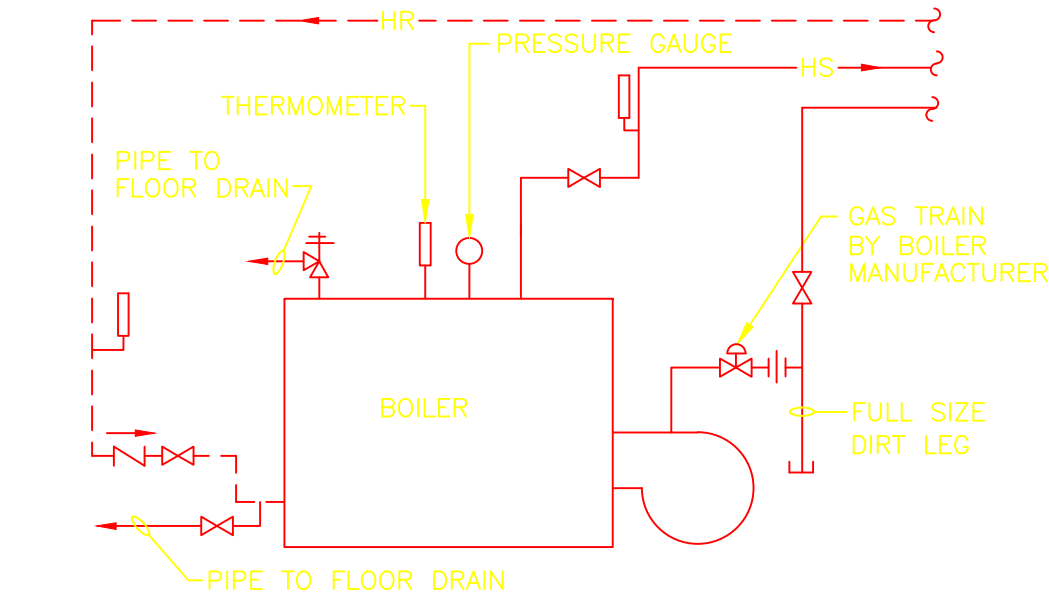
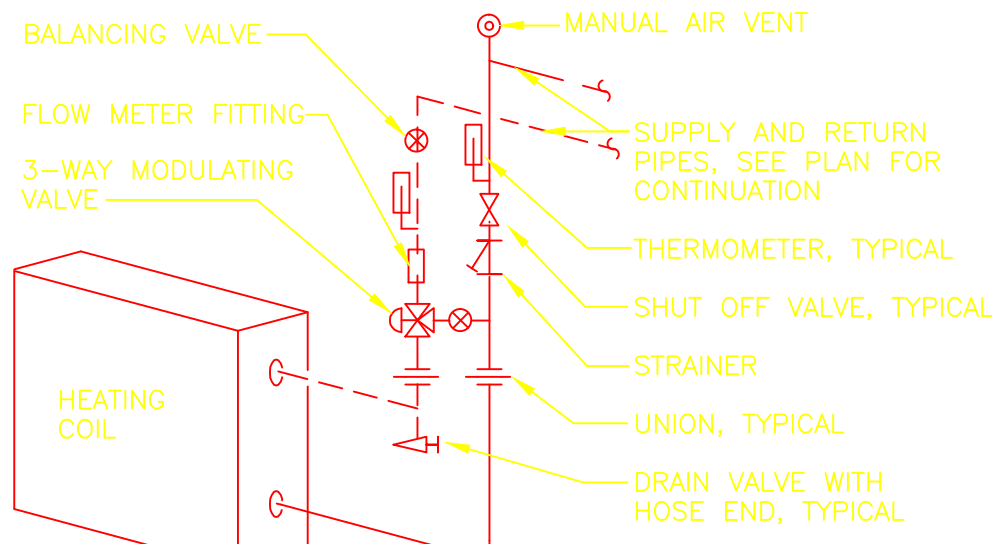


MECHANICAL LEGEND

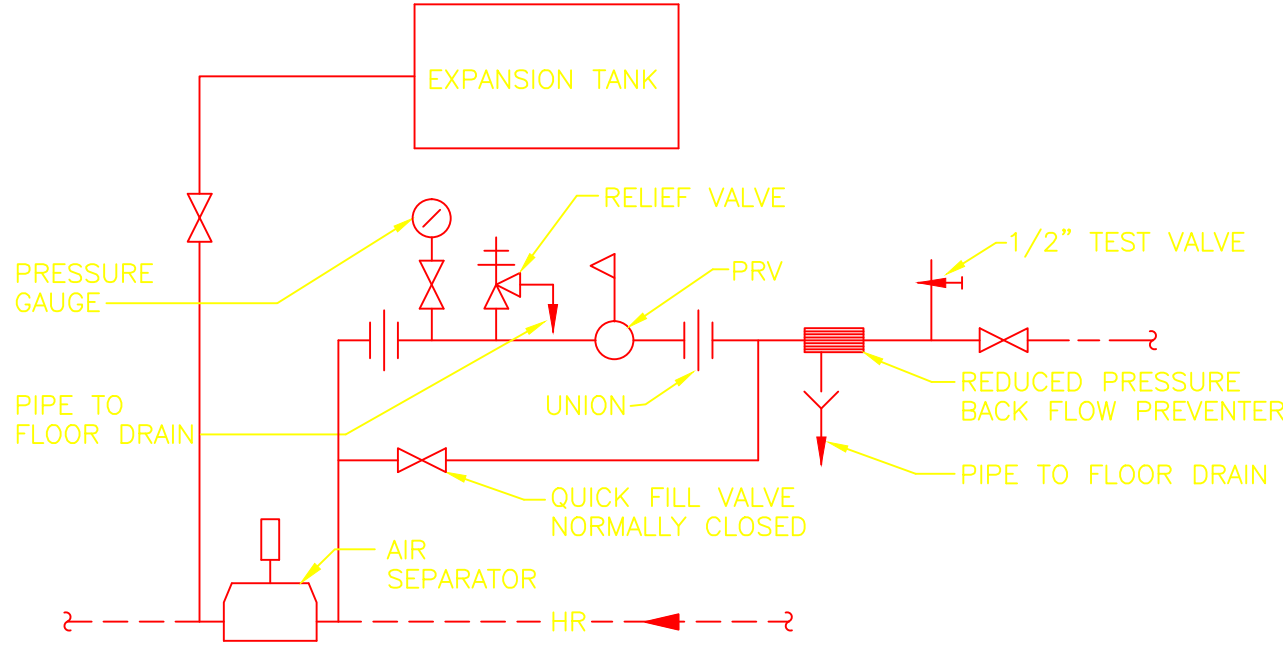
SYMBOL	ABBREV	DESCRIPTION
	EX	CONNECT NEW WORK TO EXISTING
	EX	EXISTING WORK TO REMAIN
	RX	REMOVE EXISTING WORK
	HS	HOT WATER HEATING SUPPLY
	HR	HOT WATER HEATING RETURN
	RL	REFRIGERANT LIQUID
	RS	REFRIGERANT SUCTION
		SHUT OFF VALVE
		SOLENOID VALVE
		CHECK VALVE
		PORTABLE FLOW METER, GPM
		BALANCING VALVE
		TEMPERATURE CONTROL VALVE(2 WAY,3 WAY)
		PRESSURE REDUCING VALVE
		RELIEF OR SAFETY VALVES
		MANUAL AIR VENT
		STRAINER
		UNION
		THERMOSTAT
		THERMOMETER
		PRESSURE GAUGE
		PIPE TURNED UP, PIPE TURNED DOWN
	FC	FLEXIBLE CONNECTION
	FD	FIRE DAMPER
	VD	VOLUME DAMPER
	MOD	MOTOR OPERATED DAMPER
	SDD	SMOKE DUCT DETECTOR
		SMOKE DAMPER
		SUPPLY DUCT TURNED UP, TURNED DOWN
		RETURN DUCT TURNED UP, TURNED DOWN
		DIRECTION OF RISE IN DUCT
		SQUARE TO ROUND TRANSITION
		REFER TO NOTE 1 ON THIS SHEET
	SA	SUPPLY AIR
	OA	OUTSIDE AIR
	RA	RETURN AIR
	ESP	EXTERNAL STATIC PRESSURE
	APD	AIR PRESSURE DROP
	WPD	WATER PRESSURE DROP
	MBH	1,000 BTU PER HOUR
		TYPICAL
	HP	HORSEPOWER
	RPM	REVOLUTIONS PER MINUTE
	CFM	CUBIC FEET PER MINUTE
	AHU	AIR HANDLING UNIT
	ATU	AIR TERMINAL UNIT
	DIFF	CEILING DIFFUSER
	RG	RETURN OR EXHAUST GRILLE
	RR	RETURN OR EXHAUST REGISTER
	GPM	GALLONS PER MINUTE
	SENS	SENSIBLE
	EAT	ENTERING AIR TEMPERATURE
	LAT	LEAVING AIR TEMPERATURE
	DB	DRY BULB
	WB	WET BULB
	SST	SATURATED SUCTION TEMPERATURE
	FLA	FULL LOAD AMPS
	EFF	EFFICIENCY
	EF	EXHAUST FAN
	CFH	CUBIC FEET PER HOUR
	EWT	ENTERING WATER TEMPERATURE
	DESIG	DESIGNATION
	IN	INCHES
	W.G.	WATER GAGE
	S.P.	STATIC PRESSURE
	DIAM	DIAMETER
	CU	CONDENSING UNIT



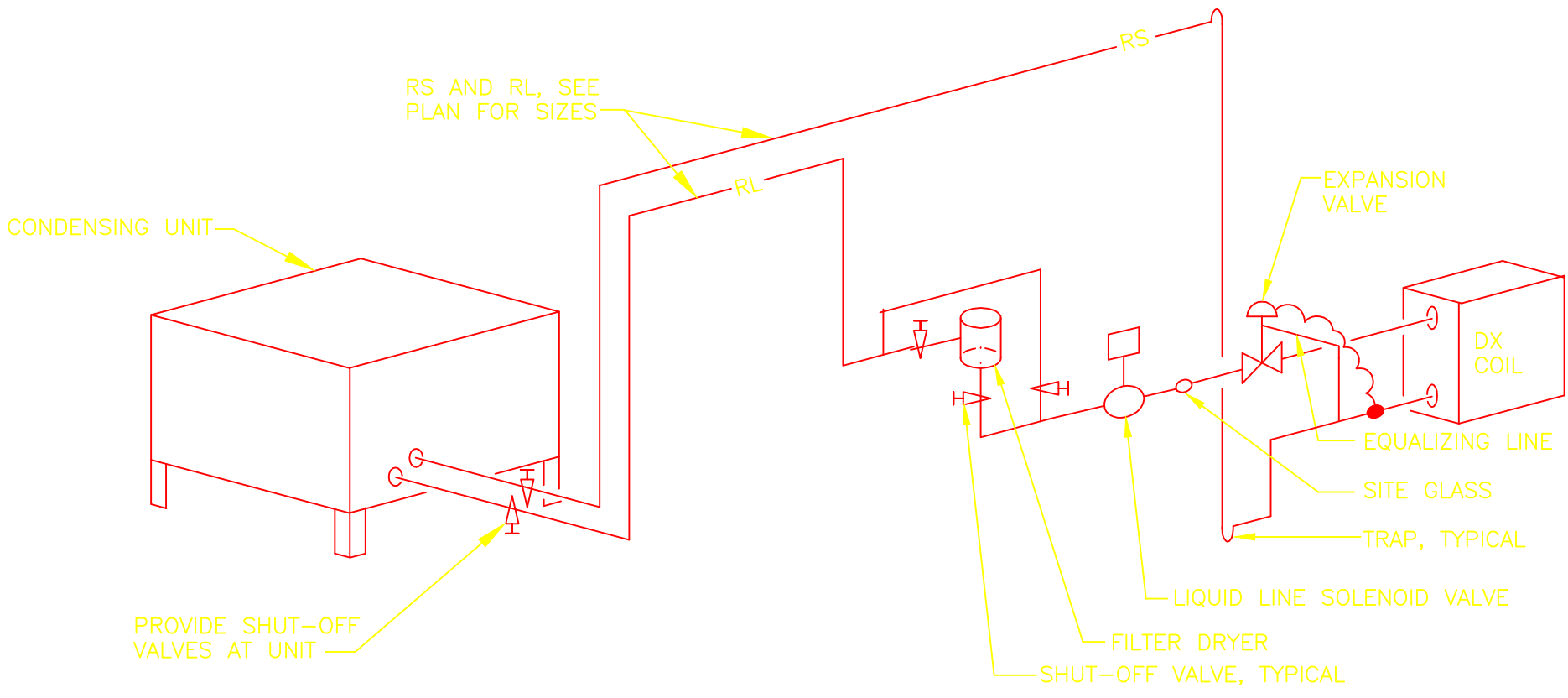
HEATING WATER BOILER CONNECTIONS
NOT TO SCALE



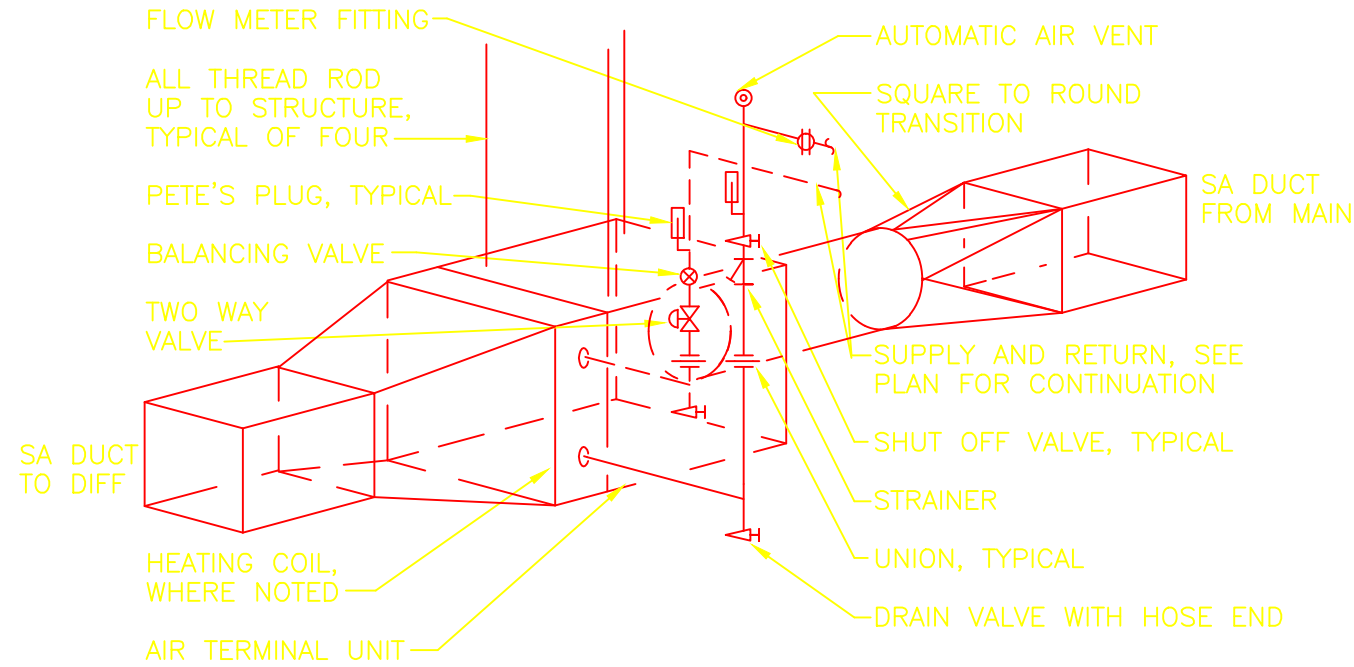
DETAIL — COIL CONNECTION
NOT TO SCALE



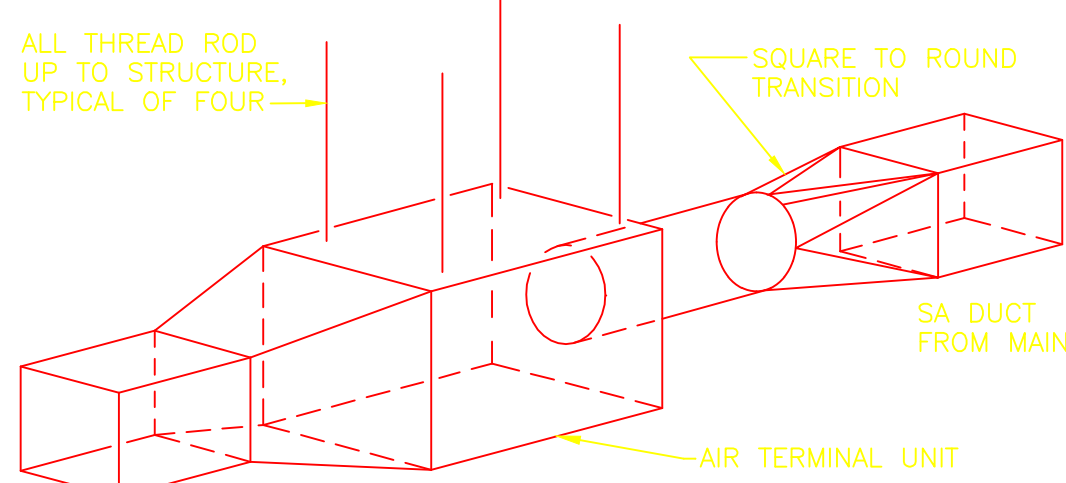
DETAIL — EXPANSION TANK CONNECTIONS
NOT TO SCALE



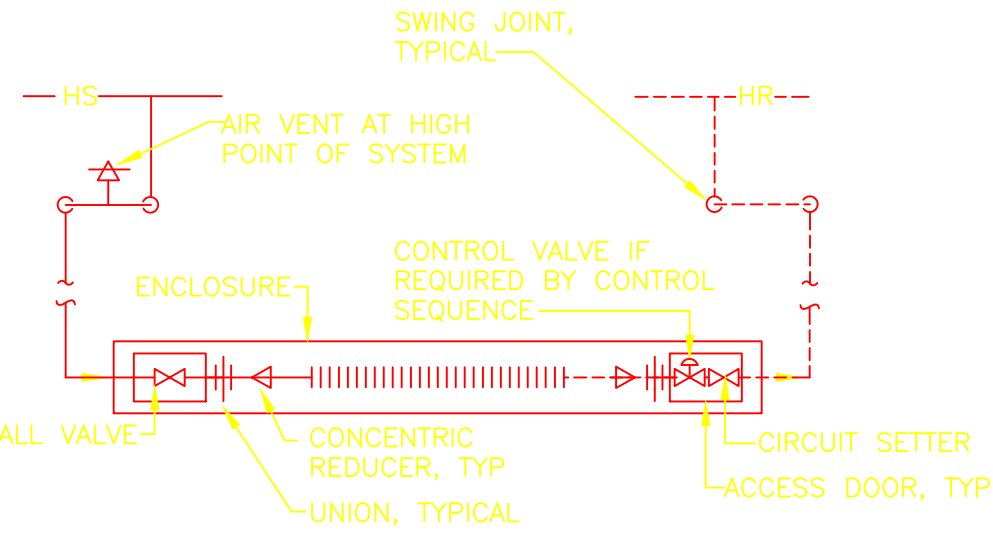
DETAIL — REFRIGERANT PIPING DIAGRAM
NOT TO SCALE



DETAIL — AIR TERMINAL UNIT
NOT TO SCALE



DETAIL — AIR TERMINAL UNIT
NOT TO SCALE



DETAIL — FINNED TUBE PIPING
NOT TO SCALE

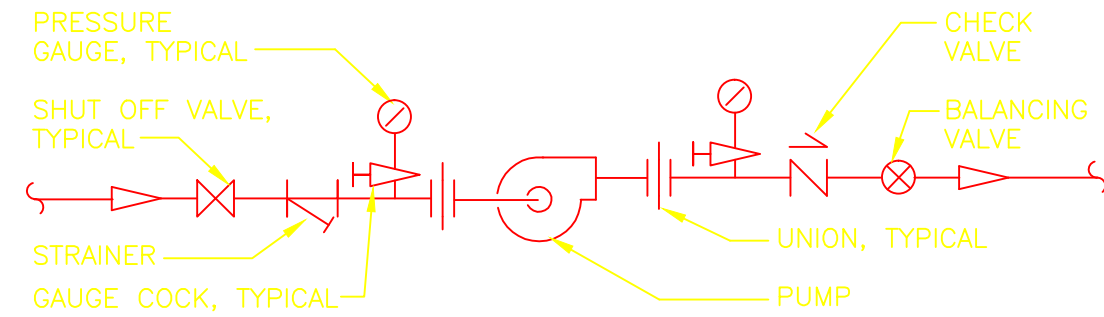
AIR HANDLING UNIT SCHEDULE																
DESIGN	SA CFM	OA CFM	COOLING COIL				SST	PREHEAT COIL				EFF	FILTERS			REMARKS
			TOTAL MBH	SENS MBH	EATdb/wb	LATdb/wb		APD	MBH(1)	LAT	GPM		APD	WPD	SIZE	
AHU-1	4,000	600	164	115	78/65	53/52.5	38	510	.7	—	—	—	30	(3)16X20X2 & (3) 16X25X2		
AHU-2	3,000	300	97.2	77.8	77/65	54/53.5	38	465	.6	100	101	6.7	0.15	2	30	(2)25X20X2
NOTES: ① BASED ON 180 F EWT & 70 F EAT.																

CONDENSING UNIT SCHEDULE										
DESIGN	TOTAL MBH	OA TEMP	SST	COMPRESSOR			FAN MOTOR			REMARKS
				RLA	VOLTS	PHASE	FLA	VOLTS	PHASE	
CU-1	164	95	38	29.3	460	3	(2)2.3	460	3	3 COOLING STAGES
CU-2	102	95	38	19.9	460	3	1.9	460	3	2 COOLING STAGES

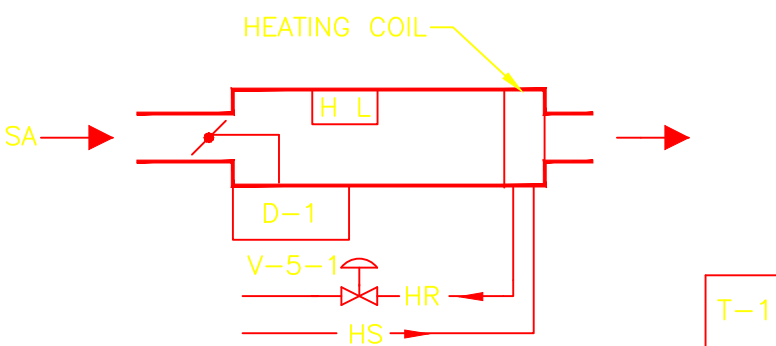
- EQUIPMENT NOTES:
1. BOILER-1: SHALL BE CAPABLE OF HEATING 16 GPM OF WATER FROM 155 F TO 180 F WHEN PROVIDED WITH 238 CFH OF NATURAL GAS.
 2. EF-1: SHALL BE CAPABLE OF PROVIDING 150 CFM AT 0.25" STATIC PRESSURE WITH 1/20 HP, 1050 RPM, 115 VOLT, 1 PHASE MOTOR.
 3. EF-1: SHALL HAVE AN ACCEPTANCE VOLUME OF 2.4 GALLONS AND A TANK VOLUME OF 7.8 GALLONS, 12"X 19" LONG. MIN. FILL PRESSURE= 10 PSIG, RELIEF PRESSURE = 30 PSIG.

PUMP SCHEDULE									
DESIGN	SERVICE	TYPE	GPM	HEAD FEET	MOTOR				REMARKS
					HP	VOLTS	PHASE	RPM	
PUMP-1	HEATING WATER	INLINE	16	23	0.33	115	1	1750	
PUMP-2	HEATING WATER	INLINE	16	23	0.33	115	1	1750	

FAN SCHEDULE										
DESIGN	TYPE	CFM	WHEEL DIAM	S.P. IN. WG	FAN RPM	MOTOR HP	MOTOR RPM	VOLTS	PHASE	REMARKS
AHU-1	FC CENTRIFUGAL	4,000	12	2.25	1210	5	1750	460	3	①
AHU-2	FC CENTRIFUGAL	3,000	12	1.75	1100	3	1750	460	3	
NOTES: ① PROVIDE VARIABLE SPEED DRIVE.										

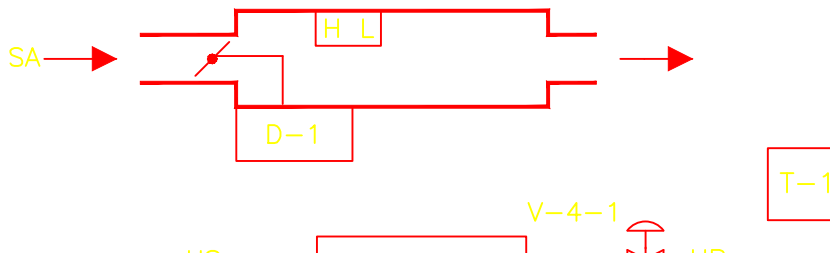


DETAIL — INLINE PUMP
NOT TO SCALE



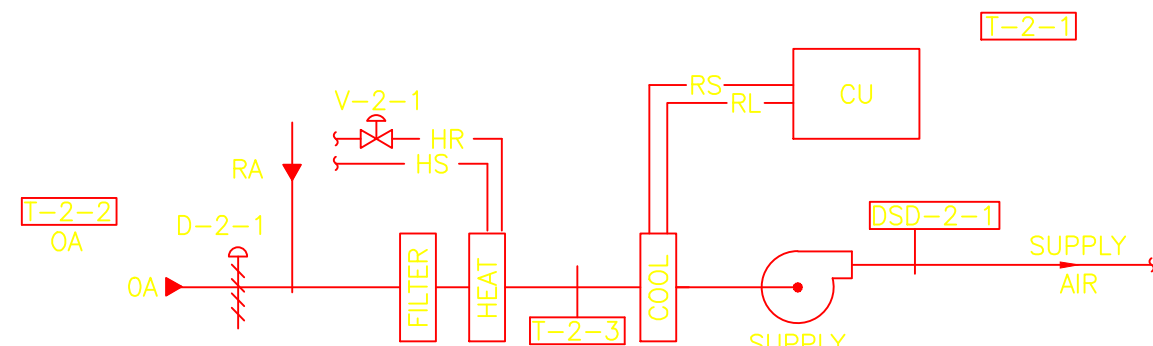
ATU WITH REHEAT CONTROL DIAGRAM
NOT TO SCALE

1. ROOM THERMOSTAT T-1 MODULATES ATU DAMPER D-1 DOWN TO 35 PERCENT AIR FLOW ON TEMPERATURE FALL TO MAINTAIN 75 DEGREES F. ON FURTHER FALL IN TEMPERATURE, VALVE V-5-1 GRADUALLY OPENS. ON RISE IN TEMPERATURE, THE REVERSE SHALL OCCUR.



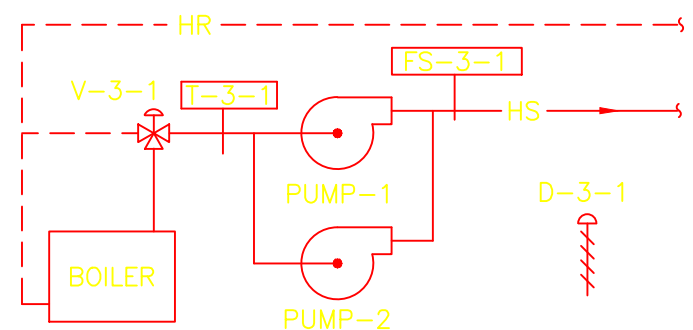
ATU WITH FIN TUBE CONTROL DIAGRAM
NOT TO SCALE

1. ROOM THERMOSTAT T-1 MODULATES ATU DAMPER D-1 DOWN TO 35 PERCENT AIR FLOW ON TEMPERATURE FALL TO MAINTAIN 75 DEGREES F. ON FURTHER FALL IN TEMPERATURE, VALVE V-4-1 GRADUALLY OPENS. ON RISE IN TEMPERATURE, THE REVERSE SHALL OCCUR.



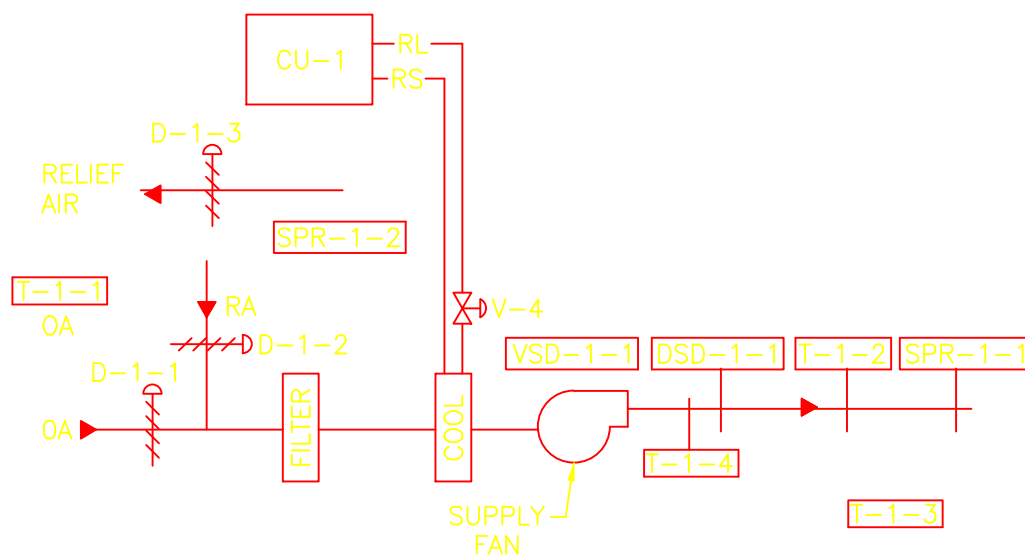
AHU-2 CONTROL DIAGRAM
NOT TO SCALE

1. SEVEN DAY PROGRAM TIMER SELECTS OCCUPIED AND UNOCCUPIED MODES.
2. OCCUPIED MODE (0630 TO 1800 HOURS DAILY)
 - a. OUTSIDE AIR DAMPER D-2-1 OPENS AND FAN STARTS. ROOMSTAT T-2-1 MODULATES VALVE V-2-1 ON TEMPERATURE FALL TO MAINTAIN 70 F. ON TEMPERATURE RISE, T-2-1 ENERGIZES CONDENSING UNIT CU-2 IN TWO STAGES TO MAINTAIN 75 F.
3. UNOCCUPIED MODE (ALL OTHER TIMES)
 - a. WHEN OUTSIDE AIR TEMPERATURE AT T-2-1 IS BELOW 60°F, FAN CYCLES ON FULL HEATING TO MAINTAIN 60°F MINIMUM AT T-2-1
 - b. WHEN OUTSIDE AIR TEMPERATURE AT T-2-2 IS ABOVE 60°F, FAN CYCLES ON FULL COOLING TO MAINTAIN 85°F MAXIMUM AT T-2-1.
4. DUCT SMOKE DETECTOR DSD-2-1; FURNISHED BY ELECTRICAL CONTRACTOR, STOPS FAN UPON SENSING SMOKE.
5. ELECTRIC FREEZESTAT T-2-3 STOPS SUPPLY FAN AND CLOSSES D-2-1 AT 38°F.



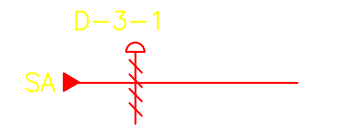
HEATING WATER CONTROL DIAGRAM
NOT TO SCALE

1. WHEN OUTSIDE AIR TEMPERATURE FALLS BELOW 75 F, SYSTEM IS ACTIVATED AND LEAD PUMP STARTS. NON-SELECTED PUMP IS LAG PUMP. LEAD PUMP IS ALTERNATED ON EACH SUCCESSIVE START.
2. FACTORY PROVIDED BOILER CONTROLS MAINTAINS BOILER WATER AT ITS SETTING. WHEN BURNER IS ACTIVATED, DAMPER D-3-1 OPENS. D-3-1 IS CLOSED WHEN BURNER IS OFF.
3. THERMOSTAT T-3-1 MODULATES V-3-1 TO MAINTAIN ITS SETTING.
4. IF LEAD PUMP FAILS OR FAILS TO START AFTER 2 MINUTE DELAY AS SENSED BY FLOW SWITCH FS-3-1, THEN LAG PUMP STARTS AND AUDIO-VISUAL ALARM IS ACTIVATED AT CONTROL PANEL.



AHU-1 CONTROL DIAGRAM
NOT TO SCALE

1. PROGRAM TIMER DETERMINES "OCCUPIED"& "UNOCCUPIED" MODES. OVERRIDE TIMER OVERRIDES PROGRAM TIMER AND INDEXES SYSTEM TO OCCUPIED MODE FOR UP TO 4 HOURS.
2. OCCUPIED MODE(0630-1800 HOURS DAILY)
 - a. SUPPLY FAN OPERATES CONTINUOUSLY. RETURN AIR DAMPER D-2-1 IS OPEN AND OUTSIDE AIR DAMPER D-1-1 IS OPEN TO MINIMUM.
 - b. WHEN OUTSIDE AIR TEMPERATURE AS SENSED BY OUTSIDE AIR THERMOSTAT T-1-1 IS BELOW 60°F, DISCHARGE THERMOSTAT T-1-2 MODULATES D-1-1 AND D-1-2 TEMPERATURE FALL TO MAINTAIN 55 DEGREES F.
 - c. WHEN OUTSIDE AIR TEMPERATURE AT T-1-1 IS ABOVE 62°F, D-1-1 CLOSSES TO MINIMUM. D-1-2 OPENS AND T-1-2 OPENS SOLENOID VALVE V-1-1 AND ENERGIZES CONDENSING UNIT IN 3 STAGES TO MAINTAIN 55 DEGREES F.
 - d. STATIC PRESSURE REGULATOR SPR-1-1 MODULATES SUPPLY FAN SPEED THROUGH VARIABLE SPEED DRIVE VSD-1-1 TO MAINTAIN ITS SETTING.
3. UNOCCUPIED MODE (ALL OTHER TIMES)
 - a. WHEN OUTSIDE AIR IS BELOW 60°F, SUPPLY FAN CYCLES ON FULL HEATING WITH D-1-1 CLOSED AND ALL ATU DAMPERS FULL OPEN TO MAINTAIN 60°F AT NIGHTSTAT T-1-3.
 - b. WHEN OUTSIDE AIR TEMPERATURE IS ABOVE 60°F, SUPPLY FAN CYCLES ON FULL COOLING WITH D-1-1 CLOSED AND ALL ATU DAMPERS OPEN TO MAINTAIN 65°F MAXIMUM AT NIGHTSTAT T-1-3.
4. WHEN BUILDING STATIC PRESSURE RISES ABOVE ITS SETTING, RELIEF DAMPER D-1-3 OPENS.
5. ELECTRIC FREEZESTAT T-1-4 STOPS SUPPLY FAN AND CLOSSES D-1-1 AT 38°F.
6. DUCT SMOKE DETECTOR DSD-1-1, FURNISHED UNDER DIVISION 13, STOPS FAN AND CLOSSES D-1-1 AND D-1-2 UPON SENSING SMOKE.



SMOKE DAMPER CONTROL DIAGRAM
NOT TO SCALE

1. UPON SENSING SMOKE, CORRIDOR SMOKE DETECTOR SD-3-1 PROVIDED UNDER DIVISION 16, CLOSSES DAMPER D-3-1.

Drawing Title
SCHEDULES, LEGEND
AND DETAILS

Date
06-14-02

Drawn
KWA

DRAWING NO.
M-2
Sheet 33