GE - Seasonal Performance Factor

Heating and Air Conditioning Seasonal Performance Factor

Job Name:	STRATON SKI RESORT
Model:	GE-AZ38H09***
City & State:	BURLINGTON, VT

Design Temperatures		Cooling Data		Payback Information	
Indoor Temp. (F):	70	**Cooling Cost per KWH (in cents):**	7.5	**Heat Pump initial cost over resist($):**	100
Outdoor Temp. (F):	-18	**Hours Above (70,75, or 80):**	75	**Electricity cost per KWH (in cents):**	0
Heat Loss (Watts):	3231	**Heat Gain (BTUH):**	9000	**Drain Line Installation Cost:**	0

Calculations based on 70°F Indoor Temperature

Outdoor Temp	Heat Loss (Watts)	Heating Hours	PTAC Resistance Heating (Kwh)	Additional Heat Required heat/hour (Watts)	Coefficient of Performance	Heat Pump (Kwh)
62	110	670	74		3.82	19.0
57	294	703	207		3.77	55.0
52	477	694	331		3.69	90.0
47	661	655	433		3.6	120.0
42	844	603	509		3.5	145.0
37	1028	637	655		3.4	193.0
32	1212	716	868		2.93	296.0
27	1395	752	1049		2.54	413.0
22	1579	561	886		0.98	886.0
17	1762	491	865		0.98	865.0
12	1946	332	646		0.98	646.0
7	2130	272	579		0.98	579.0
2	2313	216	500		0.97	500.0
-3	2497	135	337		0.97	337.0
-8	2680	81	217		0.96	217.0
-13	2864	39	112		0.96	112.0
-18	3047	25	76		0.95	76.0
-23	3231					
-28	3415					
-33	3598					
		Totals:	8344		**Totals:**	5549

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Summary Data

Indoor Temperature	65°F	75°F	70°F
Annual KWH Required For Resistance Heat	7422	9270	8344
Annual KWH Required For Heat Pump System	5161	5923	5549
Annual KWH Saved With Heat Pump System	2261	3347	2795
SPF of Heat Pump	1.44	1.57	1.5
% Energy Savings	30.0	36.0	33.0

Heat Gain in BTUH	9000
Estimated Cooling KWHR Per Year (Hours Above 75°F)	189.0
Estimated Cooling Costs At $ 0.075 Per KWHR	14.18

	KiloWatt Hours	PTAC	KiloWatt Hours	PTHP
Total KWHR Per Year	N/A	8533.0	N/A	5738.0
% of Energy For Cooling	189.0	2.21%	189.0	3.29%
% of Energy For Heating	8344	97.79%	5549	96.71%

Heat loss and KiloWatt Hours are estimates only and should be verifiied by the consulting engineer for the project.

Heat Pump Payback Analysis

Cooling Data

Hours Above (70°F,75°F,80°F)	75
Heat Gain In BTUH	9000

Heating KWH Savings Per Unit Per Year

Annual KWH Required For Resistance Heat	8344
Annual KWH Required For Heat Pump System	5549
Annual KWH Savings	2795

Incremental Costs

Heat Pump Cost Over Comparable System	100
Heat Pump Cost Over Comparable System	0
Total Incremental Cost Per Unit	100

Utility Cost Per KWHR	Total Annual Cost Resistance Heat	Total Annual Cost Heat Pump	Annual Savings With Heat Pump	Years for Payback
0.06	512.0	344.0	168.0	0.6
0.07	597.0	402.0	196.0	0.5
0.08	683.0	459.0	224.0	0.4
0.09	768.0	516.0	252.0	0.4
0.1	853.0	574.0	280.0	0.4
0.11	939.0	631.0	307.0	0.3
0.12	1024.0	689.0	335.0	0.3
0.13	1109.0	746.0	363.0	0.3
0.14	1195.0	803.0	391.0	0.3
0.15	1280.0	861.0	419.0	0.2

Utility rates should be verified locally.

Years heating payback per unit equals incremental cost per unit divided by KWHR savings per unit times the cost per KWH.

Operating KWH Hours are estimates only and should be verified locally by the operating engineers of the project.