



ENERGY GUIDE

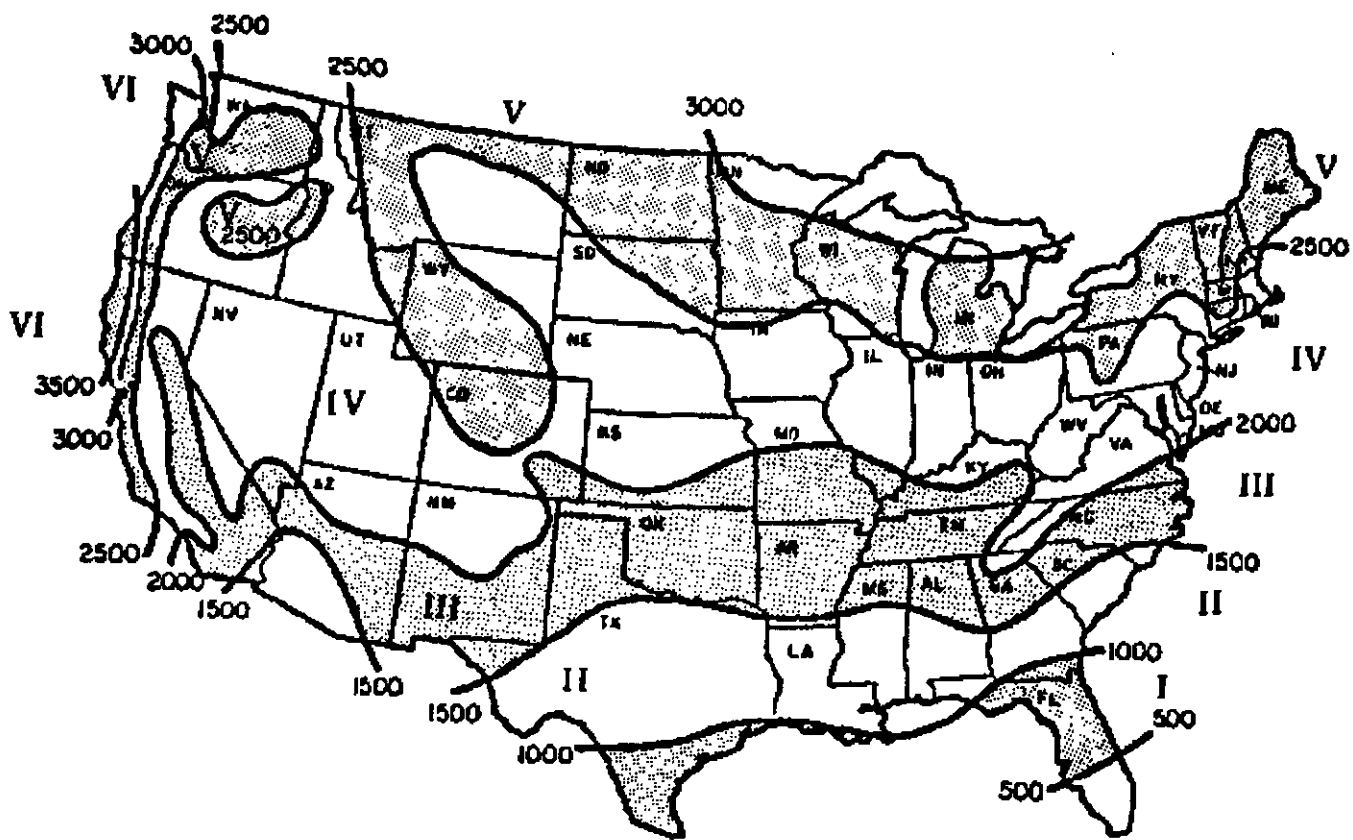
DUAL FUEL ADD-ON HEAT PUMP GUIDE FOR OPERATIONAL COST SAVINGS

REGION 5

BARD MANUFACTURING COMPANY
Bryan, Ohio 43506

Since 1914...Moving, ahead just as planned.

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REGION HEATING LOAD HOURS

<u>Region</u>	<u>HLHr</u>
I	750
II	1250
III	1750
IV	2250
V	2750
VI	2750

This map is reasonably accurate for the most parts of the United States but is necessarily highly generalized and consequently not too accurate in mountainous regions, particularly in the Rockies.

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 Bryan, Ohio 43506

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Heat Pump Outdoor Model	Heat Pump Indoor Model	Furnace Fuel	Furnace AFUE Efficiency Rating	Page
WQS30A	A36AQ-A	Electric	100%	1
		Natural Gas	78%	2
		Oil	78%	3
		Propane	78%	4
WQS36A	A36AQ-A	Electric	100%	5
		Natural Gas	78%	6
		Oil	78%	7
		Propane	78%	8
WQS42A	A42AQ-A	Electric	100%	9
		Natural Gas	78%	10
		Oil	78%	11
		Propane	78%	12
24UHPQC	A36AQ-A	Electric	100%	13
		Natural Gas	78%	14
		Oil	78%	15
		Propane	78%	16
30UHPQC	A36AQ-A	Electric	100%	17
		Natural Gas	78%	18
		Oil	78%	19
		Propane	78%	20
30UHPQC	A37AQ-A	Electric	100%	21
		Natural Gas	78%	22
		Oil	78%	23
		Propane	78%	24
36UHPQC	A37AQ-A	Electric	100%	25
		Natural Gas	78%	26
		Oil	78%	27
		Propane	78%	28
42UHPQA	A61AQ-A	Electric	100%	29
		Natural Gas	78%	30
		Oil	78%	31
		Propane	78%	32
48UHPQB	A61AQ-A	Electric	100%	33
		Natural Gas	78%	34
		Oil	78%	35
		Propane	78%	36
60UHPQB	A61AQ-A	Electric	100%	37
		Natural Gas	78%	38
		Oil	78%	39
		Propane	78%	40

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--FUEL SAVER MODULE

These estimates utilize the Bard 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 Fuel Saver Module.

FURNACE EFFICIENCY

For purposes of these cost estimates, furnace efficiency levels of 100% AFUE for electric, 78% AFUE for natural and propane gas and 78% 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.

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

- Determine the heating Btuh loss and cooling Btuh gain for structure using a Bard "Whole-House Heat Loss and Gain Work Sheet," Form B008, ACCA "Load Calculation," Manual J.
 - Heating house Btuh loss is _____ .
 - Cooling house Btuh gain is _____ .
- Determine the type of fuel available at structure (what type of (fuel) heating system is already there).
 - Electricity
 - Natural gas
 - Propane gas
 - Fuel oil
 - Good water supply and disposal
- Call local utilities and determine area energy costs.
 - Electricity _____ \$/Kilowatt-hour
 - Natural gas _____ \$/Therm
 - Propane gas _____ \$/Gallon
 - Fuel Oil _____ \$/Gallon
- Tentatively select an add-on heat pump system using Bard Manual 2100-057, "Heat Pump Sizing" as a guide, and a Bard equipment catalog.
 - Air to air heat pump
Model _____ Indoor Coil _____
Btuh _____ Heat Btuh _____ Cool
 - Water to air
Model _____ Indoor Coil _____
Btuh _____ Heat Btuh _____ Cool
- 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.
 - 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 Contents.

Example 36UHPQA w/A36AQ-A Indoor Coil

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

REGION 5		36UHPQA/A36AQ-A		
HEAT PUMP MODEL	OUTDOOR	<u>36UHPQA</u>	INDOOR	<u>A36AQ-A</u>
ARI RATED COOLING CAP:		BTUH (95)	<u>33000</u>	SEER <u>8.69</u>
ARI RATED HEATING CAP:		BTUH (47)	<u>13600</u>	COP (47) <u>2.90</u> , HSPF <u>6.90</u> MIN. DHR REG IV
		BTUH (17)	<u>20000</u>	COP (17) <u>2.20</u>

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

EXAMPLE: A fuel oil furnace with AFUE of 78%.

FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 78.00% AFUE

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 the 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 \$1,568.

- 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 the 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 cost and \$1.40 per gallon fuel oil. The annual cost using a 36UHPQA Bard heat pump with the oil furnace would be \$1,613 for an annual savings of \$299 (\$1,912 minus \$1,613).

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 36UHPQA heat pump has a balance point of 31°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 Fuel Saver Module.

70,000	\$	952	1092	1231	1363	1502	1641	1780	1912	2052	2191	2323	2462	← THEORETICAL HEATING COST * FURNACE ONLY
05	\$	946	1029	1119	1203	1286	1377	1460	1544	1627	1718	1801	1885	
06	\$	1015	1099	1189	1272	1356	1446	1530	1613	1697	1787	1871	1954	← THEORETICAL HEATING COST * FURN + HEAT PUMP \$ PER YEAR
07	\$	1085	1168	1259	1342	1426	1516	1599	1683	1766	1857	1940	2024	
08	\$	1154	1238	1328	1412	1495	1586	1669	1752	1836	1926	2010	2093	
09	\$	1224	1307	1398	1481	1565	1655	1739	1822	1905	1996	2079	2163	
10	\$	1293	1377	1467	1551	1634	1725	1808	1892	1975	2065	2149	2232	
12	\$	1432	1516	1606	1690	1773	1864	1947	2031	2114	2205	2288	2372	
14	\$	1572	1655	1745	1829	1912	2003	2086	2170	2253	2344	2427	2511	
16	\$	1711	1794	1885	1968	2052	2142	2225	2309	2392	2483	2566	2650	← 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 \$91.00 annually.

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

05	06	07	08	09	10	12	14	16	← ELECTRIC RATE \$/KWH
\$ 75	91	106	121	136	151	182	212	243	← 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.

FIGURE 1

HEAT LOSS BTU/H	ELEC COST \$/KWH	HEATING OIL COST - \$/GALLON												
		70	80	90	1 00	1 10	1 20	1 30	1 40	1 50	1 60	1 70	1 80	
35,000	\$ 473	542	612	681	751	820	890	952	1022	1092	1161	1231	←THEORETICAL HEATING COST * FURNACE ONLY	
05	\$ 500	521	542	563	584	605	626	646	667	688	709	737	THEORETICAL HEATING COST * FURN + HEAT PUMP \$ PER YEAR	
06	\$ 570	591	612	633	653	674	695	716	737	758	779	806		
07	\$ 639	660	681	702	723	744	765	786	806	827	848	876		
08	\$ 716	737	758	779	799	820	841	862	883	904	925	952		
09	\$ 786	806	827	848	869	890	911	932	952	973	994	1022		
10	\$ 855	876	897	918	939	959	980	1001	1022	1043	1064	1092		
12	\$ 994	1015	1036	1057	1078	1099	1119	1140	1161	1182	1203	1231		
14	\$ 1140	1161	1182	1203	1224	1245	1266	1286	1307	1328	1349	1377	BALANCE POINT 13 DEG. F.	
16	\$ 1279	1300	1321	1342	1363	1384	1405	1426	1446	1467	1488	1516		
40,000	\$ 542	626	702	779	855	939	1015	1092	1168	1252	1328	1405	←THEORETICAL HEATING COST * FURNACE ONLY	
05	\$ 563	591	612	639	660	688	709	730	758	779	806	827	THEORETICAL HEATING COST * FURN + HEAT PUMP \$ PER YEAR	
06	\$ 646	674	695	723	744	772	793	813	841	862	890	911		
07	\$ 723	751	772	799	820	848	869	890	918	939	966	987		
08	\$ 799	827	848	876	897	925	946	966	994	1015	1043	1064		
09	\$ 883	911	932	959	980	1008	1029	1050	1078	1099	1126	1147		
10	\$ 959	987	1008	1036	1057	1085	1106	1126	1154	1175	1203	1224		
12	\$ 1119	1147	1168	1196	1217	1245	1266	1286	1314	1335	1363	1384		
14	\$ 1279	1307	1328	1356	1377	1405	1426	1446	1474	1495	1523	1544	BALANCE POINT 16 DEG. F.	
16	\$ 1439	1467	1488	1516	1537	1565	1586	1606	1634	1655	1683	1704		
50,000	\$ 681	779	876	973	1071	1168	1266	1363	1467	1565	1662	1759	←THEORETICAL HEATING COST * FURNACE ONLY	
05	\$ 695	744	793	841	890	939	987	1036	1085	1133	1189	1238	THEORETICAL HEATING COST * FURN + HEAT PUMP \$ PER YEAR	
06	\$ 765	813	862	911	959	1008	1057	1106	1154	1203	1259	1307		
07	\$ 834	883	932	980	1029	1078	1126	1175	1224	1272	1328	1377		
08	\$ 904	952	1001	1050	1099	1147	1196	1245	1293	1342	1398	1446		
09	\$ 966	1015	1064	1112	1161	1210	1259	1307	1356	1405	1460	1509		
10	\$ 1036	1085	1133	1182	1231	1279	1328	1377	1426	1474	1530	1579		
12	\$ 1175	1224	1272	1321	1370	1419	1467	1516	1565	1613	1669	1718		
14	\$ 1314	1363	1412	1460	1509	1558	1606	1655	1704	1752	1808	1857	BALANCE POINT 22 DEG. F.	
16	\$ 1453	1502	1551	1599	1648	1697	1745	1794	1843	1892	1947	1996		
60,000	\$ 820	939	1050	1168	1286	1405	1523	1641	1759	1878	1996	2107	←THEORETICAL HEATING COST * FURNACE ONLY	
05	\$ 820	890	966	1036	1112	1189	1259	1335	1405	1481	1551	1627	THEORETICAL HEATING COST * FURN + HEAT PUMP \$ PER YEAR	
06	\$ 883	952	1029	1099	1175	1252	1321	1398	1467	1544	1613	1690		
07	\$ 834	883	932	980	1029	1078	1126	1175	1224	1272	1328	1377		
08	\$ 904	952	1001	1050	1099	1147	1196	1245	1293	1342	1398	1446		
09	\$ 966	1015	1064	1112	1161	1210	1259	1307	1356	1405	1460	1509		
10	\$ 1036	1085	1133	1182	1231	1279	1328	1377	1426	1474	1530	1579		
12	\$ 1175	1224	1272	1321	1370	1419	1467	1516	1565	1613	1669	1718		
14	\$ 1314	1363	1412	1460	1509	1558	1606	1655	1704	1752	1808	1857	BALANCE POINT 27 DEG. F.	
16	\$ 1453	1502	1551	1599	1648	1697	1745	1794	1843	1892	1947	1996		
70,000	\$ 952	1092	1231	1363	1502	1641	1780	1912	2052	2191	2323	2462	←THEORETICAL HEATING COST * FURNACE ONLY	
05	\$ 946	1029	1119	1203	1286	1377	1460	1544	1627	1718	1801	1885	THEORETICAL HEATING COST * FURN + HEAT PUMP \$ PER YEAR	
06	\$ 1015	1099	1189	1273	1356	1446	1530	1613	1697	1787	1871	1954		
07	\$ 1085	1168	1259	1342	1426	1516	1599	1683	1766	1857	1940	2024		
08	\$ 1154	1238	1328	1412	1495	1586	1669	1752	1836	1926	2079	2163		
09	\$ 1224	1307	1398	1481	1565	1655	1739	1822	1905	1996	2079	2163		
10	\$ 1293	1377	1467	1551	1634	1725	1808	1892	1975	2065	2149	2232		
12	\$ 1432	1516	1606	1690	1773	1864	1947	2031	2114	2205	2288	2372		
14	\$ 1572	1655	1745	1829	1912	2003	2086	2170	2253	2344	2427	2511	BALANCE POINT 31 DEG. F.	
16	\$ 1711	1794	1885	1968	2052	2142	2225	2309	2392	2483	2566	2650		

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

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
	\$ 75	91	106	121	136	151	182	212	243	←ELECTRIC RATE \$/KWH
										←THEORETICAL AIR CONDITIONING COST

THE ABOVE ANNUAL HEATING AND COOLING OPERATION 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 5
 HEAT PUMP MODEL: COMPRESSOR SECTION W0530A INDOOR A36A0-A
 COOLING CAPACITY AT 45 DEG.F. ENTERING WATER TEMP.: 30900 BTUH, 17.25 SEER
 HEATING CAPACITY AT 45 DEG.F. ENTERING WATER TEMP.: 24750 BTUH, 3.35 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			
.05	\$	306	772
.06	\$	368	925
.07	\$	438	1085
.08	\$	493	1238
.09	\$	556	1391
.10	\$	619	1544
.12	\$	744	1857
.14	\$	862	2170
.16	\$	994	2476
30,000			
.05	\$	361	925
.06	\$	438	1112
.07	\$	507	1300
.08	\$	584	1488
.09	\$	653	1669
.10	\$	730	1857
.12	\$	876	2232
.14	\$	1022	2601
.16	\$	1168	2977
			BALANCE POINT 15- DEG.F.
35,000			
.05	\$	417	1085
.06	\$	500	1300
.07	\$	591	1516
.08	\$	667	1732
.09	\$	758	1947
.10	\$	841	2170
.12	\$	1008	2601
.14	\$	1182	3039
.16	\$	1349	3471
			BALANCE POINT 3- DEG.F.
40,000			
.05	\$	479	1238
.06	\$	577	1488
.07	\$	667	1732
.08	\$	765	1982
.09	\$	862	2232
.10	\$	959	2476
.12	\$	1147	2977
.14	\$	1342	3471
.16	\$	1530	3965
			BALANCE POINT 5 DEG.F.
50,000			
.05	\$	626	1544
.06	\$	751	1857
.07	\$	869	2170
.08	\$	994	2476
.09	\$	1119	2789
.10	\$	1245	3095
.12	\$	1495	3721
.14	\$	1739	4340
.16	\$	1996	4959
			BALANCE POINT 17 DEG.F.

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

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
\$	35	42	50	57	64	71	85	100	114	<--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 5
 HEAT PUMP MODEL: COMPRESSOR SECTION MOS30A INDOOR A36AO-A
 COOLING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 30900 BTUH, 17.25 SEER
 HEATING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 24750 BTUH, 3.35 COP
 FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00% AFUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	NATURAL GAS COST - \$/THERM													
		.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.90		1.00	
25,000	\$	236	271	299	333	368	403	438	473	507	542	605	674	---THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	271	271	271	278	278	278	285	285	285	292	299	299	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	319	319	319	326	326	326	333	333	333	340	347	347		
.07	\$	375	375	375	382	382	382	389	389	389	396	403	403		
.08	\$	424	424	424	431	431	431	438	438	438	445	452	452		
.09	\$	473	473	473	479	479	479	486	486	486	493	500	500		
.10	\$	521	521	521	528	528	528	535	535	535	542	549	549		
.12	\$	626	626	626	633	633	633	639	639	639	646	653	653		
.14	\$	723	723	723	730	730	730	737	737	737	744	751	751		
.16	\$	827	827	827	834	834	834	841	841	841	848	855	855		
30,000	\$	278	319	361	403	445	486	528	563	605	646	730	813			---THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	313	319	319	326	326	333	333	333	340	340	347	354	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	375	382	382	389	389	396	396	396	403	403	410	417		
.07	\$	431	438	438	445	445	452	452	452	459	459	466	473		
.08	\$	493	500	500	507	507	514	514	514	521	521	528	535		
.09	\$	549	556	556	563	563	570	570	570	577	577	584	591		
.10	\$	612	619	619	626	626	633	633	633	639	639	646	653		
.12	\$	730	737	737	744	744	751	751	751	758	758	765	772		
.14	\$	848	855	855	862	862	869	869	869	876	876	883	890		
.16	\$	959	966	966	973	973	980	980	980	987	987	994	1001		
35,000	\$	326	375	424	473	521	563	612	660	709	758	848	946	---THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	361	361	368	375	382	389	396	396	403	410	424	431	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	431	431	438	445	452	459	466	466	473	479	493	500		
.07	\$	493	493	500	507	514	521	528	528	535	542	556	563		
.08	\$	556	556	563	570	577	584	591	591	598	605	619	626		
.09	\$	626	626	633	639	646	653	660	660	667	674	688	695		
.10	\$	688	688	695	702	709	716	723	723	730	737	751	758		
.12	\$	820	820	827	834	841	848	855	855	862	869	883	890		
.14	\$	946	946	952	959	966	973	980	980	987	994	1008	1015		
.16	\$	1078	1078	1085	1092	1099	1106	1112	1112	1119	1126	1140	1147		
40,000	\$	375	431	486	542	591	646	702	758	813	862	973	1085	---THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	403	410	417	431	438	445	452	459	466	479	493	507	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	473	479	486	500	507	514	521	528	535	549	563	577		
.07	\$	549	556	563	577	584	591	598	605	612	626	639	653		
.08	\$	619	626	633	646	653	660	667	674	681	695	709	723		
.09	\$	688	695	702	716	723	730	737	744	751	765	779	793		
.10	\$	758	765	772	786	793	799	806	813	820	834	848	862		
.12	\$	897	904	911	925	932	939	946	952	959	973	987	1001		
.14	\$	1036	1043	1050	1064	1071	1078	1085	1092	1099	1112	1126	1140		
.16	\$	1175	1182	1189	1203	1210	1217	1224	1231	1238	1252	1266	1279		
50,000	\$	473	542	605	674	744	813	876	946	1015	1085	1217	1356	---THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	493	521	549	577	605	626	653	681	709	737	793	841	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	556	584	612	639	667	688	716	744	772	799	855	904		
.07	\$	619	646	674	702	730	751	779	806	834	862	918	966		
.08	\$	681	709	737	765	793	813	841	869	897	925	980	1029		
.09	\$	744	772	799	827	855	876	904	932	959	987	1043	1092		
.10	\$	806	834	862	890	918	939	966	994	1022	1050	1106	1154		
.12	\$	932	959	987	1015	1043	1064	1092	1119	1147	1175	1231	1279		
.14	\$	1057	1085	1112	1140	1168	1189	1217	1245	1272	1300	1356	1405		
.16	\$	1175	1203	1231	1259	1286	1307	1335	1363	1391	1419	1474	1523		

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

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
\$	35	42	50	57	64	71	85	100	114	<--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 5
 HEAT PUMP MODEL: COMPRESSOR SECTION MOS30A INDOOR A36A0-A
 COOLING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 30900 BTUH, 17.25 SEER
 HEATING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 24750 BTUH, 3.35 COP
 FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 78.00% AFUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	HEATING OIL COST - \$/GALLON													
		.70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80		
25,000	\$	340	389	438	486	535	584	633	681	730	779	827	876	<--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	278	278	285	285	292	292	299	299	306	306	313	313	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	326	326	333	333	340	340	347	347	354	354	361	361		
.07	\$	382	382	389	389	396	396	403	403	410	410	417	417		
.08	\$	431	431	438	438	445	445	452	452	459	459	466	466		
.09	\$	479	479	486	486	493	493	500	500	507	507	514	514		
.10	\$	528	528	535	535	542	542	549	549	556	556	563	563		
.12	\$	633	633	639	639	646	646	653	653	660	660	667	667		
.14	\$	730	730	737	737	744	744	751	751	758	758	765	765		
.16	\$	834	834	841	841	848	848	855	855	862	862	869	869		
30,000	\$	410	466	521	584	639	702	758	820	876	939	994	1050			<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	326	326	333	340	340	347	354	354	361	368	368	375	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	389	389	396	403	403	410	417	417	424	431	431	438		
.07	\$	445	445	452	459	459	466	473	473	479	486	486	493		
.08	\$	507	507	514	521	521	528	535	535	542	549	549	556		
.09	\$	563	563	570	577	577	584	591	591	598	605	605	612		
.10	\$	626	626	633	639	639	646	653	653	660	667	667	674		
.12	\$	744	744	751	758	758	765	772	772	779	786	786	793		
.14	\$	862	862	869	876	876	883	890	890	897	904	904	911		
.16	\$	973	973	980	987	987	994	1001	1001	1008	1015	1015	1022		
35,000	\$	473	542	612	681	751	820	890	952	1022	1092	1161	1231	<--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	375	382	389	403	410	417	424	431	438	452	459	466	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	445	452	459	473	479	486	493	500	507	521	528	535		
.07	\$	507	514	521	535	542	549	556	563	570	584	591	598		
.08	\$	570	577	584	598	605	612	619	626	633	646	653	660		
.09	\$	639	646	653	667	674	681	688	695	702	716	723	730		
.10	\$	702	709	716	730	737	744	751	758	765	779	786	793		
.12	\$	834	841	848	862	869	876	883	890	897	911	918	925		
.14	\$	959	966	973	987	994	1001	1008	1015	1022	1036	1043	1050		
.16	\$	1092	1099	1106	1119	1126	1133	1140	1147	1154	1168	1175	1182		
40,000	\$	542	626	702	779	855	939	1015	1092	1168	1252	1328	1405	<--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	431	438	452	466	473	486	500	514	521	535	549	556	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	500	507	521	535	542	556	570	584	591	605	619	626		
.07	\$	577	584	598	612	619	633	646	660	667	681	695	702		
.08	\$	646	653	667	681	688	702	716	730	737	751	765	772		
.09	\$	716	723	737	751	758	772	786	799	806	820	834	841		
.10	\$	786	793	806	820	827	841	855	869	876	890	904	911		
.12	\$	925	932	946	959	966	980	994	1008	1015	1029	1043	1050		
.14	\$	1064	1071	1085	1099	1106	1119	1133	1147	1154	1168	1182	1189		
.16	\$	1203	1210	1224	1238	1245	1259	1272	1286	1293	1307	1321	1328		
50,000	\$	681	779	876	973	1071	1168	1266	1363	1467	1565	1662	1759	<--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	577	619	653	695	730	772	813	848	890	925	966	1001	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	639	681	716	758	793	834	876	911	952	987	1029	1064		
.07	\$	702	744	779	820	855	897	939	973	1015	1050	1092	1126		
.08	\$	765	806	841	883	918	959	1001	1036	1078	1112	1154	1189		
.09	\$	827	869	904	946	980	1022	1064	1099	1140	1175	1217	1252		
.10	\$	890	932	966	1008	1043	1085	1126	1161	1203	1238	1279	1314		
.12	\$	1015	1057	1092	1133	1168	1210	1252	1286	1328	1363	1405	1439		
.14	\$	1140	1182	1217	1259	1293	1335	1377	1412	1453	1488	1530	1565		
.16	\$	1259	1300	1335	1377	1412	1453	1495	1530	1572	1606	1648	1683		

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

\$	.05	.06	.07	.08	.09	.10	.12	.14	.16	<--ELECTRIC RATE \$/KWH
\$	35	42	50	57	64	71	85	100	114	<--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 5
 HEAT PUMP MODEL: COMPRESSOR SECTION W0530A INDOOR A36A0-A
 COOLING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 30900 BTUH, 17.25 SEER
 HEATING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 24750 BTUH, 3.35 COP
 FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 78.00% 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	
25,000	\$	445	479	521	556	591	633	667	702	744	813	890	890	<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	285	285	292	292	292	299	299	306	306	313	319	319	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	333	333	340	340	340	347	347	354	354	361	368	368	
.07	\$	389	389	396	396	396	403	403	410	410	417	424	424	
.08	\$	438	438	445	445	445	452	452	459	459	466	473	473	
.09	\$	486	486	493	493	493	500	500	507	507	514	521	521	
.10	\$	535	535	542	542	542	549	549	556	556	563	570	570	
.12	\$	639	639	646	646	646	653	653	660	660	667	674	674	
.14	\$	737	737	744	744	744	751	751	758	758	765	772	772	
.16	\$	841	841	848	848	848	855	855	862	862	869	876	876	
30,000	\$	535	577	626	667	709	758	799	848	890	980	1071	1071		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	333	340	340	347	347	354	354	361	361	368	375	375	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	396	403	403	410	410	417	417	424	424	431	438	438	
.07	\$	452	459	459	466	466	473	473	479	479	486	493	493	
.08	\$	514	521	521	528	528	535	535	542	542	549	556	556	
.09	\$	570	577	577	584	584	591	591	598	598	605	612	612	
.10	\$	633	639	639	646	646	653	653	660	660	667	674	674	
.12	\$	751	758	758	765	765	772	772	779	779	786	793	793	
.14	\$	869	876	876	883	883	890	890	897	897	904	911	911	
.16	\$	980	987	987	994	994	1001	1001	1008	1008	1015	1022	1022	
35,000	\$	626	674	730	779	834	883	939	987	1043	1147	1252	1252		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	396	403	403	410	417	424	431	438	445	459	466	466	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	466	473	473	479	486	493	500	507	514	528	535	535	
.07	\$	528	535	535	542	549	556	563	570	577	591	598	598	
.08	\$	591	598	598	605	612	619	626	633	639	653	660	660	
.09	\$	660	667	667	674	681	688	695	702	709	723	730	730	
.10	\$	723	730	730	737	744	751	758	765	772	786	793	793	
.12	\$	855	862	862	869	876	883	890	897	904	918	925	925	
.14	\$	980	987	987	994	1001	1008	1015	1022	1029	1043	1050	1050	
.16	\$	1112	1119	1119	1126	1133	1140	1147	1154	1161	1175	1182	1182	
40,000	\$	709	772	834	890	952	1008	1071	1126	1189	1307	1426	1426		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	452	466	473	479	486	500	507	514	528	542	563	563	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	521	535	542	549	556	570	577	584	598	612	633	633	
.07	\$	598	612	619	626	633	646	653	660	674	688	709	709	
.08	\$	667	681	688	695	702	716	723	730	744	758	779	779	
.09	\$	737	751	758	765	772	786	793	799	813	827	848	848	
.10	\$	806	820	827	834	841	855	862	869	883	897	918	918	
.12	\$	946	959	966	973	980	994	1001	1008	1022	1036	1057	1057	
.14	\$	1085	1099	1106	1112	1119	1133	1140	1147	1161	1175	1196	1196	
.16	\$	1224	1238	1245	1252	1259	1272	1279	1286	1300	1314	1335	1335	
50,000	\$	890	966	1043	1112	1189	1266	1335	1412	1488	1634	1787	1787		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	660	688	723	751	779	806	841	869	897	959	1015	1015	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	723	751	786	813	841	869	904	932	959	1022	1078	1078	
.07	\$	786	813	848	876	904	932	966	994	1022	1085	1140	1140	
.08	\$	848	876	911	939	966	994	1029	1057	1085	1147	1203	1203	
.09	\$	911	939	973	1001	1029	1057	1092	1119	1147	1210	1266	1266	
.10	\$	973	1001	1036	1064	1092	1119	1154	1182	1210	1272	1328	1328	
.12	\$	1099	1126	1161	1189	1217	1245	1279	1307	1335	1398	1453	1453	
.14	\$	1224	1252	1286	1314	1342	1370	1405	1432	1460	1523	1579	1579	
.16	\$	1342	1370	1405	1432	1460	1488	1523	1551	1579	1641	1697	1697	

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

	.05	.06	.07	.08	.09	.10	.12	.14	.16	<--ELECTRIC RATE \$/KWH
\$	35	42	50	57	64	71	85	100	114	<--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 5
 HEAT PUMP MODEL: COMPRESSOR SECTION W0S36A INDOOR A36A0-A
 COOLING CAPACITY AT 45 DEG.F. ENTERING WATER TEMP.: 36950 BTUH, 16.70 SEER
 HEATING CAPACITY AT 45 DEG.F. ENTERING WATER TEMP.: 32300 BTUH, 3.50 COP
 FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00% APUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
35,000			
.05	\$	417	1085
.06	\$	500	1300
.07	\$	577	1516
.08	\$	667	1732
.09	\$	751	1947
.10	\$	827	2170
.12	\$	1001	2601
.14	\$	1168	3039
.16	\$	1328	3471
40,000			
.05	\$	466	1238
.06	\$	563	1488
.07	\$	660	1732
.08	\$	751	1982
.09	\$	841	2232
.10	\$	939	2476
.12	\$	1126	2977
.14	\$	1307	3471
.16	\$	1502	3965
			BALANCE POINT 13- DEG.F.
50,000			
.05	\$	577	1544
.06	\$	695	1857
.07	\$	806	2170
.08	\$	925	2476
.09	\$	1043	2789
.10	\$	1154	3095
.12	\$	1384	3721
.14	\$	1620	4340
.16	\$	1850	4959
			BALANCE POINT 2 DEG.F.
60,000			
.05	\$	709	1857
.06	\$	848	2232
.07	\$	987	2601
.08	\$	1126	2977
.09	\$	1272	3345
.10	\$	1412	3721
.12	\$	1697	4465
.14	\$	1982	5210
.16	\$	2260	5954
			BALANCE POINT 12 DEG.F.
70,000			
.05	\$	869	2170
.06	\$	1036	2601
.07	\$	1217	3039
.08	\$	1391	3471
.09	\$	1565	3902
.10	\$	1739	4340
.12	\$	2086	5210
.14	\$	2434	6079
.16	\$	2782	6942
			BALANCE POINT 20 DEG.F.

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

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
\$	44	53	61	70	79	88	106	123	141	<--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 5
 HEAT PUMP MODEL: COMPRESSOR SECTION W0336A INDOOR A36AO-A
 COOLING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 36950 BTUH, 16.70 SEER
 HEATING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 32300 BTUH, 3.50 COP
 FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00% APUE

HEAT LOSS BTUH	KWH COST \$/KWH	NATURAL GAS COST - \$/THERM												
		.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.90		1.00
30,000	\$	278	319	361	403	445	486	528	563	605	646	730	813	<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	313	313	319	319	326	326	333	333	340	340	347	354	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	368	368	375	375	382	382	389	389	396	396	403	410	
.07	\$	431	431	438	438	445	445	452	452	459	459	466	473	
.08	\$	486	486	493	493	500	500	507	507	514	514	521	528	
.09	\$	549	549	556	556	563	563	570	570	577	577	584	591	
.10	\$	605	605	612	612	619	619	626	626	633	633	639	646	
.12	\$	723	723	730	730	737	737	744	744	751	751	758	765	
.14	\$	841	841	848	848	855	855	862	862	869	869	876	883	
.16	\$	952	952	959	959	966	966	973	973	980	980	987	994	
35,000	\$	326	375	424	473	521	563	612	660	709	758	848	946	<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	361	361	368	368	375	375	382	382	389	389	396	403	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	431	431	438	438	445	445	452	452	459	459	466	473	
.07	\$	493	493	500	500	507	507	514	514	521	521	528	535	
.08	\$	563	563	570	570	577	577	584	584	591	591	598	605	
.09	\$	633	633	639	639	646	646	653	653	660	660	667	674	
.10	\$	695	695	702	702	709	709	716	716	723	723	730	737	
.12	\$	834	834	841	841	848	848	855	855	862	862	869	876	
.14	\$	966	966	973	973	980	980	987	987	994	994	1001	1008	
.16	\$	1099	1099	1106	1106	1112	1112	1119	1119	1126	1126	1133	1140	
														BALANCE POINT 63 DEG.F.
40,000	\$	375	431	486	542	591	646	702	758	813	862	973	1085	<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	410	410	417	424	424	431	438	438	445	452	459	466	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	479	479	486	493	493	500	507	507	514	521	528	535	
.07	\$	556	556	563	570	570	577	584	584	591	598	605	612	
.08	\$	633	633	639	646	646	653	660	660	667	674	681	688	
.09	\$	702	702	709	716	716	723	730	730	737	744	751	758	
.10	\$	779	779	786	793	793	799	806	806	813	820	827	834	
.12	\$	925	925	932	939	939	946	952	952	959	966	973	980	
.14	\$	1078	1078	1085	1092	1092	1099	1106	1106	1112	1119	1126	1133	
.16	\$	1224	1224	1231	1238	1238	1245	1252	1252	1259	1266	1272	1279	
														BALANCE POINT 13- DEG.F.
50,000	\$	473	542	605	674	744	813	876	946	1015	1085	1217	1356	<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	493	507	514	528	535	542	556	563	577	584	605	626	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	577	591	598	612	619	626	633	646	660	667	688	709	
.07	\$	660	674	681	695	702	709	723	730	744	751	772	793	
.08	\$	744	758	765	779	786	793	806	813	827	834	855	876	
.09	\$	827	841	848	862	869	876	890	897	911	918	939	959	
.10	\$	911	925	932	946	952	959	973	980	994	1001	1022	1043	
.12	\$	1085	1099	1106	1119	1126	1133	1147	1154	1168	1175	1196	1217	
.14	\$	1252	1266	1272	1286	1293	1300	1314	1321	1335	1342	1363	1384	
.16	\$	1419	1432	1439	1453	1460	1467	1481	1488	1502	1509	1530	1551	
														BALANCE POINT 2 DEG.F.
60,000	\$	563	646	730	813	890	973	1057	1133	1217	1300	1460	1627	<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	584	612	633	660	688	709	737	758	786	813	862	911	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	660	688	709	737	765	786	813	834	862	890	939	987	
.07	\$	744	772	793	820	848	869	897	918	946	973	1022	1071	
.08	\$	827	855	876	904	932	952	980	1001	1029	1057	1106	1154	
.09	\$	911	939	959	987	1015	1036	1064	1085	1112	1140	1189	1238	
.10	\$	987	1015	1036	1064	1092	1112	1140	1161	1189	1217	1266	1314	
.12	\$	1154	1182	1203	1231	1259	1279	1307	1328	1356	1384	1432	1481	
.14	\$	1314	1342	1363	1391	1419	1439	1467	1488	1516	1544	1592	1641	
.16	\$	1481	1509	1530	1558	1586	1606	1634	1655	1683	1711	1759	1808	
														BALANCE POINT 12 DEG.F.
70,000	\$	660	758	848	946	1043	1133	1231	1328	1419	1516	1704	1899	<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	674	709	751	786	827	862	897	939	973	1015	1092	1161	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	758	793	834	869	911	946	980	1022	1057	1099	1175	1245	
.07	\$	834	869	911	946	987	1022	1057	1099	1133	1175	1252	1321	
.08	\$	918	952	994	1029	1071	1106	1140	1182	1217	1259	1335	1405	
.09	\$	1001	1036	1078	1112	1154	1189	1224	1266	1300	1342	1419	1488	
.10	\$	1085	1119	1161	1196	1238	1272	1307	1349	1384	1426	1502	1572	
.12	\$	1245	1279	1321	1356	1398	1432	1467	1509	1544	1586	1662	1732	
.14	\$	1412	1446	1488	1523	1565	1599	1634	1676	1711	1752	1829	1899	
.16	\$	1572	1606	1648	1683	1725	1759	1794	1836	1871	1912	1989	2059	
														BALANCE POINT 20 DEG.F.

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

	.05	.06	.07	.08	.09	.10	.12	.14	.16		<--ELECTRIC RATE \$/KWH
\$	44	53	61	70	79	88	106	123	141		<--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 5
 HEAT PUMP MODEL: COMPRESSOR SECTION W0S36A INDOOR A36AO-A
 COOLING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 36950 BTUH, 16.70 SEER
 HEATING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 32300 BTUH, 3.50 COP
 FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 78.00% AEUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	HEATING OIL COST - \$/GALLON												
		.70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70		1.80
30,000	\$	410	466	521	584	639	702	758	820	876	939	994	1050	<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	319	326	333	333	340	347	347	354	354	361	368	368	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	375	382	389	389	396	403	403	410	410	417	424	424	
.07	\$	438	445	452	452	459	466	466	473	473	479	486	486	
.08	\$	493	500	507	507	514	521	521	528	528	535	542	542	
.09	\$	556	563	570	570	577	584	584	591	591	598	605	605	
.10	\$	612	619	626	626	633	639	639	646	646	653	660	660	
.12	\$	730	737	744	744	751	758	758	765	765	772	779	779	
.14	\$	848	855	862	862	869	876	876	883	883	890	897	897	
.16	\$	959	966	973	973	980	987	987	994	994	1001	1008	1008	
35,000	\$	473	542	612	681	751	820	890	952	1022	1092	1161	1231	<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	368	375	382	382	389	396	403	403	410	417	417	424	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	438	445	452	452	459	466	473	473	479	486	486	493	
.07	\$	500	507	514	514	521	528	535	535	542	549	549	556	
.08	\$	570	577	584	584	591	598	605	605	612	619	619	626	
.09	\$	639	646	653	653	660	667	674	674	681	688	688	695	
.10	\$	702	709	716	716	723	730	737	737	744	751	751	758	
.12	\$	841	848	855	855	862	869	876	883	890	890	897	897	
.14	\$	973	980	987	987	994	1001	1008	1008	1015	1022	1022	1029	
.16	\$	1106	1112	1119	1119	1126	1133	1140	1140	1147	1154	1154	1161	
40,000	\$	542	626	702	779	855	939	1015	1092	1168	1252	1328	1405	<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	424	431	438	445	452	459	466	466	473	479	486	493	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	493	500	507	514	521	528	535	535	542	549	556	563	
.07	\$	570	577	584	591	598	605	612	612	619	626	633	639	
.08	\$	646	653	660	667	674	681	688	688	695	702	709	716	
.09	\$	716	723	730	737	744	751	758	758	765	772	779	786	
.10	\$	793	799	806	813	820	827	834	834	841	848	855	862	
.12	\$	939	946	952	959	966	973	980	980	987	994	1001	1008	
.14	\$	1092	1099	1106	1112	1119	1126	1133	1133	1140	1147	1154	1161	
.16	\$	1238	1245	1252	1259	1266	1272	1279	1279	1286	1293	1300	1307	
50,000	\$	681	779	876	973	1071	1168	1266	1363	1467	1565	1662	1759	<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	528	542	556	570	584	598	612	626	639	660	674	688	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	612	626	639	653	667	681	695	709	723	744	758	772	
.07	\$	695	709	723	737	751	765	779	793	806	827	841	855	
.08	\$	779	793	806	820	834	848	862	876	890	911	925	939	
.09	\$	862	876	890	904	918	932	946	959	973	994	1008	1022	
.10	\$	946	959	973	987	1001	1015	1029	1043	1057	1078	1092	1106	
.12	\$	1119	1133	1147	1161	1175	1189	1203	1217	1231	1252	1266	1279	
.14	\$	1286	1300	1314	1328	1342	1356	1370	1384	1398	1419	1432	1446	
.16	\$	1453	1467	1481	1495	1509	1523	1537	1551	1565	1586	1599	1613	
60,000	\$	820	939	1050	1168	1286	1405	1523	1641	1759	1878	1996	2107	<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	660	702	737	772	806	841	883	918	952	987	1022	1057	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	737	779	813	848	883	918	959	994	1029	1064	1099	1133	
.07	\$	820	862	897	932	966	1001	1043	1078	1112	1147	1182	1217	
.08	\$	904	946	980	1015	1050	1085	1126	1161	1196	1231	1266	1300	
.09	\$	987	1029	1064	1099	1133	1168	1210	1245	1279	1314	1349	1384	
.10	\$	1064	1106	1140	1175	1210	1245	1286	1321	1356	1391	1426	1460	
.12	\$	1231	1272	1307	1342	1377	1412	1453	1488	1523	1558	1592	1627	
.14	\$	1391	1432	1467	1502	1537	1572	1613	1648	1683	1718	1752	1787	
.16	\$	1558	1599	1634	1669	1704	1739	1780	1815	1850	1885	1919	1954	
70,000	\$	952	1092	1231	1363	1502	1641	1780	1912	2052	2191	2323	2462	<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	793	841	897	952	1008	1064	1119	1168	1224	1279	1335	1391	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	876	925	980	1036	1092	1147	1203	1252	1307	1363	1419	1474	
.07	\$	952	1001	1057	1112	1168	1224	1279	1328	1384	1439	1495	1551	
.08	\$	1036	1085	1140	1196	1252	1307	1363	1412	1467	1523	1579	1634	
.09	\$	1119	1168	1224	1279	1335	1391	1446	1495	1551	1606	1662	1718	
.10	\$	1203	1252	1307	1363	1419	1474	1530	1579	1634	1690	1745	1801	
.12	\$	1363	1412	1467	1523	1579	1634	1690	1739	1794	1850	1905	1961	
.14	\$	1530	1579	1634	1690	1745	1801	1857	1905	1961	2017	2072	2128	
.16	\$	1690	1739	1794	1850	1905	1961	2017	2065	2121	2177	2232	2288	

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

	.05	.06	.07	.08	.09	.10	.12	.14	.16	<--ELECTRIC RATE \$/KWH
\$	44	53	61	70	79	88	106	123	141	<--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.

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

REGION 5
 HEAT PUMP MODEL: COMPRESSOR SECTION W0336A INDOOR A36A0-A
 COOLING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 36950 BTUH, 16.70 SEER
 HEATING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 32300 BTUH, 3.50 COP
 FURNACE TYPE: PROPANE GAS FURNACE EFFICIENCY: 78.00% 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		
30,000	\$	535	577	626	667	709	758	799	848	890	980	1071	1071	<--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	333	333	340	340	347	347	354	354	361	368	375	375	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	389	389	396	396	403	403	410	410	417	424	431	431		
.07	\$	452	452	459	459	466	466	473	473	479	486	493	493		
.08	\$	507	507	514	514	521	521	528	528	535	542	549	549		
.09	\$	570	570	577	577	584	584	591	591	598	605	612	612		
.10	\$	626	626	633	633	639	639	646	646	653	660	667	667		
.12	\$	744	744	751	751	758	758	765	765	772	779	786	786		
.14	\$	862	862	869	869	876	876	883	883	890	897	904	904		
.16	\$	973	973	980	980	987	987	994	994	1001	1008	1015	1015		
35,000	\$	626	674	730	779	834	883	939	987	1043	1147	1252	1252		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	382	382	389	389	396	403	403	410	410	417	424	424		THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	452	452	459	459	466	473	473	479	479	486	493	493		
.07	\$	514	514	521	521	528	535	535	542	542	549	556	556		
.08	\$	584	584	591	591	598	605	605	612	612	619	626	626		
.09	\$	653	653	660	660	667	674	674	681	681	688	695	695		
.10	\$	716	716	723	723	730	737	737	744	744	751	758	758		
.12	\$	855	855	862	862	869	876	876	883	883	890	897	897		
.14	\$	987	987	994	994	1001	1008	1008	1015	1015	1022	1029	1029		
.16	\$	1119	1119	1126	1126	1133	1140	1140	1147	1147	1154	1161	1161		
40,000	\$	709	772	834	890	952	1008	1071	1126	1189	1307	1426	1426	<--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	438	445	445	452	459	459	466	473	479	486	500	500	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	507	514	514	521	528	528	535	542	549	556	570	570		
.07	\$	584	591	591	598	605	605	612	619	626	633	646	646		
.08	\$	660	667	667	674	681	681	688	695	702	709	723	723		
.09	\$	730	737	737	744	751	751	758	765	772	779	793	793		
.10	\$	806	813	813	820	827	827	834	841	848	855	869	869		
.12	\$	952	959	959	966	973	973	980	987	994	1001	1015	1015		
.14	\$	1106	1112	1112	1119	1126	1126	1133	1140	1147	1154	1168	1168		
.16	\$	1252	1259	1259	1266	1272	1272	1279	1286	1293	1300	1314	1314		
50,000	\$	890	966	1043	1112	1189	1266	1335	1412	1488	1634	1787	1787		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	556	570	577	591	605	612	626	633	646	667	688	688		THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	639	653	660	674	688	695	709	716	730	751	772	772		
.07	\$	723	737	744	758	772	779	793	799	813	834	855	855		
.08	\$	806	820	827	841	855	862	876	883	897	918	939	939		
.09	\$	890	904	911	925	939	946	959	966	980	1001	1022	1022		
.10	\$	973	987	994	1008	1022	1029	1043	1050	1064	1085	1106	1106		
.12	\$	1147	1161	1168	1182	1196	1203	1217	1224	1238	1259	1279	1279		
.14	\$	1314	1328	1335	1349	1363	1370	1384	1391	1405	1426	1446	1446		
.16	\$	1481	1495	1502	1516	1530	1537	1551	1558	1572	1592	1613	1613		
60,000	\$	1071	1161	1252	1335	1426	1516	1606	1697	1787	1968	2142	2142	<--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	737	765	793	820	848	876	904	932	959	1015	1071	1071	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	813	841	869	897	925	952	980	1008	1036	1092	1147	1147		
.07	\$	897	925	952	980	1008	1036	1064	1092	1119	1175	1231	1231		
.08	\$	980	1008	1036	1064	1092	1119	1147	1175	1203	1259	1314	1314		
.09	\$	1064	1092	1119	1147	1175	1203	1231	1259	1286	1342	1398	1398		
.10	\$	1140	1168	1196	1224	1252	1279	1307	1335	1363	1419	1474	1474		
.12	\$	1307	1335	1363	1391	1419	1446	1474	1502	1530	1586	1641	1641		
.14	\$	1467	1495	1523	1551	1579	1606	1634	1662	1690	1745	1801	1801		
.16	\$	1634	1662	1690	1718	1745	1773	1801	1829	1857	1912	1968	1968		
70,000	\$	1252	1356	1460	1565	1669	1773	1878	1982	2086	2295	2504	2504		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	904	946	987	1029	1071	1112	1154	1196	1238	1321	1405	1405		THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	987	1029	1071	1112	1154	1196	1238	1279	1321	1405	1488	1488		
.07	\$	1064	1106	1147	1189	1231	1272	1314	1356	1398	1481	1565	1565		
.08	\$	1147	1189	1231	1272	1314	1356	1398	1439	1481	1565	1648	1648		
.09	\$	1231	1272	1314	1356	1398	1439	1481	1523	1565	1648	1732	1732		
.10	\$	1314	1356	1398	1439	1481	1523	1565	1606	1648	1732	1815	1815		
.12	\$	1474	1516	1558	1599	1641	1683	1725	1766	1808	1892	1975	1975		
.14	\$	1641	1683	1725	1766	1808	1850	1892	1933	1975	2059	2142	2142		
.16	\$	1801	1843	1885	1926	1968	2010	2052	2093	2135	2219	2302	2302		

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

	.05	.06	.07	.08	.09	.10	.12	.14	.16		
	\$	44	53	61	70	79	88	106	123	141	<--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 5
 HEAT PUMP MODEL: COMPRESSOR SECTION W0S42A INDOOR A42A0-A
 COOLING CAPACITY AT 45 DEG.F. ENTERING WATER TEMP.: 43600 BTUH, 17.45 SEER
 HEATING CAPACITY AT 45 DEG.F. ENTERING WATER TEMP.: 37500 BTUH, 3.40 COP
 FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00% AFUE

HEAT LOSS
BTUH

ELEC.
COST
\$/KWH

40,000

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

.05	\$	486	1238
.06	\$	584	1488
.07	\$	681	1732
.08	\$	779	1982
.09	\$	876	2232
.10	\$	980	2476
.12	\$	1168	2977
.14	\$	1363	3471
.16	\$	1565	3965

50,000

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

.05	\$	598	1544
.06	\$	716	1857
.07	\$	834	2170
.08	\$	952	2476
.09	\$	1071	2789
.10	\$	1196	3095
.12	\$	1432	3721
.14	\$	1669	4340
.16	\$	1905	4959

BALANCE POINT 8- DEG.F.

60,000

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

.05	\$	709	1857
.06	\$	855	2232
.07	\$	994	2601
.08	\$	1140	2977
.09	\$	1279	3345
.10	\$	1419	3721
.12	\$	1704	4465
.14	\$	1989	5210
.16	\$	2274	5954

BALANCE POINT 4 DEG.F.

70,000

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

.05	\$	841	2170
.06	\$	1008	2601
.07	\$	1182	3039
.08	\$	1349	3471
.09	\$	1516	3902
.10	\$	1690	4340
.12	\$	2024	5210
.14	\$	2358	6079
.16	\$	2698	6942

BALANCE POINT 13 DEG.F.

80,000

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

.05	\$	1001	2476
.06	\$	1210	2977
.07	\$	1405	3471
.08	\$	1613	3965
.09	\$	1808	4465
.10	\$	2010	4959
.12	\$	2413	5954
.14	\$	2817	6942
.16	\$	3220	7936

BALANCE POINT 19 DEG.F.

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

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
\$	49	59	69	79	89	99	119	139	159	<-- 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 5
 HEAT PUMP MODEL: COMPRESSOR SECTION MOS42A INDOOR A42AO-A
 COOLING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 43600 BTUH, 17.45 SEER
 HEATING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 37500 BTUH, 3.40 COP
 FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00% APUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	NATURAL GAS COST - \$/THERM															
		.35	.40	.45	.50	.55	.60	.65	.70	.75	.80		.90	1.00			
35,000	\$	326	375	424	473	521	563	612	660	709	758	848	946	<--THEORETICAL HEATING COST * FURNACE ONLY			
.05	\$	375	375	382	382	389	389	396	396	403	403	410	417	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR			
.06	\$	452	452	459	459	466	466	473	473	479	479	486	493				
.07	\$	521	521	528	528	535	535	542	542	549	549	556	563				
.08	\$	591	591	598	598	605	605	612	612	619	619	626	633				
.09	\$	660	660	667	667	674	674	681	681	688	688	695	702				
.10	\$	730	730	737	737	744	744	751	751	758	758	765	772				
.12	\$	869	869	876	876	883	883	890	890	897	897	904	911				
.14	\$	1008	1008	1015	1015	1022	1022	1029	1029	1036	1036	1043	1050				
.16	\$	1147	1147	1154	1154	1161	1161	1168	1168	1175	1175	1182	1189				
40,000	\$	375	431	486	542	591	646	702	758	813	862	973	1085			<--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	424	431	431	438	438	445	452	452	459	459	466	479			THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	500	507	507	514	514	521	528	528	535	535	542	556				
.07	\$	577	584	584	591	591	598	605	605	612	612	619	633				
.08	\$	660	667	667	674	674	681	688	688	695	695	702	716				
.09	\$	737	744	744	751	751	758	765	765	772	772	779	793				
.10	\$	820	827	827	834	834	841	848	848	855	855	862	876				
.12	\$	973	980	980	987	987	994	1001	1001	1008	1008	1015	1029				
.14	\$	1133	1140	1140	1147	1147	1154	1161	1161	1168	1168	1175	1189				
.16	\$	1293	1300	1300	1307	1307	1314	1321	1321	1328	1328	1335	1349				
														BALANCE POINT 63 DEG.F.			
50,000	\$	473	542	605	674	744	813	876	946	1015	1085	1217	1356	<--THEORETICAL HEATING COST * FURNACE ONLY			
.05	\$	514	521	528	535	535	542	549	556	563	570	584	598	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR			
.06	\$	612	619	626	633	633	639	646	653	660	667	681	695				
.07	\$	702	709	716	723	723	730	737	744	751	758	772	786				
.08	\$	799	806	813	820	820	827	834	841	848	855	869	883				
.09	\$	890	897	904	911	911	918	925	932	939	946	959	973				
.10	\$	987	994	1001	1008	1008	1015	1022	1029	1036	1043	1057	1071				
.12	\$	1175	1182	1189	1196	1196	1203	1210	1217	1224	1231	1245	1259				
.14	\$	1363	1370	1377	1384	1384	1391	1398	1405	1412	1419	1432	1446				
.16	\$	1551	1558	1565	1572	1572	1579	1586	1592	1599	1606	1620	1634				
																BALANCE POINT 8- DEG.F.	
60,000	\$	563	646	730	813	890	973	1057	1133	1217	1300	1460	1627			<--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	605	619	633	639	653	667	681	688	702	716	737	765			THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	709	723	737	744	758	772	786	793	806	820	841	869				
.07	\$	806	820	834	841	855	869	883	890	904	918	939	966				
.08	\$	911	925	939	946	959	973	987	994	1008	1022	1043	1071				
.09	\$	1015	1029	1043	1050	1064	1078	1092	1099	1112	1126	1147	1175				
.10	\$	1119	1133	1147	1154	1168	1182	1196	1203	1217	1231	1252	1279				
.12	\$	1328	1342	1356	1363	1377	1391	1405	1412	1426	1439	1460	1488				
.14	\$	1537	1551	1565	1572	1586	1599	1613	1620	1634	1648	1669	1697				
.16	\$	1745	1759	1773	1780	1794	1808	1822	1829	1843	1857	1878	1905				
														BALANCE POINT 4 DEG.F.			
70,000	\$	660	758	848	946	1043	1133	1231	1328	1419	1516	1704	1899	<--THEORETICAL HEATING COST * FURNACE ONLY			
.05	\$	695	730	758	786	813	841	876	904	932	959	1022	1078	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR			
.06	\$	793	827	855	883	911	939	973	1001	1029	1057	1119	1175				
.07	\$	890	925	952	980	1008	1036	1071	1099	1126	1154	1217	1272				
.08	\$	987	1022	1050	1078	1106	1133	1168	1196	1224	1252	1314	1370				
.09	\$	1085	1119	1147	1175	1203	1231	1266	1293	1321	1349	1412	1467				
.10	\$	1182	1217	1245	1272	1300	1328	1363	1391	1419	1446	1509	1565				
.12	\$	1377	1412	1439	1467	1495	1523	1558	1586	1613	1641	1704	1759				
.14	\$	1572	1606	1634	1662	1690	1718	1752	1780	1808	1836	1899	1954				
.16	\$	1773	1808	1836	1864	1892	1919	1954	1982	2010	2038	2100	2156				
																BALANCE POINT 13 DEG.F.	
80,000	\$	758	862	973	1085	1189	1300	1405	1516	1627	1732	1947	2170			<--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	779	827	869	911	952	994	1036	1085	1126	1168	1252	1342			THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	876	925	966	1008	1050	1092	1133	1182	1224	1266	1349	1439				
.07	\$	973	1022	1064	1106	1147	1189	1231	1279	1321	1363	1446	1537				
.08	\$	1071	1119	1161	1203	1245	1286	1328	1377	1419	1460	1544	1634				
.09	\$	1168	1217	1259	1300	1342	1384	1426	1474	1516	1558	1641	1732				
.10	\$	1266	1314	1356	1398	1439	1481	1523	1572	1613	1655	1739	1829				
.12	\$	1460	1509	1551	1592	1634	1676	1718	1766	1808	1850	1933	2024				
.14	\$	1655	1704	1745	1787	1829	1871	1912	1961	2003	2045	2128	2219				
.16	\$	1843	1892	1933	1975	2017	2059	2100	2149	2191	2232	2316	2406				
														BALANCE POINT 19 DEG.F.			

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

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
\$	49	59	69	79	89	99	119	139	159	<--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 5
 HEAT PUMP MODEL: COMPRESSOR SECTION W0S42A INDOOR A42A0-A
 COOLING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 43600 BTUH 17.45 SEER
 HEATING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 37500 BTUH 3.40 COP
 FURNACE TYPE PUEL OIL FURNACE EFFICIENCY 78.00% APUE

HEAT LOSS BTUH	ELRC COST \$/KWH	HEATING OIL COST - \$/GALLON													
		.70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70		1.80	
35,000	\$	473	542	612	681	751	820	890	952	1022	1092	1161	1231	--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	382	389	396	396	403	410	417	417	424	431	431	438	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	459	466	473	473	479	486	493	493	500	507	507	514		
.07	\$	528	535	542	542	549	556	563	563	570	577	577	584		
.08	\$	598	605	612	612	619	626	633	633	639	646	646	653		
.09	\$	667	674	681	681	688	695	702	702	709	716	716	723		
.10	\$	737	744	751	751	758	765	772	772	779	786	786	793		
.12	\$	876	883	890	890	897	904	911	911	918	925	925	932		
.14	\$	1015	1022	1029	1029	1036	1043	1050	1050	1057	1064	1064	1071		
.16	\$	1154	1161	1168	1168	1175	1182	1189	1189	1196	1203	1203	1210		
40,000	\$	542	626	702	779	855	939	1015	1092	1168	1252	1328	1405			--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	438	445	452	452	459	466	473	479	486	486	493	500	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	514	521	528	528	535	542	549	556	563	563	570	577		
.07	\$	591	598	605	605	612	619	626	633	639	639	646	653		
.08	\$	674	681	688	688	695	702	709	716	723	723	730	737		
.09	\$	751	758	765	765	772	779	786	793	799	799	806	813		
.10	\$	834	841	848	848	855	862	869	876	883	883	890	897		
.12	\$	987	994	1001	1001	1008	1015	1022	1029	1036	1036	1043	1050		
.14	\$	1147	1154	1161	1161	1168	1175	1182	1189	1196	1196	1203	1210		
.16	\$	1307	1314	1321	1321	1328	1335	1342	1349	1356	1356	1363	1370		
50,000	\$	681	779	876	973	1071	1168	1266	1363	1467	1565	1662	1759	--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	535	542	549	563	570	584	591	598	612	619	626	639	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	633	639	646	660	667	681	688	695	709	716	723	737		
.07	\$	723	730	737	751	758	772	779	786	799	806	813	827		
.08	\$	820	827	834	848	855	869	876	883	897	904	911	925		
.09	\$	911	918	925	939	946	959	966	973	987	994	1001	1015		
.10	\$	1008	1015	1022	1036	1043	1057	1064	1071	1085	1092	1099	1112		
.12	\$	1196	1203	1210	1224	1231	1245	1252	1259	1272	1279	1286	1300		
.14	\$	1384	1391	1398	1412	1419	1432	1439	1446	1460	1467	1474	1488		
.16	\$	1572	1579	1586	1599	1606	1620	1627	1634	1648	1655	1662	1676		
60,000	\$	820	939	1050	1168	1286	1405	1523	1641	1759	1878	1996	2107	--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	646	660	681	695	716	730	751	765	786	799	820	834	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	751	765	786	799	820	834	855	869	890	904	925	939		
.07	\$	848	862	883	897	918	932	952	966	987	1001	1022	1036		
.08	\$	952	966	987	1001	1022	1036	1057	1071	1092	1106	1126	1140		
.09	\$	1057	1071	1092	1106	1126	1140	1161	1175	1196	1210	1231	1245		
.10	\$	1161	1175	1196	1210	1231	1245	1266	1279	1300	1314	1335	1349		
.12	\$	1370	1384	1405	1419	1439	1453	1474	1488	1509	1523	1544	1558		
.14	\$	1579	1592	1613	1627	1648	1662	1683	1697	1718	1732	1752	1766		
.16	\$	1787	1801	1822	1836	1857	1871	1892	1905	1926	1940	1961	1975		
70,000	\$	952	1092	1231	1363	1502	1641	1780	1912	2052	2191	2323	2462	--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	786	827	876	918	959	1001	1043	1085	1126	1168	1210	1252	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	883	925	973	1015	1057	1099	1140	1182	1224	1266	1307	1349		
.07	\$	980	1022	1071	1112	1154	1196	1238	1279	1321	1363	1405	1446		
.08	\$	1078	1119	1168	1210	1252	1293	1335	1377	1419	1460	1502	1544		
.09	\$	1175	1217	1266	1307	1349	1391	1432	1474	1516	1558	1599	1641		
.10	\$	1272	1314	1363	1405	1446	1488	1530	1572	1613	1655	1697	1739		
.12	\$	1467	1509	1558	1599	1641	1683	1725	1766	1808	1850	1892	1933		
.14	\$	1662	1704	1752	1794	1836	1878	1919	1961	2003	2045	2086	2128		
.16	\$	1864	1905	1954	1996	2038	2079	2121	2163	2205	2246	2288	2330		
80,000	\$	1092	1252	1405	1565	1718	1878	2031	2191	2344	2504	2657	2817	--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	911	973	1036	1099	1161	1224	1286	1349	1412	1474	1537	1599	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	1008	1071	1133	1196	1259	1321	1384	1446	1509	1572	1634	1697		
.07	\$	1106	1168	1231	1293	1356	1419	1481	1544	1606	1669	1732	1794		
.08	\$	1203	1266	1328	1391	1453	1516	1579	1641	1704	1766	1829	1892		
.09	\$	1300	1363	1426	1488	1551	1613	1676	1739	1801	1864	1926	1989		
.10	\$	1398	1460	1523	1586	1648	1711	1773	1836	1899	1961	2024	2086		
.12	\$	1592	1655	1718	1780	1843	1905	1968	2031	2093	2156	2219	2281		
.14	\$	1787	1850	1912	1975	2038	2100	2163	2225	2288	2351	2413	2476		
.16	\$	1975	2038	2100	2163	2225	2288	2351	2413	2476	2538	2601	2664		

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

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
\$	49	59	69	79	89	99	119	139	159	--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 5
 HEAT PUMP MODEL: COMPRESSOR SECTION MCS42A INDOOR A42AO-A
 COOLING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 43600 BTUH, 17.45 SEER
 HEATING CAPACITY AT 45 DEG. F. ENTERING WATER TEMP.: 37500 BTUH, 3.40 COP
 FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 78.00% 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		
35,000		\$ 626	674	730	779	834	883	939	987	1043	1147	1252	1252	<--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$ 396	396	403	403	410	417	417	424	424	431	438	438		THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$ 473	473	479	479	486	493	493	500	500	507	514	514			
.07	\$ 542	542	549	549	556	563	563	570	570	577	584	584			
.08	\$ 612	612	619	619	626	633	633	639	639	646	653	653			
.09	\$ 681	681	688	688	695	702	702	709	709	716	723	723			
.10	\$ 751	751	758	758	765	772	772	779	779	786	793	793			
.12	\$ 890	890	897	897	904	911	911	918	918	925	932	932			
.14	\$ 1029	1029	1036	1036	1043	1050	1050	1057	1057	1064	1071	1071			
.16	\$ 1168	1168	1175	1175	1182	1189	1189	1196	1196	1203	1210	1210			
40,000		\$ 709	772	834	890	952	1008	1071	1126	1189	1307	1426	1426		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$ 452	452	459	466	466	473	479	479	486	493	500	500			THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$ 528	528	535	542	542	549	556	556	563	570	577	577			
.07	\$ 605	605	612	619	619	626	633	633	639	646	653	653			
.08	\$ 688	688	695	702	702	709	716	716	723	730	737	737			
.09	\$ 765	765	772	779	779	786	793	793	799	806	813	813			
.10	\$ 848	848	855	862	862	869	876	876	883	890	897	897			
.12	\$ 1001	1001	1008	1015	1015	1022	1029	1029	1036	1043	1050	1050			
.14	\$ 1161	1161	1168	1175	1175	1182	1189	1189	1196	1203	1210	1210			
.16	\$ 1321	1321	1328	1335	1335	1342	1349	1349	1356	1363	1370	1370			
														BALANCE POINT 63 DEG.F.	
50,000		\$ 890	966	1043	1112	1189	1266	1335	1412	1488	1634	1787	1787	<--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$ 556	563	570	577	584	591	598	605	612	626	639	639		THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$ 653	660	667	674	681	688	695	702	709	723	737	737			
.07	\$ 744	751	758	765	772	779	786	793	799	813	827	827			
.08	\$ 841	848	855	862	869	876	883	890	897	911	925	925			
.09	\$ 932	939	946	952	959	966	973	980	987	1001	1015	1015			
.10	\$ 1029	1036	1043	1050	1057	1064	1071	1078	1085	1099	1112	1112			
.12	\$ 1217	1224	1231	1238	1245	1252	1259	1266	1272	1286	1300	1300			
.14	\$ 1405	1412	1419	1426	1432	1439	1446	1453	1460	1474	1488	1488			
.16	\$ 1592	1599	1606	1613	1620	1627	1634	1641	1648	1662	1676	1676			
															BALANCE POINT 8- DEG.F.
60,000		\$ 1071	1161	1252	1335	1426	1516	1606	1697	1787	1968	2142	2142		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$ 681	695	709	723	737	751	765	772	786	813	841	841			THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$ 786	799	813	827	841	855	869	876	890	918	946	946			
.07	\$ 883	897	911	925	939	952	966	973	987	1015	1043	1043			
.08	\$ 987	1001	1015	1029	1043	1057	1071	1078	1092	1119	1147	1147			
.09	\$ 1092	1106	1119	1133	1147	1161	1175	1182	1196	1224	1252	1252			
.10	\$ 1196	1210	1224	1238	1252	1266	1279	1286	1300	1328	1356	1356			
.12	\$ 1405	1419	1432	1446	1460	1474	1488	1495	1509	1537	1565	1565			
.14	\$ 1613	1627	1641	1655	1669	1683	1697	1704	1718	1745	1773	1773			
.16	\$ 1822	1836	1850	1864	1878	1892	1905	1912	1926	1954	1982	1982			
														BALANCE POINT 4 DEG.F.	
70,000		\$ 1252	1356	1460	1565	1669	1773	1878	1982	2086	2295	2504	2504	<--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$ 876	911	946	973	1008	1036	1071	1106	1133	1203	1266	1266		THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$ 973	1008	1043	1071	1106	1133	1168	1203	1231	1300	1363	1363			
.07	\$ 1071	1106	1140	1168	1203	1231	1266	1300	1328	1398	1460	1460			
.08	\$ 1168	1203	1238	1266	1300	1328	1363	1398	1426	1495	1558	1558			
.09	\$ 1266	1300	1335	1363	1398	1426	1460	1495	1523	1592	1655	1655			
.10	\$ 1363	1398	1432	1460	1495	1523	1558	1592	1620	1690	1752	1752			
.12	\$ 1558	1592	1627	1655	1690	1718	1752	1787	1815	1885	1947	1947			
.14	\$ 1752	1787	1822	1850	1885	1912	1947	1982	2010	2079	2142	2142			
.16	\$ 1954	1989	2024	2052	2086	2114	2149	2184	2212	2281	2344	2344			
															BALANCE POINT 13 DEG.F.
80,000		\$ 1426	1551	1669	1787	1905	2024	2142	2260	2385	2622	2858	2858		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$ 1050	1092	1140	1189	1238	1286	1328	1377	1426	1523	1613	1613			THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$ 1147	1189	1238	1286	1335	1384	1426	1474	1523	1620	1711	1711			
.07	\$ 1245	1286	1335	1384	1432	1481	1523	1572	1620	1718	1808	1808			
.08	\$ 1342	1384	1432	1481	1530	1579	1620	1669	1718	1815	1905	1905			
.09	\$ 1439	1481	1530	1579	1627	1676	1718	1766	1815	1912	2003	2003			
.10	\$ 1537	1579	1627	1676	1725	1773	1815	1864	1912	2010	2100	2100			
.12	\$ 1732	1773	1822	1871	1919	1968	2010	2059	2107	2205	2295	2295			
.14	\$ 1926	1968	2017	2065	2114	2163	2205	2253	2302	2399	2490	2490			
.16	\$ 2114	2156	2205	2253	2302	2351	2392	2441	2490	2587	2678	2678			
														BALANCE POINT 19 DEG.F.	

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

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
	\$ 49	59	69	79	89	99	119	139	159	<--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

REGION 5 24UHPOC/A36AQ-A
 HEAT PUMP MODEL. OUTDOOR 24UHPOC INDOOR A36AQ-A
 ARI RATED COOLING CAP. BTUH(95) 23000, SEER12.00
 ARI RATED HEATING CAP. BTUH(47) 22000, COP(47) 3.20, HSPF 7.50 MIN.DHR REG IV
 BTUH(17) 13600, COP(17) 2.00
 FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00% AFUE

HEAT LOSS ELEC
 BTUH \$/KWH

25,000

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

05	\$	438		772	
06	\$	521		925	
07	\$	612		1085	
08	\$	702		1238	
09	\$	786		1391	
10	\$	876		1544	
12	\$	1043		1857	BALANCE POINT 14 DEG.F.
14	\$	1224		2170	
16	\$	1398		2476	

30,000

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

05	\$	535		925	
06	\$	639		1112	
07	\$	737		1300	
08	\$	848		1488	
09	\$	952		1669	
10	\$	1057		1857	
12	\$	1272		2232	BALANCE POINT 19 DEG.F.
14	\$	1488		2601	
16	\$	1697		2977	

35,000

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

05	\$	626		1085	
06	\$	751		1300	
07	\$	883		1516	
08	\$	1008		1732	
09	\$	1133		1947	
10	\$	1259		2170	
12	\$	1516		2601	BALANCE POINT 23 DEG.F.
14	\$	1766		3039	
16	\$	2017		3471	

40,000

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

05	\$	737		1238	
06	\$	883		1488	
07	\$	1029		1732	
08	\$	1175		1982	
09	\$	1328		2232	
10	\$	1474		2476	
12	\$	1766		2977	BALANCE POINT 27 DEG.F.
14	\$	2059		3471	
16	\$	2358		3965	

50,000

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

05	\$	973		1544	
06	\$	1168		1857	
07	\$	1363		2170	
08	\$	1558		2476	
09	\$	1752		2789	
10	\$	1947		3095	
12	\$	2337		3721	BALANCE POINT 32 DEG.F.
14	\$	2726		4340	
16	\$	3116		4959	

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

	05	06	07	08	09	10	12	14	16	<—ELECTRIC RATE \$/KWH
\$	38	45	53	61	68	76	91	107	122	<—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

REGION 5 24UHPQC/A36AQ-A
 HEAT PUMP MODEL OUTDOOR 24UHPQC INDOOR A36AQ-A
 ARI RATED COOLING CAP BTUH(95) 23000, SEER12.00
 ARI RATED HEATING CAP BTUH (47) 22000, COP(47) 3.20, HSPF 7.50 MIN DHR REG IV
 BTUH (17) 13600, COP(17) 2.00
 FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC COST \$/KWH	NATURAL GAS COST - \$/THERM												
		35	40	45	50	55	60	65	70	75	80	90	100	
20,000	\$	187	215	243	271	292	319	347	375	403	431	486	542	<—THEORETICAL HEATING COST * FURNACE ONLY
05	\$	271	278	285	292	299	299	306	313	319	326	340	347	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
06	\$	319	326	333	340	347	347	354	361	368	375	389	396	\$ PER YEAR
07	\$	368	375	382	389	396	396	403	410	417	424	438	445	
08	\$	410	417	424	431	438	438	445	452	459	466	479	486	
09	\$	459	466	473	479	486	486	493	500	507	514	528	535	
10	\$	500	507	514	521	528	528	535	542	549	556	570	577	
12	\$	598	605	612	619	626	626	633	639	646	653	667	674	BALANCE POINT 9 DEG.F
14	\$	688	695	702	709	716	716	723	730	737	744	758	765	
16	\$	779	786	793	799	806	806	813	820	827	834	848	855	
25,000	\$	236	271	299	333	368	403	438	473	507	542	605	674	<—THEORETICAL HEATING COST * FURNACE ONLY
05	\$	319	326	340	347	361	368	382	389	403	410	431	452	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
06	\$	368	375	389	396	410	417	431	438	452	459	479	500	\$ PER YEAR
07	\$	417	424	438	445	459	466	479	486	500	507	528	549	
08	\$	466	473	486	493	507	514	528	535	549	556	577	598	
09	\$	514	521	535	542	556	563	577	584	598	605	626	646	
10	\$	570	577	591	598	612	619	633	639	653	660	681	702	
12	\$	667	674	688	695	709	716	730	737	751	758	779	799	BALANCE POINT 14 DEG.F
14	\$	765	772	786	793	806	813	827	834	848	855	876	897	
16	\$	862	869	883	890	904	911	925	932	946	952	973	994	
30,000	\$	278	319	361	403	445	486	528	563	605	646	730	813	<—THEORETICAL HEATING COST * FURNACE ONLY
05	\$	354	375	389	403	424	438	452	473	486	500	535	563	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
06	\$	403	424	438	452	473	486	500	521	535	549	584	612	\$ PER YEAR
07	\$	459	479	493	507	528	542	556	577	591	605	639	667	
08	\$	507	528	542	556	577	591	605	626	639	653	688	716	
09	\$	556	577	591	605	626	639	653	674	688	702	737	765	
10	\$	605	626	639	653	674	688	702	723	737	751	786	813	
12	\$	702	723	737	751	772	786	799	820	834	848	883	911	BALANCE POINT 19 DEG.F
14	\$	799	820	834	848	869	883	897	918	932	946	980	1008	
16	\$	897	918	932	946	966	980	994	1015	1029	1043	1078	1106	
35,000	\$	326	375	424	473	521	563	612	660	709	758	848	946	<—THEORETICAL HEATING COST * FURNACE ONLY
05	\$	396	424	445	466	493	514	542	563	591	612	660	709	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
06	\$	438	466	486	507	535	556	584	605	633	653	702	751	\$ PER YEAR
07	\$	486	514	535	556	584	605	633	653	681	702	751	799	
08	\$	528	556	577	598	626	646	674	695	723	744	793	841	
09	\$	577	605	626	646	674	695	723	744	772	793	841	890	
10	\$	619	646	667	688	716	737	765	786	813	834	883	932	
12	\$	709	737	758	779	806	827	855	876	904	925	973	1022	BALANCE POINT 23 DEG.F
14	\$	799	827	848	869	897	918	946	966	994	1015	1064	1112	
16	\$	890	918	939	959	987	1008	1036	1057	1085	1106	1154	1203	
40,000	\$	375	431	486	542	591	646	702	758	813	862	973	1085	<—THEORETICAL HEATING COST * FURNACE ONLY
05	\$	424	459	493	528	563	591	626	660	695	730	799	862	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
06	\$	459	493	528	563	598	626	660	695	730	765	834	897	\$ PER YEAR
07	\$	500	535	570	605	639	667	702	737	772	806	876	939	
08	\$	535	570	605	639	674	702	737	772	806	841	911	973	
09	\$	577	612	646	681	716	744	779	813	848	883	952	1015	
10	\$	612	646	681	716	751	779	813	848	883	918	987	1050	
12	\$	688	723	758	793	827	855	890	925	959	994	1064	1126	BALANCE POINT 27 DEG.F
14	\$	765	799	834	869	904	932	966	1001	1036	1071	1140	1203	
16	\$	841	876	911	946	980	1008	1043	1078	1112	1147	1217	1279	
50,000	\$	473	542	605	674	744	813	876	946	1015	1085	1217	1356	<—THEORETICAL HEATING COST * FURNACE ONLY
05	\$	500	556	605	653	702	751	806	855	904	952	1057	1154	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
06	\$	535	591	639	688	737	786	841	890	939	987	1092	1189	\$ PER YEAR
07	\$	563	619	667	716	765	813	869	918	966	1015	1119	1217	
08	\$	598	653	702	751	799	848	904	952	1001	1050	1154	1252	
09	\$	626	681	730	779	827	876	932	980	1029	1078	1182	1279	
10	\$	660	716	765	813	862	911	966	1015	1064	1112	1217	1314	
12	\$	716	772	820	869	918	966	1022	1071	1119	1168	1272	1370	BALANCE POINT 32 DEG.F
14	\$	779	834	883	932	980	1029	1085	1133	1182	1231	1335	1432	
16	\$	841	897	946	994	1043	1092	1147	1196	1245	1293	1398	1495	

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

	05	06	07	08	09	10	12	14	16	<—ELECTRIC RATE \$/KWH
\$	38	45	53	61	68	76	91	107	122	<—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

REGION 5
 HEAT PUMP MODEL OUTDOOR 24UHPQC INDOOR A36AQ-A
 ARI RATED COOLING CAP BTUH(95) 23000, SEER12.00
 ARI RATED HEATING CAP BTUH (47) 22000, COP(47) 3.20, HSPF 7.50 MIN DHR REG IV
 BTUH (17) 13600, COP(17) 2.00
 FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 78.00% AFUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	HEATING OIL COST - \$/GALLON												
		70	80	90	100	110	120	130	140	150	160	170		180
20,000		\$ 271	313	347	389	424	466	507	542	584	626	660	702	<---THEORETICAL HEATING COST * FURNACE ONLY
05	\$	292	299	306	319	326	333	340	354	361	368	375	389	THEORETICAL HEATING COST * FURN. + HEAT PUMP
06	\$	340	347	354	368	375	382	389	403	410	417	424	438	\$ PER YEAR
07	\$	389	396	403	417	424	431	438	452	459	466	473	486	
08	\$	431	438	445	459	466	473	479	493	500	507	514	528	
09	\$	479	486	493	507	514	521	528	542	549	556	563	577	
10	\$	521	528	535	549	556	563	570	584	591	598	605	619	
12	\$	619	626	633	646	653	660	667	681	688	695	702	716	BALANCE POINT 9 DEG.F.
14	\$	709	716	723	737	744	751	758	772	779	786	793	806	
16	\$	799	806	813	827	834	841	848	862	869	876	883	897	
25,000		\$ 340	389	438	486	535	584	633	681	730	779	827	876	<---THEORETICAL HEATING COST * FURNACE ONLY
05	\$	347	361	375	396	410	424	438	452	466	486	500	514	THEORETICAL HEATING COST * FURN. + HEAT PUMP
06	\$	396	410	424	445	459	473	486	500	514	535	549	563	\$ PER YEAR
07	\$	445	459	473	493	507	521	535	549	563	584	598	612	
08	\$	493	507	521	542	556	570	584	598	612	633	646	660	
09	\$	542	556	570	591	605	619	633	646	660	681	695	709	
10	\$	598	612	626	646	660	674	688	702	716	737	751	765	
12	\$	695	709	723	744	758	772	786	799	813	834	848	862	BALANCE POINT 14 DEG.F.
14	\$	793	806	820	841	855	869	883	897	911	932	946	959	
16	\$	890	904	918	939	952	966	980	994	1008	1029	1043	1057	
30,000		\$ 410	466	521	584	639	702	758	820	876	939	994	1050	<---THEORETICAL HEATING COST * FURNACE ONLY
05	\$	403	431	452	473	500	521	549	570	591	619	639	660	THEORETICAL HEATING COST * FURN. + HEAT PUMP
06	\$	452	479	500	521	549	570	598	619	639	667	688	709	\$ PER YEAR
07	\$	507	535	556	577	605	626	653	674	695	723	744	765	
08	\$	556	584	605	626	653	674	702	723	744	772	793	813	
09	\$	605	633	653	674	702	723	751	772	793	820	841	862	
10	\$	653	681	702	723	751	772	799	820	841	869	890	911	
12	\$	751	779	799	820	848	869	897	918	939	966	987	1008	BALANCE POINT 19 DEG.F.
14	\$	848	876	897	918	946	966	994	1015	1036	1064	1085	1106	
16	\$	946	973	994	1015	1043	1064	1092	1112	1133	1161	1182	1203	
35,000		\$ 473	542	612	681	751	820	890	952	1022	1092	1161	1231	<---THEORETICAL HEATING COST * FURNACE ONLY
05	\$	473	507	542	577	612	646	681	709	744	779	813	848	THEORETICAL HEATING COST * FURN. + HEAT PUMP
06	\$	514	549	584	619	653	688	723	751	786	820	855	890	\$ PER YEAR
07	\$	563	598	633	667	702	737	772	799	834	869	904	939	
08	\$	605	639	674	709	744	779	813	841	876	911	946	980	
09	\$	653	688	723	758	793	827	862	890	925	959	994	1029	
10	\$	695	730	765	799	834	869	904	932	966	1001	1036	1071	
12	\$	786	820	855	890	925	959	994	1022	1057	1092	1126	1161	BALANCE POINT 23 DEG.F.
14	\$	876	911	946	980	1015	1050	1085	1112	1147	1182	1217	1252	
16	\$	966	1001	1036	1071	1106	1140	1175	1203	1238	1272	1307	1342	
40,000		\$ 542	626	702	779	855	939	1015	1092	1168	1252	1328	1405	<---THEORETICAL HEATING COST * FURNACE ONLY
05	\$	528	577	626	674	723	772	820	869	918	966	1015	1071	THEORETICAL HEATING COST * FURN. + HEAT PUMP
06	\$	563	612	660	709	758	806	855	904	952	1001	1050	1106	\$ PER YEAR
07	\$	605	653	702	751	799	848	897	946	994	1043	1092	1147	
08	\$	639	688	737	786	834	883	932	980	1029	1078	1126	1182	
09	\$	681	730	779	827	876	925	973	1022	1071	1119	1168	1224	
10	\$	716	765	813	862	911	959	1008	1057	1106	1154	1203	1259	
12	\$	793	841	890	939	987	1036	1085	1133	1182	1231	1279	1335	BALANCE POINT 27 DEG.F.
14	\$	869	918	966	1015	1064	1112	1161	1210	1259	1307	1356	1412	
16	\$	946	994	1043	1092	1140	1189	1238	1286	1335	1384	1432	1488	
50,000		\$ 681	779	876	973	1071	1168	1266	1363	1467	1565	1662	1759	<---THEORETICAL HEATING COST * FURNACE ONLY
05	\$	660	730	799	876	946	1022	1092	1161	1238	1307	1377	1453	THEORETICAL HEATING COST * FURN. + HEAT PUMP
06	\$	695	765	834	911	980	1057	1126	1196	1272	1342	1412	1488	\$ PER YEAR
07	\$	723	793	862	939	1008	1085	1154	1224	1300	1370	1439	1516	
08	\$	758	827	897	973	1043	1119	1189	1259	1335	1405	1474	1551	
09	\$	786	855	925	1001	1071	1147	1217	1286	1363	1432	1502	1579	
10	\$	820	890	959	1036	1106	1182	1252	1321	1398	1467	1537	1613	
12	\$	876	946	1015	1092	1161	1238	1307	1377	1453	1523	1592	1669	BALANCE POINT 32 DEG.F.
14	\$	939	1008	1078	1154	1224	1300	1370	1439	1516	1586	1655	1732	
16	\$	1001	1071	1140	1217	1286	1363	1432	1502	1579	1648	1718	1794	

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

	05	06	07	08	09	10	12	14	16	<---ELECTRIC RATE \$/KWH	<---THEORETICAL AIR CONDITIONING COST
\$	38	45	53	61	68	76	91	107	122		

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

REGION 5
 HEAT PUMP MODEL OUTDOOR 24UHPQC INDOOR A36AQ-A
 ARI RATED COOLING CAP. BTUH(95) 23000, SEER 12.00
 ARI RATED HEATING CAP. BTUH(47) 22000, COP(47) 3.20, HSPF 7.50 MIN DHR REG IV
 BTUH(17) 13600, COP(17) 2.00
 FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 78.00% 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														<—THEORETICAL HEATING COST * FURNACE ONLY
05	\$	354	382	417	445	473	500	535	563	591	653	709	709	THEORETICAL HEATING COST * FURN + HEAT PUMP
06	\$	313	313	319	326	333	340	347	354	361	375	389	389	\$ PER YEAR
07	\$	361	361	368	375	382	389	396	403	410	424	438	438	
08	\$	410	410	417	424	431	438	445	452	459	473	486	486	
09	\$	452	452	459	466	473	479	486	493	500	514	528	528	
10	\$	500	500	507	514	521	528	535	542	549	563	577	577	
12	\$	542	542	549	556	563	570	577	584	591	605	619	619	BALANCE POINT 9 DEG F
14	\$	639	639	646	653	660	667	674	681	688	702	716	716	
16	\$	730	730	737	744	751	758	765	772	779	793	806	806	
	\$	820	820	827	834	841	848	855	862	869	883	897	897	
25,000														<—THEORETICAL HEATING COST * FURNACE ONLY
05	\$	445	479	521	556	591	633	667	702	744	813	890	890	THEORETICAL HEATING COST * FURN + HEAT PUMP
06	\$	382	389	403	417	424	438	452	459	473	493	521	521	\$ PER YEAR
07	\$	431	438	452	466	473	486	500	507	521	542	570	570	
08	\$	479	486	500	514	521	535	549	556	570	591	619	619	
09	\$	528	535	549	563	570	584	598	605	619	639	667	667	
10	\$	577	584	598	612	619	633	646	653	667	688	716	716	
12	\$	633	639	653	667	674	688	702	709	723	744	772	772	BALANCE POINT 14 DEG F
14	\$	730	737	751	765	772	786	799	806	820	841	869	869	
16	\$	827	834	848	862	869	883	897	904	918	939	966	966	
	\$	925	932	946	959	966	980	994	1001	1015	1036	1064	1064	
30,000														<—THEORETICAL HEATING COST * FURNACE ONLY
05	\$	535	577	626	667	709	758	799	848	890	980	1071	1071	THEORETICAL HEATING COST * FURN + HEAT PUMP
06	\$	459	473	493	507	528	542	563	577	598	633	667	667	\$ PER YEAR
07	\$	507	521	542	556	577	591	612	626	646	681	716	716	
08	\$	563	577	598	612	633	646	667	681	702	737	772	772	
09	\$	612	626	646	660	681	695	716	730	751	786	820	820	
10	\$	660	674	695	709	730	744	765	779	799	834	869	869	
12	\$	709	723	744	758	779	793	813	827	848	883	918	918	BALANCE POINT 19 DEG F
14	\$	806	820	841	855	876	890	911	925	946	980	1015	1015	
16	\$	904	918	939	952	973	987	1008	1022	1043	1078	1112	1112	
	\$	1001	1015	1036	1050	1071	1085	1106	1119	1140	1175	1210	1210	
35,000														<—THEORETICAL HEATING COST * FURNACE ONLY
05	\$	626	674	730	779	834	883	939	987	1043	1147	1252	1252	THEORETICAL HEATING COST * FURN + HEAT PUMP
06	\$	542	570	598	626	653	674	702	730	758	806	862	862	\$ PER YEAR
07	\$	584	612	639	667	695	716	744	772	799	848	904	904	
08	\$	633	660	688	716	744	765	793	820	848	897	952	952	
09	\$	674	702	730	758	786	806	834	862	890	939	994	994	
10	\$	723	751	779	806	834	855	883	911	939	987	1043	1043	
12	\$	765	793	820	848	876	897	925	952	980	1029	1085	1085	BALANCE POINT 23 DEG F
14	\$	855	883	911	939	966	987	1015	1043	1071	1119	1175	1175	
16	\$	946	973	1001	1029	1057	1078	1106	1133	1161	1210	1266	1266	
	\$	1036	1064	1092	1119	1147	1168	1196	1224	1252	1300	1356	1356	
40,000														<—THEORETICAL HEATING COST * FURNACE ONLY
05	\$	709	772	834	890	952	1008	1071	1126	1189	1307	1426	1426	THEORETICAL HEATING COST * FURN + HEAT PUMP
06	\$	633	674	709	744	786	820	855	897	932	1008	1085	1085	\$ PER YEAR
07	\$	667	709	744	779	820	855	890	932	966	1043	1119	1119	
08	\$	709	751	786	820	862	897	932	973	1008	1085	1161	1161	
09	\$	744	786	820	855	897	932	966	1008	1043	1119	1196	1196	
10	\$	786	827	862	897	939	973	1008	1050	1085	1161	1238	1238	
12	\$	820	862	897	932	973	1008	1043	1085	1119	1196	1272	1272	BALANCE POINT 27 DEG F
14	\$	897	939	973	1008	1050	1085	1119	1161	1196	1272	1349	1349	
16	\$	973	1015	1050	1085	1126	1161	1196	1238	1272	1349	1426	1426	
	\$	1050	1092	1126	1161	1203	1238	1272	1314	1349	1426	1502	1502	
50,000														<—THEORETICAL HEATING COST * FURNACE ONLY
05	\$	890	966	1043	1112	1189	1266	1335	1412	1488	1634	1787	1787	THEORETICAL HEATING COST * FURN + HEAT PUMP
06	\$	813	869	925	980	1036	1092	1140	1196	1252	1363	1474	1474	\$ PER YEAR
07	\$	848	904	959	1015	1071	1126	1175	1231	1286	1398	1509	1509	
08	\$	876	932	987	1043	1099	1154	1203	1259	1314	1426	1537	1537	
09	\$	911	966	1022	1078	1133	1189	1238	1293	1349	1460	1572	1572	
10	\$	939	994	1050	1106	1161	1217	1266	1321	1377	1488	1599	1599	
12	\$	973	1029	1085	1140	1196	1252	1300	1356	1412	1523	1634	1634	BALANCE POINT 32 DEG F
14	\$	1029	1085	1140	1196	1252	1307	1356	1412	1467	1579	1690	1690	
16	\$	1092	1147	1203	1259	1314	1370	1419	1474	1530	1641	1752	1752	
	\$	1154	1210	1266	1321	1377	1432	1481	1537	1592	1704	1815	1815	

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

	05	06	07	08	09	10	12	14	16	<—ELECTRIC RATE \$/KWH
\$	38	45	53	61	68	76	91	107	122	<—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

REGION 5
 HEAT PUMP MODEL: OUTDOOR 30UHPC 30UHPC/A36AO-A INDOOR A36AO-A
 ARI RATED COOLING CAP.: BTUH (95) 28000 SEER 12.00
 ARI RATED HEATING CAP.: BTUH (47) 28000 COP (47) 3.20 HSEF 7.20 MIN.DHR REG IV
 BTUH (17) 17200 COP (17) 2.10
 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
30,000			
.05	\$	521	925
.06	\$	619	1112
.07	\$	723	1300
.08	\$	834	1488
.09	\$	932	1669
.10	\$	1036	1857
.12	\$	1245	2232
.14	\$	1453	2601
.16	\$	1655	2977
			BALANCE POINT 13 DEG.F.

HEAT LOSS BTUH	ELEC. COST \$/KWH	--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
35,000			
.05	\$	605	1085
.06	\$	737	1300
.07	\$	855	1516
.08	\$	980	1732
.09	\$	1099	1947
.10	\$	1217	2170
.12	\$	1460	2601
.14	\$	1704	3039
.16	\$	1947	3471
			BALANCE POINT 17 DEG.F.

HEAT LOSS BTUH	ELEC. COST \$/KWH	--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
40,000			
.05	\$	709	1238
.06	\$	848	1488
.07	\$	994	1732
.08	\$	1133	1982
.09	\$	1279	2232
.10	\$	1419	2476
.12	\$	1697	2977
.14	\$	1982	3471
.16	\$	2267	3965
			BALANCE POINT 21 DEG.F.

HEAT LOSS BTUH	ELEC. COST \$/KWH	--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
50,000			
.05	\$	932	1544
.06	\$	1112	1857
.07	\$	1300	2170
.08	\$	1488	2476
.09	\$	1669	2789
.10	\$	1857	3095
.12	\$	2225	3721
.14	\$	2594	4340
.16	\$	2970	4959
			BALANCE POINT 28 DEG.F.

HEAT LOSS BTUH	ELEC. COST \$/KWH	--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
60,000			
.05	\$	1168	1857
.06	\$	1405	2232
.07	\$	1634	2601
.08	\$	1878	2977
.09	\$	2107	3345
.10	\$	2344	3721
.12	\$	2810	4465
.14	\$	3283	5210
.16	\$	3749	5954
			BALANCE POINT 33 DEG.F.

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

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
\$	46	55	65	74	83	93	111	130	149	<-- ELECTRIC RATE \$/KWH
										<-- THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY

REGION 5
 HEAT PUMP MODEL: 30UHPC/A36AO-A
 OUTDOOR 30UHPC INDOOR A36AO-A
 ARI RATED COOLING CAP.: BTUH (95) 28000 SEER 12.00
 ARI RATED HEATING CAP.: BTUH (47) 28000 COP (47) 3.20 HSPF 7.20 MIN. DHR REG IV
 BTUH (17) 17200 COP (17) 2.10
 FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00 % ARIUE

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	\$ 278	319	361	403	445	486	528	563	605	646	730	813	<--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$ 389	396	410	424	438	452	459	473	486	500	521	549	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$ 445	452	466	479	493	507	514	528	542	556	577	605		
.07	\$ 507	514	528	542	556	570	577	591	605	619	639	667		
.08	\$ 563	570	584	598	612	626	633	646	660	674	695	723		
.09	\$ 626	633	646	660	674	688	695	709	723	737	758	786		
.10	\$ 681	688	702	716	730	744	751	765	779	793	813	841		
.12	\$ 799	806	820	834	848	862	869	883	897	911	932	959		
.14	\$ 925	932	946	959	973	987	994	1008	1022	1036	1057	1085		
.16	\$ 1043	1050	1064	1078	1092	1106	1112	1126	1140	1154	1175	1203		BALANCE POINT 13 DEG.F.
35,000	\$ 326	375	424	473	521	563	612	660	709	758	848	946		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$ 424	445	459	479	500	521	535	556	577	591	633	667	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$ 486	507	521	542	563	584	598	619	639	653	695	730		
.07	\$ 542	563	577	598	619	639	653	674	695	709	751	786		
.08	\$ 605	626	639	660	681	702	716	737	758	772	813	848		
.09	\$ 660	681	695	716	737	758	772	793	813	827	869	904		
.10	\$ 723	744	758	779	799	820	834	855	876	890	932	966		
.12	\$ 841	862	876	897	918	939	952	973	994	1008	1050	1085		
.14	\$ 959	980	994	1015	1036	1057	1071	1092	1112	1126	1168	1203		
.16	\$ 1078	1099	1112	1133	1154	1175	1189	1210	1231	1245	1286	1321		BALANCE POINT 17 DEG.F.
40,000	\$ 375	431	486	542	591	646	702	758	813	862	973	1085		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$ 486	507	528	549	570	591	612	633	653	681	723	765	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$ 549	570	591	612	633	653	674	695	716	744	786	827		
.07	\$ 619	639	660	681	702	723	744	765	786	813	855	897		
.08	\$ 681	702	723	744	765	786	806	827	848	876	918	959		
.09	\$ 751	772	793	813	834	855	876	897	918	946	987	1029		
.10	\$ 813	834	855	876	897	918	939	959	980	1008	1050	1092		
.12	\$ 946	966	987	1008	1029	1050	1071	1092	1112	1140	1182	1224		
.14	\$ 1078	1099	1119	1140	1161	1182	1203	1224	1245	1272	1314	1356		
.16	\$ 1210	1231	1252	1272	1293	1314	1335	1356	1377	1405	1446	1488		BALANCE POINT 21 DEG.F.
50,000	\$ 473	542	605	674	744	813	876	946	1015	1085	1217	1356		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$ 542	584	626	667	709	751	793	834	876	918	1008	1092	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$ 591	633	674	716	758	799	841	883	925	966	1057	1140		
.07	\$ 639	681	723	765	806	848	890	932	973	1015	1106	1189		
.08	\$ 688	730	772	813	855	897	939	980	1022	1064	1154	1238		
.09	\$ 737	779	820	862	904	946	987	1029	1071	1112	1203	1286		
.10	\$ 786	827	869	911	952	994	1036	1078	1119	1161	1252	1335		
.12	\$ 883	925	966	1008	1050	1092	1133	1175	1217	1259	1349	1432		
.14	\$ 980	1022	1064	1106	1147	1189	1231	1272	1314	1356	1446	1530		
.16	\$ 1078	1119	1161	1203	1245	1286	1328	1370	1412	1453	1544	1627		BALANCE POINT 28 DEG.F.
60,000	\$ 563	646	730	813	890	973	1057	1133	1217	1300	1460	1627		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$ 612	674	737	793	855	918	973	1036	1099	1154	1279	1398	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$ 646	709	772	827	890	952	1008	1071	1133	1189	1314	1432		
.07	\$ 688	751	813	869	932	994	1050	1112	1175	1231	1356	1474		
.08	\$ 730	793	855	911	973	1036	1092	1154	1217	1272	1398	1516		
.09	\$ 765	827	890	946	1008	1071	1126	1189	1252	1307	1432	1551		
.10	\$ 806	869	932	987	1050	1112	1168	1231	1293	1349	1474	1592		
.12	\$ 883	946	1008	1064	1126	1189	1245	1307	1370	1426	1551	1669		
.14	\$ 959	1022	1085	1140	1203	1266	1321	1384	1446	1502	1627	1745		
.16	\$ 1036	1099	1161	1217	1279	1342	1398	1460	1523	1579	1704	1822		BALANCE POINT 33 DEG.F.

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

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
\$	46	55	65	74	83	93	111	130	149	<--ELECTRIC RATE \$/KWH
										<--THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY

REGION 5
 HEAT PUMP MODEL: OUTDOOR 30UHPOC 30UHPOC/A36AO-A
 INDOOR A36AO-A
 ARI RATED COOLING CAP.: BTUH(95) 28000 SEER12.00
 ARI RATED HEATING CAP.: BTUH(47) 28000 COP(47) 3.20 HSPF 7.20 MIN.DHR REG IV
 BTUH(17) 17200 COP(17) 2.10
 FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	HEATING OIL COST - \$/GALLON												
		.70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	
30,000	\$	410	466	521	584	639	702	758	820	876	939	994	1050	<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	424	445	459	479	500	514	535	549	570	591	605	626	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	479	500	514	535	556	570	591	605	626	646	660	681	
.07	\$	542	563	577	598	619	633	653	667	688	709	723	744	
.08	\$	598	619	633	653	674	688	709	723	744	765	779	799	
.09	\$	660	681	695	716	737	751	772	786	806	827	841	862	
.10	\$	716	737	751	772	793	806	827	841	862	883	897	918	BALANCE POINT 13 DEG.F.
.12	\$	834	855	869	890	911	925	946	959	980	1001	1015	1036	
.14	\$	959	980	994	1015	1036	1050	1071	1085	1106	1126	1140	1161	
.16	\$	1078	1099	1112	1133	1154	1168	1189	1203	1224	1245	1259	1279	
35,000	\$	473	542	612	681	751	820	890	952	1022	1092	1161	1231		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	479	507	535	563	591	619	646	674	702	723	751	779	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	542	570	598	626	653	681	709	737	765	786	813	841	
.07	\$	598	626	653	681	709	737	765	793	820	841	869	897	
.08	\$	660	688	716	744	772	799	827	855	883	904	932	959	
.09	\$	716	744	772	799	827	855	883	911	939	959	987	1015	
.10	\$	779	806	834	862	890	918	946	973	1001	1022	1050	1078	BALANCE POINT 17 DEG.F.
.12	\$	897	925	952	980	1008	1036	1064	1092	1119	1140	1168	1196	
.14	\$	1015	1043	1071	1099	1126	1154	1182	1210	1238	1259	1286	1314	
.16	\$	1133	1161	1189	1217	1245	1272	1300	1328	1356	1377	1405	1432	
40,000	\$	542	626	702	779	855	939	1015	1092	1168	1252	1328	1405		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	549	584	612	646	674	709	737	765	799	827	862	890	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	612	646	674	709	737	772	799	827	862	890	925	952	
.07	\$	681	716	744	779	806	841	869	897	932	959	994	1022	
.08	\$	744	779	806	841	869	904	932	959	994	1022	1057	1085	
.09	\$	813	848	876	911	939	973	1001	1029	1064	1092	1126	1154	
.10	\$	876	911	939	973	1001	1036	1064	1092	1126	1154	1189	1217	BALANCE POINT 21 DEG.F.
.12	\$	1008	1043	1071	1106	1133	1168	1196	1224	1259	1286	1321	1349	
.14	\$	1140	1175	1203	1238	1266	1300	1328	1356	1391	1419	1453	1481	
.16	\$	1272	1307	1335	1370	1398	1432	1460	1488	1523	1551	1586	1613	
50,000	\$	681	779	876	973	1071	1168	1266	1363	1467	1565	1662	1759		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	667	730	793	855	918	973	1036	1099	1161	1224	1279	1342	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	716	779	841	904	966	1022	1085	1147	1210	1272	1328	1391	
.07	\$	765	827	890	952	1015	1071	1133	1196	1259	1321	1377	1439	
.08	\$	813	876	939	1001	1064	1119	1182	1245	1307	1370	1426	1488	
.09	\$	862	925	987	1050	1112	1168	1231	1293	1356	1419	1474	1537	
.10	\$	911	973	1036	1099	1161	1217	1279	1342	1405	1467	1523	1586	BALANCE POINT 28 DEG.F.
.12	\$	1008	1071	1133	1196	1259	1314	1377	1439	1502	1565	1620	1683	
.14	\$	1106	1168	1231	1293	1356	1412	1474	1537	1599	1662	1718	1780	
.16	\$	1203	1266	1328	1391	1453	1509	1572	1634	1697	1759	1815	1878	
60,000	\$	820	939	1050	1168	1286	1405	1523	1641	1759	1878	1996	2107		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	799	890	973	1064	1147	1231	1321	1405	1495	1579	1669	1752	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	834	925	1008	1099	1182	1266	1356	1439	1530	1613	1704	1787	
.07	\$	876	966	1050	1140	1224	1307	1398	1481	1572	1655	1745	1829	
.08	\$	918	1008	1092	1182	1266	1349	1439	1523	1613	1697	1787	1871	
.09	\$	952	1043	1126	1217	1300	1384	1474	1558	1648	1732	1822	1905	
.10	\$	994	1085	1168	1259	1342	1426	1516	1599	1690	1773	1864	1947	BALANCE POINT 33 DEG.F.
.12	\$	1071	1161	1245	1335	1419	1502	1592	1676	1766	1850	1940	2024	
.14	\$	1147	1238	1321	1412	1495	1579	1669	1752	1843	1926	2017	2100	
.16	\$	1224	1314	1398	1488	1572	1655	1745	1829	1919	2003	2093	2177	

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

.05	.06	.07	.08	.09	.10	.12	.14	.16	<--ELECTRIC RATE \$/KWH
\$ 46	\$ 55	\$ 65	\$ 74	\$ 83	\$ 93	\$ 111	\$ 130	\$ 149	<--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

REGION 5
 HEAT PUMP MODEL: OUTDOOR 30UHPC 30UHPC/A36AQ-A
 INDOOR A36AQ-A
 ARI RATED COOLING CAP.: BTUH(95) 28000 SEER12.00
 ARI RATED HEATING CAP.: BTUH(47) 28000 COP(47) 3.20 HSPF 7.20 MIN.DHR REG IV
 BTUH(17) 17200 COP(17) 2.10
 FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	BLRC COST \$/KWH	PROPANE GAS COST - \$/GALLON											
		.60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10	1.20		1.20
30,000	\$ 535	577	626	667	709	758	799	848	890	980	1071	1071	<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$ 466	479	493	507	521	535	549	563	577	605	626	626	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$ 521	535	549	563	577	591	605	619	633	660	681	681	
.07	\$ 584	598	612	626	639	653	667	681	695	723	744	744	
.08	\$ 639	653	667	681	695	709	723	737	751	779	799	799	
.09	\$ 702	716	730	744	758	772	786	799	813	841	862	862	
.10	\$ 758	772	786	799	813	827	841	855	869	897	918	918	BALANCE POINT 13 DEG.F.
.12	\$ 876	890	904	918	932	946	959	973	987	1015	1036	1036	
.14	\$ 1001	1015	1029	1043	1057	1071	1085	1099	1112	1140	1161	1161	
.16	\$ 1119	1133	1147	1161	1175	1189	1203	1217	1231	1259	1279	1279	
35,000	\$ 626	674	730	779	834	883	939	987	1043	1147	1252	1252		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$ 542	563	584	605	626	646	667	688	709	744	786	786	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$ 605	626	646	667	688	709	730	751	772	806	848	848	
.07	\$ 660	681	702	723	744	765	786	806	827	862	904	904	
.08	\$ 723	744	765	786	806	827	848	869	890	925	966	966	
.09	\$ 779	799	820	841	862	883	904	925	946	980	1022	1022	
.10	\$ 841	862	883	904	925	946	966	987	1008	1043	1085	1085	BALANCE POINT 17 DEG.F.
.12	\$ 959	980	1001	1022	1043	1064	1085	1106	1126	1161	1203	1203	
.14	\$ 1078	1099	1119	1140	1161	1182	1203	1224	1245	1279	1321	1321	
.16	\$ 1196	1217	1238	1259	1279	1300	1321	1342	1363	1398	1439	1439	
40,000	\$ 709	772	834	890	952	1008	1071	1126	1189	1307	1426	1426		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$ 619	639	667	688	709	737	758	786	806	855	904	904	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$ 681	702	730	751	772	799	820	848	869	918	966	966	
.07	\$ 751	772	799	820	841	869	890	918	939	987	1036	1036	
.08	\$ 813	834	862	883	904	932	952	980	1001	1050	1099	1099	
.09	\$ 883	904	932	952	973	1001	1022	1050	1071	1119	1168	1168	
.10	\$ 946	966	994	1015	1036	1064	1085	1112	1133	1182	1231	1231	BALANCE POINT 21 DEG.F.
.12	\$ 1078	1099	1126	1147	1168	1196	1217	1245	1266	1314	1363	1363	
.14	\$ 1210	1231	1259	1279	1300	1328	1349	1377	1398	1446	1495	1495	
.16	\$ 1342	1363	1391	1412	1432	1460	1481	1509	1530	1579	1627	1627	
50,000	\$ 890	966	1043	1112	1189	1266	1335	1412	1488	1634	1787	1787		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$ 799	848	897	939	987	1036	1085	1126	1175	1266	1363	1363	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$ 848	897	946	987	1036	1085	1133	1175	1224	1314	1412	1412	
.07	\$ 897	946	994	1036	1085	1133	1182	1224	1272	1363	1460	1460	
.08	\$ 946	994	1043	1085	1133	1182	1231	1272	1321	1412	1509	1509	
.09	\$ 994	1043	1092	1133	1182	1231	1279	1321	1370	1460	1558	1558	
.10	\$ 1043	1092	1140	1182	1231	1279	1328	1370	1419	1509	1606	1606	BALANCE POINT 28 DEG.F.
.12	\$ 1140	1189	1238	1279	1328	1377	1426	1467	1516	1606	1704	1704	
.14	\$ 1238	1286	1335	1377	1426	1474	1523	1565	1613	1704	1801	1801	
.16	\$ 1335	1384	1432	1474	1523	1572	1620	1662	1711	1801	1899	1899	
60,000	\$ 1071	1161	1252	1335	1426	1516	1606	1697	1787	1968	2142	2142		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$ 987	1050	1119	1182	1252	1314	1384	1446	1516	1648	1780	1780	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$ 1022	1085	1154	1217	1286	1349	1419	1481	1551	1683	1815	1815	
.07	\$ 1064	1126	1196	1259	1328	1391	1460	1523	1592	1725	1857	1857	
.08	\$ 1106	1168	1238	1300	1370	1432	1502	1565	1634	1766	1899	1899	
.09	\$ 1140	1203	1272	1335	1405	1467	1537	1599	1669	1801	1933	1933	
.10	\$ 1182	1245	1314	1377	1446	1509	1579	1641	1711	1843	1975	1975	BALANCE POINT 33 DEG.F.
.12	\$ 1259	1321	1391	1453	1523	1586	1655	1718	1787	1919	2052	2052	
.14	\$ 1335	1398	1467	1530	1599	1662	1732	1794	1864	1996	2128	2128	
.16	\$ 1412	1474	1544	1606	1676	1739	1808	1871	1940	2072	2205	2205	

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

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
\$	46	55	65	74	83	93	111	130	149	<--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

REGION 5
 HEAT PUMP MODEL: OUTDOOR 30UHPOC 30UHPOC/A37
 INDOOR A37AO-A
 ARI RATED COOLING CAP.: BTUH(95) 30000 SEER12.00
 ARI RATED HEATING CAP.: BTUH (47) 28000 COP(47) 3.40 HSPF 7.50 MIN.DHR REG IV
 BTUH (17) 17000 COP(17) 2.20
 FURNACE TYPR ELECTRIC FURNACE EFFICIENCY 100.00 % AFUE

HEAT LOSS
 BTUH
 ELEC.
 COST
 \$/KWH

30,000

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

.05	\$	507	925
.06	\$	605	1112
.07	\$	709	1300
.08	\$	806	1488
.09	\$	904	1669
.10	\$	1008	1857
.12	\$	1217	2232
.14	\$	1412	2601
.16	\$	1613	2977

BALANCE POINT 13 DEG.F.

35,000

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

.05	\$	591	1085
.06	\$	709	1300
.07	\$	827	1516
.08	\$	952	1732
.09	\$	1071	1947
.10	\$	1189	2170
.12	\$	1426	2601
.14	\$	1662	3039
.16	\$	1899	3471

BALANCE POINT 17 DEG.F.

40,000

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

.05	\$	688	1238
.06	\$	827	1488
.07	\$	966	1732
.08	\$	1106	1982
.09	\$	1245	2232
.10	\$	1384	2476
.12	\$	1655	2977
.14	\$	1933	3471
.16	\$	2212	3965

BALANCE POINT 21 DEG.F.

50,000

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

.05	\$	911	1544
.06	\$	1092	1857
.07	\$	1272	2170
.08	\$	1453	2476
.09	\$	1634	2789
.10	\$	1815	3095
.12	\$	2184	3721
.14	\$	2545	4340
.16	\$	2907	4959

BALANCE POINT 28 DEG.F.

60,000

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

.05	\$	1154	1857
.06	\$	1384	2232
.07	\$	1606	2601
.08	\$	1843	2977
.09	\$	2072	3345
.10	\$	2302	3721
.12	\$	2761	4465
.14	\$	3227	5210
.16	\$	3679	5954

BALANCE POINT 33 DEG.F.

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

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
\$	50	60	70	80	90	100	120	140	160	<--ELECTRIC RATE \$/KWH
										<--THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY

REGION 5
 HEAT PUMP MODEL: OUTDOOR 30UHPOC 30UHPOC/A37AO-A INDOOR A37AO-A
 ARI RATED COOLING CAP.: BTUH(95) 30000 SEER12.00
 ARI RATED HEATING CAP.: BTUH(47) 28000 COP(47) 3.40 HSFP 7.50 MIN.DHR REG IV
 BTUH(17) 17000 COP(17) 2.20
 FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	NATURAL GAS COST - \$/THERM												
		.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.90	1.00	
30,000	\$	278	319	361	403	445	486	528	563	605	646	730	813	<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	375	382	396	410	424	438	445	459	473	486	507	535	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	431	438	452	466	479	493	500	514	528	542	563	591	
.07	\$	486	493	507	521	535	549	556	570	584	598	619	646	
.08	\$	549	556	570	584	598	612	619	633	646	660	681	709	
.09	\$	605	612	626	639	653	667	674	688	702	716	737	765	
.10	\$	660	667	681	695	709	723	730	744	758	772	793	820	BALANCE POINT 13 DEG.F.
.12	\$	772	779	793	806	820	834	841	855	869	883	904	932	
.14	\$	890	897	911	925	939	952	959	973	987	1001	1022	1050	
.16	\$	1001	1008	1022	1036	1050	1064	1071	1085	1099	1112	1133	1161	
35,000	\$	326	375	424	473	521	563	612	660	709	758	848	946		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	417	438	452	473	493	514	528	549	570	584	626	660	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	473	493	507	528	549	570	584	605	626	639	681	716	
.07	\$	528	549	563	584	605	626	639	660	681	695	737	772	
.08	\$	584	605	619	639	660	681	695	716	737	751	793	827	
.09	\$	639	660	674	695	716	737	751	772	793	806	848	883	
.10	\$	695	716	730	751	772	793	806	827	848	862	904	939	BALANCE POINT 17 DEG.F.
.12	\$	806	827	841	862	883	904	918	939	959	973	1015	1050	
.14	\$	925	946	959	980	1001	1022	1036	1057	1078	1092	1133	1168	
.16	\$	1036	1057	1071	1092	1112	1133	1147	1168	1189	1203	1245	1279	
40,000	\$	375	431	486	542	591	646	702	758	813	862	973	1085		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	473	493	514	535	556	577	598	619	639	667	709	751	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	535	556	577	598	619	639	660	681	702	730	772	813	
.07	\$	598	619	639	660	681	702	723	744	765	793	834	876	
.08	\$	660	681	702	723	744	765	786	806	827	855	897	939	
.09	\$	723	744	765	786	806	827	848	869	890	918	959	1001	
.10	\$	786	806	827	848	869	890	911	932	952	980	1022	1064	BALANCE POINT 21 DEG.F.
.12	\$	911	932	952	973	994	1015	1036	1057	1078	1106	1147	1189	
.14	\$	1043	1064	1085	1106	1126	1147	1168	1189	1210	1238	1279	1321	
.16	\$	1168	1189	1210	1231	1252	1272	1293	1314	1335	1363	1405	1446	
50,000	\$	473	542	605	674	744	813	876	946	1015	1085	1217	1356		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	535	577	619	660	702	744	786	827	869	911	1001	1085	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	577	619	660	702	744	786	827	869	911	952	1043	1126	
.07	\$	626	667	709	751	793	834	876	918	959	1001	1092	1175	
.08	\$	674	716	758	799	841	883	925	966	1008	1050	1140	1224	
.09	\$	716	758	799	841	883	925	966	1008	1050	1092	1182	1266	
.10	\$	765	806	848	890	932	973	1015	1057	1099	1140	1231	1314	BALANCE POINT 28 DEG.F.
.12	\$	855	897	939	980	1022	1064	1106	1147	1189	1231	1321	1405	
.14	\$	952	994	1036	1078	1119	1161	1203	1245	1286	1328	1419	1502	
.16	\$	1043	1085	1126	1168	1210	1252	1293	1335	1377	1419	1509	1592	
60,000	\$	563	646	730	813	890	973	1057	1133	1217	1300	1460	1627		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	605	667	730	786	848	911	966	1029	1092	1147	1272	1391	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR
.06	\$	639	702	765	820	883	946	1001	1064	1126	1182	1307	1426	
.07	\$	674	737	799	855	918	980	1036	1099	1161	1217	1342	1460	
.08	\$	716	779	841	897	959	1022	1078	1140	1203	1259	1384	1502	
.09	\$	751	813	876	932	994	1057	1112	1175	1238	1293	1419	1537	
.10	\$	786	848	911	966	1029	1092	1147	1210	1272	1328	1453	1572	BALANCE POINT 33 DEG.F.
.12	\$	862	925	987	1043	1106	1168	1224	1286	1349	1405	1530	1648	
.14	\$	932	994	1057	1112	1175	1238	1293	1356	1419	1474	1599	1718	
.16	\$	1008	1071	1133	1189	1252	1314	1370	1432	1495	1551	1676	1794	

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

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
\$	50	60	70	80	90	100	120	140	160	<--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

REGION 5
 HEAT PUMP MODEL: OUTDOOR 30UHPOC 30UHPOC/A37AO-A INDOOR A37AO-A
 ARI RATED COOLING CAP.: BTUH(95) 30000 SEER12.00
 ARI RATED HEATING CAP.: BTUH(47) 28000 COP(47) 3.40 HSPF 7.50 MIN.DHR REG IV
 BTUH(17) 17000 COP(17) 2.20
 FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 78.00% AFUR

HEAT LOSS BTUH	ELEC. COST \$/KWH	HEATING OIL COST - \$/GALLON													
		.70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70		1.80	
30,000	\$	410	466	521	584	639	702	758	820	876	939	994	1050	---THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	410	431	445	466	486	500	521	535	556	577	591	612	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	466	486	500	521	542	556	577	591	612	633	646	667		
.07	\$	521	542	556	577	598	612	633	646	667	688	702	723		
.08	\$	584	605	619	639	660	674	695	709	730	751	765	786		
.09	\$	639	660	674	695	716	730	751	765	786	806	820	841		
.10	\$	695	716	730	751	772	786	806	820	841	862	876	897	BALANCE POINT 13 DEG.F.	
.12	\$	806	827	841	862	883	897	918	932	952	973	987	1008		
.14	\$	925	946	959	980	1001	1015	1036	1050	1071	1092	1106	1126		
.16	\$	1036	1057	1071	1092	1112	1126	1147	1161	1182	1203	1217	1238		
35,000	\$	473	542	612	681	751	820	890	952	1022	1092	1161	1231			---THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	473	500	528	556	584	612	639	667	695	716	744	772	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	528	556	584	612	639	667	695	723	751	772	799	827		
.07	\$	584	612	639	667	695	723	751	779	806	827	855	883		
.08	\$	639	667	695	723	751	779	806	834	862	883	911	939		
.09	\$	695	723	751	779	806	834	862	890	918	939	966	994		
.10	\$	751	779	806	834	862	890	918	946	973	994	1022	1050	BALANCE POINT 17 DEG.F.	
.12	\$	862	890	918	946	973	1001	1029	1057	1085	1106	1133	1161		
.14	\$	980	1008	1036	1064	1092	1119	1147	1175	1203	1224	1252	1279		
.16	\$	1092	1119	1147	1175	1203	1231	1259	1286	1314	1335	1363	1391		
40,000	\$	542	626	702	779	855	939	1015	1092	1168	1252	1328	1405			---THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	542	570	598	633	660	695	723	751	786	813	848	876	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	598	633	660	695	723	758	786	820	848	876	911	939		
.07	\$	660	695	723	758	786	820	848	876	911	939	973	1001		
.08	\$	723	758	786	820	848	883	911	939	973	1001	1036	1064		
.09	\$	786	820	848	883	911	946	973	1001	1036	1064	1099	1126		
.10	\$	848	883	911	946	973	1008	1036	1064	1099	1126	1161	1189	BALANCE POINT 21 DEG.F.	
.12	\$	973	1008	1036	1071	1099	1133	1161	1189	1224	1252	1286	1314		
.14	\$	1106	1140	1168	1203	1231	1266	1293	1321	1356	1384	1419	1446		
.16	\$	1231	1266	1293	1328	1356	1391	1419	1446	1481	1509	1544	1572		
50,000	\$	681	779	876	973	1071	1168	1266	1363	1467	1565	1662	1759			---THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	681	723	786	848	911	966	1029	1092	1154	1217	1272	1335	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	723	765	827	890	952	1008	1071	1133	1196	1259	1314	1377		
.07	\$	786	827	876	939	1001	1057	1119	1182	1245	1307	1363	1426		
.08	\$	848	883	925	987	1050	1106	1168	1231	1293	1356	1412	1474		
.09	\$	911	946	966	1029	1092	1147	1210	1272	1335	1398	1453	1516		
.10	\$	973	1008	1036	1071	1106	1133	1161	1189	1224	1252	1286	1314	BALANCE POINT 28 DEG.F.	
.12	\$	1106	1140	1168	1203	1231	1266	1293	1321	1356	1384	1419	1446		
.14	\$	1231	1266	1293	1328	1356	1391	1419	1446	1481	1509	1544	1572		
.16	\$	1356	1391	1419	1446	1481	1509	1537	1565	1592	1620	1648	1676		
60,000	\$	820	939	1050	1168	1286	1405	1523	1641	1759	1878	1996	2107			---THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	820	883	966	1057	1140	1224	1314	1398	1488	1572	1662	1745	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	883	918	1001	1092	1175	1259	1349	1432	1523	1606	1697	1780		
.07	\$	946	987	1036	1126	1210	1293	1384	1467	1558	1641	1732	1815		
.08	\$	1008	1043	1078	1168	1252	1335	1426	1509	1599	1683	1773	1857		
.09	\$	1071	1106	1147	1238	1321	1405	1495	1579	1669	1752	1843	1926		
.10	\$	1133	1168	1203	1286	1370	1460	1544	1634	1718	1808	1892	1976	BALANCE POINT 33 DEG.F.	
.12	\$	1266	1301	1342	1432	1516	1606	1695	1784	1873	1962	2051	2140		
.14	\$	1398	1433	1474	1564	1648	1737	1826	1915	2004	2093	2182	2271		
.16	\$	1530	1565	1606	1696	1780	1869	1958	2047	2136	2225	2314	2403		

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

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
\$	50	60	70	80	90	100	120	140	160	---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

REGION 5
 HEAT PUMP MODEL: OUTDOOR 30URPCC 30URPCC/A37AQ-A INDOOR A37AQ-A
 ARI RATED COOLING CAP.: BTUH(95) 30000 SEER12.00
 ARI RATED HEATING CAP.: BTUH (47) 28000 COP(47) 3.40. HSPF 7.50 MIN.DHR REG IV
 BTUH (17) 17000 COP(17) 2.20
 FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 78.00% AFUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	.60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10	1.20	1.20		
30,000	\$	535	577	626	667	709	758	799	848	890	980	1071	1071	<--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	452	466	479	493	507	521	535	549	563	591	612	612	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	507	521	535	549	563	577	591	605	619	646	667	667		
.07	\$	563	577	591	605	619	633	646	660	674	702	723	723		
.08	\$	626	639	653	667	681	695	709	723	737	765	786	786		
.09	\$	681	695	709	723	737	751	765	779	793	820	841	841		
.10	\$	737	751	765	779	793	806	820	834	848	876	897	897		
.12	\$	848	862	876	890	904	918	932	946	959	987	1008	1008		
.14	\$	966	980	994	1008	1022	1036	1050	1064	1078	1106	1126	1126		
.16	\$	1078	1092	1106	1119	1133	1147	1161	1175	1189	1217	1238	1238		BALANCE POINT 13 DEG.F.
35,000	\$	626	674	730	779	834	883	939	987	1043	1147	1252	1252		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	535	556	577	598	619	639	660	681	702	737	779	779	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	591	612	633	653	674	695	716	737	758	793	834	834		
.07	\$	646	667	688	709	730	751	772	793	813	848	890	890		
.08	\$	702	723	744	765	786	806	827	848	869	904	946	946		
.09	\$	758	779	799	820	841	862	883	904	925	959	1001	1001		
.10	\$	813	834	855	876	897	918	939	959	980	1015	1057	1057		
.12	\$	925	946	966	987	1008	1029	1050	1071	1092	1126	1168	1168		
.14	\$	1043	1064	1085	1106	1126	1147	1168	1189	1210	1245	1286	1286		
.16	\$	1154	1175	1196	1217	1238	1259	1279	1300	1321	1356	1398	1398		BALANCE POINT 17 DEG.F.
40,000	\$	709	772	834	890	952	1008	1071	1126	1189	1307	1426	1426		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	605	626	653	674	695	723	744	772	793	841	890	890	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	667	688	716	737	758	786	806	834	855	904	952	952		
.07	\$	730	751	779	799	820	848	869	897	918	966	1015	1015		
.08	\$	793	813	841	862	883	911	932	959	980	1029	1078	1078		
.09	\$	855	876	904	925	946	973	994	1022	1043	1092	1140	1140		
.10	\$	918	939	966	987	1008	1036	1057	1085	1106	1154	1203	1203		
.12	\$	1043	1064	1092	1112	1133	1161	1182	1210	1231	1279	1328	1328		
.14	\$	1175	1196	1224	1245	1266	1293	1314	1342	1363	1412	1460	1460		
.16	\$	1300	1321	1349	1370	1391	1419	1439	1467	1488	1537	1586	1586		BALANCE POINT 21 DEG.F.
50,000	\$	890	966	1043	1112	1189	1266	1335	1412	1488	1634	1787	1787		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	793	841	890	932	980	1029	1078	1119	1168	1259	1356	1356	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	834	883	932	973	1022	1071	1119	1161	1210	1300	1398	1398		
.07	\$	883	932	980	1022	1071	1119	1168	1210	1259	1349	1446	1446		
.08	\$	932	980	1029	1071	1119	1168	1217	1259	1307	1398	1495	1495		
.09	\$	973	1022	1071	1112	1161	1210	1259	1300	1349	1439	1537	1537		
.10	\$	1022	1071	1119	1161	1210	1259	1307	1349	1398	1488	1586	1586		
.12	\$	1112	1161	1210	1252	1300	1349	1398	1439	1488	1579	1676	1676		
.14	\$	1210	1259	1307	1349	1398	1446	1495	1537	1586	1676	1773	1773		
.16	\$	1300	1349	1398	1439	1488	1537	1586	1627	1676	1766	1864	1864		BALANCE POINT 28 DEG.F.
60,000	\$	1071	1161	1252	1335	1426	1516	1606	1697	1787	1968	2142	2142		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	980	1043	1112	1175	1245	1307	1377	1439	1509	1641	1773	1773	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	1015	1078	1147	1210	1279	1342	1412	1474	1544	1676	1808	1808		
.07	\$	1050	1112	1182	1245	1314	1377	1446	1509	1579	1711	1843	1843		
.08	\$	1092	1154	1224	1286	1356	1419	1488	1551	1620	1752	1885	1885		
.09	\$	1126	1189	1259	1321	1391	1453	1523	1586	1655	1787	1919	1919		
.10	\$	1161	1224	1293	1356	1426	1488	1558	1620	1690	1822	1954	1954		
.12	\$	1238	1300	1370	1432	1502	1565	1634	1697	1766	1899	2031	2031		
.14	\$	1307	1370	1439	1502	1572	1634	1704	1766	1836	1968	2100	2100		
.16	\$	1384	1446	1516	1579	1648	1711	1780	1843	1912	2045	2177	2177		BALANCE POINT 33 DEG.F.

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

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
\$	50	60	70	80	90	100	120	140	160	<--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

REGION 5 36UHPQC/A37AQ-A
 HEAT PUMP MODEL OUTDOOR 36UHPQC INDOOR A37AQ-A
 ARI RATED COOLING CAP. BTUH(95) 35000, SEER12.00
 ARI RATED HEATING CAP. BTUH(47) 35000, COP(47) 3.20, HSPF 7.50 MIN DHR REG IV
 BTUH(17) 20800, COP(17) 2.10
 FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00 % AFUE

HEAT LOSS
 BTUH ELEC COST
 \$/KWH

40,000

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

05	\$	681	1238	
06	\$	820	1488	
07	\$	946	1732	
08	\$	1085	1982	
09	\$	1224	2232	
10	\$	1363	2476	
12	\$	1627	2977	BALANCE POINT 15 DEG.F.
14	\$	1905	3471	
16	\$	2170	3965	

50,000

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

05	\$	869	1544	
06	\$	1043	1857	
07	\$	1217	2170	
08	\$	1391	2476	
09	\$	1565	2789	
10	\$	1739	3095	
12	\$	2093	3721	BALANCE POINT 21 DEG.F.
14	\$	2434	4340	
16	\$	2782	4959	

60,000

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

05	\$	1085	1857	
06	\$	1293	2232	
07	\$	1516	2601	
08	\$	1732	2977	
09	\$	1947	3345	
10	\$	2163	3721	
12	\$	2594	4465	BALANCE POINT 26 DEG.F.
14	\$	3025	5210	
16	\$	3457	5954	

70,000

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

05	\$	1314	2170	
06	\$	1572	2601	
07	\$	1836	3039	
08	\$	2100	3471	
09	\$	2372	3902	
10	\$	2629	4340	
12	\$	3158	5210	BALANCE POINT 30 DEG.F.
14	\$	3679	6079	
16	\$	4208	6942	

80,000

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

05	\$	1565	2476	
06	\$	1871	2977	
07	\$	2184	3471	
08	\$	2504	3965	
09	\$	2810	4465	
10	\$	3123	4959	
12	\$	3742	5954	BALANCE POINT 33 DEG.F.
14	\$	4375	6942	
16	\$	4994	7936	

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

	05	06	07	08	09	10	12	14	16	<—ELECTRIC RATE \$/KWH
\$	58	69	81	93	104	116	139	163	186	<—THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY

REGION 5 36UHPQC/A37AQ-A
HEAT PUMP MODEL OUTDOOR 36UHPQC INDOOR A37AQ-A
ARI RATED COOLING CAP BTUH(95) 35000, SEER12.00
ARI RATED HEATING CAP BTUH(47) 35000, COP(47) 3.20, HSPF 7.50 MIN DHR REG IV
BTUH(17) 20800, COP(17) 2.10
FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00 % AFUE

Table with columns: HEAT LOSS BTUH, ELEC COST \$/KWH, NATURAL GAS COST \$/THERM (35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 90, 1.00), and heating cost data for various balance points (12, 15, 21, 26, 30, 33 DEG.F).

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

Table with columns: Balance Point (05, 06, 07, 08, 09, 10, 12, 14, 16), Electric Rate (\$/KWH), and 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

REGION 5 36UHPOC/A37AQ-A
 HEAT PUMP MODEL OUTDOOR 36UHPOC INDOOR A37AQ-A
 ARI RATED COOLING CAP BTUH(95) 35000, SEER12.00
 ARI RATED HEATING CAP BTUH(47) 35000, COP(47) 3.20, HSPF 7.50 MIN DHR REG IV
 BTUH(17) 20800, COP(17) 2.10
 FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC COST \$/KWH	HEATING OIL COST - \$/GALLON													
		70	80	90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80		
35,000	\$	473	542	612	681	751	820	890	952	1022	1092	1161	1231	<—THEORETICAL HEATING COST * FURNACE ONLY	
	05 \$	473	493	514	535	556	577	598	619	639	660	681	709	THEORETICAL HEATING COST * FURN + HEAT PUMP	
	06 \$	542	563	584	605	626	646	667	688	709	730	751	779	\$ PER YEAR	
	07 \$	605	626	646	667	688	709	730	751	772	793	813	841		
	08 \$	674	695	716	737	758	779	799	820	841	862	883	911		
	09 \$	737	758	779	799	820	841	862	883	904	925	946	973		
	10 \$	806	827	848	869	890	911	932	952	973	994	1015	1043		
	12 \$	939	959	980	1001	1022	1043	1064	1085	1106	1126	1147	1175	BALANCE POINT 12 DEG.F.	
	14 \$	1071	1092	1112	1133	1154	1175	1196	1217	1238	1259	1279	1307		
	16 \$	1203	1224	1245	1266	1286	1307	1328	1349	1370	1391	1412	1439		
	40,000	\$	542	626	702	779	855	939	1015	1092	1168	1252	1328	1405	<—THEORETICAL HEATING COST * FURNACE ONLY
		05 \$	542	570	591	619	639	667	688	709	737	758	786	806	THEORETICAL HEATING COST * FURN + HEAT PUMP
		06 \$	612	639	660	688	709	737	758	779	806	827	855	876	\$ PER YEAR
		07 \$	688	716	737	765	786	813	834	855	883	904	932	952	
		08 \$	765	793	813	841	862	890	911	932	959	980	1008	1029	
		09 \$	834	862	883	911	932	959	980	1001	1029	1050	1078	1099	
10 \$		911	939	959	987	1008	1036	1057	1078	1106	1126	1154	1175		
12 \$		1057	1085	1106	1133	1154	1182	1203	1224	1252	1272	1300	1321	BALANCE POINT 15 DEG.F.	
14 \$		1210	1238	1259	1286	1307	1335	1356	1377	1405	1426	1453	1474		
16 \$		1356	1384	1405	1432	1453	1481	1502	1523	1551	1572	1599	1620		
50,000		\$	681	779	876	973	1071	1168	1266	1363	1467	1565	1662	1759	<—THEORETICAL HEATING COST * FURNACE ONLY
		05 \$	660	702	737	779	813	855	897	932	973	1008	1050	1085	THEORETICAL HEATING COST * FURN + HEAT PUMP
		06 \$	737	779	813	855	890	932	973	1008	1050	1085	1126	1161	\$ PER YEAR
		07 \$	820	862	897	939	973	1015	1057	1092	1133	1168	1210	1245	
		08 \$	897	939	973	1015	1050	1092	1133	1168	1210	1245	1286	1321	
		09 \$	973	1015	1050	1092	1126	1168	1210	1245	1286	1321	1363	1398	
	10 \$	1050	1092	1126	1168	1203	1245	1286	1321	1363	1398	1439	1474		
	12 \$	1210	1252	1286	1328	1363	1405	1446	1481	1523	1558	1599	1634	BALANCE POINT 21 DEG.F.	
	14 \$	1363	1405	1439	1481	1516	1558	1599	1634	1676	1711	1752	1787		
	16 \$	1523	1565	1599	1641	1676	1718	1759	1794	1836	1871	1912	1947		
	60,000	\$	820	939	1050	1168	1286	1405	1523	1641	1759	1878	1996	2107	<—THEORETICAL HEATING COST * FURNACE ONLY
		05 \$	793	848	911	966	1029	1085	1147	1203	1266	1321	1384	1439	THEORETICAL HEATING COST * FURN + HEAT PUMP
		06 \$	862	918	980	1036	1099	1154	1217	1272	1335	1391	1453	1509	\$ PER YEAR
		07 \$	939	994	1057	1112	1175	1231	1293	1349	1412	1467	1530	1586	
		08 \$	1015	1071	1133	1189	1252	1307	1370	1426	1488	1544	1606	1662	
		09 \$	1085	1140	1203	1259	1321	1377	1439	1495	1558	1613	1676	1732	
10 \$		1161	1217	1279	1335	1398	1453	1516	1572	1634	1690	1752	1808		
12 \$		1307	1363	1426	1481	1544	1599	1662	1718	1780	1836	1899	1954	BALANCE POINT 26 DEG.F.	
14 \$		1460	1516	1579	1634	1697	1752	1815	1871	1933	1989	2052	2107		
16 \$		1606	1662	1725	1780	1843	1899	1961	2017	2079	2135	2198	2253		
70,000		\$	952	1092	1231	1363	1502	1641	1780	1912	2052	2191	2323	2462	<—THEORETICAL HEATING COST * FURNACE ONLY
		05 \$	918	1001	1092	1175	1259	1349	1432	1516	1599	1690	1773	1857	THEORETICAL HEATING COST * FURN + HEAT PUMP
		06 \$	980	1064	1154	1238	1321	1412	1495	1579	1662	1752	1836	1919	\$ PER YEAR
		07 \$	1043	1126	1217	1300	1384	1474	1558	1641	1725	1815	1899	1982	
		08 \$	1106	1189	1279	1363	1446	1537	1620	1704	1787	1878	1961	2045	
		09 \$	1168	1252	1342	1426	1509	1599	1683	1766	1850	1940	2024	2107	
	10 \$	1231	1314	1405	1488	1572	1662	1745	1829	1912	2003	2086	2170		
	12 \$	1356	1439	1530	1613	1697	1787	1871	1954	2038	2128	2212	2295	BALANCE POINT 30 DEG F	
	14 \$	1481	1565	1655	1739	1822	1912	1996	2079	2163	2253	2337	2420		
	16 \$	1613	1697	1787	1871	1954	2045	2128	2212	2295	2385	2469	2552		
	80,000	\$	1092	1252	1405	1565	1718	1878	2031	2191	2344	2504	2657	2817	<—THEORETICAL HEATING COST * FURNACE ONLY
		05 \$	1050	1168	1279	1398	1516	1627	1745	1864	1975	2093	2205	2323	THEORETICAL HEATING COST * FURN + HEAT PUMP
		06 \$	1099	1217	1328	1446	1565	1676	1794	1912	2024	2142	2253	2372	\$ PER YEAR
		07 \$	1147	1266	1377	1495	1613	1725	1843	1961	2072	2191	2302	2420	
		08 \$	1196	1314	1426	1544	1662	1773	1892	2010	2121	2239	2351	2469	
		09 \$	1245	1363	1474	1592	1711	1822	1940	2059	2170	2288	2399	2518	
10 \$		1286	1405	1516	1634	1752	1864	1982	2100	2212	2330	2441	2559		
12 \$		1384	1502	1613	1732	1850	1961	2079	2198	2309	2427	2538	2657	BALANCE POINT 33 DEG F	
14 \$		1481	1599	1711	1829	1947	2059	2177	2295	2406	2525	2636	2754		
16 \$		1579	1697	1808	1926	2045	2156	2274	2392	2504	2622	2733	2852		

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

	05	06	07	08	09	10	12	14	16	<—ELECTRIC RATE \$/KWH
\$	58	69	81	93	104	116	139	163	186	<—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

REGION 5 36UHPQC/A37AQ-A
HEAT PUMP MODEL: OUTDOOR 36UHPQC INDOOR A37AQ-A
ARI RATED COOLING CAP BTUH(95) 35000, SEER12.00
ARI RATED HEATING CAP BTUH(47) 35000, COP(47) 3.20, HSPF 7.50, MIN DHR REG IV
BTUH(17) 20800, COP(17) 2.10
FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 78.00% AFUE

Table with columns: HEAT LOSS BTUH, ELEC COST \$/KWH, PROPANE GAS COST - \$/GALLON (60, 65, 70, 75, 80, 85, 90, 95, 100, 110, 120, 120), and theoretical heating cost comparisons for various balance points (12, 15, 21, 26, 30, 33 DEG.F).

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

Table with columns: ELEC RATE \$/KWH (105, 06, 07, 08, 09, 10, 12, 14, 16) and 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

REGION 5
 HEAT PUMP MODEL: OUTDOOR 42UHPOA 42UHPOA/A61AQ-A INDOOR A61AQ-A
 ARI RATED COOLING CAP.: BTUH (95) 43500, SEER11.30
 ARI RATED HEATING CAP.: BTUH (47) 41000, COP(47) 3.40, HSPF 7.60 MIN.DHR REG IV
 BTUH (17) 25000, COP(17) 2.20
 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
50,000			
.05	\$	841	1544
.06	\$	1001	1857
.07	\$	1168	2170
.08	\$	1335	2476
.09	\$	1509	2789
.10	\$	1676	3095
.12	\$	2010	3721
.14	\$	2351	4340
.16	\$	2678	4959

BALANCE POINT 16 DEG.F.

HEAT LOSS BTUH	ELEC. COST \$/KWH	--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
60,000			
.05	\$	1022	1857
.06	\$	1231	2232
.07	\$	1439	2601
.08	\$	1634	2977
.09	\$	1843	3345
.10	\$	2052	3721
.12	\$	2462	4465
.14	\$	2872	5210
.16	\$	3283	5954

BALANCE POINT 22 DEG.F.

HEAT LOSS BTUH	ELEC. COST \$/KWH	--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
70,000			
.05	\$	1231	2170
.06	\$	1481	2601
.07	\$	1725	3039
.08	\$	1968	3471
.09	\$	2225	3902
.10	\$	2469	4340
.12	\$	2963	5210
.14	\$	3450	6079
.16	\$	3951	6942

BALANCE POINT 26 DEG.F.

HEAT LOSS BTUH	ELEC. COST \$/KWH	--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
80,000			
.05	\$	1460	2476
.06	\$	1759	2977
.07	\$	2045	3471
.08	\$	2337	3965
.09	\$	2636	4465
.10	\$	2921	4959
.12	\$	3505	5954
.14	\$	4097	6942
.16	\$	4681	7936

BALANCE POINT 30 DEG.F.

HEAT LOSS BTUH	ELEC. COST \$/KWH	--- THEORETICAL ANNUAL HEATING COST ---	
		HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY
90,000			
.05	\$	1704	2789
.06	\$	2038	3345
.07	\$	2385	3902
.08	\$	2726	4465
.09	\$	3060	5022
.10	\$	3408	5578
.12	\$	4083	6698
.14	\$	4764	7811
.16	\$	5446	8931

BALANCE POINT 33 DEG.F.

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

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
\$	76	92	107	123	138	153	184	215	246	<--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

REGION 5
 HEAT PUMP MODEL: OUTDOOR 42URPOA 42URPOA/A61AQ-A INDOOR A61AQ-A
 ARI RATED COOLING CAP.: BTUH (95) 43500, SEER11.30
 ARI RATED HEATING CAP.: BTUH (47) 41000, COP(47) 3.40, RSPF 7.60 MIN.DHR REG IV
 BTUH (17) 25000, COP(17) 2.20
 FURNACE TYPE NATURAL GAS FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	NATURAL GAS COST - \$/THERM													
		.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.90	1.00		
40,000	\$	375	431	486	542	591	646	702	758	813	862	973	1085	<--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	514	528	542	549	563	577	591	598	612	626	646	674	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	605	619	633	639	653	667	681	688	702	716	737	765		
.07	\$	688	702	716	723	737	751	765	772	786	799	820	848		
.08	\$	779	793	806	813	827	841	855	862	876	890	911	939		
.09	\$	862	876	890	897	911	925	939	946	959	973	994	1022		
.10	\$	952	966	980	987	1001	1015	1029	1036	1050	1064	1085	1112		
.12	\$	1126	1140	1154	1161	1175	1189	1203	1210	1224	1238	1259	1286		
.14	\$	1293	1307	1321	1328	1342	1356	1370	1377	1391	1405	1426	1453		
.16	\$	1467	1481	1495	1502	1516	1530	1544	1551	1565	1579	1599	1627		BALANCE POINT 11 DEG.F.
50,000	\$	473	542	605	674	744	813	876	946	1015	1085	1217	1356		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	605	626	646	667	688	709	730	751	772	793	834	876	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	695	716	737	758	779	799	820	841	862	883	925	966		
.07	\$	793	813	834	855	876	897	918	939	959	980	1022	1064		
.08	\$	883	904	925	946	966	987	1008	1023	1050	1071	1112	1154		
.09	\$	973	994	1015	1036	1057	1078	1099	1119	1140	1161	1203	1245		
.10	\$	1064	1085	1106	1126	1147	1168	1189	1210	1231	1252	1293	1335		
.12	\$	1252	1272	1293	1314	1335	1356	1377	1398	1419	1439	1481	1523		
.14	\$	1432	1453	1474	1495	1516	1537	1558	1579	1599	1620	1662	1704		
.16	\$	1620	1641	1662	1683	1704	1725	1745	1766	1787	1808	1850	1892		BALANCE POINT 16 DEG.F.
60,000	\$	563	646	730	813	890	973	1057	1133	1217	1300	1460	1627		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	660	702	744	786	827	869	911	952	994	1029	1112	1196	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	737	779	820	862	904	946	987	1029	1071	1106	1189	1272		
.07	\$	813	855	897	939	980	1022	1064	1106	1147	1182	1266	1349		
.08	\$	890	932	973	1015	1057	1099	1140	1182	1224	1259	1342	1426		
.09	\$	966	1008	1050	1092	1133	1175	1217	1259	1300	1335	1419	1502		
.10	\$	1043	1085	1126	1168	1210	1252	1293	1335	1377	1412	1495	1579		
.12	\$	1189	1231	1272	1314	1356	1398	1439	1481	1523	1558	1641	1725		
.14	\$	1342	1384	1426	1467	1509	1551	1592	1634	1676	1711	1794	1878		
.16	\$	1495	1537	1579	1620	1662	1704	1745	1787	1829	1864	1947	2031		BALANCE POINT 22 DEG.F.
70,000	\$	660	758	848	946	1043	1133	1231	1328	1419	1516	1704	1899		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	765	813	862	911	959	1008	1050	1099	1147	1196	1293	1391	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	848	897	946	994	1043	1092	1133	1182	1231	1279	1377	1474		
.07	\$	939	987	1036	1085	1133	1182	1224	1272	1321	1370	1467	1565		
.08	\$	1022	1071	1119	1168	1217	1266	1307	1356	1405	1453	1551	1648		
.09	\$	1106	1154	1203	1252	1300	1349	1391	1439	1488	1537	1634	1732		
.10	\$	1196	1245	1293	1342	1391	1439	1481	1530	1579	1627	1725	1822		
.12	\$	1363	1412	1460	1509	1558	1606	1648	1697	1745	1794	1892	1989		
.14	\$	1537	1586	1634	1683	1732	1780	1822	1871	1919	1968	2065	2163		
.16	\$	1711	1759	1808	1857	1905	1954	1996	2045	2093	2142	2239	2337		BALANCE POINT 26 DEG.F.
80,000	\$	758	862	973	1085	1189	1300	1405	1516	1627	1732	1947	2170		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	834	904	973	1036	1106	1175	1245	1307	1377	1446	1579	1718	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	904	973	1043	1106	1175	1245	1314	1377	1446	1516	1648	1787		
.07	\$	973	1043	1112	1175	1245	1314	1384	1446	1516	1586	1718	1857		
.08	\$	1050	1119	1189	1252	1321	1391	1460	1523	1592	1662	1794	1933		
.09	\$	1119	1189	1259	1321	1391	1460	1530	1592	1662	1732	1864	2003		
.10	\$	1189	1259	1328	1391	1460	1530	1599	1662	1732	1801	1933	2072		
.12	\$	1335	1405	1474	1537	1606	1676	1745	1808	1878	1947	2079	2219		
.14	\$	1481	1551	1620	1683	1752	1822	1892	1954	2024	2093	2225	2365		
.16	\$	1620	1690	1759	1822	1892	1961	2031	2093	2163	2232	2365	2504		BALANCE POINT 30 DEG.F.
90,000	\$	848	973	1099	1217	1342	1460	1586	1704	1829	1947	2198	2441		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	904	994	1085	1175	1266	1356	1439	1530	1620	1711	1892	2072	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR	
.06	\$	959	1050	1140	1231	1321	1412	1495	1586	1676	1766	1947	2128		
.07	\$	1015	1106	1196	1286	1377	1467	1551	1641	1732	1822	2003	2184		
.08	\$	1071	1161	1252	1342	1432	1523	1606	1697	1787	1878	2059	2239		
.09	\$	1119	1210	1300	1391	1481	1572	1655	1745	1836	1926	2107	2288		
.10	\$	1175	1266	1356	1446	1537	1627	1711	1801	1892	1982	2163	2344		
.12	\$	1286	1377	1467	1558	1648	1739	1822	1912	2003	2093	2274	2455		
.14	\$	1398	1488	1579	1669	1759	1850	1933	2024	2114	2205	2385	2566		
.16	\$	1502	1592	1683	1773	1864	1954	2038	2128	2219	2309	2490	2671		BALANCE POINT 33 DEG.F.

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

.05 .06 .07 .08 .09 .10 .12 .14 .16 <--ELECTRIC RATE \$/KWH

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 5
 HEAT PUMP MODEL: OUTDOOR 42URPOA 42URPOA/A61AO-A INDOOR A61AO-A
 RATED COOLING CAP.: BTUH(95) 43500 SEER11.30
 RATED HEATING CAP.: BTUH (47) 41000, COP(47) 3.40, HSPFF 7.60 MIN.DHR REG IV
 BTUH (17) 25000, COP(17) 2.20
 FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELBC COST \$/KWH	HEATING OIL COST - \$/GALLON													
		.70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80		
40,000	\$	542	626	702	779	855	939	1015	1092	1168	1252	1328	1405	<--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	556	570	591	605	626	639	660	674	695	709	730	744	THEORETICAL HEATING COST * FURN. + HEAT PUMP \$ PER YEAR	
.06	\$	646	660	681	695	716	730	751	765	786	799	820	834		
.07	\$	730	744	765	779	799	813	834	848	869	883	904	918		
.08	\$	820	834	855	869	890	904	925	939	959	973	994	1008		
.09	\$	904	918	939	952	973	987	1008	1022	1043	1057	1078	1092		
.10	\$	994	1008	1029	1043	1064	1078	1099	1112	1133	1147	1168	1182		
.12	\$	1168	1182	1203	1217	1238	1252	1272	1286	1307	1321	1342	1356		
.14	\$	1335	1349	1370	1384	1405	1419	1439	1453	1474	1488	1509	1523		
.16	\$	1509	1523	1544	1558	1579	1592	1613	1627	1648	1662	1683	1697		BALANCE POINT 11 DEG.F.
50,000	\$	681	779	876	973	1071	1168	1266	1363	1467	1565	1662	1759		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	667	702	730	758	793	820	848	883	911	939	973	1001		THEORETICAL HEATING COST * FURN. + HEAT PUMP \$ PER YEAR
.06	\$	758	793	820	848	883	911	939	973	1001	1029	1064	1092		
.07	\$	855	890	918	946	980	1008	1036	1071	1099	1126	1161	1189		
.08	\$	946	980	1008	1036	1071	1099	1126	1161	1189	1217	1252	1279		
.09	\$	1036	1071	1099	1126	1161	1189	1217	1252	1279	1307	1342	1370		
.10	\$	1126	1161	1189	1217	1252	1279	1307	1342	1370	1398	1432	1460		
.12	\$	1314	1349	1377	1405	1439	1467	1495	1530	1558	1586	1620	1648		
.14	\$	1495	1530	1558	1586	1620	1648	1676	1711	1739	1766	1801	1829		
.16	\$	1683	1718	1745	1773	1808	1836	1864	1899	1926	1954	1989	2017	BALANCE POINT 16 DEG.F.	
60,000	\$	820	939	1050	1168	1286	1405	1523	1641	1759	1878	1996	2107	<--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	793	848	911	966	1029	1085	1147	1203	1266	1321	1384	1439	THEORETICAL HEATING COST * FURN. + HEAT PUMP \$ PER YEAR	
.06	\$	869	925	987	1043	1106	1161	1224	1279	1342	1398	1460	1516		
.07	\$	946	1001	1064	1119	1182	1238	1300	1356	1419	1474	1537	1592		
.08	\$	1022	1078	1140	1196	1259	1314	1377	1432	1495	1551	1613	1669		
.09	\$	1099	1154	1217	1272	1335	1391	1453	1509	1572	1627	1690	1745		
.10	\$	1175	1231	1293	1349	1412	1467	1530	1586	1648	1704	1766	1822		
.12	\$	1321	1377	1439	1495	1558	1613	1676	1732	1794	1850	1912	1968		
.14	\$	1474	1530	1592	1648	1711	1766	1829	1885	1947	2003	2065	2121		
.16	\$	1627	1683	1745	1801	1864	1919	1982	2038	2100	2156	2219	2274		BALANCE POINT 22 DEG.F.
70,000	\$	952	1092	1231	1363	1502	1641	1780	1912	2052	2191	2323	2462		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	911	980	1050	1119	1189	1259	1328	1398	1467	1537	1606	1676		THEORETICAL HEATING COST * FURN. + HEAT PUMP \$ PER YEAR
.06	\$	994	1064	1133	1203	1272	1342	1412	1481	1551	1620	1690	1759		
.07	\$	1085	1154	1224	1293	1363	1432	1502	1572	1641	1711	1780	1850		
.08	\$	1168	1238	1307	1377	1446	1516	1586	1655	1725	1794	1864	1933		
.09	\$	1252	1321	1391	1460	1530	1599	1669	1739	1808	1878	1947	2017		
.10	\$	1342	1412	1481	1551	1620	1690	1759	1829	1899	1968	2038	2107		
.12	\$	1509	1579	1648	1718	1787	1857	1926	1996	2065	2135	2205	2274		
.14	\$	1683	1752	1822	1892	1961	2031	2100	2170	2239	2309	2379	2448		
.16	\$	1857	1926	1996	2065	2135	2205	2274	2344	2413	2483	2552	2622	BALANCE POINT 26 DEG.F.	
80,000	\$	1092	1252	1405	1565	1718	1878	2031	2191	2344	2504	2657	2817	<--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	1043	1140	1245	1342	1439	1537	1634	1732	1829	1926	2024	2121	THEORETICAL HEATING COST * FURN. + HEAT PUMP \$ PER YEAR	
.06	\$	1112	1210	1314	1412	1509	1606	1704	1801	1899	1996	2093	2191		
.07	\$	1182	1279	1384	1481	1579	1676	1773	1871	1968	2065	2163	2260		
.08	\$	1259	1356	1460	1558	1655	1752	1850	1947	2045	2142	2239	2337		
.09	\$	1328	1426	1530	1627	1725	1822	1919	2017	2114	2212	2309	2406		
.10	\$	1398	1495	1599	1697	1794	1892	1989	2086	2184	2281	2379	2476		
.12	\$	1544	1641	1745	1843	1940	2038	2135	2232	2330	2427	2525	2622		
.14	\$	1690	1787	1892	1989	2086	2184	2281	2379	2476	2573	2671	2768		
.16	\$	1829	1926	2031	2128	2225	2323	2420	2518	2615	2712	2810	2907		BALANCE POINT 30 DEG.F.
90,000	\$	1231	1405	1579	1759	1933	2107	2288	2462	2636	2817	2991	3165		<--THEORETICAL HEATING COST * FURNACE ONLY
.05	\$	1182	1307	1439	1572	1704	1829	1961	2093	2219	2351	2483	2608		THEORETICAL HEATING COST * FURN. + HEAT PUMP \$ PER YEAR
.06	\$	1238	1363	1495	1627	1759	1885	2017	2149	2274	2406	2538	2664		
.07	\$	1293	1419	1551	1683	1815	1940	2072	2205	2330	2462	2594	2719		
.08	\$	1349	1474	1606	1739	1871	1996	2128	2260	2385	2518	2650	2775		
.09	\$	1398	1523	1655	1787	1919	2045	2177	2309	2434	2566	2698	2824		
.10	\$	1453	1579	1711	1843	1975	2100	2232	2365	2490	2622	2754	2879		
.12	\$	1565	1690	1822	1954	2086	2212	2344	2476	2601	2733	2865	2991		
.14	\$	1676	1801	1933	2065	2198	2323	2455	2587	2712	2845	2977	3102		
.16	\$	1780	1905	2038	2170	2302	2427	2559	2692	2817	2949	3081	3206	BALANCE POINT 33 DEG.F.	

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

.05 .06 .07 .08 .09 .10 .12 .14 .16 <--ELECTRIC RATE \$/KWH

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 5
 HEAT PUMP MODEL: OUTDOOR 42UHPCA 42UMQA/A61AQ-A INDOOR A61AQ-A
 ARI RATED COOLING CAP.: BTUH(95) 43500 SEER11.30
 ARI RATED HEATING CAP.: BTUH (47) 41000 COP(47) 3.40, HSPF 7.60 MIN.DHR REG IV
 BTUH (17) 25000, COP(17) 2.20
 FURNACE TYPE PROPANE GAS FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	EL.EC. COST \$/KWH	PROPANE GAS COST - \$/GALLON													
		.60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10	1.20	1.20		
40,000	\$ 709	772	834	890	952	1008	1071	1126	1189	1307	1426	1426	---THEORETICAL HEATING COST * FURNACE ONLY		
.05	\$ 591	605	619	633	646	660	674	681	695	723	751	751	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR		
.06	\$ 681	695	709	723	737	751	765	772	786	813	841	841			
.07	\$ 765	779	793	806	820	834	848	855	869	897	925	925			
.08	\$ 855	869	883	897	911	925	939	946	959	987	1015	1015			
.09	\$ 939	952	966	980	994	1008	1022	1029	1043	1071	1099	1099			
.10	\$ 1029	1043	1057	1071	1085	1099	1112	1119	1133	1161	1189	1189			
.12	\$ 1203	1217	1231	1245	1259	1272	1286	1293	1307	1335	1363	1363			
.14	\$ 1370	1384	1398	1412	1426	1439	1453	1460	1474	1502	1530	1530			
.16	\$ 1544	1558	1572	1586	1599	1613	1627	1634	1648	1676	1704	1704			BALANCE POINT 11 DEG.F.
50,000	\$ 890	966	1043	1112	1189	1266	1335	1412	1488	1634	1787	1787			---THEORETICAL HEATING COST * FURNACE ONLY
.05	\$ 737	758	779	799	827	848	869	897	918	966	1008	1008	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR		
.06	\$ 827	848	869	890	918	939	959	987	1008	1057	1099	1099			
.07	\$ 925	946	966	987	1015	1036	1057	1085	1106	1154	1196	1196			
.08	\$ 1015	1036	1057	1078	1106	1126	1147	1175	1196	1245	1286	1286			
.09	\$ 1106	1126	1147	1168	1196	1217	1238	1266	1286	1335	1377	1377			
.10	\$ 1196	1217	1238	1259	1286	1307	1328	1356	1377	1426	1467	1467			
.12	\$ 1384	1405	1426	1446	1474	1495	1516	1544	1565	1613	1655	1655			
.14	\$ 1565	1586	1606	1627	1655	1676	1697	1725	1745	1794	1836	1836			
.16	\$ 1752	1773	1794	1815	1843	1864	1885	1912	1933	1982	2024	2024			BALANCE POINT 16 DEG.F.
60,000	\$ 1071	1161	1252	1335	1426	1516	1606	1697	1787	1968	2142	2142			---THEORETICAL HEATING COST * FURNACE ONLY
.05	\$ 918	959	1008	1050	1099	1140	1189	1231	1279	1370	1460	1460	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR		
.06	\$ 994	1036	1085	1126	1175	1217	1266	1307	1356	1446	1537	1537			
.07	\$ 1071	1112	1161	1203	1252	1293	1342	1384	1432	1523	1613	1613			
.08	\$ 1147	1189	1238	1279	1328	1370	1419	1460	1509	1599	1690	1690			
.09	\$ 1224	1266	1314	1356	1405	1446	1495	1537	1586	1676	1766	1766			
.10	\$ 1300	1342	1391	1432	1481	1523	1572	1613	1662	1752	1843	1843			
.12	\$ 1446	1488	1537	1579	1627	1669	1718	1759	1808	1899	1989	1989			
.14	\$ 1599	1641	1690	1732	1780	1822	1871	1912	1961	2052	2142	2142			
.16	\$ 1752	1794	1843	1885	1933	1975	2024	2065	2114	2205	2295	2295			BALANCE POINT 22 DEG.F.
70,000	\$ 1252	1356	1460	1565	1669	1773	1878	1982	2086	2295	2504	2504			---THEORETICAL HEATING COST * FURNACE ONLY
.05	\$ 1064	1112	1168	1217	1272	1328	1377	1432	1481	1586	1697	1697	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR		
.06	\$ 1147	1196	1252	1300	1356	1412	1460	1516	1565	1669	1780	1780			
.07	\$ 1238	1286	1342	1391	1446	1502	1551	1606	1655	1759	1871	1871			
.08	\$ 1321	1370	1426	1474	1530	1586	1634	1690	1739	1843	1954	1954			
.09	\$ 1405	1453	1509	1558	1613	1669	1718	1773	1822	1926	2038	2038			
.10	\$ 1495	1544	1599	1648	1704	1759	1808	1864	1912	2017	2128	2128			
.12	\$ 1662	1711	1766	1815	1871	1926	1975	2031	2079	2184	2295	2295			
.14	\$ 1836	1885	1940	1989	2045	2100	2149	2205	2253	2358	2469	2469			
.16	\$ 2010	2059	2114	2163	2219	2274	2323	2379	2427	2532	2643	2643			BALANCE POINT 26 DEG.F.
80,000	\$ 1426	1551	1669	1787	1905	2024	2142	2260	2385	2622	2858	2858			---THEORETICAL HEATING COST * FURNACE ONLY
.05	\$ 1259	1328	1405	1481	1551	1627	1704	1780	1850	2003	2149	2149	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR		
.06	\$ 1328	1398	1474	1551	1620	1697	1773	1850	1919	2072	2219	2219			
.07	\$ 1398	1467	1544	1620	1690	1766	1843	1919	1989	2142	2288	2288			
.08	\$ 1474	1544	1620	1697	1766	1843	1919	1996	2065	2219	2365	2365			
.09	\$ 1544	1613	1690	1766	1836	1912	1989	2065	2135	2288	2434	2434			
.10	\$ 1613	1683	1759	1836	1905	1982	2059	2135	2205	2358	2504	2504			
.12	\$ 1759	1829	1905	1982	2052	2128	2205	2281	2351	2504	2650	2650			
.14	\$ 1905	1975	2052	2128	2198	2274	2351	2427	2497	2650	2796	2796			
.16	\$ 2045	2114	2191	2267	2337	2413	2490	2566	2636	2789	2935	2935			BALANCE POINT 30 DEG.F.
90,000	\$ 1606	1739	1878	2010	2142	2281	2413	2545	2678	2949	3220	3220			---THEORETICAL HEATING COST * FURNACE ONLY
.05	\$ 1460	1558	1655	1759	1857	1954	2052	2156	2253	2448	2650	2650	THEORETICAL HEATING COST * FURN.+ HEAT PUMP \$ PER YEAR		
.06	\$ 1516	1613	1711	1815	1912	2010	2107	2212	2309	2504	2705	2705			
.07	\$ 1572	1669	1766	1871	1968	2065	2163	2267	2365	2559	2761	2761			
.08	\$ 1627	1725	1822	1926	2024	2121	2219	2323	2420	2615	2817	2817			
.09	\$ 1676	1773	1871	1975	2072	2170	2267	2372	2469	2664	2865	2865			
.10	\$ 1732	1829	1926	2031	2128	2225	2323	2427	2525	2719	2921	2921			
.12	\$ 1843	1940	2038	2142	2239	2337	2434	2538	2636	2831	3032	3032			
.14	\$ 1954	2052	2149	2253	2351	2448	2545	2650	2747	2942	3144	3144			
.16	\$ 2059	2156	2253	2358	2455	2552	2650	2754	2852	3046	3248	3248			BALANCE POINT 33 DEG.F.

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

.05 .06 .07 .08 .09 .10 .12 .14 .16 ---ELECTRIC RATE \$/KWH

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 5
 HEAT PUMP MODEL: OUTDOOR 48UHPOB 48UHPOB/A61AQ-A INDOOR A61AQ-A
 ARI RATED COOLING CAP.: BTUH (95) 50000, SEER10.50
 ARI RATED HEATING CAP.: BTUH (47) 48000, COP(47) 3.20, HSPF 7.40 MIN.DHR REG IV
 BTUH (17) 29000, COP(17) 2.10
 FURNACE TYPE ELECTRIC FURNACE EFFICIENCY 100.00 % AFUE

HEAT LOSS BTUH
 ELEC. COST \$/KWH

70,000

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

.05	\$	1231	2170
.06	\$	1481	2601
.07	\$	1732	3039
.08	\$	1975	3471
.09	\$	2225	3902
.10	\$	2469	4340
.12	\$	2963	5210
.14	\$	3457	6079
.16	\$	3951	6942

BALANCE POINT 22 DEG.F.

80,000

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

.05	\$	1446	2476
.06	\$	1739	2977
.07	\$	2024	3471
.08	\$	2316	3965
.09	\$	2601	4465
.10	\$	2893	4959
.12	\$	3478	5954
.14	\$	4055	6942
.16	\$	4625	7936

BALANCE POINT 26 DEG.F.

90,000

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

.05	\$	1676	2789
.06	\$	2010	3345
.07	\$	2344	3902
.08	\$	2685	4465
.09	\$	3012	5022
.10	\$	3352	5578
.12	\$	4027	6698
.14	\$	4695	7811
.16	\$	5363	8931

BALANCE POINT 29 DEG.F.

100,000

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

.05	\$	1912	3095
.06	\$	2295	3721
.07	\$	2678	4340
.08	\$	3060	4959
.09	\$	3443	5578
.10	\$	3825	6197
.12	\$	4591	7443
.14	\$	5349	8681
.16	\$	6121	9926

BALANCE POINT 32 DEG.F.

110,000

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

.05	\$	2170	3408
.06	\$	2608	4090
.07	\$	3032	4771
.08	\$	3471	5453
.09	\$	3902	6135
.10	\$	4340	6823
.12	\$	5203	8187
.14	\$	6072	9550
.16	\$	6942	10914

BALANCE POINT 34 DEG.F.

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

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
\$	95	114	133	152	171	190	228	266	304	<--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 5
HEAT PUMP MODEL: OUTDOOR 60UHPOB 60UHPOB/A61AQ-A INDOOR A61AQ-A
ARI RATED COOLING CAP.: BTUH (95) 58000, SEER(10.70)
ARI RATED HEATING CAP.: BTUH (47) 61000, COP(47) 3.20, HSPF 7.50 MIN.DHR REG IV
BTUH (17) 35500, COP(17) 2.20
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
80,000			
.05	\$	1363	2476
.06	\$	1634	2977
.07	\$	1905	3471
.08	\$	2177	3965
.09	\$	2448	4465
.10	\$	2719	4959
.12	\$	3269	5954
.14	\$	3811	6942
.16	\$	4361	7936
			BALANCE POINT 19 DEG.F.
90,000			
.05	\$	1558	2789
.06	\$	1871	3345
.07	\$	2177	3902
.08	\$	2490	4465
.09	\$	2803	5022
.10	\$	3116	5578
.12	\$	3742	6698
.14	\$	4361	7811
.16	\$	4987	8931
			BALANCE POINT 23 DEG.F.
100,000			
.05	\$	1766	3095
.06	\$	2121	3721
.07	\$	2476	4340
.08	\$	2831	4959
.09	\$	3178	5578
.10	\$	3533	6197
.12	\$	4243	7443
.14	\$	4952	8681
.16	\$	5655	9926
			BALANCE POINT 25 DEG.F.
110,000			
.05	\$	1989	3408
.06	\$	2385	4090
.07	\$	2782	4771
.08	\$	3185	5453
.09	\$	3582	6135
.10	\$	3978	6823
.12	\$	4771	8187
.14	\$	5571	9550
.16	\$	6364	10914
			BALANCE POINT 28 DEG.F.
130,000			
.05	\$	2455	4027
.06	\$	2942	4834
.07	\$	3443	5641
.08	\$	3930	6448
.09	\$	4424	7255
.10	\$	4911	8062
.12	\$	5898	9676
.14	\$	6879	11289
.16	\$	7860	12903
			BALANCE POINT 32 DEG.F.

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

	.05	.06	.07	.08	.09	.10	.12	.14	.16	
\$	108	130	151	173	195	216	260	303	346	<--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 5
 HEAT PUMP MODEL: OUTDOOR 60URPOB 60URPOB/A61AQ-A INDOOR A61AQ-A
 ARI RATED COOLING CAP.: BTUH(95) 58000 SERIO.70
 ARI RATED HEATING CAP.: BTUH (47) 61000, COP(47) 3.20, HSPF 7.50 MIN.DHR REG IV
 BTUH (17) 35500, COP(17) 2.20
 FURNACE TYPE FUEL OIL FURNACE EFFICIENCY 78.00 % AEUE

HEAT LOSS BTUH	ELEC. COST \$/KWH	HEATING OIL COST - \$/GALLON															
		.70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80				
60,000	\$	820	939	1050	1168	1286	1405	1523	1641	1759	1878	1996	2107	--THEORETICAL HEATING COST * FURNACE ONLY			
.05	\$	813	855	890	925	959	994	1036	1071	1106	1140	1175	1210	THEORETICAL HEATING COST * FURN. + HEAT PUMP \$ PER YEAR			
.06	\$	925	966	1001	1036	1071	1106	1147	1182	1217	1252	1286	1321				
.07	\$	1036	1078	1112	1147	1182	1217	1259	1293	1328	1363	1398	1432				
.08	\$	1154	1196	1231	1266	1300	1335	1377	1412	1446	1481	1516	1551				
.09	\$	1266	1307	1342	1377	1412	1446	1488	1523	1558	1592	1627	1662				
.10	\$	1377	1419	1453	1488	1523	1558	1599	1634	1669	1704	1739	1773				
.12	\$	1599	1641	1676	1711	1745	1780	1822	1857	1892	1926	1961	1996				
.14	\$	1829	1871	1905	1940	1975	2010	2052	2086	2121	2156	2191	2225				
.16	\$	2052	2093	2128	2163	2198	2232	2274	2309	2344	2379	2413	2448			BALANCE POINT 12 DEG.F.	
70,000	\$	952	1092	1231	1363	1502	1641	1780	1912	2052	2191	2323	2462			--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	939	980	1029	1071	1112	1154	1196	1238	1279	1321	1363	1405			THEORETICAL HEATING COST * FURN. + HEAT PUMP \$ PER YEAR	
.06	\$	1064	1106	1154	1196	1238	1279	1321	1363	1405	1446	1488	1530				
.07	\$	1196	1238	1286	1328	1370	1412	1453	1495	1537	1579	1620	1662				
.08	\$	1321	1363	1412	1453	1495	1537	1579	1620	1662	1704	1745	1787				
.09	\$	1453	1495	1544	1586	1627	1669	1711	1752	1794	1836	1878	1919				
.10	\$	1579	1620	1669	1711	1752	1794	1836	1878	1919	1961	2003	2045				
.12	\$	1836	1878	1926	1968	2010	2052	2093	2135	2177	2219	2260	2302				
.14	\$	2093	2135	2184	2225	2267	2309	2351	2392	2434	2476	2518	2559				
.16	\$	2351	2392	2441	2483	2525	2566	2608	2650	2692	2733	2775	2817	BALANCE POINT 16 DEG.F.			
80,000	\$	1092	1252	1405	1565	1718	1878	2031	2191	2344	2504	2657	2817	--THEORETICAL HEATING COST * FURNACE ONLY			
.05	\$	1057	1119	1182	1245	1307	1370	1432	1495	1558	1620	1683	1745	THEORETICAL HEATING COST * FURN. + HEAT PUMP \$ PER YEAR			
.06	\$	1175	1238	1300	1363	1426	1488	1551	1613	1676	1739	1801	1864				
.07	\$	1300	1363	1426	1488	1551	1613	1676	1739	1801	1864	1926	1989				
.08	\$	1426	1488	1551	1613	1676	1739	1801	1864	1926	1989	2052	2114				
.09	\$	1551	1613	1676	1739	1801	1864	1926	1989	2052	2114	2177	2239				
.10	\$	1676	1739	1801	1864	1926	1989	2052	2114	2177	2239	2302	2365				
.12	\$	1926	1989	2052	2114	2177	2239	2302	2365	2427	2490	2552	2615				
.14	\$	2177	2239	2302	2365	2427	2490	2552	2615	2678	2740	2803	2865				
.16	\$	2420	2483	2545	2608	2671	2733	2796	2858	2921	2984	3046	3109			BALANCE POINT 19 DEG.F.	
90,000	\$	1231	1405	1579	1759	1933	2107	2288	2462	2636	2817	2991	3165			--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	1182	1272	1363	1453	1537	1627	1718	1808	1892	1982	2072	2163			THEORETICAL HEATING COST * FURN. + HEAT PUMP \$ PER YEAR	
.06	\$	1293	1384	1474	1565	1648	1739	1829	1919	2003	2093	2184	2274				
.07	\$	1405	1495	1586	1676	1759	1850	1940	2031	2114	2205	2295	2385				
.08	\$	1516	1606	1697	1787	1871	1961	2052	2142	2225	2316	2406	2497				
.09	\$	1627	1718	1808	1899	1982	2072	2163	2253	2337	2427	2518	2608				
.10	\$	1739	1829	1919	2010	2093	2184	2274	2365	2448	2538	2629	2719				
.12	\$	1961	2052	2142	2232	2316	2406	2497	2587	2671	2761	2852	2942				
.14	\$	2191	2281	2372	2462	2545	2636	2726	2817	2900	2991	3081	3172				
.16	\$	2413	2504	2594	2685	2768	2858	2949	3039	3123	3213	3304	3394	BALANCE POINT 23 DEG.F.			
100,000	\$	1363	1565	1759	1954	2149	2344	2538	2733	2935	3130	3325	3519	--THEORETICAL HEATING COST * FURNACE ONLY			
.05	\$	1300	1398	1502	1599	1697	1794	1892	1996	2093	2191	2288	2385	THEORETICAL HEATING COST * FURN. + HEAT PUMP \$ PER YEAR			
.06	\$	1426	1523	1627	1725	1822	1919	2017	2121	2219	2316	2413	2511				
.07	\$	1544	1641	1745	1843	1940	2038	2135	2239	2337	2434	2532	2629				
.08	\$	1669	1766	1871	1968	2065	2163	2260	2365	2462	2559	2657	2754				
.09	\$	1794	1892	1996	2093	2191	2288	2385	2490	2587	2685	2782	2879				
.10	\$	1912	2010	2114	2212	2309	2406	2504	2608	2705	2803	2900	2998				
.12	\$	2163	2260	2365	2462	2559	2657	2754	2858	2956	3053	3151	3248				
.14	\$	2406	2504	2608	2705	2803	2900	2998	3102	3199	3297	3394	3491				
.16	\$	2650	2747	2852	2949	3046	3144	3241	3345	3443	3540	3638	3735			BALANCE POINT 25 DEG.F.	
110,000	\$	1502	1718	1933	2149	2365	2580	2796	3012	3227	3443	3658	3874			--THEORETICAL HEATING COST * FURNACE ONLY	
.05	\$	1439	1579	1711	1843	1982	2114	2246	2385	2518	2650	2789	2921			THEORETICAL HEATING COST * FURN. + HEAT PUMP \$ PER YEAR	
.06	\$	1537	1676	1808	1940	2079	2212	2344	2483	2615	2747	2886	3018				
.07	\$	1634	1773	1905	2038	2177	2309	2441	2580	2712	2845	2984	3116				
.08	\$	1739	1878	2010	2142	2281	2413	2545	2685	2817	2949	3088	3220				
.09	\$	1836	1975	2107	2239	2379	2511	2643	2782	2914	3046	3185	3318				
.10	\$	1933	2072	2205	2337	2476	2608	2740	2879	3012	3144	3283	3415				
.12	\$	2135	2274	2406	2538	2678	2810	2942	3081	3213	3345	3485	3617				
.14	\$	2337	2476	2608	2740	2879	3012	3144	3283	3415	3547	3686	3818				
.16	\$	2532	2671	2803	2935	3074	3206	3338	3478	3610	3742	3881	4013	BALANCE POINT 28 DEG.F.			

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.

