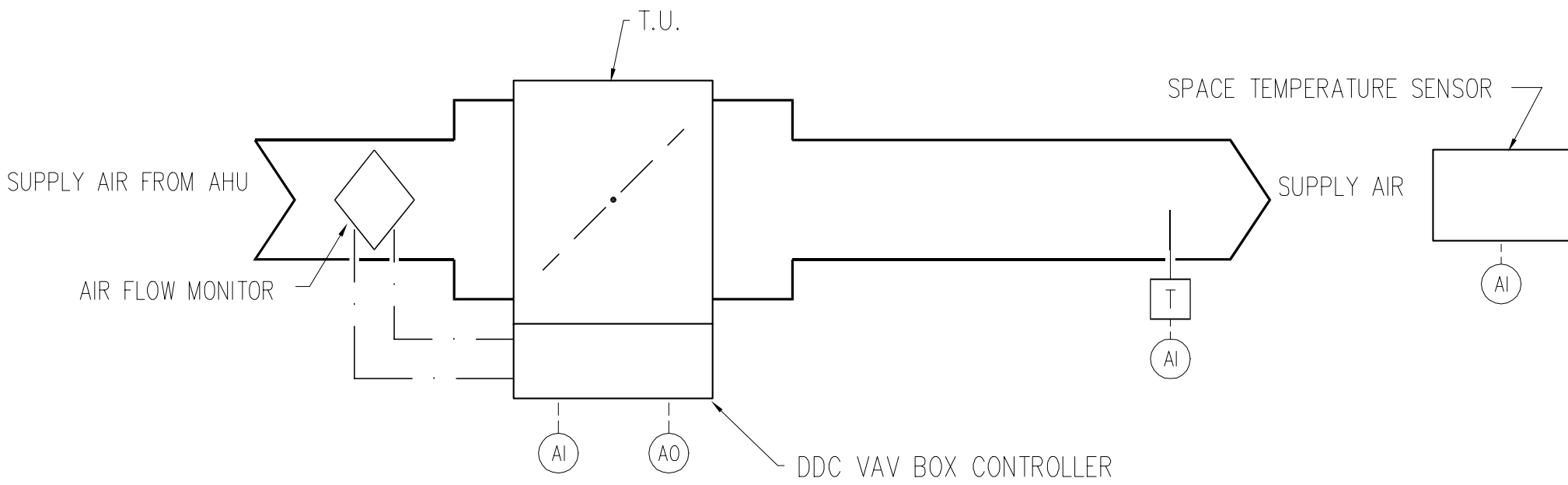
FAN CONTROLLED BY SPACE THERMOSTATS SHALL START WHEN SPACE TEMPERATURE RISES ABOVE 27 °C SET POINT AND STOP WHEN TEMPERATURE FALLS BELOW 27 °C SET POINT. DAMPERS SHALL OPEN WHEN FAN STARTS AND CLOSE WHEN FAN STOPS.



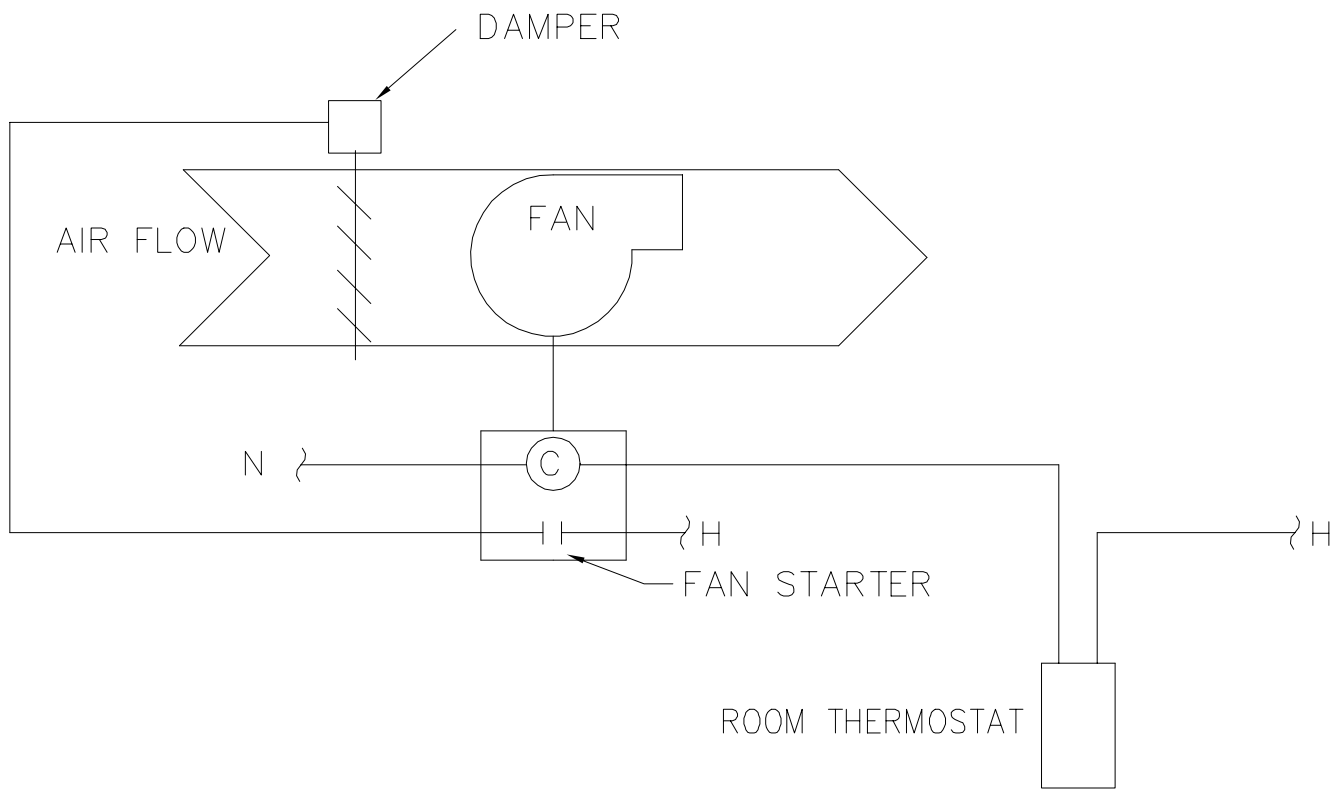
VAV (W/ HEAT) TERMINAL BOX CONTROLS: CV TERMINAL BOX CONTROLS SIMILAR
NO SCALE



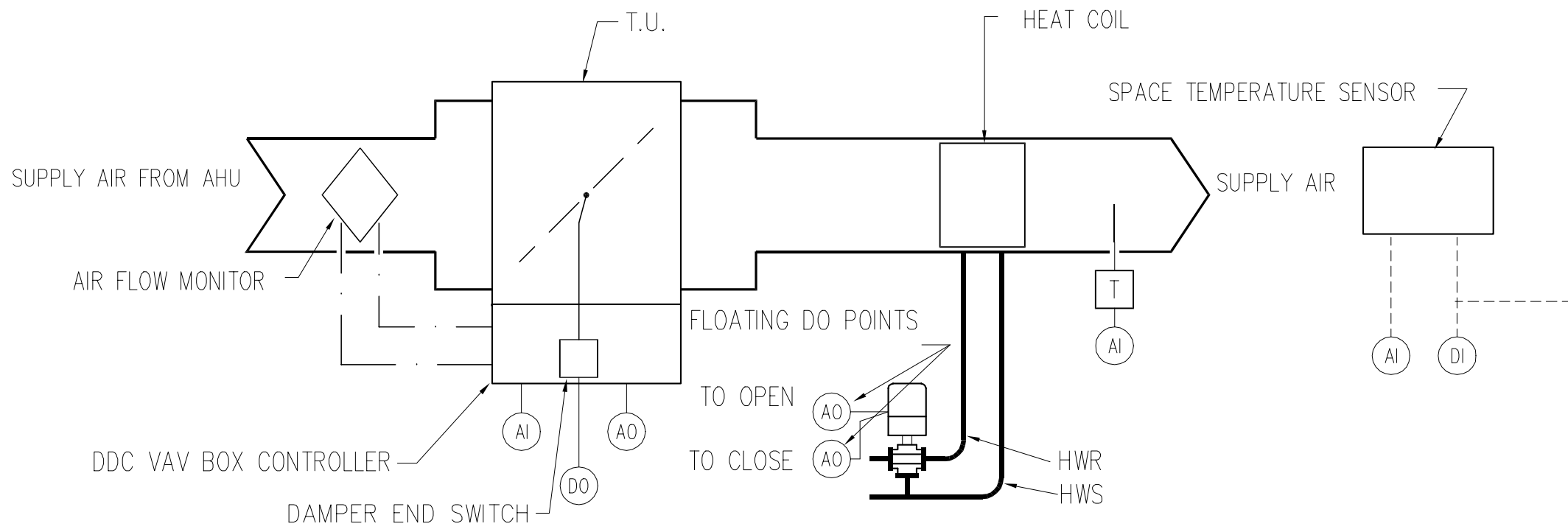
VAV TERMINAL UNIT AIR AND WATER FLOW SEQUENCE
NO SCALE



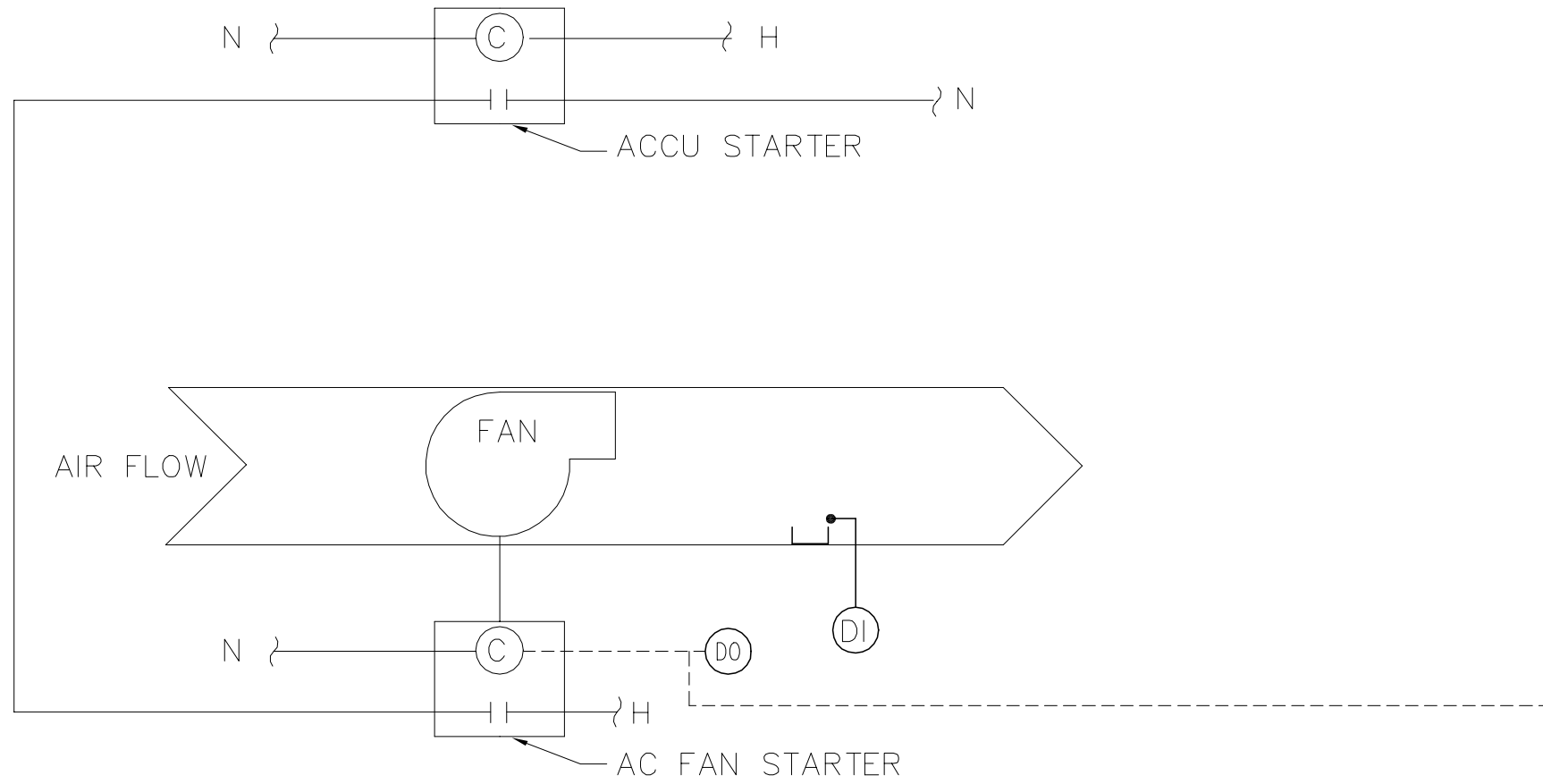
VAV (COOL ONLY) TERMINAL BOX CONTROLS
NO SCALE



SUPPLY FAN-1 CONTROL
NO SCALE:
EXHAUST FANS EF-3 THROUGH EF-7 SIMILAR

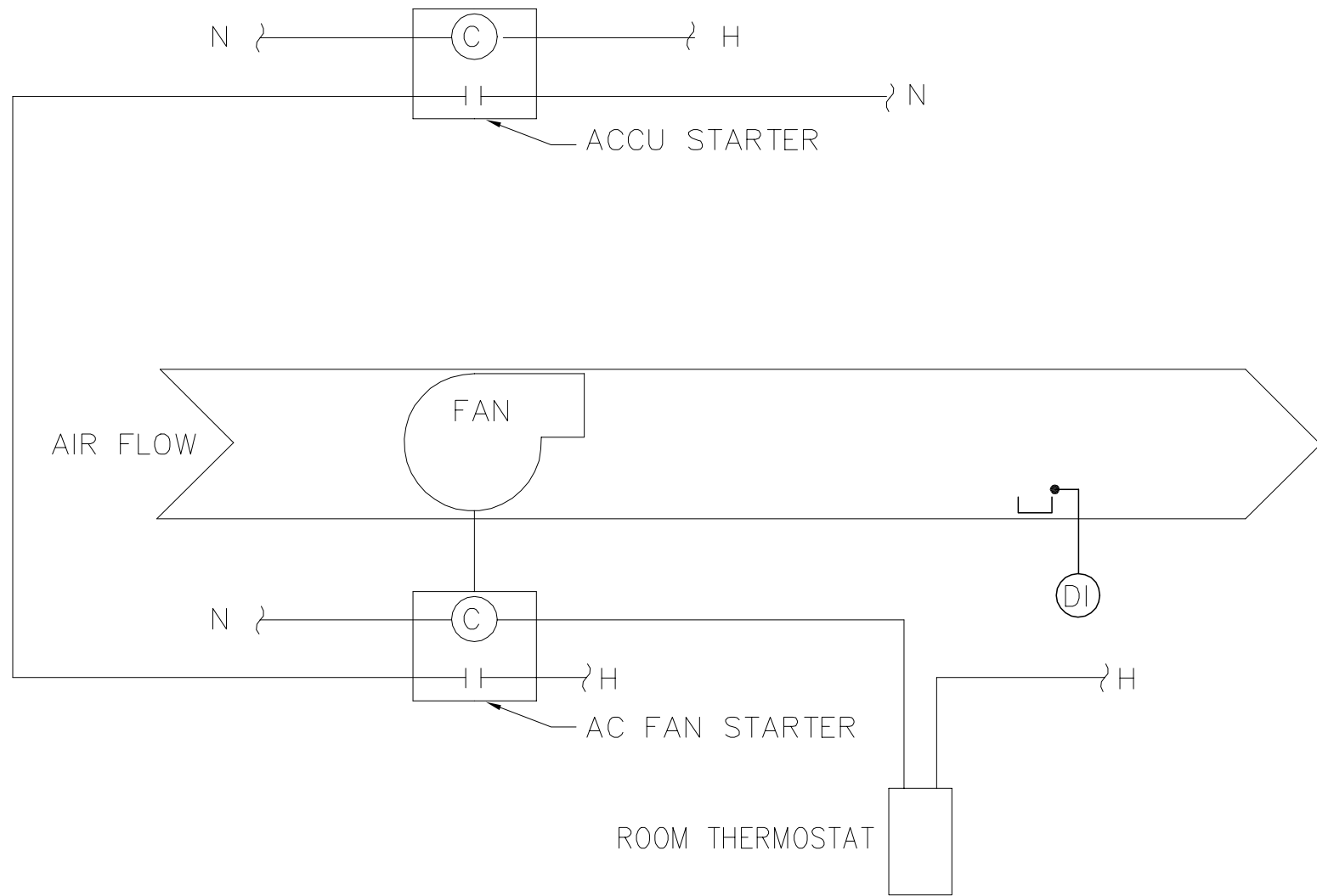


T.U. 2-UU



AC-5 & ACCU-5

COMPUTER ROOM (2D-04) T.U. 2-UU & AC-5
NO SCALE



AC-1 THROUGH AC-4 CONTROL
NO SCALE:

DDC POINTS LIST

	HARDWARE										SOFTWARE ALARMS
	INPUT						OUTPUT				
	DIGITAL			ANALOG			DIGITAL		ANALOG		
	TEMPERATURE	SET BACK	CONDENSATE OVERFLOW	TEMPERATURE	SET POINT	UPS (AIR FLOW)	START/STOP		CONTROL MODULE		
VAV, CV BOXES, AC-1 THRU AC-4 AC-5 & ACCU-5											
AIR FLOW						■					
DAMPER									■	■	
HOT WATER VALVE									■	■	
SUPPLY AIR TEMPERATURE					■						
SPACE TEMPERATURE					■	■					■
TIMED OVERRIDE							■				
AC-1			■								■
AC-2			■								■
AC-3			■								■
AC-4			■								■
AC-5			■				■				■

IF SHEET IS LESS THAN 28"x42", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

M9-2

MEDICAL/DENTAL CLINIC

HVAC CONTROL
DIAGRAMS

SIZE	CODE IDENT. NO.	DRAWING NO.
F	XXXXX	8144754
CONST. CONTR. NO.		
SCALE:	AS SHOWN	SPEC. 11996048
		SHEET 249 OF 316