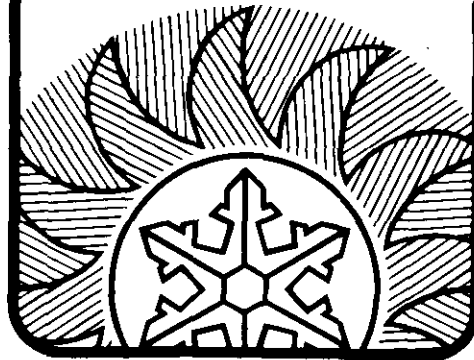


**DUAL FUEL ADD-ON HEAT PUMP GUIDE
FOR OPERATIONAL COST SAVINGS**

REGION 2

Bard[®]

**DUAL ENERGY
SYSTEMS**



BARD MANUFACTURING CO. • BRYAN, OHIO 43506

Dependable quality equipment. . . since 1914

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Heat Pump Outdoor Model	Heat Pump Indoor Model	Furnace Fuel	Furnace AFUE Efficiency Rating	Page
WQS30/WQSD30	H3AQ/H3AQ1	Electric	100%	1
		Natural Gas	65%	2
		Oil	65%	3
		Propane	65%	4
WQS36/WQSD36	H3AQ/H3AQ1	Electric	100%	5
		Natural Gas	65%	6
		Oil	65%	7
		Propane	65%	8
24HPQ2	H24QS1	Electric	100%	9
		Natural Gas	65%	10
		Oil	65%	11
		Propane	65%	12
30HPQ4	H3AQ/H3AQ1	Electric	100%	13
		Natural Gas	65%	14
		Oil	65%	15
		Propane	65%	16
36HPQ4	H3AQ/H3AQ1	Electric	100%	17
		Natural Gas	65%	18
		Oil	65%	19
		Propane	65%	20
42HPQ	H5AQ	Electric	100%	21
		Natural Gas	65%	22
		Oil	65%	23
		Propane	65%	24
48HPQ2	H5AQ	Electric	100%	25
		Natural Gas	65%	26
		Oil	65%	27
		Propane	65%	28

GENERAL DESCRIPTION

WHAT DOES THIS GUIDE SHOW?

This operational cost savings guide has been prepared to show theoretical cost savings for Bard dual fuel "add-on" heat pumps when used with either existing or new furnaces. It covers add-on applications for electric, oil, propane gas and natural gas type forced air furnaces. It includes both air source heat pumps and ground water source heat pumps at many combinations of gas, oil and electrical rates. It enables the user not only to make a theoretical operating cost comparison at today's fuel costs but also at future estimated higher energy costs.

It is important to understand that this is a theoretical comparison between fuels. Actual operation costs can vary depending on many difficult to predict variables such as the actual design heating or cooling load, air infiltration, and wind effects, solar effect, efficiency of existing furnace, severity of weather for a given heating or cooling season and also individual usage pattern.

SPECIAL FEATURE - FSM-1 FUEL SAVER MODULE

These estimates utilize the Bard FSM-1 Fuel Saver Module which permit the heat pump to operate below the balance point to maximize the energy savings. For each application an analysis should be made to determine the economic balance point which is the outdoor temperature at which it becomes more cost effective to shut the heat pump down with an outdoor thermostat. This temperature varies with each combination of fuel cost and furnace and heat pump efficiency level. Refer to tables included in the instructions with the FSM-1 module.

FURNACE EFFICIENCY

For purposes of these cost estimates, furnace efficiency levels of 100% AFUE for electric, 65% AFUE for natural and propane gas and 65% AFUE for oil was chosen. We recognize that any variation in efficiency from these values will change the operating cost somewhat. These values were chosen to best represent typical efficiency levels of most equipment in the field today. Bard standing pilot gas furnaces without flue dampers range from 60.6% to 67.9% AFUE with a 65.1% average. New Bard oil furnaces which utilize high speed flame retention head power burners range from 72% to 83.5% AFUE with the average at 78.5%. In order to represent the typical efficiency level of oil-fired furnaces currently installed in the field, it is necessary to recognize the fact that many older less efficient designs are still in use and that the efficiency level of any oil heating system will be reduced by improper adjustment or a lack of adequate maintenance and servicing on a regular basis. An oil-fired system typically requires more frequent and complex maintenance to prevent degradation of its efficiency level, hence, a 65% AFUE was chosen for these calculations. The AFUE efficiency varies, depending on the design of the specific piece of equipment and its maintenance and condition.

HOW TO USE DUAL FUEL ADD-ON
HEAT PUMP GUIDE TO ENERGY COST SAVINGS

1. Determine the heating Btuh loss and cooling Btuh gain for structure using a Bard "Whole-House Heat Loss and Gain Work Sheet," Form B008, or ACCA "Load Calculation," Manual J.
 - a. Heating house Btuh loss is _____.
 - b. Cooling house Btuh gain is _____.

2. Determine the type of fuel available at structure (what type of [fuel] heating system is already there).
 - a. Electricity
 - b. Natural Gas
 - c. Propane Gas
 - d. Fuel Oil
 - e. Good water supply and disposal

3. Call local utilities and determine area energy costs.
 - a. Electricity _____ \$/Kilowatt-hour
 - b. Natural Gas _____ \$/Therm
 - c. Propane Gas _____ \$/Gallon
 - d. Fuel Oil _____ \$/Gallon

4. Tentatively select an add-on heat pump system using Bard Manual 2100-057, "Heat Pump Sizing" as a guide, and a Bard equipment catalog.
 - a. Air to air heat pump
Model _____ Indoor Coil _____
Btuh _____ Heat Btuh _____ Cool
 - b. Water to air
Model _____ Indoor Coil _____
Btuh _____ Heat Btuh _____ Cool

5. Determine heating region where the structure is located. To do this, find the geographic location of house on regional heating load hours map. A map is located inside the front cover of this guide.
 - a. Region structure is located _____.

YOU ARE NOW READY TO USE THE "DUAL FUEL ADD-ON HEAT PUMP GUIDE"

6. Select the "Dual Fuel Add-On Heat Pump Guide" for the region the structure is located. (See step 5 above)

7. Locate the add-on heat pump model or models you tentatively selected (Step 4) in the "Guide." Refer to Table of Contents.

EXAMPLE: 36HPQ4 w/H3AQ Indoor Coil

BARD MANUFACTURING COMPANY DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS	
REGION <u>4</u> HEAT PUMP MODEL: <u>OUTDOOR 36HPQ4</u>	INDOOR <u>H3AQ/H3AQ1</u>
ARI RATED COOLING CAP.: BTUH (95) <u>36600</u> , SEER <u>7.50</u>	
ARI RATED HEATING CAP.: BTUH (47) <u>40500</u> , COP(47) <u>2.65</u> , HSPF <u>6.40</u> MIN.DHR	
	BTUH (17) <u>24800</u> , COP(17) <u>1.95</u>

8. Now locate the furnace type by fuel used (Step 2).

EXAMPLE: A fuel oil furnace with AFUE of 65%.

FURNACE TYPE <u>FUEL_OIL</u>	FURNACE EFFICIENCY <u>65.00% AFUE</u>
------------------------------	---------------------------------------

9. You now have located the page or pages that will help you determine annual operating cost. See example - Figure 1.

- a. Locate the closest structure loss in Btuh column on left side of page (step 1).

EXAMPLE: 70,000 Btuh Heat Loss

- b. Locate the heating cost per unit at top of page (step 3).

EXAMPLE: \$1.40 per gallon fuel oil.

- c. Now read down the fuel cost column until directly across from structure heat loss in Btuh. This will be the theoretical annual heating cost using only the furnace.

EXAMPLE: 70,000 Btuh heat loss @ \$1.40 per gallon fuel oil, the annual cost will be \$1,878.

- d. Next locate the electric cost \$/Kw under Heat Loss Btuh for structure (step 3).

EXAMPLE: \$.06 Kw rate

- e. Now once again read down the fuel cost column until directly across from electric cost \$/Kw. You now have located the annual heating cost for the house using an add-on heat pump with the furnace.

EXAMPLE: 70,000 Btuh structure heat loss, with \$.06 Kw cost and \$1.40 per gallon fuel oil. The annual cost using a 36HPQ4 Bard heat pump with the oil furnace would be \$1173 for an annual savings of \$705 (\$1878 minus \$1173).

Now repeat steps 8 through 9 for each type fuel and/or heat pump selected. This will enable you to select the best combination of furnace and heat pump to use for a structure.

10. The balance point (the outdoor temperature at which the heat pump is running 100% of the time and just meeting structure heat loss requirements) is located on right side of page.

EXAMPLE: For a structure with a 70,000 Btuh with a 36HPQ4 heat pump has a balance point of 31 Deg. F. Below this theoretical balance point, the heating load is automatically transferred between the heat pump and the furnace by the wall thermostat to maintain the desired temperature. This is accomplished with the FSM-1 Fuel Saver Module.

70,000	\$ 1342	1478	1613	1743	1878	2014	2149	2285	2420	2555	2755	3227	←-THEORETICAL HEATING COST = FURNACE ONLY
.03	\$ 660	698	716	739	767	795	818	846	868	925	976	1026	←-THEORETICAL HEATING COST = FURN. + HEAT PUMP
.04	\$ 795	823	852	874	902	931	953	981	1006	1060	1111	1162	\$ PER YEAR
.05	\$ 931	959	987	1010	1038	1055	1089	1117	1135	1196	1247	1297	
.06	\$ 1066	1094	1122	1145	1173	1201	1224	1252	1275	1331	1382	1433	
.07	\$ 1201	1230	1258	1280	1309	1337	1358	1385	1412	1467	1517	1568	
.08	\$ 1337	1365	1393	1416	1444	1472	1495	1523	1546	1602	1653	1704	
.09	\$ 1467	1495	1523	1546	1574	1602	1625	1653	1675	1732	1783	1833	
.10	\$ 1602	1630	1658	1681	1709	1737	1760	1788	1811	1867	1918	1969	
.12	\$ 1873	1901	1929	1952	1980	2008	2031	2059	2082	2138	2189	2240	

BALANCE POINT 31 DEG.F. 10

11. To find annual cooling cost of heat pump, look at the bottom of page under annual air conditioning cost. Directly under the electric rate \$/Kw (step 3) line, is located the annual cooling cost.

EXAMPLE: At .06 \$/Kw rate for electricity, the cooling cost would be \$234.00 annually.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.										
	.03	.04	.05	.06	.07	.08	.09	.10	.12	
\$	117	156	195	234	273	312	351	390	469	←-ELECTRIC RATE \$/KWH
										←-THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

NOTE. The accuracy of the "Dual Fuel-Add-On Heat Pump Guide to Energy Cost Savings," is directly affected by how accurately you estimate the structure's heat loss and heat gain in step 1. Because of uncontrollable variables, Bard Manufacturing Company is not responsible for any variation in actual operating costs from these theoretical estimates.

HEAT LOSS BT/H	ELEC. COST \$/KWH	HEATING OIL COST - \$/GALLON														
		1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	2.00	2.20	2.40			
40,000	\$	767	340	919	798	1072	1151	1224	1373	1332	1534	1587	1839	←--THEORETICAL HEATING COST = FURNACE ONLY		
-03	\$	332	338	338	344	349	355	355	361	366	372	379	389	THEORETICAL HEATING COST = FURN. + HEAT PUMP		
-04	\$	438	434	434	440	445	451	453	457	452	468	473	485	\$ PER YEAR		
-05	\$	524	530	530	536	541	547	547	552	558	564	569	581			
-06	\$	626	631	631	637	643	648	648	654	660	665	671	682			
-07	\$	722	727	727	733	739	744	744	750	756	761	767	778			
-08	\$	818	823	823	829	835	840	840	846	852	857	863	874			
-09	\$	919	925	925	931	936	942	942	947	953	959	964	975			
-10	\$	1015	1021	1021	1026	1032	1038	1038	1043	1049	1055	1060	1072	BALANCE POINT 15 DEG.F.		
-12	\$	1207	1213	1213	1218	1224	1230	1230	1235	1241	1247	1252	1263			
50,000	\$	959	1055	1151	1247	1342	1438	1534	1630	1726	1918	2110	2302	←--THEORETICAL HEATING COST = FURNACE ONLY		
-03	\$	428	440	445	457	462	473	485	490	502	519	536	552	THEORETICAL HEATING COST = FURN. + HEAT PUMP		
-04	\$	541	552	558	569	575	586	598	603	615	631	648	665	\$ PER YEAR		
-05	\$	654	665	671	682	688	699	710	716	727	744	761	779			
-06	\$	767	778	784	795	801	812	823	829	837	857	874	891			
-07	\$	880	891	897	908	914	925	936	942	953	970	987	1004			
-08	\$	993	1004	1010	1021	1026	1038	1049	1055	1066	1083	1100	1117			
-09	\$	1105	1117	1122	1134	1139	1151	1162	1168	1179	1195	1213	1230			
-10	\$	1218	1230	1235	1247	1252	1263	1275	1280	1292	1309	1325	1342	BALANCE POINT 23 DEG.F.		
-12	\$	1444	1455	1461	1472	1478	1489	1500	1506	1517	1534	1551	1568			
60,000	\$	1151	1253	1342	1438	1534	1630	1726	1839	1937	2070	2302	2533	2764	←--THEORETICAL HEATING COST = FURNACE ONLY	
-03	\$	541	558	575	592	609	625	643	650	677	705	739	773	THEORETICAL HEATING COST = FURN. + HEAT PUMP		
-04	\$	665	682	699	716	731	750	757	784	801	829	863	897	\$ PER YEAR		
-05	\$	789	805	823	840	857	874	891	908	925	953	987	1021			
-06	\$	914	931	947	964	981	998	1015	1032	1049	1077	1111	1145			
-07	\$	1038	1055	1072	1089	1105	1122	1139	1156	1173	1201	1235	1269			
-08	\$	1162	1179	1195	1213	1229	1247	1263	1280	1297	1325	1359	1393			
-09	\$	1292	1309	1325	1342	1359	1375	1393	1410	1427	1455	1489	1523			
-10	\$	1415	1433	1450	1467	1484	1500	1517	1534	1551	1579	1613	1647			
-12	\$	1664	1681	1698	1715	1731	1748	1766	1783	1800	1828	1862	1895	BALANCE POINT 27 DEG.F.		
70,000	\$	1342	1478	1613	1743	1873	2014	2149	2295	2427	2695	2956	3227	←--THEORETICAL HEATING COST = FURNACE ONLY		
-03	\$	660	686	716	739	767	795	818	845	869	925	976	1026	THEORETICAL HEATING COST = FURN. + HEAT PUMP		
-04	\$	795	823	852	874	902	931	953	981	1004	1060	1111	1162	\$ PER YEAR		
-05	\$	931	959	987	1015	1043	1072	1099	1127	1154	1196	1247	1297			
-06	\$	1067	1095	1123	1151	1179	1207	1235	1263	1291	1333	1384	1435			
-07	\$	1203	1231	1259	1287	1315	1343	1371	1399	1427	1470	1521	1572			
-08	\$	1337	1365	1393	1421	1449	1477	1495	1523	1551	1602	1653	1704			
-09	\$	1467	1495	1523	1551	1579	1607	1625	1653	1675	1732	1783	1833			
-10	\$	1602	1630	1658	1686	1709	1737	1760	1788	1811	1867	1918	1969			
-12	\$	1973	1931	1929	1952	1990	2028	2031	2059	2092	2192	2189	2243	BALANCE POINT 31 DEG.F.		
80,000	\$	1534	1687	1839	1997	2149	2322	2454	2612	2754	3069	3379	3684	←--THEORETICAL HEATING COST = FURNACE ONLY		
-03	\$	812	852	891	931	970	1010	1049	1087	1129	1207	1284	1365	THEORETICAL HEATING COST = FURN. + HEAT PUMP		
-04	\$	953	993	1032	1072	1111	1151	1190	1230	1269	1348	1427	1505	\$ PER YEAR		
-05	\$	1094	1134	1173	1213	1252	1292	1331	1371	1410	1489	1568	1647			
-06	\$	1235	1275	1314	1354	1393	1433	1472	1512	1551	1630	1709	1788			
-07	\$	1376	1416	1455	1495	1534	1574	1613	1653	1692	1771	1850	1929			
-08	\$	1517	1557	1596	1636	1675	1715	1754	1794	1833	1912	1991	2070			
-09	\$	1658	1698	1737	1777	1816	1856	1890	1929	1969	2048	2127	2206			
-10	\$	1794	1833	1873	1912	1952	1991	2031	2070	2110	2189	2268	2347			
-12	\$	2076	2115	2155	2194	2234	2273	2313	2352	2392	2471	2550	2629	BALANCE POINT 34 DEG.F.		
ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.																
	\$	-03	-04	-05	-06	-07	-08	-09	-10	-12	←--ELECTRIC RATE \$/KWH					
	\$	117	156	195	234	273	312	351	390	468	←--THEORETICAL AIR CONDITIONING COST					

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

Figure 1.

BARD MANUFACTURING COMPANY
 DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
 HEAT PUMP MODEL: COMPRESSOR SECTION WQ530/WQ5030 INDOOR H1A0/H1A01
 COOLING CAPACITY AT 68 DEG.F. ENTERING WATER TEMP.: 31000 BTUH, 12.40 EER
 HEATING CAPACITY AT 68 DEG.F. ENTERING WATER TEMP.: 53000 BTUH, 3.70 COP
 FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100% AFUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	HEAT PUMP WITH ELECTRIC HEAT	ANNUAL HEATING COST	ELECTRIC HEAT ONLY	
20,000					
		--- THEORETICAL ANNUAL HEATING COST ---			
		HEAT PUMP WITH ELECTRIC HEAT	ANNUAL HEATING COST	ELECTRIC HEAT ONLY	
.03	\$	56		166	
.04	\$	75		223	
.05	\$	97		280	
.06	\$	116		336	
.07	\$	135		393	
.08	\$	154		450	
.09	\$	173		506	
.10	\$	192		563	
.12	\$	229		676	BALANCE POINT -16 DEG.F.
25,000					
		--- THEORETICAL ANNUAL HEATING COST ---			
		HEAT PUMP WITH ELECTRIC HEAT	ANNUAL HEATING COST	ELECTRIC HEAT ONLY	
.03	\$	72		210	
.04	\$	94		280	
.05	\$	119		349	
.06	\$	141		421	
.07	\$	166		491	
.08	\$	189		563	
.09	\$	214		632	
.10	\$	236		701	
.12	\$	286		843	BALANCE POINT 0 DEG.F.
30,000					
		--- THEORETICAL ANNUAL HEATING COST ---			
		HEAT PUMP WITH ELECTRIC HEAT	ANNUAL HEATING COST	ELECTRIC HEAT ONLY	
.03	\$	84		251	
.04	\$	113		336	
.05	\$	141		421	
.06	\$	169		506	
.07	\$	198		591	
.08	\$	226		676	
.09	\$	254		758	
.10	\$	283		843	
.12	\$	336		1013	BALANCE POINT 10 DEG.F.
35,000					
		--- THEORETICAL ANNUAL HEATING COST ---			
		HEAT PUMP WITH ELECTRIC HEAT	ANNUAL HEATING COST	ELECTRIC HEAT ONLY	
.03	\$	97		295	
.04	\$	129		393	
.05	\$	163		491	
.06	\$	195		591	
.07	\$	226		689	
.08	\$	261		786	
.09	\$	292		887	
.10	\$	324		985	
.12	\$	390		1183	BALANCE POINT 18 DEG.F.
40,000					
		--- THEORETICAL ANNUAL HEATING COST ---			
		HEAT PUMP WITH ELECTRIC HEAT	ANNUAL HEATING COST	ELECTRIC HEAT ONLY	
.03	\$	110		336	
.04	\$	151		450	
.05	\$	185		563	
.06	\$	223		676	
.07	\$	261		786	
.08	\$	295		900	
.09	\$	333		1013	
.10	\$	371		1126	
.12	\$	446		1353	BALANCE POINT 24 DEG.F.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12	
\$	150	201	251	301	351	402	452	502	603	<--ELECTRIC RATE \$/KWH
										<--THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY
DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
HEAT PUMP MODEL: COMPRESSOR SECTION HQS30/HQSD30 INDOOR H3A0/H3A01
COOLING CAPACITY AT 68 DEG.F. ENTERING WATER TEMP. 31000 BTUH, 12.40 COP
HEATING CAPACITY AT 68 DEG.F. ENTERING WATER TEMP. 31000 BTUH, 3.70 COP
FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 85.00% AFUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	NATURAL GAS COST - \$/THERM														
		.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.90		1.00		
20,000	\$	100	116	132	147	160	176	192	204	220	236	264	295	---THEORETICAL HEATING COST * FURNACE ONLY		
.03	\$	56	56	56	56	56	56	56	56	56	56	56	56	56	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.04	\$	75	75	75	75	75	75	75	75	75	75	75	75			
.05	\$	97	97	97	97	97	97	97	97	97	97	97	97			
.06	\$	116	116	116	116	116	116	116	116	116	116	116	116			
.07	\$	135	135	135	135	135	135	135	135	135	135	135	135			
.08	\$	154	154	154	154	154	154	154	154	154	154	154	154			
.09	\$	173	173	173	173	173	173	173	173	173	173	173	173			
.10	\$	192	192	192	192	192	192	192	192	192	192	192	192			
.12	\$	229	229	229	229	229	229	229	229	229	229	229	229	BALANCE POINT -16 DEG.F.		
25,000	\$	129	147	163	182	201	220	239	258	277	295	330	368	---THEORETICAL HEATING COST * FURNACE ONLY		
.03	\$	72	72	72	72	72	72	72	72	72	72	72	72	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR		
.04	\$	94	94	94	94	94	94	94	94	94	94	94	94			
.05	\$	119	119	119	119	119	119	119	119	119	119	119	119			
.06	\$	141	141	141	141	141	141	141	141	141	141	141	141			
.07	\$	166	166	166	166	166	166	166	166	166	166	166	166			
.08	\$	188	188	188	188	188	188	188	188	188	188	188	188			
.09	\$	214	214	214	214	214	214	214	214	214	214	214	214			
.10	\$	236	236	236	236	236	236	236	236	236	236	236	236			
.12	\$	286	286	286	286	286	286	286	286	286	286	286	286		BALANCE POINT 0 DEG.F.	
30,000	\$	154	176	198	220	242	264	286	308	330	352	399	443		---THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	84	84	84	84	84	84	84	84	84	84	84	84		THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.04	\$	113	113	113	113	113	113	113	113	113	113	113	113			
.05	\$	141	141	141	141	141	141	141	141	141	141	141	141			
.06	\$	169	169	169	169	169	169	169	169	169	169	169	169			
.07	\$	198	198	198	198	198	198	198	198	198	198	198	198			
.08	\$	226	226	226	226	226	226	226	226	226	226	226	226			
.09	\$	254	254	254	254	254	254	254	254	254	254	254	254			
.10	\$	283	283	283	283	283	283	283	283	283	283	283	283			
.12	\$	336	336	336	336	336	336	336	336	336	336	336	336	BALANCE POINT 10 DEG.F.		
35,000	\$	179	204	232	258	283	308	336	361	387	412	465	516	---THEORETICAL HEATING COST * FURNACE ONLY		
.03	\$	97	97	97	97	97	97	97	97	97	97	97	97	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR		
.04	\$	129	129	129	129	129	129	129	129	129	129	129	129			
.05	\$	163	163	163	163	163	163	163	163	163	163	163	163			
.06	\$	195	195	195	195	195	195	195	195	195	195	195	195			
.07	\$	226	226	226	226	226	226	226	226	226	226	226	226			
.08	\$	261	261	261	261	261	261	261	261	261	261	261	261			
.09	\$	292	292	292	292	292	292	292	292	292	292	292	292			
.10	\$	324	324	324	324	324	324	324	324	324	324	324	324			
.12	\$	390	390	390	390	390	390	390	390	390	390	390	390		BALANCE POINT 18 DEG.F.	
40,000	\$	204	236	264	295	324	352	384	412	443	472	531	591		---THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	110	110	110	110	110	110	113	113	113	113	113	113		THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.04	\$	147	147	147	147	147	147	151	151	151	151	151	151			
.05	\$	182	182	182	182	182	182	185	185	185	185	185	185			
.06	\$	220	220	220	220	220	220	223	223	223	223	223	223			
.07	\$	258	258	258	258	258	258	261	261	261	261	261	261			
.08	\$	292	292	292	292	292	292	295	295	295	295	295	295			
.09	\$	330	330	330	330	330	330	333	333	333	333	333	333			
.10	\$	365	365	365	365	365	365	368	368	368	368	368	368			
.12	\$	440	440	440	440	440	440	443	443	443	443	443	443	BALANCE POINT 24 DEG.F.		

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12	
\$	150	201	251	301	351	402	452	502	603	<--ELECTRIC RATE \$/KWH
										<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY
 DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
 HEAT PUMP MODEL: COMPRESSOR SECTION W0530/W05030 INDOOR HEAT/H2A01
 COOLING CAPACITY AT 68 DEG.F. ENTERING WATER TEMP.: 11000 BTUH, 13.40 CDP
 HEATING CAPACITY AT 68 DEG.F. ENTERING WATER TEMP.: 11000 BTUH, 13.40 CDP
 FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 82.0% AFUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	HEATING OIL COST - \$/GALLON											2.00	2.20	2.40		
		1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	2.00					
20,000	\$	210	232	254	277	295	317	339	361	384	424	469	509	---THEORETICAL HEATING COST * FURNACE ONLY			
.03	\$	56	56	56	56	56	56	56	56	56	56	56	56	THEORETICAL HEATING COST * FURN.+ HEAT PUMP			
.04	\$	75	75	75	75	75	75	75	75	75	75	75	75	\$ PER YEAR			
.05	\$	97	97	97	97	97	97	97	97	97	97	97	97				
.06	\$	116	116	116	116	116	116	116	116	116	116	116	116				
.07	\$	135	135	135	135	135	135	135	135	135	135	135	135				
.08	\$	154	154	154	154	154	154	154	154	154	154	154	154				
.09	\$	173	173	173	173	173	173	173	173	173	173	173	173				
.10	\$	192	192	192	192	192	192	192	192	192	192	192	192	BALANCE POINT-16 DEG.F.			
.12	\$	229	229	229	229	229	229	229	229	229	229	229	229				
25,000	\$	264	292	317	346	371	399	424	453	478	531	585	639	---THEORETICAL HEATING COST * FURNACE ONLY			
.03	\$	72	72	72	72	72	72	72	72	72	72	72	72	THEORETICAL HEATING COST * FURN.+ HEAT PUMP			
.04	\$	94	94	94	94	94	94	94	94	94	94	94	94	\$ PER YEAR			
.05	\$	119	119	119	119	119	119	119	119	119	119	119	119				
.06	\$	141	141	141	141	141	141	141	141	141	141	141	141				
.07	\$	166	166	166	166	166	166	166	166	166	166	166	166				
.08	\$	188	188	188	188	188	188	188	188	188	188	188	188				
.09	\$	214	214	214	214	214	214	214	214	214	214	214	214				
.10	\$	236	236	236	236	236	236	236	236	236	236	236	236	BALANCE POINT 0 DEG.F.			
.12	\$	286	286	286	286	286	286	286	286	286	286	286	286				
30,000	\$	317	349	384	415	446	478	509	541	576	638	701	768	---THEORETICAL HEATING COST * FURNACE ONLY			
.03	\$	84	84	84	84	84	84	84	84	84	84	84	84	THEORETICAL HEATING COST * FURN.+ HEAT PUMP			
.04	\$	113	113	113	113	113	113	113	113	113	113	113	113	\$ PER YEAR			
.05	\$	141	141	141	141	141	141	141	141	141	141	141	141				
.06	\$	169	169	169	169	169	169	169	169	169	169	169	169				
.07	\$	198	198	198	198	198	198	198	198	198	198	198	198				
.08	\$	226	226	226	226	226	226	226	226	226	226	226	226				
.09	\$	254	254	254	254	254	254	254	254	254	254	254	254				
.10	\$	283	283	283	283	283	283	283	283	283	283	283	283	BALANCE POINT 10 DEG.F.			
.12	\$	336	336	336	336	336	336	336	336	336	336	336	336				
35,000	\$	371	409	446	484	522	560	594	632	670	746	821	893	---THEORETICAL HEATING COST * FURNACE ONLY			
.03	\$	97	97	97	97	97	97	97	97	97	97	97	97	THEORETICAL HEATING COST * FURN.+ HEAT PUMP			
.04	\$	129	129	129	129	129	129	129	129	129	129	129	129	\$ PER YEAR			
.05	\$	163	163	163	163	163	163	163	163	163	163	163	163				
.06	\$	195	195	195	195	195	195	195	195	195	195	195	195				
.07	\$	226	226	226	226	226	226	226	226	226	226	226	226				
.08	\$	261	261	261	261	261	261	261	261	261	261	261	261				
.09	\$	292	292	292	292	292	292	292	292	292	292	292	292				
.10	\$	324	324	324	324	324	324	324	324	324	324	324	324	BALANCE POINT 18 DEG.F.			
.12	\$	390	390	390	390	390	390	390	390	390	390	390	390				
40,000	\$	424	469	509	554	594	638	683	723	768	853	938	1023	---THEORETICAL HEATING COST * FURNACE ONLY			
.03	\$	113	113	113	113	113	113	113	113	113	113	113	113	THEORETICAL HEATING COST * FURN.+ HEAT PUMP			
.04	\$	151	151	151	151	151	151	151	151	151	151	151	151	\$ PER YEAR			
.05	\$	185	185	185	185	185	185	185	185	185	185	185	185				
.06	\$	223	223	223	223	223	223	223	223	223	223	223	223				
.07	\$	261	261	261	261	261	261	261	261	261	261	261	261				
.08	\$	295	295	295	295	295	295	295	295	295	295	295	295				
.09	\$	333	333	333	333	333	333	333	333	333	333	333	333				
.10	\$	368	368	368	368	368	368	368	368	368	368	368	368	BALANCE POINT 24 DEG.F.			
.12	\$	443	443	443	443	443	443	443	443	443	443	443	443				

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12	
\$	150	201	251	301	351	402	452	502	603	<--ELECTRIC RATE \$/KWH
										<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY
 DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
 HEAT PUMP MODEL: COMPRESSOR SECTION WQ330/WQSD30 INDOOR H3A0/H3A0I
 COOLING CAPACITY AT 68 DEG.F. ENTERING WATER TEMP. 31000 BTUH, 14.41 EER
 HEATING CAPACITY AT 58 DEG.F. ENTERING WATER TEMP. 33000 BTUH, 14.70 COP
 FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 82.0% AFUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	PROpane GAS COST - \$/GALLON													
		.60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10	1.20	1.20		
20,000	\$	195	210	226	242	258	273	292	308	324	355	390	390	<--THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	56	56	56	56	56	56	56	56	56	56	56	56	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.04	\$	75	75	75	75	75	75	75	75	75	75	75	75		
.05	\$	97	97	97	97	97	97	97	97	97	97	97	97		
.06	\$	116	116	116	116	116	116	116	116	116	116	116	116		
.07	\$	135	135	135	135	135	135	135	135	135	135	135	135		
.08	\$	154	154	154	154	154	154	154	154	154	154	154	154		
.09	\$	173	173	173	173	173	173	173	173	173	173	173	173		
.10	\$	192	192	192	192	192	192	192	192	192	192	192	192		
.12	\$	229	229	229	229	229	229	229	229	229	229	229	229		
25,000	\$	242	264	283	302	324	343	365	384	406	446	487	487		<--THEORETICAL HEATING COST * FURNACE ONLY
.03	\$	72	72	72	72	72	72	72	72	72	72	72	72		THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.04	\$	94	94	94	94	94	94	94	94	94	94	94	94		
.05	\$	119	119	119	119	119	119	119	119	119	119	119	119		
.06	\$	141	141	141	141	141	141	141	141	141	141	141	141		
.07	\$	166	166	166	166	166	166	166	166	166	166	166	166		
.08	\$	188	188	188	188	188	188	188	188	188	188	188	188		
.09	\$	214	214	214	214	214	214	214	214	214	214	214	214		
.10	\$	236	236	236	236	236	236	236	236	236	236	236	236		
.12	\$	286	286	286	286	286	286	286	286	286	286	286	286		
30,000	\$	292	314	339	365	390	412	437	462	487	535	585	585	<--THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	84	84	84	84	84	84	84	84	84	84	84	84	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.04	\$	113	113	113	113	113	113	113	113	113	113	113	113		
.05	\$	141	141	141	141	141	141	141	141	141	141	141	141		
.06	\$	169	169	169	169	169	169	169	169	169	169	169	169		
.07	\$	198	198	198	198	198	198	198	198	198	198	198	198		
.08	\$	226	226	226	226	226	226	226	226	226	226	226	226		
.09	\$	254	254	254	254	254	254	254	254	254	254	254	254		
.10	\$	283	283	283	283	283	283	283	283	283	283	283	283		
.12	\$	336	336	336	336	336	336	336	336	336	336	336	336		
35,000	\$	339	368	396	424	453	481	509	538	566	626	683	683		<--THEORETICAL HEATING COST * FURNACE ONLY
.03	\$	97	97	97	97	97	97	97	97	97	97	97	97		THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.04	\$	129	129	129	129	129	129	129	129	129	129	129	129		
.05	\$	163	163	163	163	163	163	163	163	163	163	163	163		
.06	\$	195	195	195	195	195	195	195	195	195	195	195	195		
.07	\$	226	226	226	226	226	226	226	226	226	226	226	226		
.08	\$	261	261	261	261	261	261	261	261	261	261	261	261		
.09	\$	292	292	292	292	292	292	292	292	292	292	292	292		
.10	\$	324	324	324	324	324	324	324	324	324	324	324	324		
.12	\$	390	390	390	390	390	390	390	390	390	390	390	390		
40,000	\$	390	421	453	487	519	550	585	616	648	714	780	780	<--THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	113	113	113	113	113	113	113	113	113	113	113	113	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.04	\$	151	151	151	151	151	151	151	151	151	151	151	151		
.05	\$	185	185	185	185	185	185	185	185	185	185	185	185		
.06	\$	223	223	223	223	223	223	223	223	223	223	223	223		
.07	\$	261	261	261	261	261	261	261	261	261	261	261	261		
.08	\$	295	295	295	295	295	295	295	295	295	295	295	295		
.09	\$	333	333	333	333	333	333	333	333	333	333	333	333		
.10	\$	368	368	368	368	368	368	368	368	368	368	368	368		
.12	\$	443	443	443	443	443	443	443	443	443	443	443	443		

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12		
	\$	150	201	251	301	351	402	452	502	603	<--ELECTRIC RATE \$/KWH
											<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY
 DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
 HEAT PUMP MODEL: COMPRESSOR SECTION WQSD36/WQSD36 INDOOR H3A2/H3A01
 COOLING CAPACITY AT 68 DEG.F. ENTERING WATER TEMP.: 36000 BTUH, 11.50 EER
 HEATING CAPACITY AT 68 DEG.F. ENTERING WATER TEMP.: 40000 BTUH, 11.50 COP
 FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00% AFUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
25,000			
	.03 \$	72	210
	.04 \$	97	280
	.05 \$	122	349
	.06 \$	147	421
	.07 \$	169	491
	.08 \$	195	563
	.09 \$	220	632
	.10 \$	245	701
	.12 \$	292	843
			BALANCE POINT -15 DEG.F.

HEAT LOSS BTUH	ELEC. COST \$/KWH	--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
30,000			
	.03 \$	88	251
	.04 \$	116	336
	.05 \$	144	421
	.06 \$	176	506
	.07 \$	204	591
	.08 \$	232	676
	.09 \$	261	758
	.10 \$	292	843
	.12 \$	349	1013
			BALANCE POINT -2 DEG.F.

HEAT LOSS BTUH	ELEC. COST \$/KWH	--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
35,000			
	.03 \$	100	295
	.04 \$	135	393
	.05 \$	169	491
	.06 \$	201	591
	.07 \$	236	689
	.08 \$	270	786
	.09 \$	302	887
	.10 \$	336	985
	.12 \$	402	1183
			BALANCE POINT 7 DEG.F.

HEAT LOSS BTUH	ELEC. COST \$/KWH	--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
40,000			
	.03 \$	113	336
	.04 \$	151	450
	.05 \$	192	563
	.06 \$	229	676
	.07 \$	267	786
	.08 \$	305	900
	.09 \$	343	1013
	.10 \$	380	1126
	.12 \$	456	1353
			BALANCE POINT 15 DEG.F.

HEAT LOSS BTUH	ELEC. COST \$/KWH	--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
50,000			
	.03 \$	141	421
	.04 \$	188	563
	.05 \$	236	701
	.06 \$	283	843
	.07 \$	333	985
	.08 \$	380	1126
	.09 \$	424	1268
	.10 \$	472	1407
	.12 \$	569	1690
			BALANCE POINT 24 DEG.F.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12	
\$	187	249	311	374	436	498	561	623	748	<--ELECTRIC RATE \$/KWH
										<--THEORETICAL AIR CONDITIONING COST

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HARD MANUFACTURING COMPANY
DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
HEAT PUMP MODEL: COMPRESSOR SECTION W2526/825033 INDOOR H230/H231
COOLING CAPACITY AT 69 DEG.F. ENTERING WATER TEMP. 40.0 BTU/H. 11.50 PER
HEATING CAPACITY AT 23 DEG.F. ENTERING WATER TEMP. 40.0 BTU/H. 11.50 PER
FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 72.0% AFUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.90	1.00	
25,000		\$ 129	147	163	182	201	220	239	258	277	295	330	368	<--THEORETICAL HEATING COST * FURNACE ONLY
.03	\$ 72	72	72	72	72	72	72	72	72	72	72	72	72	
.04	\$ 97	97	97	97	97	97	97	97	97	97	97	97	97	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
.05	\$ 122	122	122	122	122	122	122	122	122	122	122	122	122	\$ PER YEAR
.06	\$ 147	147	147	147	147	147	147	147	147	147	147	147	147	
.07	\$ 169	169	169	169	169	169	169	169	169	169	169	169	169	
.08	\$ 195	195	195	195	195	195	195	195	195	195	195	195	195	
.09	\$ 220	220	220	220	220	220	220	220	220	220	220	220	220	
.10	\$ 245	245	245	245	245	245	245	245	245	245	245	245	245	BALANCE POINT -15 DEG.F.
.12	\$ 292	292	292	292	292	292	292	292	292	292	292	292	292	
30,000		\$ 154	176	198	220	242	264	286	308	330	352	399	443	<--THEORETICAL HEATING COST * FURNACE ONLY
.03	\$ 88	88	88	88	88	88	88	88	88	88	88	88	88	
.04	\$ 116	116	116	116	116	116	116	116	116	116	116	116	116	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
.05	\$ 144	144	144	144	144	144	144	144	144	144	144	144	144	\$ PER YEAR
.06	\$ 176	176	176	176	176	176	176	176	176	176	176	176	176	
.07	\$ 204	204	204	204	204	204	204	204	204	204	204	204	204	
.08	\$ 232	232	232	232	232	232	232	232	232	232	232	232	232	
.09	\$ 261	261	261	261	261	261	261	261	261	261	261	261	261	
.10	\$ 292	292	292	292	292	292	292	292	292	292	292	292	292	BALANCE POINT -2 DEG.F.
.12	\$ 349	349	349	349	349	349	349	349	349	349	349	349	349	
35,000		\$ 179	204	232	258	283	308	336	361	387	412	465	516	<--THEORETICAL HEATING COST * FURNACE ONLY
.03	\$ 100	100	100	100	100	100	100	100	100	100	100	100	100	
.04	\$ 135	135	135	135	135	135	135	135	135	135	135	135	135	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
.05	\$ 169	169	169	169	169	169	169	169	169	169	169	169	169	\$ PER YEAR
.06	\$ 201	201	201	201	201	201	201	201	201	201	201	201	201	
.07	\$ 236	236	236	236	236	236	236	236	236	236	236	236	236	
.08	\$ 270	270	270	270	270	270	270	270	270	270	270	270	270	
.09	\$ 302	302	302	302	302	302	302	302	302	302	302	302	302	
.10	\$ 336	336	336	336	336	336	336	336	336	336	336	336	336	BALANCE POINT 7 DEG.F.
.12	\$ 402	402	402	402	402	402	402	402	402	402	402	402	402	
40,000		\$ 204	236	264	295	324	352	384	412	443	472	531	591	<--THEORETICAL HEATING COST * FURNACE ONLY
.03	\$ 113	113	113	113	113	113	113	113	113	113	113	113	113	
.04	\$ 151	151	151	151	151	151	151	151	151	151	151	151	151	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
.05	\$ 192	192	192	192	192	192	192	192	192	192	192	192	192	\$ PER YEAR
.06	\$ 229	229	229	229	229	229	229	229	229	229	229	229	229	
.07	\$ 267	267	267	267	267	267	267	267	267	267	267	267	267	
.08	\$ 305	305	305	305	305	305	305	305	305	305	305	305	305	
.09	\$ 343	343	343	343	343	343	343	343	343	343	343	343	343	
.10	\$ 380	380	380	380	380	380	380	380	380	380	380	380	380	BALANCE POINT 15 DEG.F.
.12	\$ 456	456	456	456	456	456	456	456	456	456	456	456	456	
50,000		\$ 258	295	330	368	406	443	478	516	554	591	664	739	<--THEORETICAL HEATING COST * FURNACE ONLY
.03	\$ 138	138	141	141	141	141	141	141	141	141	141	141	141	
.04	\$ 185	185	188	188	188	188	188	188	188	188	188	188	188	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
.05	\$ 232	232	236	236	236	236	236	236	236	236	236	236	236	\$ PER YEAR
.06	\$ 280	280	283	283	283	283	283	283	283	283	283	283	283	
.07	\$ 327	327	330	330	330	330	330	330	330	330	330	330	330	
.08	\$ 374	374	377	377	377	377	377	377	377	377	377	377	377	
.09	\$ 418	418	421	421	421	421	421	421	421	421	421	421	421	
.10	\$ 465	465	469	469	469	469	469	469	469	469	469	469	469	BALANCE POINT 24 DEG.F.
.12	\$ 560	560	563	563	563	563	563	563	563	563	563	563	563	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.10	.12	
\$	187	249	311	374	436	498	561	523	748
									<--ELECTRIC RATE \$/KWH
									<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY
 DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
 HEAT PUMP MODEL: COMPRESSOR SECTION WQSD36/WQSD36 INDOOR H3A2/H3A01
 COOLING CAPACITY AT 68 DEG.F. ENTERING WATER TEMP.: 16000 BTUH, 11.40 EER
 HEATING CAPACITY AT 68 DEG.F. ENTERING WATER TEMP.: 40000 BTUH, 3.80 COP
 FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 82.00% AFUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	HEATING OIL COST - \$/GALLON														
		1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	2.00	2.20	2.40			
25,000	\$	264	292	317	346	371	399	424	453	478	531	585	639	---THEORETICAL HEATING COST * FURNACE ONLY		
.03	\$	72	72	72	72	72	72	72	72	72	72	72	72	72	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.04	\$	97	97	97	97	97	97	97	97	97	97	97	97			
.05	\$	122	122	122	122	122	122	122	122	122	122	122	122			
.06	\$	147	147	147	147	147	147	147	147	147	147	147	147			
.07	\$	169	169	169	169	169	169	169	169	169	169	169	169			
.08	\$	195	195	195	195	195	195	195	195	195	195	195	195			
.09	\$	220	220	220	220	220	220	220	220	220	220	220	220			
.10	\$	245	245	245	245	245	245	245	245	245	245	245	245	BALANCE POINT -15 DEG.F.		
.12	\$	292	292	292	292	292	292	292	292	292	292	292	292			
30,000	\$	317	349	384	415	446	478	509	541	576	638	701	768	---THEORETICAL HEATING COST * FURNACE ONLY		
.03	\$	88	88	88	88	88	88	88	88	88	88	88	88	88		THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.04	\$	116	116	116	116	116	116	116	116	116	116	116	116			
.05	\$	144	144	144	144	144	144	144	144	144	144	144	144			
.06	\$	176	176	176	176	176	176	176	176	176	176	176	176			
.07	\$	204	204	204	204	204	204	204	204	204	204	204	204			
.08	\$	232	232	232	232	232	232	232	232	232	232	232	232			
.09	\$	261	261	261	261	261	261	261	261	261	261	261	261			
.10	\$	292	292	292	292	292	292	292	292	292	292	292	292	BALANCE POINT -2 DEG.F.		
.12	\$	349	349	349	349	349	349	349	349	349	349	349	349			
35,000	\$	371	409	446	484	522	560	594	632	670	746	821	893	---THEORETICAL HEATING COST * FURNACE ONLY		
.03	\$	100	100	100	100	100	100	100	100	100	100	100	100	100	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.04	\$	135	135	135	135	135	135	135	135	135	135	135	135			
.05	\$	169	169	169	169	169	169	169	169	169	169	169	169			
.06	\$	201	201	201	201	201	201	201	201	201	201	201	201			
.07	\$	236	236	236	236	236	236	236	236	236	236	236	236			
.08	\$	270	270	270	270	270	270	270	270	270	270	270	270			
.09	\$	302	302	302	302	302	302	302	302	302	302	302	302			
.10	\$	336	336	336	336	336	336	336	336	336	336	336	336	BALANCE POINT 7 DEG.F.		
.12	\$	402	402	402	402	402	402	402	402	402	402	402	402			
40,000	\$	424	469	509	554	594	638	683	723	768	853	938	1023	---THEORETICAL HEATING COST * FURNACE ONLY		
.03	\$	113	113	113	113	113	113	113	113	113	113	113	113	113		THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.04	\$	151	151	151	151	151	151	151	151	151	151	151	151			
.05	\$	192	192	192	192	192	192	192	192	192	192	192	192			
.06	\$	229	229	229	229	229	229	229	229	229	229	229	229			
.07	\$	267	267	267	267	267	267	267	267	267	267	267	267			
.08	\$	305	305	305	305	305	305	305	305	305	305	305	305			
.09	\$	343	343	343	343	343	343	343	343	343	343	343	343			
.10	\$	380	380	380	380	380	380	380	380	380	380	380	380	BALANCE POINT 15 DEG.F.		
.12	\$	456	456	456	456	456	456	456	456	456	456	456	456			
50,000	\$	531	585	638	692	746	799	853	906	960	1067	1174	1277	---THEORETICAL HEATING COST * FURNACE ONLY		
.03	\$	141	141	141	141	141	141	141	141	144	144	144	144	144	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.04	\$	188	188	188	188	188	188	188	188	192	192	192	192			
.05	\$	236	236	236	236	236	236	236	236	239	239	239	239			
.06	\$	283	283	283	283	283	283	283	283	286	286	286	286			
.07	\$	330	330	330	330	330	330	330	330	333	333	333	333			
.08	\$	377	377	377	377	377	377	377	377	380	380	380	380			
.09	\$	421	421	421	421	421	421	421	421	424	424	424	424			
.10	\$	469	469	469	469	469	469	469	469	472	472	472	472			
.12	\$	563	563	563	563	563	563	563	563	566	566	566	566	BALANCE POINT 24 DEG.F.		

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12		
	\$	187	249	311	374	436	498	561	623	748	---ELECTRIC RATE \$/KWH
											---THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY
 DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
 HEAT PUMP MODEL: OUTDOOR_24HRQ2----- INDOOR_H24QS1-----
 ARI RATED COOLING CAP.: BTUH 195 1--23200 SEER 7.89
 ARI RATED HEATING CAP.: BTUH 147 1--24000 COP 1.77 2.70 HSPF 6.35 MIN.DHR REG IV
 BTUH (17 1)--14200 COP 1.17 1.92
 FURNACE TYPE ELECTRIC--- FURNACE EFFICIENCY 100.00% A/EUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
15,000			
.03	\$	62	125
.04	\$	81	166
.05	\$	103	210
.06	\$	125	251
.07	\$	144	295
.08	\$	166	336
.09	\$	185	377
.10	\$	207	421
.12	\$	248	506
			BALANCE POINT 17 DEG.F.
20,000			
.03	\$	78	166
.04	\$	107	223
.05	\$	132	280
.06	\$	160	336
.07	\$	188	393
.08	\$	217	450
.09	\$	242	506
.10	\$	270	563
.12	\$	324	676
			BALANCE POINT 25 DEG.F.
25,000			
.03	\$	100	210
.04	\$	135	280
.05	\$	166	349
.06	\$	201	421
.07	\$	232	491
.08	\$	264	563
.09	\$	302	632
.10	\$	333	701
.12	\$	399	843
			BALANCE POINT 31 DEG.F.
30,000			
.03	\$	122	251
.04	\$	160	336
.05	\$	201	421
.06	\$	245	506
.07	\$	283	591
.08	\$	324	676
.09	\$	361	758
.10	\$	406	843
.12	\$	484	1013
			BALANCE POINT 35 DEG.F.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12	
\$	160	213	266	320	373	427	480	533	640	<--ELECTRIC RATE \$/KWH
										<--THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY
 DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
 HEAT PUMP MODEL: OUTDOOR 24HQ2 INDOOR H24Q51
 ARI RATED COOLING CAP.: BTUH 785 SEER 7.89
 ARI RATED HEATING CAP.: BTUH (47) COP (4.7) HSPF 6.35 MIN.DHR REG IV
 FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 65.00% AEUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	NATURAL GAS COST - \$/THERM												
		.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.90	1.00	
15,000	\$	75	88	97	110	119	132	141	154	163	176	198	220	<--THEORETICAL HEATING COST * FURNACE ONLY
.03	\$	62	62	62	62	62	62	62	62	62	62	62	62	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
.04	\$	81	81	81	81	81	81	81	81	81	81	81	81	\$ PER YEAR
.05	\$	103	103	103	103	103	103	103	103	103	103	103	103	
.06	\$	122	122	122	122	122	122	122	122	122	122	122	122	
.07	\$	144	144	144	144	144	144	144	144	144	144	144	144	
.08	\$	163	163	163	163	163	163	163	163	163	163	163	163	
.09	\$	185	185	185	185	185	185	185	185	185	185	185	185	
.10	\$	207	207	207	207	207	207	207	207	207	207	207	207	BALANCE POINT 17 DEG.F.
.12	\$	248	248	248	248	248	248	248	248	248	248	248	248	
20,000	\$	100	116	132	147	160	176	192	204	220	236	264	295	<--THEORETICAL HEATING COST * FURNACE ONLY
.03	\$	81	81	81	81	84	84	84	84	84	84	84	88	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
.04	\$	107	107	107	107	110	110	110	110	110	110	110	113	\$ PER YEAR
.05	\$	132	132	132	132	135	135	135	135	135	135	135	138	
.06	\$	160	160	160	160	163	163	163	163	163	163	163	166	
.07	\$	185	185	185	185	188	188	188	188	188	188	188	192	
.08	\$	210	210	210	210	214	214	214	214	214	214	214	217	
.09	\$	236	236	236	236	239	239	239	239	239	239	239	242	
.10	\$	264	264	264	264	267	267	267	267	267	267	267	270	BALANCE POINT 25 DEG.F.
.12	\$	314	314	314	314	317	317	317	317	317	317	317	321	
25,000	\$	129	147	163	182	201	220	239	258	277	295	330	368	<--THEORETICAL HEATING COST * FURNACE ONLY
.03	\$	100	100	103	103	107	107	110	110	113	113	116	122	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
.04	\$	132	132	135	135	138	138	141	141	144	144	147	154	\$ PER YEAR
.05	\$	160	160	163	163	166	166	169	169	173	173	176	182	
.06	\$	188	188	192	192	195	195	198	198	201	201	204	210	
.07	\$	220	220	223	223	226	226	229	229	232	232	236	242	
.08	\$	248	248	251	251	254	254	258	258	261	261	264	270	
.09	\$	280	280	283	283	286	286	289	289	292	292	295	302	
.10	\$	308	308	311	311	314	314	317	317	321	321	324	330	BALANCE POINT 31 DEG.F.
.12	\$	368	368	371	371	374	374	377	377	380	380	384	390	
30,000	\$	154	176	198	220	242	264	286	308	330	352	399	443	<--THEORETICAL HEATING COST * FURNACE ONLY
.03	\$	119	125	129	135	138	144	147	154	157	163	173	182	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
.04	\$	151	157	160	166	169	176	179	185	188	195	204	214	\$ PER YEAR
.05	\$	179	185	188	195	198	204	207	214	217	223	232	242	
.06	\$	210	217	220	226	229	236	239	245	248	254	264	273	
.07	\$	239	245	248	254	258	264	267	273	277	283	292	302	
.08	\$	270	277	280	286	289	295	299	305	308	314	324	333	
.09	\$	299	305	308	314	317	324	327	333	336	343	352	361	
.10	\$	330	336	339	346	349	355	358	365	368	374	384	393	BALANCE POINT 35 DEG.F.
.12	\$	390	396	399	406	409	415	418	424	428	434	443	453	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12		
	\$	160	213	266	320	373	427	480	533	640	<--ELECTRIC RATE \$/KWH
											<--THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY
 DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
 HEAT PUMP MODEL: OUTDOOR 24HR02 INDOOR H24Q51
 ARI RATED COOLING CAP.: BTUH (195) SEER 7.89
 ARI RATED HEATING CAP.: BTUH (47) COP (2.7) HSPF 6.32 MIN.DHR REG IV
 FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 65.00% A/EVE

HEAT LOSS BTUH	ELEC. COST \$/KWH	HEATING OIL COST - \$/GALLON														
		1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	2.00	2.20	2.40			
15,000	\$	157	173	192	207	223	239	254	270	286	317	349	384	---THEORETICAL HEATING COST * FURNACE ONLY		
.03	\$	62	62	62	62	62	62	62	62	62	62	62	62	62	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.04	\$	81	81	81	81	81	81	81	81	81	81	81	81			
.05	\$	103	103	103	103	103	103	103	103	103	103	103	103			
.06	\$	125	125	125	125	125	125	125	125	125	125	125	125			
.07	\$	144	144	144	144	144	144	144	144	144	144	144	144			
.08	\$	166	166	166	166	166	166	166	166	166	166	166	166			
.09	\$	185	185	185	185	185	185	185	185	185	185	185	185			
.10	\$	207	207	207	207	207	207	207	207	207	207	207	207			
.12	\$	248	248	248	248	248	248	248	248	248	248	248	248	BALANCE POINT 17 DEG.F.		
20,000	\$	210	232	254	277	295	317	339	361	384	424	469	509	---THEORETICAL HEATING COST * FURNACE ONLY		
.03	\$	81	81	81	81	81	81	81	81	81	81	81	81	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR		
.04	\$	110	110	110	110	110	110	110	110	110	110	110	110			
.05	\$	135	135	135	135	135	135	135	135	135	135	135	135			
.06	\$	163	163	163	163	163	163	163	163	163	163	163	163			
.07	\$	188	188	188	188	188	188	188	188	188	188	188	188			
.08	\$	217	217	217	217	217	217	217	217	217	217	217	217			
.09	\$	242	242	242	242	242	242	242	242	242	242	242	242			
.10	\$	270	270	270	270	270	270	270	270	270	270	270	270			
.12	\$	321	321	321	321	321	321	321	321	321	321	321	321		BALANCE POINT 25 DEG.F.	
25,000	\$	264	292	317	346	371	399	424	453	478	531	585	639		---THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	103	103	103	103	107	107	107	110	110	113	113	113		THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.04	\$	135	135	135	135	138	138	138	141	141	144	144	144			
.05	\$	166	166	166	166	169	169	169	173	173	176	176	176			
.06	\$	198	198	198	198	201	201	201	204	204	207	207	207			
.07	\$	229	229	229	229	232	232	232	236	236	239	239	239			
.08	\$	261	261	261	261	264	264	264	267	267	270	270	270			
.09	\$	292	292	292	292	295	295	295	299	299	302	302	302			
.10	\$	324	324	324	324	327	327	327	330	330	333	333	333			
.12	\$	390	390	390	390	393	393	393	396	396	399	399	399	BALANCE POINT 31 DEG.F.		
30,000	\$	317	349	384	415	446	478	509	541	576	638	701	768	---THEORETICAL HEATING COST * FURNACE ONLY		
.03	\$	129	132	132	135	138	141	141	144	147	151	154	160	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR		
.04	\$	163	166	166	169	173	176	176	179	182	185	188	195			
.05	\$	201	204	204	207	210	214	214	217	220	223	226	232			
.06	\$	236	239	239	242	245	248	248	251	254	258	261	267			
.07	\$	270	273	273	277	280	283	283	286	289	292	295	302			
.08	\$	305	308	308	311	314	317	317	321	324	327	330	336			
.09	\$	343	346	346	349	352	355	355	358	361	365	368	374			
.10	\$	377	380	380	384	387	390	390	393	396	399	402	409			
.12	\$	450	453	453	456	459	462	462	465	469	472	475	481		BALANCE POINT 35 DEG.F.	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12	
	160	213	266	320	373	427	480	533	640	<--ELECTRIC RATE \$/KWH
										<--THEORETICAL AIR CONDITIONING COST

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 DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
 HEAT PUMP MODEL: OUTDOOR 24HPQ2 INDOOR H24QSI
 ARI RATED COOLING CAP.: BTUH (95) 12,000 SEER 7.83
 ARI RATED HEATING CAP.: BTUH (47) 12,000 COP (47) 2.10 HSPF 6.35 MIN. OHR REG IV
 FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 62.00% AEU

HEAT LOSS BTUH	ELEC. COST \$/KWH	PROPANE GAS COST - \$/GALLON													
		.60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10	1.20		1.20	
15,000	\$	144	157	169	182	195	204	217	229	242	267	292	292	<--THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	62	62	62	62	62	62	62	62	62	62	62	62	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.04	\$	81	81	81	81	81	81	81	81	81	81	81	81		
.05	\$	103	103	103	103	103	103	103	103	103	103	103	103		
.06	\$	125	125	125	125	125	125	125	125	125	125	125	125		
.07	\$	144	144	144	144	144	144	144	144	144	144	144	144		
.08	\$	166	166	166	166	166	166	166	166	166	166	166	166		
.09	\$	185	185	185	185	185	185	185	185	185	185	185	185		
.10	\$	207	207	207	207	207	207	207	207	207	207	207	207		
.12	\$	248	248	248	248	248	248	248	248	248	248	248	248		
20,000	\$	195	210	226	242	258	273	292	308	324	355	390	390		<--THEORETICAL HEATING COST * FURNACE ONLY
.03	\$	81	81	81	81	81	81	81	81	81	81	81	81		THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.04	\$	110	110	110	110	110	110	110	110	110	110	110	110		
.05	\$	135	135	135	135	135	135	135	135	135	135	135	135		
.06	\$	163	163	163	163	163	163	163	163	163	163	163	163		
.07	\$	188	188	188	188	188	188	188	188	188	188	188	188		
.08	\$	217	217	217	217	217	217	217	217	217	217	217	217		
.09	\$	242	242	242	242	242	242	242	242	242	242	242	242		
.10	\$	270	270	270	270	270	270	270	270	270	270	270	270		
.12	\$	321	321	321	321	321	321	321	321	321	321	321	321		
25,000	\$	242	264	283	302	324	343	365	384	406	446	487	487	<--THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	100	100	103	103	103	103	103	107	107	107	110	110	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.04	\$	132	132	135	135	135	135	135	138	138	138	141	141		
.05	\$	163	163	166	166	166	166	166	169	169	169	173	173		
.06	\$	195	195	198	198	198	198	198	201	201	201	204	204		
.07	\$	226	226	229	229	229	229	229	232	232	232	236	236		
.08	\$	258	258	261	261	261	261	261	264	264	264	267	267		
.09	\$	289	289	292	292	292	292	292	295	295	295	299	299		
.10	\$	321	321	324	324	324	324	324	327	327	327	330	330		
.12	\$	387	387	390	390	390	390	390	393	393	393	396	396		
30,000	\$	292	314	339	365	390	412	437	462	487	535	585	585		<--THEORETICAL HEATING COST * FURNACE ONLY
.03	\$	125	129	132	132	135	135	138	138	141	144	147	147		THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.04	\$	160	163	166	166	169	169	173	173	176	179	182	182		
.05	\$	198	201	204	204	207	207	210	210	214	217	220	220		
.06	\$	232	236	239	239	242	242	245	245	248	251	254	254		
.07	\$	267	270	273	273	277	277	280	280	283	286	289	289		
.08	\$	302	305	308	308	311	311	314	314	317	321	324	324		
.09	\$	339	343	346	346	349	349	352	352	355	358	361	361		
.10	\$	374	377	380	380	384	384	387	387	390	393	396	396		
.12	\$	446	450	453	453	456	456	459	459	462	465	469	469		

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12		
	\$	160	213	266	320	373	427	480	533	640	<--ELECTRIC RATE \$/KWH
											<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY
 DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
 HEAT PUMP MODEL: OUTDOOR 30HP04 INDOOR H3A0_Q8_H3A01
 ARI RATED COOLING CAP.: BTUH (17) 79500 SEER 8.30
 ARI RATED HEATING CAP.: BTUH (47) 12000 COP (47) 2.72 HSPF 6.20 MIN. OHR REG IV
 BTUH (17) 20200 COP (17) 1.90
 FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00% AEWE

HEAT LOSS BTUH	ELEC. COST \$/KWH	HEAT PUMP WITH ELECTRIC HEAT	ANNUAL HEATING COST ELECTRIC HEAT ONLY	
20,000		--- THEORETICAL ANNUAL HEATING COST ---		
		HEAT PUMP WITH ELECTRIC HEAT		
			ELECTRIC HEAT ONLY	
	.03 \$	78	166	
	.04 \$	107	223	
	.05 \$	132	280	
	.06 \$	160	336	
	.07 \$	185	393	
	.08 \$	214	450	
	.09 \$	239	506	
	.10 \$	267	563	BALANCE POINT 16 DEG.F.
	.12 \$	321	676	

HEAT LOSS BTUH	ELEC. COST \$/KWH	HEAT PUMP WITH ELECTRIC HEAT	ANNUAL HEATING COST ELECTRIC HEAT ONLY	
25,000		--- THEORETICAL ANNUAL HEATING COST ---		
		HEAT PUMP WITH ELECTRIC HEAT		
			ELECTRIC HEAT ONLY	
	.03 \$	97	210	
	.04 \$	129	280	
	.05 \$	163	349	
	.06 \$	195	421	
	.07 \$	226	491	
	.08 \$	261	563	
	.09 \$	292	632	
	.10 \$	324	701	BALANCE POINT 22 DEG.F.
	.12 \$	390	843	

HEAT LOSS BTUH	ELEC. COST \$/KWH	HEAT PUMP WITH ELECTRIC HEAT	ANNUAL HEATING COST ELECTRIC HEAT ONLY	
30,000		--- THEORETICAL ANNUAL HEATING COST ---		
		HEAT PUMP WITH ELECTRIC HEAT		
			ELECTRIC HEAT ONLY	
	.03 \$	116	251	
	.04 \$	154	336	
	.05 \$	192	421	
	.06 \$	229	506	
	.07 \$	267	591	
	.08 \$	305	676	
	.09 \$	346	758	
	.10 \$	384	843	BALANCE POINT 27 DEG.F.
	.12 \$	459	1013	

HEAT LOSS BTUH	ELEC. COST \$/KWH	HEAT PUMP WITH ELECTRIC HEAT	ANNUAL HEATING COST ELECTRIC HEAT ONLY	
35,000		--- THEORETICAL ANNUAL HEATING COST ---		
		HEAT PUMP WITH ELECTRIC HEAT		
			ELECTRIC HEAT ONLY	
	.03 \$	135	295	
	.04 \$	176	393	
	.05 \$	223	491	
	.06 \$	267	591	
	.07 \$	311	689	
	.08 \$	358	786	
	.09 \$	399	887	
	.10 \$	446	985	BALANCE POINT 31 DEG.F.
	.12 \$	535	1183	

HEAT LOSS BTUH	ELEC. COST \$/KWH	HEAT PUMP WITH ELECTRIC HEAT	ANNUAL HEATING COST ELECTRIC HEAT ONLY	
40,000		--- THEORETICAL ANNUAL HEATING COST ---		
		HEAT PUMP WITH ELECTRIC HEAT		
			ELECTRIC HEAT ONLY	
	.03 \$	154	336	
	.04 \$	207	450	
	.05 \$	258	563	
	.06 \$	308	676	
	.07 \$	361	786	
	.08 \$	412	900	
	.09 \$	465	1013	
	.10 \$	516	1126	BALANCE POINT 34 DEG.F.
	.12 \$	620	1353	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12	
	\$ 191	255	318	382	446	510	573	637	765	<--ELECTRIC RATE \$/KWH
										<--THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY
 DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
 HEAT PUMP MODEL: OUTDOOR 30HP04 SEER 8.20 INDOOR H3A0/H3A01
 ARI RATED COOLING CAP.: BTUH (95) 29700 COP (17) 2.75 HSPF 6.50 MIN. OHR REG IV
 ARI RATED HEATING CAP.: BTUH (47) 32000 COP (17) 1.90
 FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY .85.02% AEWE

HEAT LOSS BTUH	ELEC. COST \$/KWH	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.90	1.00	
20,000		\$ 100	116	132	147	160	176	192	204	220	236	264	295	<--THEORETICAL HEATING COST * FURNACE ONLY
	.03	\$ 78	78	78	78	78	78	78	78	78	78	78	78	
	.04	\$ 107	107	107	107	107	107	107	107	107	107	107	107	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
	.05	\$ 132	132	132	132	132	132	132	132	132	132	132	132	
	.06	\$ 160	160	160	160	160	160	160	160	160	160	160	160	
	.07	\$ 185	185	185	185	185	185	185	185	185	185	185	185	
	.08	\$ 214	214	214	214	214	214	214	214	214	214	214	214	
	.09	\$ 239	239	239	239	239	239	239	239	239	239	239	239	
	.10	\$ 267	267	267	267	267	267	267	267	267	267	267	267	
	.12	\$ 321	321	321	321	321	321	321	321	321	321	321	321	BALANCE POINT 16 DEG.F.
25,000		\$ 129	147	163	182	201	220	239	258	277	295	330	368	<--THEORETICAL HEATING COST * FURNACE ONLY
	.03	\$ 97	97	100	100	100	100	100	100	103	103	103	103	
	.04	\$ 129	129	132	132	132	132	132	132	135	135	135	135	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
	.05	\$ 160	160	163	163	163	163	163	163	166	166	166	166	
	.06	\$ 192	192	195	195	195	195	195	195	198	198	198	198	
	.07	\$ 223	223	226	226	226	226	226	226	229	229	229	229	
	.08	\$ 254	254	258	258	258	258	258	258	261	261	261	261	
	.09	\$ 286	286	289	289	289	289	289	289	292	292	292	292	
	.10	\$ 317	317	321	321	321	321	321	321	324	324	324	324	
	.12	\$ 380	380	384	384	384	384	384	384	387	387	387	387	BALANCE POINT 22 DEG.F.
30,000		\$ 154	176	198	220	242	264	286	308	330	352	399	443	<--THEORETICAL HEATING COST * FURNACE ONLY
	.03	\$ 116	119	122	122	125	129	129	132	132	135	138	144	
	.04	\$ 151	154	157	157	160	163	163	166	166	169	173	179	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
	.05	\$ 185	188	192	192	195	198	198	201	201	204	207	214	
	.06	\$ 220	223	226	226	229	232	232	236	236	239	242	248	
	.07	\$ 254	258	261	261	264	267	267	270	270	273	277	283	
	.08	\$ 289	292	295	295	299	302	302	305	305	308	311	317	
	.09	\$ 324	327	330	330	333	336	336	339	339	343	346	352	
	.10	\$ 358	361	365	365	368	371	371	374	374	377	380	387	
	.12	\$ 428	431	434	434	437	440	440	443	443	446	450	456	BALANCE POINT 27 DEG.F.
35,000		\$ 179	204	232	258	283	308	336	361	387	412	465	516	<--THEORETICAL HEATING COST * FURNACE ONLY
	.03	\$ 135	138	141	141	144	147	151	151	154	157	160	166	
	.04	\$ 173	176	179	179	182	185	188	188	192	195	198	204	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
	.05	\$ 214	217	220	220	223	226	229	229	232	236	239	245	
	.06	\$ 251	254	258	258	261	264	267	267	270	273	277	283	
	.07	\$ 292	295	299	299	302	305	308	308	311	314	317	324	
	.08	\$ 330	333	336	336	339	343	346	346	349	352	355	361	
	.09	\$ 371	374	377	377	380	384	387	387	390	393	396	402	
	.10	\$ 409	412	415	415	418	421	424	424	428	431	434	440	
	.12	\$ 487	491	494	494	497	500	503	503	506	509	513	519	BALANCE POINT 31 DEG.F.
40,000		\$ 204	236	264	295	324	352	384	412	443	472	531	591	<--THEORETICAL HEATING COST * FURNACE ONLY
	.03	\$ 157	163	169	176	182	188	195	201	207	214	226	239	
	.04	\$ 195	201	207	214	220	226	232	239	245	251	264	277	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
	.05	\$ 236	242	248	254	261	267	273	280	286	292	305	317	
	.06	\$ 273	280	286	292	299	305	311	317	324	330	343	355	
	.07	\$ 311	317	324	330	336	343	349	355	361	368	380	393	
	.08	\$ 349	355	361	368	374	380	387	393	399	406	418	431	
	.09	\$ 387	393	399	406	412	418	424	431	437	443	456	469	
	.10	\$ 424	431	437	443	450	456	462	469	475	481	494	506	
	.12	\$ 500	506	513	519	525	531	538	544	550	557	569	582	BALANCE POINT 34 DEG.F.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12	
	\$ 191	255	318	382	446	510	573	637	765	<--ELECTRIC RATE \$/KWH
										<--THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY
 DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
 HEAT PUMP MODEL: OUTDOOR_30HP04_42000 SEER_8-20 INDOOR_H1A0/H1A01
 ARI RATED COOLING CAP.: BTUH (147) 1-42000 COP(47) 2.75 HSPF_6.50 MIN.DHR REG IV
 ARI RATED HEATING CAP.: BTUH (117) 1-20200 COP(17) 1.1-90
 FURNACE TYPE FUEL_OIL FURNACE EFFICIENCY .65.00% AEUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	HEATING OIL COST - \$/GALLON													
		1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	2.00	2.20	2.40		
20,000	\$	210	232	254	277	295	317	339	361	384	424	469	509	---THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	78	78	78	78	78	78	78	78	78	78	78	78	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.04	\$	107	107	107	107	107	107	107	107	107	107	107	107	\$ PER YEAR	
.05	\$	132	132	132	132	132	132	132	132	132	132	132	132		
.06	\$	160	160	160	160	160	160	160	160	160	160	160	160		
.07	\$	185	185	185	185	185	185	185	185	185	185	185	185		
.08	\$	214	214	214	214	214	214	214	214	214	214	214	214		
.09	\$	239	239	239	239	239	239	239	239	239	239	239	239		
.10	\$	267	267	267	267	267	267	267	267	267	267	267	267	BALANCE POINT 16 DEG.F.	
.12	\$	321	321	321	321	321	321	321	321	321	321	321	321		
25,000	\$	264	292	317	346	371	399	424	453	478	531	585	639	---THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	97	97	97	97	97	97	97	97	97	97	97	100	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.04	\$	129	129	129	129	129	129	129	129	129	129	129	132	\$ PER YEAR	
.05	\$	163	163	163	163	163	163	163	163	163	163	163	166		
.06	\$	195	195	195	195	195	195	195	195	195	195	195	198		
.07	\$	226	226	226	226	226	226	226	226	226	226	226	229		
.08	\$	258	258	258	258	258	258	258	258	258	258	258	261		
.09	\$	292	292	292	292	292	292	292	292	292	292	292	295		
.10	\$	324	324	324	324	324	324	324	324	324	324	324	327	BALANCE POINT 22 DEG.F.	
.12	\$	390	390	390	390	390	390	390	390	390	390	390	393		
30,000	\$	317	349	384	415	446	478	509	541	576	638	701	768	---THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	116	116	116	116	119	119	119	119	119	119	122	122	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.04	\$	144	144	144	144	147	147	147	147	147	147	151	151	\$ PER YEAR	
.05	\$	192	192	192	192	195	195	195	195	195	195	198	198		
.06	\$	229	229	229	229	232	232	232	232	232	232	236	236		
.07	\$	267	267	267	267	270	270	270	270	270	270	273	273		
.08	\$	305	305	305	305	308	308	308	308	308	308	311	311		
.09	\$	343	343	343	343	346	346	346	346	346	346	349	349		
.10	\$	380	380	380	380	384	384	384	384	384	384	387	387	BALANCE POINT 27 DEG.F.	
.12	\$	456	456	456	456	459	459	459	459	459	459	462	462		
35,000	\$	371	409	446	484	522	560	594	632	670	746	821	893	---THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	135	138	138	141	141	141	144	144	144	147	151	151	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.04	\$	179	182	182	185	185	185	188	188	188	192	195	195	\$ PER YEAR	
.05	\$	220	223	223	226	226	226	229	229	229	232	236	236		
.06	\$	264	267	267	270	270	270	273	273	273	277	280	280		
.07	\$	305	308	308	311	311	311	314	314	314	317	321	321		
.08	\$	346	349	349	352	352	352	355	355	355	358	361	361		
.09	\$	390	393	393	396	396	396	399	399	399	402	406	406		
.10	\$	431	434	434	437	437	437	440	440	440	443	446	446	BALANCE POINT 31 DEG.F.	
.12	\$	516	519	519	522	522	522	525	525	525	528	531	531		
40,000	\$	424	469	509	554	594	638	683	723	768	853	938	1023	---THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	163	166	169	169	173	176	179	182	182	188	195	198	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.04	\$	210	214	217	217	220	223	226	229	229	236	242	245	\$ PER YEAR	
.05	\$	254	258	261	261	264	267	270	273	273	280	286	289		
.06	\$	302	305	308	308	311	314	317	321	321	327	333	336		
.07	\$	346	349	352	352	355	358	361	365	365	371	377	380		
.08	\$	393	396	399	399	402	406	409	412	412	418	424	428		
.09	\$	440	443	446	446	450	453	456	459	459	465	472	475		
.10	\$	484	487	491	491	494	494	500	503	503	509	516	519	BALANCE POINT 34 DEG.F.	
.12	\$	579	582	585	585	588	591	594	598	598	604	610	613		

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.
 \$.03 191 .04 255 .05 318 .06 446 .07 510 .08 573 .09 637 .12 765
 ---ELECTRIC RATE \$/KWH
 ---THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY
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REGION 2
 HEAT PUMP MODEL: OUTDOOR 30HP04 INDOOR H3A0/H3A1
 ARI RATED COOLING CAP.: BTUH 147,000 SEER 8.30
 ARI RATED HEATING CAP.: BTUH 147,000 COP 1.75 4SPF 6.50 MIN.DHR REG IV
 FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 65.00% A/E/W

HEAT LOSS BTUH	ELEC. COST \$/KWH	PROPANE GAS COST - \$/GALLON													
		.60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10	1.20	1.20		
20,000	\$	195	210	226	242	258	273	292	308	324	355	390	390	←--THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	78	78	78	78	78	78	78	78	78	78	78	78		
.04	\$	107	107	107	107	107	107	107	107	107	107	107	107	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.05	\$	132	132	132	132	132	132	132	132	132	132	132	132	\$ PER YEAR	
.06	\$	160	160	160	160	160	160	160	160	160	160	160	160		
.07	\$	185	185	185	185	185	185	185	185	185	185	185	185		
.08	\$	214	214	214	214	214	214	214	214	214	214	214	214		
.09	\$	239	239	239	239	239	239	239	239	239	239	239	239		
.10	\$	267	267	267	267	267	267	267	267	267	267	267	267	BALANCE POINT 16 DEG.F.	
.12	\$	321	321	321	321	321	321	321	321	321	321	321	321		
25,000	\$	242	264	283	302	324	343	365	384	436	446	487	487	←--THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	97	97	97	97	97	97	97	97	97	97	97	97		
.04	\$	129	129	129	129	129	129	129	129	129	129	129	129	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.05	\$	163	163	163	163	163	163	163	163	163	163	163	163	\$ PER YEAR	
.06	\$	195	195	195	195	195	195	195	195	195	195	195	195		
.07	\$	226	226	226	226	226	226	226	226	226	226	226	226		
.08	\$	258	258	258	258	258	258	258	258	258	258	258	258		
.09	\$	292	292	292	292	292	292	292	292	292	292	292	292		
.10	\$	324	324	324	324	324	324	324	324	324	324	324	324	BALANCE POINT 22 DEG.F.	
.12	\$	390	390	390	390	390	390	390	390	390	390	390	390		
30,000	\$	292	314	339	365	390	412	437	462	487	535	585	585	←--THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	116	116	116	116	116	116	119	119	119	119	119	119		
.04	\$	154	154	154	154	154	154	157	157	157	157	157	157	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.05	\$	192	192	192	192	192	192	195	195	195	195	195	195	\$ PER YEAR	
.06	\$	229	229	229	229	229	229	232	232	232	232	232	232		
.07	\$	267	267	267	267	267	267	270	270	270	270	270	270		
.08	\$	305	305	305	305	305	305	308	308	308	308	308	308		
.09	\$	343	343	343	343	343	343	346	346	346	346	346	346		
.10	\$	380	380	380	380	380	380	384	384	384	384	384	384	BALANCE POINT 27 DEG.F.	
.12	\$	456	456	456	456	456	456	459	459	459	459	459	459		
35,000	\$	339	368	396	424	453	481	509	538	566	626	683	683	←--THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	135	135	138	138	138	141	141	141	141	144	144	144		
.04	\$	179	179	182	182	182	185	185	185	185	188	188	188	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.05	\$	220	220	223	223	223	226	226	226	226	229	229	229	\$ PER YEAR	
.06	\$	264	264	267	267	267	270	270	270	270	273	273	273		
.07	\$	305	305	308	308	308	311	311	311	311	314	314	314		
.08	\$	346	346	349	349	349	352	352	352	352	355	355	355		
.09	\$	390	390	393	393	393	396	396	396	396	399	399	399		
.10	\$	431	431	434	434	434	437	437	437	437	440	440	440	BALANCE POINT 31 DEG.F.	
.12	\$	516	516	519	519	519	522	522	522	522	525	525	525		
40,000	\$	390	421	453	487	519	550	585	616	648	714	780	780	←--THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	160	163	163	166	169	169	173	176	176	179	185	185		
.04	\$	207	210	210	214	217	217	220	223	223	226	232	232	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.05	\$	251	254	254	258	261	261	264	267	267	270	277	277	\$ PER YEAR	
.06	\$	299	302	302	305	308	308	311	314	314	317	324	324		
.07	\$	343	346	346	349	352	352	355	358	358	361	368	368		
.08	\$	390	393	393	396	399	399	402	406	406	409	415	415		
.09	\$	437	440	440	443	446	446	450	453	453	456	462	462		
.10	\$	481	484	484	487	491	491	494	497	497	500	506	506	BALANCE POINT 34 DEG.F.	
.12	\$	576	579	579	582	585	585	588	591	591	594	601	601		

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12		
	\$	191	255	318	382	446	510	573	637	765	←--ELECTRIC RATE \$/KWH
											←--THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY
DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
 HEAT PUMP MODEL: OUTDOOR 36HP04 SEER 7.50 INDOOR H1A0 OR H1A01
 ARI RATED COOLING CAP.: BTUH (95) 16600 COP (47) 2.62 HSPF 6.40 MIN. DHR REG IV
 ARI RATED HEATING CAP.: BTUH (17) 24800 COP (17) 1.95
 FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00% A/EUE

HEAT LOSS
BTUH

ELEC. COST
\$/KWH

25,000

		--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
.03	\$	103	210
.04	\$	138	280
.05	\$	173	349
.06	\$	207	421
.07	\$	242	491
.08	\$	277	563
.09	\$	311	632
.10	\$	346	701
.12	\$	415	843

BALANCE POINT 16 DEG.F.

30,000

		--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
.03	\$	122	251
.04	\$	163	336
.05	\$	204	421
.06	\$	245	506
.07	\$	286	591
.08	\$	324	676
.09	\$	365	758
.10	\$	406	843
.12	\$	487	1013

BALANCE POINT 21 DEG.F.

35,000

		--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
.03	\$	138	295
.04	\$	188	393
.05	\$	236	491
.06	\$	283	591
.07	\$	327	689
.08	\$	374	786
.09	\$	421	887
.10	\$	469	985
.12	\$	563	1183

BALANCE POINT 25 DEG.F.

40,000

		--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
.03	\$	157	336
.04	\$	214	450
.05	\$	264	563
.06	\$	321	676
.07	\$	371	786
.08	\$	428	900
.09	\$	478	1013
.10	\$	535	1126
.12	\$	638	1353

BALANCE POINT 29 DEG.F.

50,000

		--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
.03	\$	201	421
.04	\$	267	563
.05	\$	333	701
.06	\$	402	843
.07	\$	469	985
.08	\$	535	1126
.09	\$	604	1268
.10	\$	670	1407
.12	\$	802	1690

BALANCE POINT 34 DEG.F.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12	
\$	263	351	439	527	614	702	790	878	1054	---
										---ELECTRIC RATE \$/KWH
										---THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY
 DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
 HEAT PUMP MODEL: OUTDOOR 36HP04 SEER 7.50 INDOOR H1A2ZH1A01
 ARI RATED COOLING CAP.: BTUH (75) 13600 COP (17) 1.895
 ARI RATED HEATING CAP.: BTUH (17) 40500 COP (17) 1.895 HSPF 5.50 MIN. DHR REG TV
 FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY .65.00% AEW

HEAT LOSS BTUH	ELEC. COST \$/KWH	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.90	1.00	
25,000		\$ 129	147	163	182	201	220	239	258	277	295	330	368	<--THEORETICAL HEATING COST * FURNACE ONLY
.03	\$	103	103	103	103	103	103	103	103	103	103	103	103	
.04	\$	138	138	138	138	138	138	138	138	138	138	138	138	
.05	\$	173	173	173	173	173	173	173	173	173	173	173	173	
.06	\$	207	207	207	207	207	207	207	207	207	207	207	207	
.07	\$	242	242	242	242	242	242	242	242	242	242	242	242	
.08	\$	277	277	277	277	277	277	277	277	277	277	277	277	
.09	\$	311	311	311	311	311	311	311	311	311	311	311	311	
.10	\$	346	346	346	346	346	346	346	346	346	346	346	346	
.12	\$	415	415	415	415	415	415	415	415	415	415	415	415	
														BALANCE POINT 16 DEG.F.
30,000		\$ 154	176	198	220	242	264	286	308	330	352	399	443	<--THEORETICAL HEATING COST * FURNACE ONLY
.03	\$	122	122	122	122	122	125	125	125	125	125	125	125	
.04	\$	160	160	160	160	160	163	163	163	163	163	163	163	
.05	\$	201	201	201	201	201	204	204	204	204	204	204	204	
.06	\$	242	242	242	242	242	245	245	245	245	245	245	245	
.07	\$	283	283	283	283	283	286	286	286	286	286	286	286	
.08	\$	324	324	324	324	324	327	327	327	327	327	327	327	
.09	\$	365	365	365	365	365	368	368	368	368	368	368	368	
.10	\$	406	406	406	406	406	409	409	409	409	409	409	409	
.12	\$	484	484	484	484	484	487	487	487	487	487	487	487	
														BALANCE POINT 21 DEG.F.
35,000		\$ 179	204	232	258	283	308	336	361	387	412	465	516	<--THEORETICAL HEATING COST * FURNACE ONLY
.03	\$	141	141	141	141	144	144	144	144	147	147	147	151	
.04	\$	188	188	188	188	192	192	192	192	195	195	195	198	
.05	\$	232	232	232	232	236	236	236	236	239	239	239	242	
.06	\$	277	277	277	277	280	280	280	280	283	283	283	286	
.07	\$	324	324	324	324	327	327	327	327	330	330	330	333	
.08	\$	368	368	368	368	371	371	371	371	374	374	374	377	
.09	\$	412	412	412	412	415	415	415	415	418	418	418	421	
.10	\$	459	459	459	459	462	462	462	462	465	465	465	469	
.12	\$	550	550	550	550	554	554	554	554	557	557	557	560	
														BALANCE POINT 25 DEG.F.
40,000		\$ 204	236	264	295	324	352	384	412	443	472	531	591	<--THEORETICAL HEATING COST * FURNACE ONLY
.03	\$	160	163	166	166	169	173	176	179	182	182	188	195	
.04	\$	210	214	217	217	220	223	226	229	232	232	239	245	
.05	\$	258	261	264	264	267	270	273	277	280	280	286	292	
.06	\$	305	308	311	311	314	317	321	324	327	327	333	339	
.07	\$	352	355	358	358	361	365	368	371	374	374	380	387	
.08	\$	399	402	406	406	409	412	415	418	421	421	428	434	
.09	\$	446	450	453	453	456	459	462	465	469	469	475	481	
.10	\$	494	497	500	500	503	506	509	513	516	516	522	528	
.12	\$	591	594	598	598	601	604	607	610	613	613	620	626	
														BALANCE POINT 29 DEG.F.
50,000		\$ 258	295	330	368	406	443	478	516	554	591	664	739	<--THEORETICAL HEATING COST * FURNACE ONLY
.03	\$	204	214	220	229	236	245	251	261	267	277	292	308	
.04	\$	254	264	270	280	286	295	302	311	317	321	343	358	
.05	\$	302	311	317	327	333	343	349	358	365	374	390	406	
.06	\$	352	361	368	377	384	393	399	409	415	424	440	456	
.07	\$	402	412	418	428	434	443	450	459	465	475	491	506	
.08	\$	453	462	469	478	484	494	500	509	516	525	541	557	
.09	\$	503	513	519	528	535	544	550	560	566	576	591	607	
.10	\$	554	563	569	579	585	594	601	610	616	626	642	657	
.12	\$	654	664	670	679	686	695	701	711	717	727	742	758	
														BALANCE POINT 34 DEG.F.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12	
	\$ 263	351	439	527	614	702	790	878	1054	<--ELECTRIC RATE \$/KWH
										<--THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY
 DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
 HEAT PUMP MODEL: OUTDOOR_H38P24 INDOOR_H38Q/H38Q1
 ARI RATED COOLING CAP.: BTUH (95) 1-26000 SEER 7.50
 ARI RATED HEATING CAP.: BTUH (147) 1-50000 COP (4.7) 2.65 HSPF 6.50 MIN.DHR REG IV
 FURNACE TYPE FUEL_OIL FURNACE EFFICIENCY .65003 AEWE

HEAT LOSS BTUH	ELEC. COST \$/KWH	HEATING OIL COST - \$/GALLON													
		1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	2.00	2.20		2.40	
25,000	\$	264	292	317	346	371	399	424	453	478	531	585	639	<--THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	103	103	103	103	103	103	103	103	103	103	103	103	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.04	\$	138	138	138	138	138	138	138	138	138	138	138	138	\$ PER YEAR	
.05	\$	173	173	173	173	173	173	173	173	173	173	173	173		
.06	\$	207	207	207	207	207	207	207	207	207	207	207	207		
.07	\$	242	242	242	242	242	242	242	242	242	242	242	242		
.08	\$	277	277	277	277	277	277	277	277	277	277	277	277		
.09	\$	311	311	311	311	311	311	311	311	311	311	311	311		
.10	\$	346	346	346	346	346	346	346	346	346	346	346	346	BALANCE POINT 16 DEG.F.	
.12	\$	415	415	415	415	415	415	415	415	415	415	415	415		
30,000	\$	317	349	384	415	446	478	509	541	576	638	701	768	<--THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	122	122	122	122	122	122	122	122	122	122	122	122	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.04	\$	163	163	163	163	163	163	163	163	163	163	163	163	\$ PER YEAR	
.05	\$	204	204	204	204	204	204	204	204	204	204	204	204		
.06	\$	245	245	245	245	245	245	245	245	245	245	245	245		
.07	\$	283	283	283	283	283	283	283	283	283	283	283	283		
.08	\$	324	324	324	324	324	324	324	324	324	324	324	324		
.09	\$	365	365	365	365	365	365	365	365	365	365	365	365		
.10	\$	406	406	406	406	406	406	406	406	406	406	406	406		
.12	\$	487	487	487	487	487	487	487	487	487	487	487	487	BALANCE POINT 21 DEG.F.	
35,000	\$	371	409	446	484	522	560	594	632	670	746	821	893	<--THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	141	141	141	141	141	141	144	144	144	144	144	144	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.04	\$	188	188	188	188	188	188	192	192	192	192	192	192	\$ PER YEAR	
.05	\$	236	236	236	236	236	236	239	239	239	239	239	239		
.06	\$	280	280	280	280	280	280	283	283	283	283	283	283		
.07	\$	327	327	327	327	327	327	330	330	330	330	330	330		
.08	\$	374	374	374	374	374	374	377	377	377	377	377	377		
.09	\$	418	418	418	418	418	418	421	421	421	421	421	421		
.10	\$	465	465	465	465	465	465	469	469	469	469	469	469		
.12	\$	557	557	557	557	557	557	560	560	560	560	560	560	BALANCE POINT 25 DEG.F.	
40,000	\$	424	469	509	554	594	638	683	723	768	853	938	1023	<--THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	163	163	163	166	166	166	169	169	169	173	173	176	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.04	\$	214	214	214	217	217	217	220	220	220	223	223	226	\$ PER YEAR	
.05	\$	267	267	267	270	270	270	273	273	273	277	277	280		
.06	\$	317	317	317	321	321	321	324	324	324	327	327	330		
.07	\$	368	368	368	371	371	371	374	374	374	377	377	380		
.08	\$	418	418	418	421	421	421	424	424	424	428	428	431		
.09	\$	472	472	472	475	475	475	478	478	478	481	481	484		
.10	\$	522	522	522	525	525	525	528	528	528	531	531	535		
.12	\$	626	626	626	629	629	629	632	632	632	635	635	638	BALANCE POINT 29 DEG.F.	
50,000	\$	531	585	638	692	746	799	853	906	960	1067	1174	1277	<--THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	214	217	220	223	226	229	232	236	239	245	251	258	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.04	\$	273	277	280	283	286	289	292	295	299	305	311	317	\$ PER YEAR	
.05	\$	333	336	339	343	346	349	352	355	358	365	371	377		
.06	\$	393	396	399	402	406	409	412	415	418	424	431	437		
.07	\$	453	456	459	462	465	469	472	475	478	484	491	497		
.08	\$	513	516	519	522	525	528	531	535	538	544	550	557		
.09	\$	572	576	579	582	585	588	591	594	598	604	610	616		
.10	\$	632	635	638	642	645	648	651	654	657	664	670	676		
.12	\$	752	755	758	761	764	768	771	774	777	783	790	796	BALANCE POINT 34 DEG.F.	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12	
\$	263	351	439	527	614	702	790	878	1054	<--ELECTRIC RATE \$/KWH
										<--THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY
 DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
 HEAT PUMP MODEL: OUTDOOR 36HP04 INDOOR_H3A2/H3A1
 ARI RATED COOLING CAP.: BTUH 1957-36500 SEER 7.40
 ARI RATED HEATING CAP.: BTUH 1471-40500 COP 1.71 2.65 HSPF 6.40 MIN. OHR REG IV
 FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY .65 Q3-AEUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	PROPANE GAS												FURNACE EFFICIENCY	
		.60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10	1.20	1.20		
25,000	\$	242	264	263	302	324	343	355	384	406	446	437	487	←--THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	103	103	103	103	103	103	103	103	103	103	103	103	THEORETICAL HEATING COST * FURN. + HEAT PUMP	
.04	\$	138	138	138	138	138	138	138	138	138	138	138	138	\$ PER YEAR	
.05	\$	173	173	173	173	173	173	173	173	173	173	173	173		
.06	\$	207	207	207	207	207	207	207	207	207	207	207	207		
.07	\$	242	242	242	242	242	242	242	242	242	242	242	242		
.08	\$	277	277	277	277	277	277	277	277	277	277	277	277		
.09	\$	311	311	311	311	311	311	311	311	311	311	311	311		
.10	\$	346	346	346	346	346	346	346	346	346	346	346	346	BALANCE POINT 16 DEG.F.	
.12	\$	415	415	415	415	415	415	415	415	415	415	415	415		
30,000	\$	292	314	339	365	390	412	437	462	487	535	585	585	←--THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	122	122	122	122	122	122	122	122	122	122	122	122	THEORETICAL HEATING COST * FURN. + HEAT PUMP	
.04	\$	163	163	163	163	163	163	163	163	163	163	163	163	\$ PER YEAR	
.05	\$	204	204	204	204	204	204	204	204	204	204	204	204		
.06	\$	245	245	245	245	245	245	245	245	245	245	245	245		
.07	\$	283	283	283	283	283	283	283	283	283	283	283	283		
.08	\$	324	324	324	324	324	324	324	324	324	324	324	324		
.09	\$	365	365	365	365	365	365	365	365	365	365	365	365		
.10	\$	406	406	406	406	406	406	406	406	406	406	406	406	BALANCE POINT 21 DEG.F.	
.12	\$	487	487	487	487	487	487	487	487	487	487	487	487		
35,000	\$	339	368	396	424	453	481	509	538	566	626	683	683	←--THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	141	141	141	141	141	141	141	141	144	144	144	144	THEORETICAL HEATING COST * FURN. + HEAT PUMP	
.04	\$	188	188	188	188	188	188	188	188	192	192	192	192	\$ PER YEAR	
.05	\$	236	236	236	236	236	236	236	236	239	239	239	239		
.06	\$	280	280	280	280	280	280	280	280	283	283	283	283		
.07	\$	327	327	327	327	327	327	327	327	330	330	330	330		
.08	\$	374	374	374	374	374	374	374	374	377	377	377	377		
.09	\$	418	418	418	418	418	418	418	418	421	421	421	421		
.10	\$	465	465	465	465	465	465	465	465	469	469	469	469	BALANCE POINT 25 DEG.F.	
.12	\$	557	557	557	557	557	557	557	557	560	560	560	560		
40,000	\$	390	421	453	487	519	550	585	616	648	714	780	780	←--THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	163	163	163	163	165	166	166	166	166	169	169	169	THEORETICAL HEATING COST * FURN. + HEAT PUMP	
.04	\$	214	214	214	214	217	217	217	217	217	220	220	220	\$ PER YEAR	
.05	\$	267	267	267	267	270	270	270	270	270	273	273	273		
.06	\$	317	317	317	317	321	321	321	321	321	324	324	324		
.07	\$	368	368	368	368	371	371	371	371	371	374	374	374		
.08	\$	418	418	418	418	421	421	421	421	421	424	424	424		
.09	\$	472	472	472	472	475	475	475	475	475	478	478	478		
.10	\$	522	522	522	522	525	525	525	525	525	528	528	528	BALANCE POINT 29 DEG.F.	
.12	\$	626	626	626	626	629	629	629	629	629	632	632	632		
50,000	\$	487	528	566	607	648	689	730	771	812	893	975	975	←--THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	210	210	214	217	220	223	223	226	229	236	239	239	THEORETICAL HEATING COST * FURN. + HEAT PUMP	
.04	\$	270	270	273	277	280	283	283	285	289	295	299	299	\$ PER YEAR	
.05	\$	330	330	333	336	339	343	343	346	349	355	358	358		
.06	\$	390	390	393	396	399	402	402	406	409	415	418	418		
.07	\$	450	450	453	456	459	462	462	465	469	475	478	478		
.08	\$	509	509	513	516	519	522	522	525	528	535	538	538		
.09	\$	569	569	572	576	579	582	582	585	588	594	598	598		
.10	\$	629	629	632	635	638	642	642	645	649	654	657	657	BALANCE POINT 34 DEG.F.	
.12	\$	749	749	752	755	758	761	761	764	768	774	777	777		

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12	
\$	263	351	439	527	614	702	790	878	1054	←--ELECTRIC RATE \$/KWH
										←--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY
 DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
 HEAT PUMP MODEL: OUTDOOR 42HPQ INDOOR H5A0
 ARI RATED COOLING CAP.: BTUH (75) 27500 SEER 8.00
 ARI RATED HEATING CAP.: BTUH (47) 21200 COP(47) 2.20 HSPF 6.25 MIN. OHR REG IV
 FURNACE TYPE ELECTRIC COP(17) 1.80 FURNACE EFFICIENCY 100% AEUE

HEAT LOSS
 BTUH
 ELEC. COST
 \$/KWH

25,000

		--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
.03	\$	103	210
.04	\$	138	280
.05	\$	173	349
.06	\$	204	421
.07	\$	239	491
.08	\$	273	563
.09	\$	308	632
.10	\$	343	701
.12	\$	412	843

BALANCE POINT 17 DEG.F.

30,000

		--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
.03	\$	119	251
.04	\$	160	336
.05	\$	201	421
.06	\$	242	506
.07	\$	283	591
.08	\$	324	676
.09	\$	361	758
.10	\$	402	843
.12	\$	484	1013

BALANCE POINT 21 DEG.F.

35,000

		--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
.03	\$	138	295
.04	\$	188	393
.05	\$	232	491
.06	\$	280	591
.07	\$	324	689
.08	\$	371	786
.09	\$	418	887
.10	\$	465	985
.12	\$	560	1183

BALANCE POINT 25 DEG.F.

40,000

		--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
.03	\$	157	336
.04	\$	210	450
.05	\$	264	563
.06	\$	317	676
.07	\$	368	786
.08	\$	424	900
.09	\$	475	1013
.10	\$	528	1126
.12	\$	632	1353

BALANCE POINT 28 DEG.F.

50,000

		--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
.03	\$	198	421
.04	\$	264	563
.05	\$	333	701
.06	\$	396	843
.07	\$	462	985
.08	\$	531	1126
.09	\$	594	1268
.10	\$	661	1407
.12	\$	796	1690

BALANCE POINT 33 DEG.F.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12	
\$	286	382	478	573	669	765	860	956	1147	<--ELECTRIC RATE \$/KWH
										<--THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY
 DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
 HEAT PUMP MODEL: OUTDOOR 42HPO INDOOR H5A2
 RATED COOLING CAP.: BTUH (75 T) SEER 8.00
 RATED HEATING CAP.: BTUH (47 T) COP 1.77 HSPF 9.25 MIN. OHR REG IV
 FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY .85-023-AEVE

HEAT LOSS BTUH	ELEC. COST \$/KWH	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.90	1.00	
25,000		\$ 129	147	163	182	201	220	239	258	277	295	330	368	<--THEORETICAL HEATING COST * FURNACE ONLY
	.03	\$ 103	103	103	103	103	103	103	107	107	107	107	107	
	.04	\$ 135	135	135	135	135	135	135	138	139	138	138	138	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
	.05	\$ 169	169	169	169	169	169	169	173	173	173	173	173	\$ PER YEAR
	.06	\$ 204	204	204	204	204	204	204	207	207	207	207	207	
	.07	\$ 239	239	239	239	239	239	239	242	242	242	242	242	
	.08	\$ 273	273	273	273	273	273	273	277	277	277	277	277	
	.09	\$ 308	308	308	308	308	308	308	311	311	311	311	311	
	.10	\$ 339	339	339	339	339	339	339	343	343	343	343	343	
	.12	\$ 409	409	409	409	409	409	409	412	412	412	412	412	BALANCE POINT 17 DEG.F.
30,000		\$ 154	176	193	220	242	264	286	308	330	352	399	443	<--THEORETICAL HEATING COST * FURNACE ONLY
	.03	\$ 119	119	119	119	119	122	122	122	122	122	122	122	
	.04	\$ 160	160	160	160	160	163	163	163	163	163	163	163	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
	.05	\$ 201	201	201	201	201	204	204	204	204	204	204	204	\$ PER YEAR
	.06	\$ 242	242	242	242	242	245	245	245	245	245	245	245	
	.07	\$ 280	280	280	280	280	283	283	283	283	283	283	283	
	.08	\$ 321	321	321	321	321	324	324	324	324	324	324	324	
	.09	\$ 361	361	361	361	361	365	365	365	365	365	365	365	
	.10	\$ 402	402	402	402	402	406	406	406	406	406	406	406	
	.12	\$ 481	481	481	481	481	484	484	484	484	484	484	484	BALANCE POINT 21 DEG.F.
35,000		\$ 179	204	232	258	283	308	336	361	387	412	465	516	<--THEORETICAL HEATING COST * FURNACE ONLY
	.03	\$ 141	141	141	141	144	144	144	144	147	147	147	151	
	.04	\$ 185	185	185	185	188	188	188	188	192	192	192	195	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
	.05	\$ 229	229	229	229	232	232	232	232	236	236	236	239	\$ PER YEAR
	.06	\$ 273	273	273	273	277	277	277	277	280	280	280	283	
	.07	\$ 321	321	321	321	324	324	324	324	327	327	327	330	
	.08	\$ 365	365	365	365	368	368	368	368	371	371	371	374	
	.09	\$ 409	409	409	409	412	412	412	412	415	415	415	418	
	.10	\$ 453	453	453	453	456	456	456	456	459	459	459	462	
	.12	\$ 544	544	544	544	547	547	547	547	550	550	550	554	BALANCE POINT 25 DEG.F.
40,000		\$ 204	236	264	295	324	352	384	412	443	472	531	591	<--THEORETICAL HEATING COST * FURNACE ONLY
	.03	\$ 160	163	166	166	169	173	176	179	182	182	188	195	
	.04	\$ 207	210	214	214	217	220	223	226	229	229	236	242	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
	.05	\$ 254	258	261	261	264	267	270	273	277	277	283	289	\$ PER YEAR
	.06	\$ 302	305	308	308	311	314	317	321	324	324	330	336	
	.07	\$ 349	352	355	355	358	361	365	368	371	371	377	384	
	.08	\$ 396	399	402	402	406	409	412	415	418	418	424	431	
	.09	\$ 443	446	450	450	453	456	459	462	465	465	472	478	
	.10	\$ 491	494	497	497	500	503	506	509	513	513	519	525	
	.12	\$ 582	585	588	588	591	594	598	601	604	604	610	616	BALANCE POINT 28 DEG.F.
50,000		\$ 258	295	330	368	406	443	478	516	554	591	664	739	<--THEORETICAL HEATING COST * FURNACE ONLY
	.03	\$ 201	210	217	226	232	242	248	258	264	273	289	305	
	.04	\$ 248	258	264	273	280	289	295	305	311	321	336	352	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
	.05	\$ 299	308	314	324	330	339	346	355	361	371	387	402	\$ PER YEAR
	.06	\$ 349	358	365	374	380	390	396	406	412	421	437	453	
	.07	\$ 396	406	412	421	428	437	443	453	459	469	484	500	
	.08	\$ 446	456	462	472	478	487	494	503	509	519	535	550	
	.09	\$ 494	503	509	519	525	535	541	550	557	566	582	598	
	.10	\$ 544	554	560	569	576	585	591	601	607	616	632	648	
	.12	\$ 642	651	657	667	673	683	689	698	705	714	730	746	BALANCE POINT 33 DEG.F.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12	
	\$ 286	382	478	573	669	765	860	956	1147	<--ELECTRIC RATE \$/KWH
										<--THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY
 DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
 HEAT PUMP MODEL: OUTDOOR_42HPO INDOOR_H5A9
 ARI RATED COOLING CAP.: BTUH (47) 42500 SEER 8.00
 ARI RATED HEATING CAP.: BTUH (17) 41500 COP (17) 2.70 HSPF 6.25 MIN.DHR REG IV
 FURNACE TYPE FUEL_OIL FURNACE EFFICIENCY .65 AEWE

HEAT LOSS BTUH	ELEC. COST \$/KWH	HEATING OIL COST - \$/GALLON													
		1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	2.00	2.20	2.40		
25,000	\$ 264	292	317	346	371	399	424	453	478	531	585	639	<--THEORETICAL HEATING COST * FURNACE ONLY		
.03	\$ 103	103	103	103	103	103	103	103	103	103	103	103	103	103	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
.04	\$ 138	138	138	138	138	138	138	138	138	138	138	138	138	138	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
.05	\$ 173	173	173	173	173	173	173	173	173	173	173	173	173	173	\$ PER YEAR
.06	\$ 204	204	204	204	204	204	204	204	204	204	204	204	204	204	
.07	\$ 239	239	239	239	239	239	239	239	239	239	239	239	239	239	
.08	\$ 273	273	273	273	273	273	273	273	273	273	273	273	273	273	
.09	\$ 308	308	308	308	308	308	308	308	308	308	308	308	308	308	
.10	\$ 343	343	343	343	343	343	343	343	343	343	343	343	343	343	BALANCE POINT 17 DEG.F.
.12	\$ 412	412	412	412	412	412	412	412	412	412	412	412	412	412	
30,000	\$ 317	349	384	415	446	478	509	541	576	638	701	768	<--THEORETICAL HEATING COST * FURNACE ONLY		
.03	\$ 119	119	119	119	119	119	119	119	119	119	119	122	122	122	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
.04	\$ 160	160	160	160	160	160	160	160	160	160	160	163	163	163	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
.05	\$ 201	201	201	201	201	201	201	201	201	201	201	204	204	204	\$ PER YEAR
.06	\$ 242	242	242	242	242	242	242	242	242	242	242	245	245	245	
.07	\$ 283	283	283	283	283	283	283	283	283	283	283	286	286	286	
.08	\$ 324	324	324	324	324	324	324	324	324	324	324	327	327	327	
.09	\$ 361	361	361	361	361	361	361	361	361	361	361	365	365	365	
.10	\$ 402	402	402	402	402	402	402	402	402	402	402	406	406	406	BALANCE POINT 21 DEG.F.
.12	\$ 484	484	484	484	484	484	484	484	484	484	484	487	487	487	
35,000	\$ 371	409	446	484	522	560	594	632	670	746	821	893	<--THEORETICAL HEATING COST * FURNACE ONLY		
.03	\$ 141	141	141	141	141	144	144	144	144	144	144	147	147	147	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
.04	\$ 185	185	185	185	185	188	188	188	188	188	188	192	192	192	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
.05	\$ 232	232	232	232	232	236	236	236	236	236	236	239	239	239	\$ PER YEAR
.06	\$ 277	277	277	277	277	280	280	280	280	280	280	283	283	283	
.07	\$ 324	324	324	324	324	327	327	327	327	327	327	330	330	330	
.08	\$ 371	371	371	371	371	374	374	374	374	374	374	377	377	377	
.09	\$ 415	415	415	415	415	418	418	418	418	418	418	421	421	421	
.10	\$ 462	462	462	462	462	465	465	465	465	465	465	469	469	469	BALANCE POINT 25 DEG.F.
.12	\$ 554	554	554	554	554	557	557	557	557	557	557	560	560	560	
40,000	\$ 424	469	509	554	594	638	683	723	768	853	938	1023	<--THEORETICAL HEATING COST * FURNACE ONLY		
.03	\$ 163	163	163	166	166	166	169	169	169	173	173	176	176	176	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
.04	\$ 214	214	214	217	217	217	220	220	220	223	223	226	226	226	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
.05	\$ 264	264	264	267	267	267	270	270	270	273	273	277	277	277	\$ PER YEAR
.06	\$ 314	314	314	317	317	317	321	321	321	324	324	327	327	327	
.07	\$ 365	365	365	368	368	368	371	371	371	374	374	377	377	377	
.08	\$ 415	415	415	418	418	418	421	421	421	424	424	428	428	428	
.09	\$ 469	469	469	472	472	472	475	475	475	478	478	481	481	481	
.10	\$ 519	519	519	522	522	522	525	525	525	528	528	531	531	531	BALANCE POINT 28 DEG.F.
.12	\$ 620	620	620	623	623	623	626	626	626	629	629	632	632	632	
50,000	\$ 531	585	638	692	746	799	853	906	960	1067	1174	1277	<--THEORETICAL HEATING COST * FURNACE ONLY		
.03	\$ 210	214	217	220	223	226	229	229	232	239	245	251	251	251	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
.04	\$ 270	273	277	280	283	286	289	289	292	299	305	311	311	311	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
.05	\$ 330	333	336	339	343	346	349	349	352	358	365	371	371	371	\$ PER YEAR
.06	\$ 387	390	393	396	399	402	406	406	409	415	421	428	428	428	
.07	\$ 446	450	453	456	459	462	465	465	469	475	481	487	487	487	
.08	\$ 506	509	513	516	519	522	525	525	528	535	541	547	547	547	
.09	\$ 566	569	572	576	579	582	585	585	588	594	601	607	607	607	
.10	\$ 626	629	632	635	638	642	645	645	648	654	661	667	667	667	BALANCE POINT 33 DEG.F.
.12	\$ 746	749	752	755	758	761	764	764	768	774	780	786	786	786	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12	
\$	286	382	478	573	669	765	860	956	1147	<--ELECTRIC RATE \$/KWH
										<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

GARD MANUFACTURING COMPANY
DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
HEAT PUMP MODEL: OUTDOOR 42HPQ INDOOR H54W
ARI RATED COOLING CAP.: BTUH 78512 SEER 8.0
ARI RATED HEATING CAP.: BTUH 147150 COP 1.23 HSPF 6.25 MIN. OHR REG IV
BTUH (17) 24000 COP (17) 1.80
FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 65.00% AEUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	PROPANE GAS COST - \$/GALLON													
		.60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10	1.20			
25,000	\$	242	264	283	302	324	343	365	384	406	446	487	487	---THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	103	103	103	103	103	103	103	103	103	103	103	103	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.04	\$	138	138	138	138	138	138	138	138	138	138	138	138	\$ PER YEAR	
.05	\$	173	173	173	173	173	173	173	173	173	173	173	173		
.06	\$	204	204	204	204	204	204	204	204	204	204	204	204		
.07	\$	239	239	239	239	239	239	239	239	239	239	239	239		
.08	\$	273	273	273	273	273	273	273	273	273	273	273	273		
.09	\$	308	308	308	308	308	308	308	308	308	308	308	308		
.10	\$	343	343	343	343	343	343	343	343	343	343	343	343	BALANCE POINT 17 DEG.F.	
.12	\$	412	412	412	412	412	412	412	412	412	412	412	412		
30,000	\$	292	314	337	365	392	412	437	462	487	535	585	585	---THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	119	119	119	119	119	119	119	119	119	119	119	119	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.04	\$	160	160	160	160	160	160	160	160	160	160	160	160	\$ PER YEAR	
.05	\$	201	201	201	201	201	201	201	201	201	201	201	201		
.06	\$	242	242	242	242	242	242	242	242	242	242	242	242		
.07	\$	283	283	283	283	283	283	283	283	283	283	283	283		
.08	\$	324	324	324	324	324	324	324	324	324	324	324	324		
.09	\$	361	361	361	361	361	361	361	361	361	361	361	361		
.10	\$	402	402	402	402	402	402	402	402	402	402	402	402	BALANCE POINT 21 DEG.F.	
.12	\$	484	484	484	484	484	484	484	484	484	484	484	484		
35,000	\$	339	368	396	424	453	491	509	538	566	626	683	683	---THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	141	141	141	141	141	141	141	144	144	144	144	144	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.04	\$	185	185	185	185	185	185	185	188	188	188	188	188	\$ PER YEAR	
.05	\$	232	232	232	232	232	232	232	236	236	236	236	236		
.06	\$	277	277	277	277	277	277	277	280	280	280	280	280		
.07	\$	324	324	324	324	324	324	324	327	327	327	327	327		
.08	\$	371	371	371	371	371	371	371	374	374	374	374	374		
.09	\$	415	415	415	415	415	415	415	418	418	418	418	418		
.10	\$	462	462	462	462	462	462	462	465	465	465	465	465	BALANCE POINT 25 DEG.F.	
.12	\$	554	554	554	554	554	554	554	557	557	557	557	557		
40,000	\$	390	421	453	487	519	550	585	615	648	714	780	780	---THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	163	163	163	163	163	166	166	166	166	169	169	169	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.04	\$	214	214	214	214	214	217	217	217	217	220	220	220	\$ PER YEAR	
.05	\$	264	264	264	264	264	267	267	267	267	270	270	270		
.06	\$	314	314	314	314	314	317	317	317	317	321	321	321		
.07	\$	365	365	365	365	365	368	368	368	368	371	371	371		
.08	\$	415	415	415	415	415	418	418	418	418	421	421	421		
.09	\$	469	469	469	469	469	472	472	472	472	475	475	475		
.10	\$	519	519	519	519	519	522	522	522	522	525	525	525	BALANCE POINT 28 DEG.F.	
.12	\$	620	620	620	620	620	623	623	623	623	626	626	626		
50,000	\$	487	528	566	607	648	689	730	771	812	893	975	975	---THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	207	210	210	214	217	220	220	223	226	229	236	236	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.04	\$	267	270	270	273	277	280	280	283	286	289	295	295	\$ PER YEAR	
.05	\$	327	330	330	333	336	339	339	343	346	349	355	355		
.06	\$	384	387	387	390	393	396	396	399	402	406	412	412		
.07	\$	443	446	446	450	453	456	456	459	462	466	472	472		
.08	\$	503	506	506	509	513	516	516	519	522	525	531	531		
.09	\$	563	566	566	569	572	576	576	579	582	585	591	591		
.10	\$	623	626	626	629	632	635	635	638	642	645	651	651	BALANCE POINT 33 DEG.F.	
.12	\$	742	746	746	749	752	755	755	758	761	764	771	771		

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12	
	\$ 286	382	478	573	669	765	860	956	1147	---ELECTRIC RATE \$/KWH
										---THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY
 DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
 HEAT PUMP MODEL: OUTDOOR 48HPQ2 INDOOR H2AQ
 ARI RATED COOLING CAP.: BTUH (95) 42500 SEER 8.10
 ARI RATED HEATING CAP.: BTUH (47) 44000 COP(47) 2.60 HSPF 6.12 MIN.DHR REG IV
 FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00% AEWE

HEAT LOSS
 BTUH

ELEC.
 COST
 \$/KWH

30,000

--- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

.03	\$	125	251
.04	\$	169	336
.05	\$	210	421
.06	\$	254	506
.07	\$	295	591
.08	\$	339	676
.09	\$	380	758
.10	\$	424	843
.12	\$	506	1013

BALANCE POINT 19 DEG.F.

35,000

--- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

.03	\$	144	295
.04	\$	195	393
.05	\$	242	491
.06	\$	292	591
.07	\$	343	689
.08	\$	390	786
.09	\$	440	887
.10	\$	487	985
.12	\$	585	1183

BALANCE POINT 23 DEG.F.

40,000

--- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

.03	\$	166	336
.04	\$	220	450
.05	\$	273	563
.06	\$	327	676
.07	\$	387	786
.08	\$	440	900
.09	\$	494	1013
.10	\$	547	1126
.12	\$	661	1353

BALANCE POINT 27 DEG.F.

50,000

--- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

.03	\$	204	421
.04	\$	273	563
.05	\$	343	701
.06	\$	409	843
.07	\$	478	985
.08	\$	544	1126
.09	\$	613	1268
.10	\$	683	1407
.12	\$	818	1690

BALANCE POINT 32 DEG.F.

60,000

--- THEORETICAL ANNUAL HEATING COST ---
 HEAT PUMP WITH ELECTRIC HEAT ELECTRIC HEAT ONLY

.03	\$	248	506
.04	\$	330	676
.05	\$	412	843
.06	\$	497	1013
.07	\$	579	1183
.08	\$	664	1353
.09	\$	749	1520
.10	\$	831	1690
.12	\$	997	2030

BALANCE POINT 36 DEG.F.

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

.03	.04	.05	.06	.07	.08	.09	.10	.12
\$ 309	413	516	619	723	826	929	1033	1239

<--ELECTRIC RATE \$/KWH
 <--THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY
 DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
 HEAT PUMP MODEL: OUTDOOR 48HP02 INDOOR H54Q
 ARI RATED COOLING CAP.: BTUH 175 1 25500 SEER 8.10
 ARI RATED HEATING CAP.: BTUH 147 1 22000 COP 4.31 2.60 HSPF 6.15 MIN.DHR REG IV
 FURNACE TYPE NATURAL GAS 26800 COP 11.85 FURNACE EFFICIENCY 65.00% A/EVE

HEAT LOSS BTUH	ELEC. COST \$/KWH	NATURAL GAS COST - \$/THERM												
		.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.90	1.00	
30,000		\$ 154	176	198	220	242	264	286	308	330	352	399	443	<--THEORETICAL HEATING COST * FURNACE ONLY
	.03	\$ 125	125	125	125	125	129	129	129	129	129	129	129	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
	.04	\$ 166	166	166	166	166	169	169	169	169	169	169	169	\$ PER YEAR
	.05	\$ 210	210	210	210	210	214	214	214	214	214	214	214	
	.06	\$ 251	251	251	251	251	254	254	254	254	254	254	254	
	.07	\$ 295	295	295	295	295	299	299	299	299	299	299	299	
	.08	\$ 336	336	336	336	336	339	339	339	339	339	339	339	
	.09	\$ 377	377	377	377	377	380	380	380	380	380	380	380	
	.10	\$ 421	421	421	421	421	424	424	424	424	424	424	424	BALANCE POINT 19 DEG.F.
	.12	\$ 503	503	503	503	503	506	506	506	506	506	506	506	
35,000		\$ 179	204	232	258	283	308	336	361	387	412	465	516	<--THEORETICAL HEATING COST * FURNACE ONLY
	.03	\$ 147	147	147	147	151	151	151	151	154	154	154	157	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
	.04	\$ 195	195	195	195	198	198	198	198	201	201	201	201	\$ PER YEAR
	.05	\$ 242	242	242	242	245	245	245	245	248	248	248	251	
	.06	\$ 289	289	289	289	292	292	292	292	295	295	295	299	
	.07	\$ 336	336	336	336	339	339	339	339	343	343	343	346	
	.08	\$ 384	384	384	384	387	387	387	387	390	390	390	393	
	.09	\$ 431	431	431	431	434	434	434	434	437	437	437	440	
	.10	\$ 478	478	478	478	481	481	481	481	484	484	484	487	BALANCE POINT 23 DEG.F.
	.12	\$ 572	572	572	572	576	576	576	576	579	579	579	582	
40,000		\$ 204	236	264	295	324	352	384	412	443	472	531	591	<--THEORETICAL HEATING COST * FURNACE ONLY
	.03	\$ 166	169	173	173	176	179	182	185	188	188	195	201	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
	.04	\$ 217	220	223	223	226	229	232	236	239	239	245	251	\$ PER YEAR
	.05	\$ 267	270	273	273	277	280	283	286	289	289	295	302	
	.06	\$ 314	317	321	321	324	327	330	333	336	336	343	349	
	.07	\$ 365	368	371	371	374	377	380	384	387	387	393	399	
	.08	\$ 415	418	421	421	424	428	431	434	437	437	443	450	
	.09	\$ 465	469	472	472	475	478	481	484	487	487	494	500	
	.10	\$ 513	516	519	519	522	525	528	531	535	535	541	547	BALANCE POINT 27 DEG.F.
	.12	\$ 613	616	620	620	623	626	629	632	635	635	642	648	
50,000		\$ 258	295	330	368	406	443	478	516	554	591	664	739	<--THEORETICAL HEATING COST * FURNACE ONLY
	.03	\$ 207	217	223	232	239	248	254	264	270	280	295	311	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
	.04	\$ 261	270	277	286	292	302	308	317	324	333	349	365	\$ PER YEAR
	.05	\$ 311	321	327	336	343	352	358	368	374	384	399	415	
	.06	\$ 365	374	380	390	396	406	412	421	428	437	453	469	
	.07	\$ 415	424	431	440	446	456	462	472	478	487	503	519	
	.08	\$ 469	478	484	494	500	509	516	525	531	541	557	572	
	.09	\$ 519	528	535	544	550	560	566	576	582	591	607	623	
	.10	\$ 572	582	588	598	604	613	620	629	635	645	661	676	BALANCE POINT 32 DEG.F.
	.12	\$ 673	683	689	698	705	714	720	730	736	746	761	777	
60,000		\$ 308	352	399	443	487	531	576	620	664	708	799	887	<--THEORETICAL HEATING COST * FURNACE ONLY
	.03	\$ 248	258	267	277	286	295	305	314	324	333	352	371	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
	.04	\$ 308	317	327	336	346	355	365	374	384	393	412	431	\$ PER YEAR
	.05	\$ 368	377	387	396	406	415	424	434	443	453	472	491	
	.06	\$ 428	437	446	456	465	475	484	494	503	513	531	550	
	.07	\$ 491	500	509	519	528	538	547	557	566	576	594	613	
	.08	\$ 550	560	569	579	588	598	607	616	626	635	654	673	
	.09	\$ 610	620	629	638	648	657	667	676	686	695	714	733	
	.10	\$ 670	679	689	698	708	717	727	736	746	755	774	793	BALANCE POINT 36 DEG.F.
	.12	\$ 793	802	812	821	831	840	849	859	868	878	897	916	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12	
	\$ 309	413	516	619	723	826	929	1033	1239	<--ELECTRIC RATE \$/KWH
										<--THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY
 DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
 HEAT PUMP MODEL: OUTDOOR 48HRQZ INDOOR H5AQ
 ARI RATED COOLING CAP.: BTUH (17) 4550 SEER 8.10
 ARI RATED HEATING CAP.: BTUH (17) 4400 COP (17) 2.60 HSPF 6.15 MIN-DHR REG IV
 BTUH (17) 26800 COP (17) 1.85
 FURNACE TYPE EVEL-OIL FURNACE EFFICIENCY .65 QD3 AFWE

HEAT LOSS BTUH	ELEC. COST \$/KWH	HEATING OIL COST - \$/GALLON													
		1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	2.00	2.20	2.40		
30,000	\$	317	349	384	415	446	478	509	541	576	638	701	768	---THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	125	125	125	125	125	125	125	125	125	125	125	125	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.04	\$	169	169	169	169	169	169	169	169	169	169	169	169	\$ PER YEAR	
.05	\$	210	210	210	210	210	210	210	210	210	210	210	210		
.06	\$	254	254	254	254	254	254	254	254	254	254	254	254		
.07	\$	295	295	295	295	295	295	295	295	295	295	295	295		
.08	\$	339	339	339	339	339	339	339	339	339	339	339	339		
.09	\$	380	380	380	380	380	380	380	380	380	380	380	380		
.10	\$	421	421	421	421	421	421	421	421	421	421	421	421	BALANCE POINT 19 DEG.F.	
.12	\$	506	506	506	506	506	506	506	506	506	506	506	506		
35,000	\$	371	409	446	484	522	560	594	632	670	746	821	893	---THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	147	147	147	147	147	147	147	147	147	147	147	147	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.04	\$	195	195	195	195	195	195	195	195	195	195	195	195	\$ PER YEAR	
.05	\$	245	245	245	245	245	245	245	245	245	245	245	245		
.06	\$	292	292	292	292	292	292	292	292	292	292	292	292		
.07	\$	339	339	339	339	339	339	339	339	339	339	339	339		
.08	\$	390	390	390	390	390	390	390	390	390	390	390	390		
.09	\$	437	437	437	437	437	437	437	437	437	437	437	437		
.10	\$	487	487	487	487	487	487	487	487	487	487	487	487	BALANCE POINT 23 DEG.F.	
.12	\$	582	582	582	582	582	582	582	582	582	582	582	582		
40,000	\$	424	469	509	554	594	638	683	723	768	853	938	1023	---THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	163	166	166	166	166	166	166	166	166	169	169	169	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.04	\$	220	223	223	223	223	223	223	223	223	226	226	226	\$ PER YEAR	
.05	\$	273	277	277	277	277	277	277	277	277	280	280	280		
.06	\$	327	330	330	330	330	330	330	330	330	333	333	333		
.07	\$	380	384	384	384	384	384	384	384	384	387	387	387		
.08	\$	434	437	437	437	437	437	437	437	437	440	440	440		
.09	\$	487	491	491	491	491	491	491	491	491	494	494	494		
.10	\$	544	547	547	547	547	547	547	547	547	550	550	550	BALANCE POINT 27 DEG.F.	
.12	\$	651	654	654	654	654	654	654	654	654	657	657	657		
50,000	\$	531	585	638	692	746	799	853	906	960	1067	1174	1277	---THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	214	214	217	220	223	223	226	229	229	236	239	242	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.04	\$	277	277	280	283	286	286	289	292	292	299	302	305	\$ PER YEAR	
.05	\$	339	339	343	346	349	349	352	355	355	361	365	368		
.06	\$	402	402	406	409	412	412	415	418	418	424	428	431		
.07	\$	465	465	469	472	475	475	478	481	481	487	491	494		
.08	\$	531	531	535	538	541	541	544	547	547	554	557	560		
.09	\$	594	594	598	601	604	604	607	610	610	616	620	623		
.10	\$	657	657	661	664	667	667	670	673	673	679	683	686	BALANCE POINT 32 DEG.F.	
.12	\$	783	783	786	790	793	793	796	799	799	805	808	812		
60,000	\$	638	701	768	831	893	960	1023	1085	1152	1277	1407	1536	---THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$	267	270	277	283	286	292	299	302	308	317	330	339	THEORETICAL HEATING COST * FURN.+ HEAT PUMP	
.04	\$	339	343	349	355	358	355	371	374	380	390	402	412	\$ PER YEAR	
.05	\$	409	412	418	424	428	434	440	443	450	459	472	481		
.06	\$	481	484	491	497	500	506	513	516	522	531	544	554		
.07	\$	550	554	560	566	569	576	582	585	591	601	613	623		
.08	\$	623	626	632	638	642	648	654	657	664	673	686	695		
.09	\$	695	698	705	711	714	720	727	730	736	746	758	768		
.10	\$	764	768	774	780	783	790	796	799	805	815	827	837		
.12	\$	909	912	919	925	928	934	941	944	950	960	972	982	BALANCE POINT 36 DEG.F.	

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12	
\$	309	413	516	619	723	826	929	1033	1239	---ELECTRIC RATE \$/KWH
										---THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.

BARD MANUFACTURING COMPANY
 DUAL FUEL ADD-ON HEAT PUMP GUIDE TO ENERGY COST SAVINGS

REGION 2
 HEAT PUMP MODEL: OUTDOOR 48HPQ2 INDOOR H2AQ
 ARI RATED COOLING CAP.: BTUH 18811-26500 SEER 8.10
 ARI RATED HEATING CAP.: BTUH 1471-2500 COP (7.1) 2.60, HSPF 6.15 MIN.DHR REG IV
 BTUH 117 2600 COP (17.1) 1.85
 FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 65.0% AEUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	PROPANE GAS COST - \$/GALLON													
		.60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10	1.20	1.20		
30,000	\$ 292	314	339	365	390	412	437	462	487	535	585	585	585	<--THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$ 125	125	125	125	125	125	125	125	125	125	125	125	125	THEORETICAL HEATING COST * FURN. + HEAT PUMP \$ PER YEAR	
.04	\$ 169	169	169	169	169	169	169	169	169	169	169	169	169		
.05	\$ 210	210	210	210	210	210	210	210	210	210	210	210	210		
.06	\$ 254	254	254	254	254	254	254	254	254	254	254	254	254		
.07	\$ 295	295	295	295	295	295	295	295	295	295	295	295	295		
.08	\$ 339	339	339	339	339	339	339	339	339	339	339	339	339		
.09	\$ 380	380	380	380	380	380	380	380	380	380	380	380	380		
.10	\$ 421	421	421	421	421	421	421	421	421	421	421	421	421		
.12	\$ 506	506	506	506	506	506	506	506	506	506	506	506	506		
35,000	\$ 339	368	396	424	453	481	509	538	566	626	683	683	683		<--THEORETICAL HEATING COST * FURNACE ONLY
.03	\$ 147	147	147	147	147	147	147	147	147	147	147	147	147		THEORETICAL HEATING COST * FURN. + HEAT PUMP \$ PER YEAR
.04	\$ 195	195	195	195	195	195	195	195	195	195	195	195	195		
.05	\$ 245	245	245	245	245	245	245	245	245	245	245	245	245		
.06	\$ 292	292	292	292	292	292	292	292	292	292	292	292	292		
.07	\$ 339	339	339	339	339	339	339	339	339	339	339	339	339		
.08	\$ 390	390	390	390	390	390	390	390	390	390	390	390	390		
.09	\$ 437	437	437	437	437	437	437	437	437	437	437	437	437		
.10	\$ 487	487	487	487	487	487	487	487	487	487	487	487	487		
.12	\$ 582	582	582	582	582	582	582	582	582	582	582	582	582		
40,000	\$ 390	421	453	487	519	550	585	616	648	714	780	780	780	<--THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$ 163	163	166	166	166	166	166	166	166	166	169	169	169	THEORETICAL HEATING COST * FURN. + HEAT PUMP \$ PER YEAR	
.04	\$ 220	220	223	223	223	223	223	223	223	223	226	226	226		
.05	\$ 273	273	277	277	277	277	277	277	277	277	280	280	280		
.06	\$ 327	327	330	330	330	330	330	330	330	330	333	333	333		
.07	\$ 380	380	384	384	384	384	384	384	384	384	387	387	387		
.08	\$ 434	434	437	437	437	437	437	437	437	437	440	440	440		
.09	\$ 487	487	491	491	491	491	491	491	491	491	494	494	494		
.10	\$ 544	544	547	547	547	547	547	547	547	547	550	550	550		
.12	\$ 651	651	654	654	654	654	654	654	654	654	657	657	657		
50,000	\$ 487	528	566	607	648	689	730	771	812	893	975	975	975		<--THEORETICAL HEATING COST * FURNACE ONLY
.03	\$ 210	214	214	217	217	220	220	223	223	226	229	229	229		THEORETICAL HEATING COST * FURN. + HEAT PUMP \$ PER YEAR
.04	\$ 273	277	277	280	280	283	283	286	286	289	292	292	292		
.05	\$ 336	339	339	343	343	346	346	349	349	352	355	355	355		
.06	\$ 399	402	402	406	406	409	409	412	412	415	418	418	418		
.07	\$ 462	465	465	469	469	472	472	475	475	478	481	481	481		
.08	\$ 528	531	531	535	535	538	538	541	541	544	547	547	547		
.09	\$ 591	594	594	598	598	601	601	604	604	607	610	610	610		
.10	\$ 654	657	657	661	661	664	664	667	667	670	673	673	673		
.12	\$ 780	783	783	786	786	790	790	793	793	796	799	799	799		
60,000	\$ 585	632	683	730	780	827	878	925	975	1073	1170	1170	1170	<--THEORETICAL HEATING COST * FURNACE ONLY	
.03	\$ 261	264	270	273	277	283	286	289	292	302	308	308	308	THEORETICAL HEATING COST * FURN. + HEAT PUMP \$ PER YEAR	
.04	\$ 333	336	343	346	349	355	358	361	365	374	380	380	380		
.05	\$ 402	406	412	415	418	424	428	431	434	443	450	450	450		
.06	\$ 475	478	484	487	491	497	500	503	506	516	522	522	522		
.07	\$ 544	547	554	557	560	566	569	572	576	585	591	591	591		
.08	\$ 616	620	626	629	632	638	642	645	648	657	664	664	664		
.09	\$ 689	692	698	701	705	711	714	717	720	730	736	736	736		
.10	\$ 758	761	768	771	774	780	783	786	790	799	805	805	805		
.12	\$ 903	906	912	916	919	925	928	931	934	944	950	950	950		

ANNUAL AIR CONDITIONING COST WHEN COOLING LOAD IS SIZED TO MATCH COOLING CAPACITY OF HEAT PUMP.

	.03	.04	.05	.06	.07	.08	.09	.10	.12	
	\$ 309	413	516	619	723	826	929	1033	1239	<--ELECTRIC RATE \$/KWH
										<--THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATING COSTS ARE THEORETICAL ESTIMATES ONLY AND ARE PROVIDED FOR A COMMON BASIS OF COMPARISON BETWEEN VARIOUS TYPES OF HEATING AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIDUAL USAGE PATTERN.