WATER SOURCE HEAT PUMP SCHEDULE

MARK	FLORIDA MODEL	TYPE	GPM	PD(FT.)	NOM CFM	E.S.P.	COOLING (MBH)		SENSIBLE (MBH)	T.H.R. (MBH)	HEATING (MBH)	T.H.A. (MBH)	ELECTRICAL				HEIGHT	REMARK
													HP	MCA	FUSE	V/Φ		
HP-1	EH007	HORIZONTAL	2	5.2	300	.29	7.6	6.3	9.6	10.0	7.8	J	1	4.8	15	277/1	19"	1,2,3,4,5
HP-4	EH009	HORIZONTAL	2.7	10.4	350	.29	9.8	8.0	12.1	13.0	10.1	J	1	5.0	15	277/1	120	1,2,3,4,5
HP-12	EH012	HORIZONTAL	3	13.6	400	.25	11.6	9.6	14.9	14.6	10.9	J	1	5.9	15	277/1	122	1,2,3,4,5
HP-18	EH018	HORIZONTAL	5	27.4	650	.2	18.9	15.5	23.2	25.0	19.8	.25	1.5	11.2	15	277/1	166	1,2,3,4,5
HP-24	EH024	HORIZONTAL	6	13.3	850	.2	24.4	20.1	29.8	30.0	23.8	.25	1.9	11.9	20	277/1	175	1,2,3,4,5
HP-28	EH028	HORIZONTAL	7	16.8	950	.49	28.2	23.4	34.6	33.4	25.9	.25	2	6.3	15	460/3	203	1,2,3,4,5
HP-36	EH036	HORIZONTAL	9	13	1200	.49	35.5	29.3	49.5	42.0	32.6	.5	3	8.3	15	460/3	240	1,2,3,4,5
HP-42	EH042	HORIZONTAL	10	16	1400	.39	41.2	38.5	52.8	51.0	39.1	.5	3	9.0	15	460/3	267	1,2,3,4,5
HP-60	EH060	HORIZONTAL	15	13.4	2000	.34	60.6	50.0	75.7	80.0	61.9	.75	5	10.9	15	460/3	336	1,2,3,4,5
HP-7V	EH007V	VERTICAL	2	5.2	300	.29	7.6	6.3	9.6	10.0	7.8	J	1	4.8	15	277/1	19"	1,2,3,4,5
HP-9V	EH009V	VERTICAL	2.7	10.4	350	.29	9.8	8.0	12.1	13.0	10.1	J	1	5.0	15	277/1	120	1,2,3,4,5
HP-24V	EH024V	VERTICAL	6.0	13.3	850	.2	24.4	20.1	29.8	30.0	23.8	.25	1.9	11.9	20	277/1	175	1,2,3,4,5
HP-36V	EH036V	VERTICAL	9.0	13.0	1200	.49	35.5	29.3	49.5	42.0	32.6	5	3	8.3	15	460/3	240	1,2,3,4,5
HP-42V	EH042	VERTICAL	10	16	1400	.39	41.2	38.5	52.8	51.0	39.1	5	3	9.0	15	460/3	267	1,2,3,4,5
HP-60V	EH060V	VERTICAL	15	13.4	2000	.34	60.6	50.0	75.7	80.0	61.9	.75	5	10.9	15	460/3	336	1,2,3,4,5

REMARKS:
1. COOLING PERFORMANCE IS FOR 80.6°F DB \ 66.2°F WB ENTERING AIR, 77°F E.W.T., 85°F L.W.T. AT ISO STANDARD 13256-1 CFM.
2. HEATING PERFORMANCE IS FOR 68°F ENTERING AIR, 68.0°F E.W.T. AT ISO STANDARD 13256-1 CFM.
3. INTEGRAL CONTROLS TRANSFORMER.
4. PROVIDE WITH FILTER RACK ONLY WHERE FILTER GRILLES NOT INDICATED.
5. SET WATER FLOW TO UNITS BASED ON (HOSE KIT) SHOP DRAWING DATA.

HEAT EXCHANGER SCHEDULE

MARK	MANUFACTURER	MODEL	TYPE	SHELL SIDE CAPACITY					TUBE SIDE CAPACITY					REMARKS
				FLOW (GPM)	EWT (°F)	LWT (°F)	P.D. (PSI)	HEAT EXCHANGE (MBH)	FLOW (GPM)	EWT (°F)	LWT (°F)	P.D. (PSI)	HEAT EXCHANGE (MBH)	
HX-1	BELL & GOSSETT	N/J SERIES	SHELL & TUBE	115	180	160	1.2	1,123	225	55.3	70.0	0.7	1,123	1

REMARKS:
1. PROVIDE PETES PLUGS ON ALL 4 PIPE CONNECTIONS.

HYDRONIC PUMP SCHEDULE

MARK	MFG./MODEL	SERVICE	GPM	TDH (FT)	MOTOR HP	RPM	EFF (%)	VOLT/PH/Hz
P-1A	B & G/1510 SERIES	HEAT PUMP LOOP	227	75	10	1750	75.6	460/3/60
P-1B	B & G/1510 SERIES	HEAT PUMP LOOP	227	75	10	1750	75.6	460/3/60
P-2A	B & G/1510 SERIES	HOT WATER LOOP	140	60	5	1750	67.5	460/3/60
P-2B	B & G/1510 SERIES	HOT WATER LOOP	140	60	5	1750	67.5	460/3/60

AIR SEPARATOR SCHEDULE

MARK	MANUF/ MODEL	SIZE		GPM MAX	NPD MAX	% AIR REMOVABLE	REMARKS
		INLET	OUTLET				
AS-1	B&G ROLAIRTROL R-4	4"	4"	225	2.8	92.0	-
AS-2	B&G ROLAIRTROL R-4	4"	4"	140	1.1	95.8	-

SCHEDULE OF PIPING

MARK	HYDRONIC PIPE SIZE (HPR/HPS)	CONDENSATE DRAIN
HP-7	¾"	¾"
HP-9	¾"	¾"
HP-12	¾"	¾"
HP-18	1"	¾"
HP-24	1"	¾"
HP-28	1¼"	¾"
HP-36	1¼"	1"
HP-42	1¼"	1"
HP-60	1½"	1"
HP-7V	¾"	¾"
HP-9V	¾"	¾"
HP-24V	1"	¾"
HP-36V	1¼"	1"
HP-42V	1¼"	1"
HP-60V	1¼"	1"

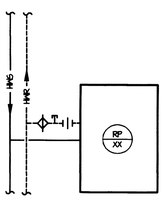
CLOSED CIRCUIT COOLER SOUND POWER LEVELS

OCTAVE BAND	END		AIR INLET		BACK		TOP	
	5'	50'	5'	50'	5'	50'	5'	50'
1	74	65	78	65	70	62	73	70
2	64	60	71	63	67	58	74	69
3	64	54	62	52	62	54	68	69
4	60	47	63	47	61	45	59	68
5	61	43	61	45	59	40	55	62
6	51	39	60	41	56	37	52	59
7	55	39	56	40	49	35	50	53
8	52	39	53	37	50	38	47	51
dBA	66	52	67	53	64	63	64	69

RADIANT PANELS

MARK	MARKEL / MODEL	BTUH/LF	WIDTH	AVG. WATER TEMPERATURE	FINISH	GPM	NPD	REMARKS
RP-1	SUN-EL	1560/LF	72"	180°F	TONGUE AND GROOVED	1.0	2.3	1,2,3

REMARKS:
1. CUSTOM COLOR SELECTED BY ARCHITECT. SUBMIT SAMPLE OF PANEL TEXTURE.
2. .115 INCHES THICK FLUTED EXTRUDED ALUMINUM FACE.
3. .564 ID COPPER TUBES (NOMINAL ½" TYPE K).



RADIANT PANEL SCHEMATIC
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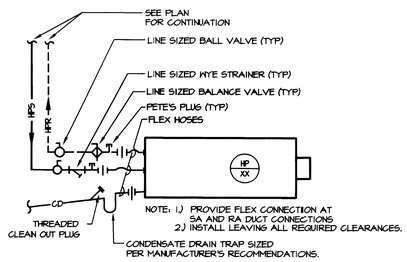

HEAT PUMP DETAIL
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GRILLES, REGISTERS & DIFFUSERS SCHEDULE

MARK	MANUF./MODEL	MATERIAL/TYPE	CORE SIZE	PANEL SIZE	INLET SIZE	CFM	AIR PATTERN	VOLUME DAMPER	MOUNTING	REMARKS
S-1	TITUS TDC/A-AA SERIES	ALUMINUM ADJUSTABLE LOUVER FACE	10X10	——	6"Ø	0-125	4-WAY	NO	SURFACE	1,2
S-2	TITUS TDC/A-AA SERIES	ALUMINUM ADJUSTABLE LOUVER FACE	12X12	——	8"Ø	126-225	4-WAY	NO	SURFACE	1,2
S-3	TITUS TDC/A-AA SERIES	ALUMINUM ADJUSTABLE LOUVER FACE	14X14	——	10"Ø	226-400	4-WAY	NO	SURFACE	1,2
S-4	TITUS TDC/A-AA SERIES	ALUMINUM ADJUSTABLE LOUVER FACE	24X24	24x24	12"Ø	401-600	4-WAY	NO	T-BAR LAY-IN	1,2
S-5	TITUS 300FS SERIES	ALUMINUM DOUBLE DEFLECTION	12x8	——	10"Ø	0-350	2-WAY	YES	SURFACE DUCT	1,2,3
R-1	TITUS 50FF	EXTRUDED ALUMINUM W/ 1/2" CUBE CORE	22X22	24x24	SEE PLANS	0-2500	——	NO	T-BAR LAY-IN	1,2,4
R-2	TITUS 50F	EXTRUDED ALUMINUM W/ 1/2" CUBE CORE	22X22	24X24	SEE PLANS	0-2500	——	NO	T-BAR LAY-IN	1,2
E-1	TITUS 50F	EXTRUDED ALUMINUM W/ 1/2" CUBE CORE	14x14	——	SEE PLANS	0-1100	——	NO	SURFACE	1,2

REMARKS:
1. FINISH TO BE SELECTED BY ARCHITECT.
2. PROVIDE TRANSITION AS REQUIRED
3. PROVIDE UNDER ALTERNATE #1.
4. PROVIDE WITH 22 X 22 FILTER

CLOSED CIRCUIT COOLER SCHEDULE

MARK	MANUF. & MODEL	GPM	MAX. P.D. (FT)	EWT/ LWT	EAT	ELECTRICAL								REMARKS
						PUMP	BLOWER	SUMP HEATER	V/Φ	MCA	SINGLE POINT CONNECTION	DISC SW.	STARTER	
CC-1	EVAPCO LSN 58-1-2	225	17.1	85°F/ 65°F	78°F WB	2 HP	30 HP	8 KW	460/3	74.6	YES	YES	YES	1,2,3,4,5,6

REMARKS:
1. HEATER WITH CONTACTOR TO MAINTAIN 40°F PAN TEMPERATURE AT -20°F AMBIENT WITH FAN OFF.
2. SPECIAL WARRANTY, SEE SPECIFICATIONS.
3. 0% GLYCOL - (PROVIDE WITH FACTORY CROSSOVER)
4. PROVIDE NEC APPROVED DISCONNECT AND ALL REQUIRED INTERLOCK WIRING.
5. SEPARATE HEAT TRACE CIRCUITS PER HYDRONIC PIPING SCHEMATIC. HEAT TRACE PUMP, PIPING, ETC. SUBJECT TO FREEZE.
6. FULL INTAKE AND DISCHARGE ATTENUATION, SEE ADJACENT SCHEDULE FOR SOUND POWER LEVELS.

BOILER

MARK	MFG/MODEL	TYPE	P.D. (FT.)	FUEL	INPUT MBH	OUTPUT MBH	GAS INLET PRESSURE (W.G.)	VOLT/PH/Hz	REMARKS
B-1,2,3,4	HYDRO THERM/AM 300	FIN TUBE	-	NAT. GAS	299	272	7-12	120/1/60	1, 2

REMARKS:
1. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
2. INCLUDE BOILER RELIEF VALVES AND GAS PRESSURE REGULATORS.

ENERGY RECOVERY VENTILATOR

MARK	HASTINGS MODEL NUMBER	SERVICE	SUPPLY AIR AIRFLOW (CFM)	RETURN AIR AIRFLOW (CFM)	MINIMUM ERV EFFICIENCY (%)	SUPPLY AIR CONDITIONS				MIN. ENERGY RECOVERED		FAN MOTOR HP \ ESP		VOLT/Φ	REMARKS
						SUMMER		WINTER							
						DB (°F)	WB (°F)	DB (°F)		COOLING (MBH)	HEATING (MBH)	SA	RA		
ERV-1	VHRE-3	BUILDING	3,500	3,300	74(NET)/ 81.5(GROSS)	76	64	53		144	253	3 \ 0.75	3 \ 0.75	460/3	1, 2, 3, 4, 5, 6, 7, 8

REMARKS:
1. PROVIDE DUCT SMOKE SHUTDOWN INTERLOCK.
2. SUMMER DESIGN: 98.0 F DB/76.0 F WB OUTDOOR, 72.0 F DB/ 60° FWB INDOOR.
WINTER DESIGN : 0 F DB OUTDOOR, 72.0 F DB INDOOR.
3. PROVIDE SINGLE POINT ELECTRICAL CONNECTION AND NEC DISCONNECT, FIELD INSTALLED.
4. UNIT SHALL BE IN ACCORDANCE WITH ASHRAE STANDARDD. 84-1984 ARI STANDARD. 1060.
5. PROVIDE SUPPLY BACKDRAFT DAMPER.
6. PROVIDE EXHAUST BACKDRAFT DAMPER.
7. PROVIDE WITH 12" ROOF CURB, EXHAUST/INTAKE LOUVERS WITH BIRDSCREENS.
8. PROVIDE FILTER RACK AND 2" FILTERS FOR BOTH AIRSTREAMS.

NOTE:
CONDENSATE DRAIN LINES TO BE SIZED PER SCHEDULE LISTED ON THIS SHEET.

EXPANSION TANK

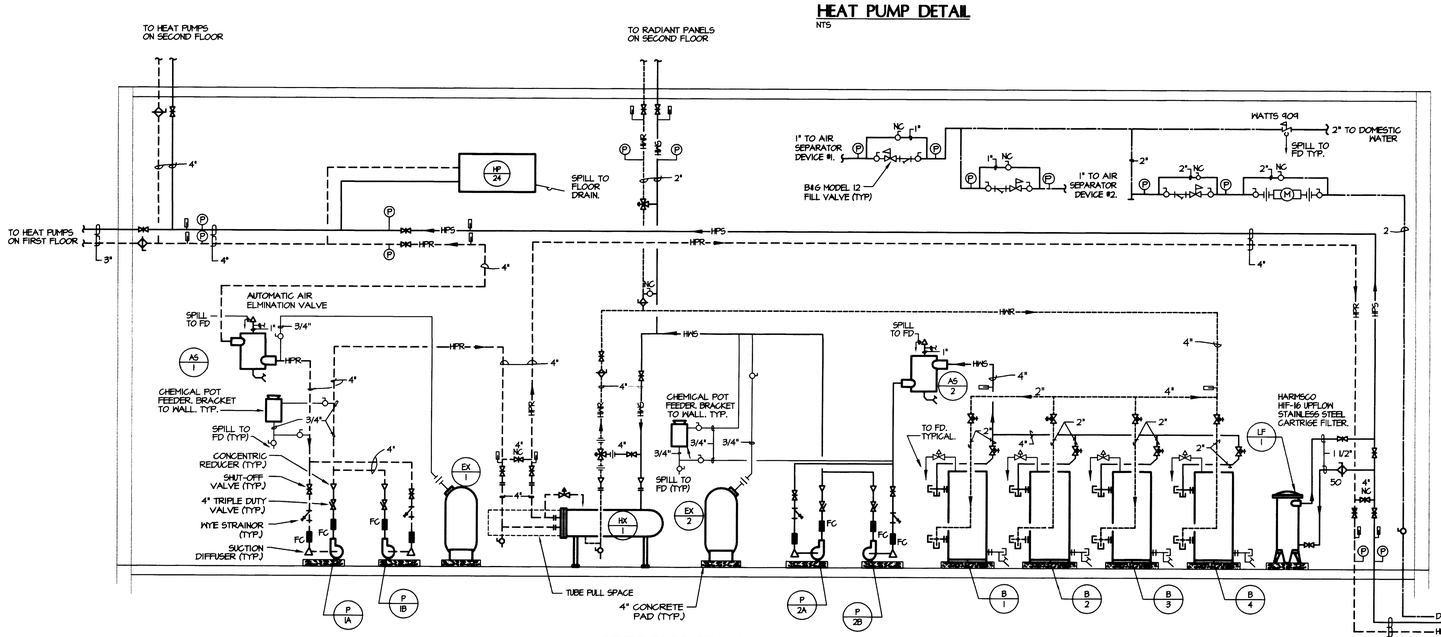
MARK	SERVICE	MESSELS MODEL	TOTAL VOLUME GAL.	REQUIRED ACCEPTANCE GAL.	SIZE (IN)
EX-1	HEAT PUMP LOOP	B&G D-60	33.6	10.0	16.3 DIA X 42.3 TALL
EX-2	HOT WATER LOOP	B&G D-120	68.0	24.0	24 DIA X 40.3 TALL

REMARKS:
PROVIDE ASME RATED TANK WITH LIFTING RINGS AND NPT SYSTEM CONNECTION.
PROVIDE STEEL SUPPORT LEGS AS REQUIRED FOR VERTICAL MOUNTING.

ELECTRIC HEATERS

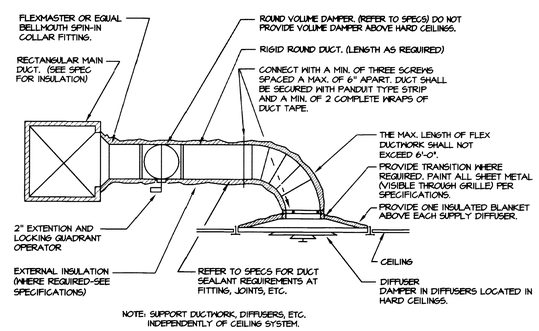
MARK	MARKEL MODEL	TYPE / MOUNTING	CFM	KW	ELECTRICAL V/Φ	REMARKS
EUH-1	3320 SERIES	CEILING	175	2	277/1	1, 3, 7
EUH-2	5100 SERIES	HORIZONTAL	----	25	480/3	1, 3, 4, 6, 7
EUH-3	DBGT SERIES	WALL/SURFACE	----	3.0	277/1	1, 2, 3, 4, 6, 7, 8, 9

REMARKS:
1. UL LISTED AND NEC COMPLIANT POWER DISCONNECT MEANS. PROVIDE WITH THERMAL OVERLOAD PROTECTION.
2. PROVIDE WITH CONTROL SECTION.
3. COLOR SELECTED BY ARCHITECT.
4. SUPPORT FROM STRUCTURE ONLY.
5. MOUNT IN WALL AT MINIMUM 18" AFF.
6. PROVIDE FACTORY BRACKETS FOR HORIZONTAL MOUNTING AND OSHA FAN GUARD.
7. BUILT IN TAMPER PROOF THERMOSTAT.
8. COLOR SELECTED BY ARCHITECT.
9. BASED ON 750 WATTS/ FT. 4FT. LENGHT.



HYDRONIC PIPING SCHEMATIC
NO SCALE

NOTE: MOUNT ALL EQUIPMENT ON A CONCRETE PAD UNLESS OTHERWISE NOTED.



TYPICAL ROUND SUPPLY/EXHAUST/RETURN AIR BRANCH DUCT DETAIL
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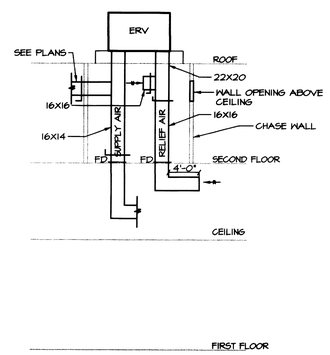
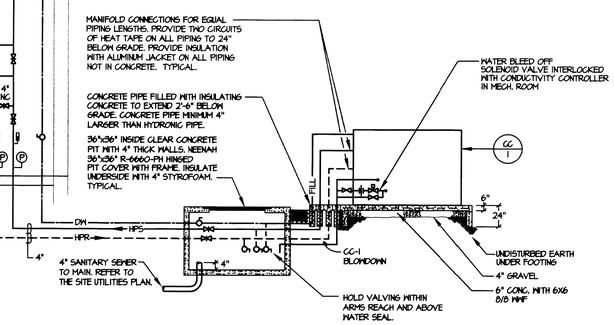


ERV SCHEMATIC
NO SCALE



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Crisp Building Replacement
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HVAC SCHEDULES & DETAILS

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REVISIONS
1 RECORD DRAWINGS 9/13/02

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