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

REGION 5

BARD MANUFACTURING COMPANY, BOX 607, BRYAN, OHIO 43506

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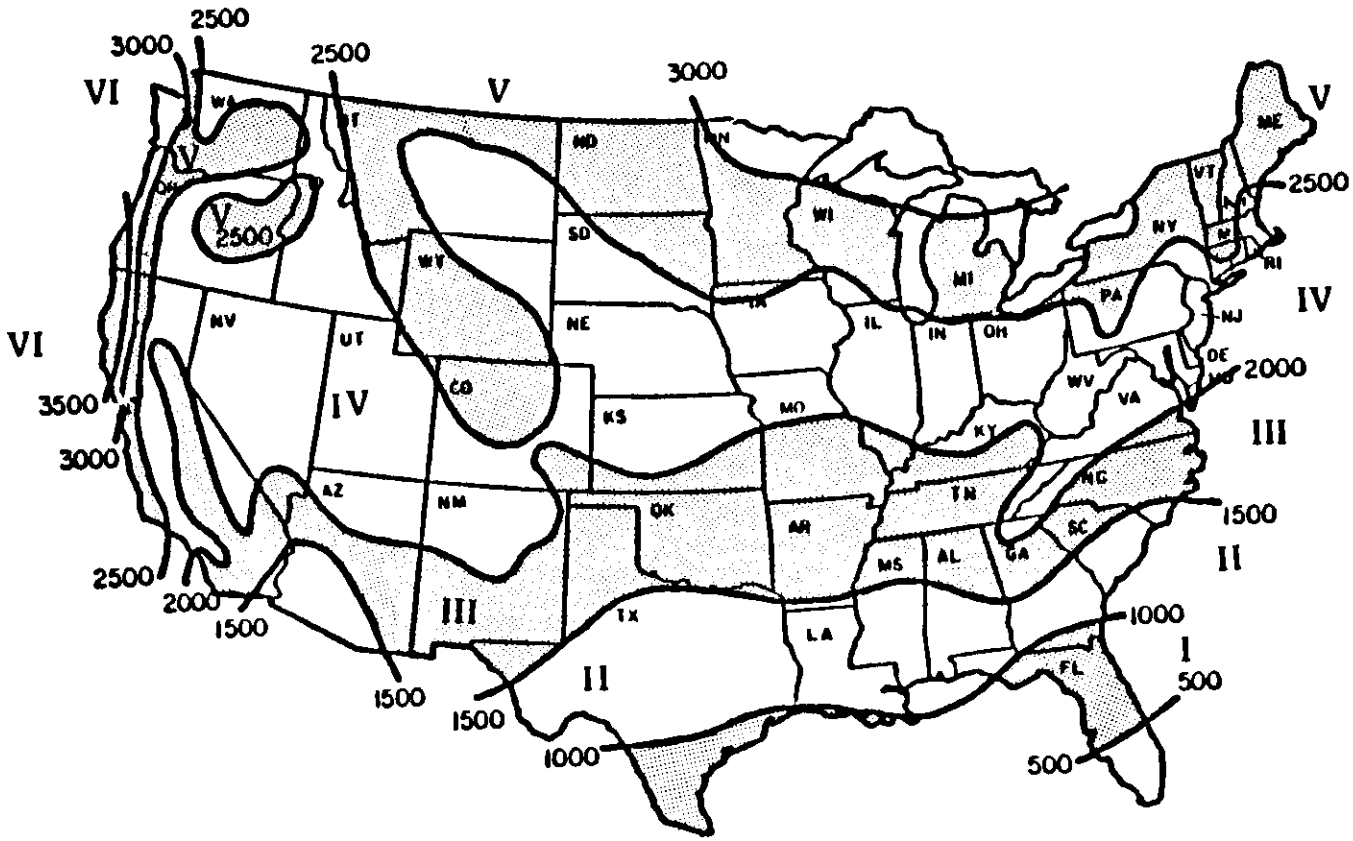
MANUAL 2100-073 REV. A
SUPERSEDES REV.



REGION HEATING LOAD HOURS

Region	HLHr
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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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

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

   a. Heating house Btuh loss is _____ .

   b. Cooling house Btuh gain is _____ .

2. Determine the type of fuel available at structure (what type of {fuel} heating system is already there).

   a. Electricity
   b. Natural Gas
   c. Propane Gas
   D. Fuel Oil
   E. Good water supply and disposal

3. Call local utilities and determine area energy costs.

   a. Electricity _____ $Kilowatt-hour

   b. Natural Gas _____ $/Therm

   c. Propane Gas _____ $/Gallon

   d. Fuel Oil _____ $/Gallon

4. Tentatively select an add-on heat pump system using Bard Manual 2100-057, "Heat Pump Sizing" as a guide, and a Bard equipment catalog.

   a. Air to air heat pump

      Model _____ Indoor Coil _____

      Btuh _____ Heat Btuh _____ Cool

   b. Water to air

      Model _____ Indoor Coil _____

      Btuh _____ Heat Btuh _____ Cool

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

   A. Region structure is located _____ .

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

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

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

EXAMPLE: 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 36UHPQA INDOOR A36AQ-A
ARI RATED COOLING CAP.: BTUH(95) 33000, SEER 8.69
ARI RATED HEATING CAP.: BTUH (47) 33600, COP(47) 2.90, HSPF 6.90 MIN.DHR REG IV
BTUH (17) 20000, COP(17) 2.20

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 $1,912.

D. Next locate the electric cost $/KW under Heat Loss Btuh for structure (step 3).

EXAMPLE: $.06 KW rate

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

EXAMPLE: 70,000 Btuh structure heat loss, with $.06 KW cost and $1.40 per gallon fuel oil. The annual cost using a 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	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$	1015	1099	1189	1272	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	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	BALANCE POINT 31 DEG.F. -10
	.16	$	1711	1794	1885	1968	2052	2142	2225	2309	2392	2483	2566	2650	

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

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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 BTUH	ELEC. COST $/KWH	HEATING OIL COST - $/GALLON .70	.80	.90	1.00	1.10	1.20	1.30	(1.40) B	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	$ 946	1015	1092	1161	1238	1314	1384	1460	1530	1606	1676	1752	
	.08	$ 1001	1071	1147	1217	1293	1370	1439	1516	1586	1662	1732	1808	
	.09	$ 1064	1133	1210	1279	1356	1432	1502	1579	1648	1725	1794	1871	
	.10	$ 1126	1196	1272	1342	1419	1495	1565	1641	1711	1787	1857	1933	
	.12	$ 1252	1321	1398	1467	1544	1620	1690	1766	1836	1912	1982	2059	
	.14	$ 1370	1439	1516	1586	1662	1739	1808	1885	1954	2031	2100	2177	BALANCE POINT 27 DEG.F.
	.16	$ 1495	1565	1641	1711	1787	1864	1933	2010	2079	2156	2225	2302	
A (70,000)		$ 952	1092	1231	1363	1502	1641	1780	(1912) C	2052	2191	2323	2462	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 946	1029	1119	1203	1286	1377	1460	1544 E	1627	1718	1801	1885	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
D	.06	~~$ 1016~~	~~1099~~	~~1189~~	~~1272~~	~~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	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	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	
										<--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.

BARD MANUFACTURING COMPANY

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

REGION 5
HEAT PUMP MODEL:COMPRESSOR SECTION W0S30A INDOOR A36AQ-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	BALANCE POINT 15- DEG.F.
	.16	$ 1168	2977	
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	BALANCE POINT 3- DEG.F.
	.16	$ 1349	3471	
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	BALANCE POINT 5 DEG.F.
	.16	$ 1530	3965	
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	BALANCE POINT 17 DEG.F.
	.16	$ 1996	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
$	35	42	50	57	64	71	85	100	114	<--THEORETICAL AIR CONDITIONING COST

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HEAT PUMP MODEL:COMPRESSOR SECTION W0S30A INDOOR A36AQ-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	BALANCE POINT 15- DEG.F.
	.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	BALANCE POINT 3- DEG.F.
	.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	BALANCE POINT 5 DEG.F.
	.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	BALANCE POINT 17 DEG.F.
	.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	<--THEORETICAL AIR CONDITIONING COST

<--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:COMPRESSOR SECTION WOS30A INDOOR A36AQ-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	BALANCE POINT 15- DEG.F.
	.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	BALANCE POINT 3- DEG.F.
	.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	BALANCE POINT 5 DEG.F.
	.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	BALANCE POINT 17 DEG.F.
	.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 W0S30A INDOOR A36AQ-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	BALANCE POINT 15- DEG.F.
	.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	BALANCE POINT 3- DEG.F.
	.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	BALANCE POINT 5 DEG.F.
	.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	BALANCE POINT 17 DEG.F.
	.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 HEATNG 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 A36AQ-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% AFUE

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	BALANCE POINT 13- DEG.F.
	.16	$ 1502	3965	
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	BALANCE POINT 2 DEG.F.
	.16	$ 1850	4959	
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	BALANCE POINT 12 DEG.F.
	.16	$ 2260	5954	
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	BALANCE POINT 20 DEG.F.
	.16	$ 2782	6942	

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

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

REGION 5
HEAT PUMP MODEL:COMPRESSOR SECTION WCS36A INDOOR A36AQ-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% 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	$ 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	BALANCE POINT 63 DEG.F.
	.16	$ 1099	1099	1106	1106	1112	1112	1119	1119	1126	1126	1133	1140	
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	BALANCE POINT 13- DEG.F.
	.16	$ 1224	1224	1231	1238	1238	1245	1252	1252	1259	1266	1272	1279	
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	639	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	BALANCE POINT 2 DEG.F.
	.16	$ 1419	1432	1439	1453	1460	1467	1481	1488	1502	1509	1530	1551	
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	BALANCE POINT 12 DEG.F.
	.16	$ 1481	1509	1530	1558	1586	1606	1634	1655	1683	1711	1759	1808	
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	BALANCE POINT 20 DEG.F.
	.16	$ 1572	1606	1648	1683	1725	1759	1794	1836	1871	1912	1989	2059	

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 A36AQ-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% 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	$ 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	876	883	890	890	897	
	.14	$ 973	980	987	987	994	1001	1008	1008	1015	1022	1022	1029	BALANCE POINT 63 DEG.F.
	.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	BALANCE POINT 13- DEG.F.
	.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	BALANCE POINT 2 DEG.F.
	.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	BALANCE POINT 12 DEG.F.
	.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	BALANCE POINT 20 DEG.F.
	.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.

BARD MANUFACTURING COMPANY

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

REGION 5
HEAT PUMP MODEL:COMPRESSOR SECTION W0S36A INDOOR A36AQ-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	BALANCE POINT 63 DEG.F.
	.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	BALANCE POINT 13- DEG.F.
	.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	BALANCE POINT 2 DEG.F.
	.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	BALANCE POINT 12 DEG.F.
	.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	BALANCE POINT 20 DEG.F.
	.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	
										<--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 HEATNG AND COOLING SYSTEMS. ACTUAL VALUES MAY VARY DEPENDING ON ACTUAL WEATHER CONDITIONS AND INDIVIOUAL 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 A42AQ-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	--- THEORETICAL ANNUAL HEATING COST --- HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY	
40,000				
	.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				
	.05	$ 598	1544	
	.06	$ 716	1857	
	.07	$ 834	2170	
	.08	$ 952	2476	
	.09	$ 1071	2789	
	.10	$ 1196	3095	
	.12	$ 1432	3721	
	.14	$ 1669	4340	BALANCE POINT 8- DEG.F.
	.16	$ 1905	4959	
60,000				
	.05	$ 709	1857	
	.06	$ 855	2232	
	.07	$ 994	2601	
	.08	$ 1140	2977	
	.09	$ 1279	3345	
	.10	$ 1419	3721	
	.12	$ 1704	4465	
	.14	$ 1989	5210	BALANCE POINT 4 DEG.F.
	.16	$ 2274	5954	
70,000				
	.05	$ 841	2170	
	.06	$ 1008	2601	
	.07	$ 1182	3039	
	.08	$ 1349	3471	
	.09	$ 1516	3902	
	.10	$ 1690	4340	
	.12	$ 2024	5210	
	.14	$ 2358	6079	BALANCE POINT 13 DEG.F.
	.16	$ 2698	6942	
80,000				
	.05	$ 1001	2476	
	.06	$ 1210	2977	
	.07	$ 1405	3471	
	.08	$ 1613	3965	
	.09	$ 1808	4465	
	.10	$ 2010	4959	
	.12	$ 2413	5954	
	.14	$ 2817	6942	BALANCE POINT 19 DEG.F.
	.16	$ 3220	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
$	49	59	69	79	89	99	119	139	159	<--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 A42AQ-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% AFUE

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	BALANCE POINT 63 DEG.F.
	.16	$ 1293	1300	1300	1307	1307	1314	1321	1321	1328	1328	1335	1349	
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	BALANCE POINT 8- DEG.F.
	.16	$ 1551	1558	1565	1572	1572	1579	1586	1592	1599	1606	1620	1634	
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	BALANCE POINT 4 DEG.F.
	.16	$ 1745	1759	1773	1780	1794	1808	1822	1829	1843	1857	1878	1905	
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	BALANCE POINT 13 DEG.F.
	.16	$ 1773	1808	1836	1864	1892	1919	1954	1982	2010	2038	2100	2156	
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	BALANCE POINT 19 DEG.F.
	.16	$ 1843	1892	1933	1975	2017	2059	2100	2149	2191	2232	2316	2406	

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
$	49	59	69	79	89	99	119	139	159	<--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 HEATNG 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 A42AQ-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 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	$ 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	BALANCE POINT 63 DEG.F.
	.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	BALANCE POINT 8- DEG.F.
	.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	BALANCE POINT 4 DEG.F.
	.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	BALANCE POINT 13 DEG.F.
	.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	BALANCE POINT 19 DEG.F.
	.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	<--ELECTRIC RATE $/KWH
$	49	59	69	79	89	99	119	139	159	<--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 A42AQ-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	BALANCE POINT 63 DEG.F.
	.16	$ 1321	1321	1328	1335	1335	1342	1349	1349	1356	1363	1370	1370	
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	BALANCE POINT 8- DEG.F.
	.16	$ 1592	1599	1606	1613	1620	1627	1634	1641	1648	1662	1676	1676	
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	BALANCE POINT 4 DEG.F.
	.16	$ 1822	1836	1850	1864	1878	1892	1905	1912	1926	1954	1982	1982	
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	BALANCE POINT 13 DEG.F.
	.16	$ 1954	1989	2024	2052	2086	2114	2149	2184	2212	2281	2344	2344	
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	BALANCE POINT 19 DEG.F.
	.16	$ 2114	2156	2205	2253	2302	2351	2392	2441	2490	2587	2678	2678	

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	<--THEORETICAL AIR CONDITIONING COST

<--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 — 24UHPQA/A30AQ-A
HEAT PUMP MODEL: OUTDOOR 24UHPQA — INDOOR A30AQ-A
ARI RATED COOLING CAP.: BTUH(95) 24000, SEER 9.69
ARI RATED HEATING CAP.: BTUH (47) 24800, COP(47) 2.90, HSPF 6.40 MIN.DHR REG IV
BTUH (17) 12500, COP(17) 1.90
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	$ 473	772	
	.06	$ 570	925	
	.07	$ 667	1085	
	.08	$ 765	1238	
	.09	$ 855	1391	
	.10	$ 952	1544	
	.12	$ 1147	1857	
	.14	$ 1335	2170	BALANCE POINT 16 DEG.F.
	.16	$ 1523	2476	
30,000	.05	$ 577	925	
	.06	$ 695	1112	
	.07	$ 806	1300	
	.08	$ 925	1488	
	.09	$ 1043	1669	
	.10	$ 1154	1857	
	.12	$ 1384	2232	
	.14	$ 1613	2601	BALANCE POINT 20 DEG.F.
	.16	$ 1843	2977	
35,000	.05	$ 681	1085	
	.06	$ 820	1300	
	.07	$ 952	1516	
	.08	$ 1092	1732	
	.09	$ 1224	1947	
	.10	$ 1363	2170	
	.12	$ 1634	2601	
	.14	$ 1912	3039	BALANCE POINT 24 DEG.F.
	.16	$ 2191	3471	
40,000	.05	$ 793	1238	
	.06	$ 952	1488	
	.07	$ 1106	1732	
	.08	$ 1272	1982	
	.09	$ 1426	2232	
	.10	$ 1579	2476	
	.12	$ 1899	2977	
	.14	$ 2212	3471	BALANCE POINT 27 DEG.F.
	.16	$ 2532	3965	
50,000	.05	$ 1029	1544	
	.06	$ 1231	1857	
	.07	$ 1439	2170	
	.08	$ 1648	2476	
	.09	$ 1850	2789	
	.10	$ 2059	3095	
	.12	$ 2469	3721	
	.14	$ 2879	4340	BALANCE POINT 31 DEG.F.
	.16	$ 3290	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
$	49	59	69	79	89	99	118	138	158	<--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 HEATNG 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 — 24UHPQA/A30AQ-A

HEAT PUMP MODEL: OUTDOOR 24UHPQA — INDOOR A30AQ-A

ARI RATED COOLING CAP.: BTUH(95) 24000, SEER 9.69

ARI RATED HEATING CAP.: BTUH (47) 24800, COP(47) 2.90, HSPF 6.40 MIN.DHR REG IV

BTUH (17) 12500, COP(17) 1.90

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	$ 347	354	368	375	389	396	410	417	431	438	459	479	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 396	403	417	424	438	445	459	466	479	486	507	528	
	.07	$ 452	459	473	479	493	500	514	521	535	542	563	584	
	.08	$ 507	514	528	535	549	556	570	577	591	598	619	639	
	.09	$ 563	570	584	591	605	612	626	633	646	653	674	695	
	.10	$ 612	619	633	639	653	660	674	681	695	702	723	744	
	.12	$ 723	730	744	751	765	772	786	793	806	813	834	855	
	.14	$ 827	834	848	855	869	876	890	897	911	918	939	959	BALANCE POINT 16 DEG.F.
	.16	$ 939	946	959	966	980	987	1001	1008	1022	1029	1050	1071	
30,000		$ 278	319	361	403	445	486	528	563	605	646	730	813	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 382	403	417	431	452	466	479	500	514	528	563	591	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 438	459	473	486	507	521	535	556	570	584	619	646	
	.07	$ 493	514	528	542	563	577	591	612	626	639	674	702	
	.08	$ 549	570	584	598	619	633	646	667	681	695	730	758	
	.09	$ 598	619	633	646	667	681	695	716	730	744	779	806	
	.10	$ 653	674	688	702	723	737	751	772	786	799	834	862	
	.12	$ 765	786	799	813	834	848	862	883	897	911	946	973	
	.14	$ 869	890	904	918	939	952	966	987	1001	1015	1050	1078	BALANCE POINT 20 DEG.F.
	.16	$ 980	1001	1015	1029	1050	1064	1078	1099	1112	1126	1161	1189	
35,000		$ 326	375	424	473	521	563	612	660	709	758	848	946	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 417	445	466	486	514	535	563	584	612	633	681	730	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 473	500	521	542	570	591	619	639	667	688	737	786	
	.07	$ 521	549	570	591	619	639	667	688	716	737	786	834	
	.08	$ 570	598	619	639	667	688	716	737	765	786	834	883	
	.09	$ 619	646	667	688	716	737	765	786	813	834	883	932	
	.10	$ 674	702	723	744	772	793	820	841	869	890	939	987	
	.12	$ 772	799	820	841	869	890	918	939	966	987	1036	1085	
	.14	$ 876	904	925	946	973	994	1022	1043	1071	1092	1140	1189	BALANCE POINT 24 DEG.F.
	.16	$ 973	1001	1022	1043	1071	1092	1119	1140	1168	1189	1238	1286	
40,000		$ 375	431	486	542	591	646	702	758	813	862	973	1085	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 452	486	521	556	591	619	653	688	723	758	827	890	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 493	528	563	598	633	660	695	730	765	799	869	932	
	.07	$ 535	570	605	639	674	702	737	772	806	841	911	973	
	.08	$ 577	612	646	681	716	744	779	813	848	883	952	1015	
	.09	$ 619	653	688	723	758	786	820	855	890	925	994	1057	
	.10	$ 660	695	730	765	799	827	862	897	932	966	1036	1099	
	.12	$ 744	779	813	848	883	911	946	980	1015	1050	1119	1182	
	.14	$ 834	869	904	939	973	1001	1036	1071	1106	1140	1210	1272	BALANCE POINT 27 DEG.F.
	.16	$ 918	952	987	1022	1057	1085	1119	1154	1189	1224	1293	1356	
50,000		$ 473	542	605	674	744	813	876	946	1015	1085	1217	1356	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 556	598	639	681	723	765	806	848	890	932	1022	1106	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 605	646	688	730	772	813	855	897	939	980	1071	1154	
	.07	$ 660	702	744	786	827	869	911	952	994	1036	1126	1210	
	.08	$ 709	751	793	834	876	918	959	1001	1043	1085	1175	1259	
	.09	$ 758	799	841	883	925	966	1008	1050	1092	1133	1224	1307	
	.10	$ 813	855	897	939	980	1022	1064	1106	1147	1189	1279	1363	
	.12	$ 911	952	994	1036	1078	1119	1161	1203	1245	1286	1377	1460	
	.14	$ 1015	1057	1099	1140	1182	1224	1266	1307	1349	1391	1481	1565	BALANCE POINT 31 DEG.F.
	.16	$ 1119	1161	1203	1245	1286	1328	1370	1412	1453	1495	1586	1669	

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
$	49	59	69	79	89	99	118	138	158	<--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 — 24UHPQA/A30AQ-A
HEAT PUMP MODEL: OUTDOOR 24UHPQA — INDOOR A30AQ-A
ARI RATED COOLING CAP.: BTUH(95) 24000, SEER 9.69
ARI RATED HEATING CAP.: BTUH (47) 24800, COP(47) 2.90, HSPF 6.40 MIN.DHR REG IV
BTUH (17) 12500, COP(17) 1.90
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	$ 375	389	403	424	438	452	466	479	493	514	528	542	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 424	438	452	473	486	500	514	528	542	563	577	591	
	.07	$ 479	493	507	528	542	556	570	584	598	619	633	646	
	.08	$ 535	549	563	584	598	612	626	639	653	674	688	702	
	.09	$ 591	605	619	639	653	667	681	695	709	730	744	758	
	.10	$ 639	653	667	688	702	716	730	744	758	779	793	806	
	.12	$ 751	765	779	799	813	827	841	855	869	890	904	918	
	.14	$ 855	869	883	904	918	932	946	959	973	994	1008	1022	BALANCE POINT 16 DEG.F.
	.16	$ 966	980	994	1015	1029	1043	1057	1071	1085	1106	1119	1133	
30,000		$ 410	466	521	584	639	702	758	820	876	939	994	1050	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 431	459	479	500	528	549	577	598	619	646	667	688	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 486	514	535	556	584	605	633	653	674	702	723	744	
	.07	$ 542	570	591	612	639	660	688	709	730	758	779	799	
	.08	$ 598	626	646	667	695	716	744	765	786	813	834	855	
	.09	$ 646	674	695	716	744	765	793	813	834	862	883	904	
	.10	$ 702	730	751	772	799	820	848	869	890	918	939	959	
	.12	$ 813	841	862	883	911	932	959	980	1001	1029	1050	1071	
	.14	$ 918	946	966	987	1015	1036	1064	1085	1106	1133	1154	1175	BALANCE POINT 20 DEG.F.
	.16	$ 1029	1057	1078	1099	1126	1147	1175	1196	1217	1245	1266	1286	
35,000		$ 473	542	612	681	751	820	890	952	1022	1092	1161	1231	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 493	528	563	598	633	667	702	730	765	799	834	869	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 549	584	619	653	688	723	758	786	820	855	890	925	
	.07	$ 598	633	667	702	737	772	806	834	869	904	939	973	
	.08	$ 646	681	716	751	786	820	855	883	918	952	987	1022	
	.09	$ 695	730	765	799	834	869	904	932	966	1001	1036	1071	
	.10	$ 751	786	820	855	890	925	959	987	1022	1057	1092	1126	
	.12	$ 848	883	918	952	987	1022	1057	1085	1119	1154	1189	1224	
	.14	$ 952	987	1022	1057	1092	1126	1161	1189	1224	1259	1293	1328	BALANCE POINT 24 DEG.F.
	.16	$ 1050	1085	1119	1154	1189	1224	1259	1286	1321	1356	1391	1426	
40,000		$ 542	626	702	779	855	939	1015	1092	1168	1252	1328	1405	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 556	605	653	702	751	799	848	897	946	994	1043	1099	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 598	646	695	744	793	841	890	939	987	1036	1085	1140	
	.07	$ 639	688	737	786	834	883	932	980	1029	1078	1126	1182	
	.08	$ 681	730	779	827	876	925	973	1022	1071	1119	1168	1224	
	.09	$ 723	772	820	869	918	966	1015	1064	1112	1161	1210	1266	
	.10	$ 765	813	862	911	959	1008	1057	1106	1154	1203	1252	1307	
	.12	$ 848	897	946	994	1043	1092	1140	1189	1238	1286	1335	1391	
	.14	$ 939	987	1036	1085	1133	1182	1231	1279	1328	1377	1426	1481	BALANCE POINT 27 DEG.F.
	.16	$ 1022	1071	1119	1168	1217	1266	1314	1363	1412	1460	1509	1565	
50,000		$ 681	779	876	973	1071	1168	1266	1363	1467	1565	1662	1759	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 681	744	806	869	932	987	1050	1112	1175	1238	1293	1356	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 730	793	855	918	980	1036	1099	1161	1224	1286	1342	1405	
	.07	$ 786	848	911	973	1036	1092	1154	1217	1279	1342	1398	1460	
	.08	$ 834	897	959	1022	1085	1140	1203	1266	1328	1391	1446	1509	
	.09	$ 883	946	1008	1071	1133	1189	1252	1314	1377	1439	1495	1558	
	.10	$ 939	1001	1064	1126	1189	1245	1307	1370	1432	1495	1551	1613	
	.12	$ 1036	1099	1161	1224	1286	1342	1405	1467	1530	1592	1648	1711	
	.14	$ 1140	1203	1266	1328	1391	1446	1509	1572	1634	1697	1752	1815	BALANCE POINT 31 DEG.F.
	.16	$ 1245	1307	1370	1432	1495	1551	1613	1676	1739	1801	1857	1919	

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
$	49	59	69	79	89	99	118	138	158	<--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 — 24UHPQA/A30AQ-A
HEAT PUMP MODEL: OUTDOOR 24UHPQA — INDOOR A30AQ-A
ARI RATED COOLING CAP.: BTUH(95) 24000, SEER 9.69
ARI RATED HEATING CAP.: BTUH (47) 24800, COP(47) 2.90, HSPF 6.40 MIN.DHR REG IV
BTUH (17) 12500, COP(17) 1.90
FURNACE TYPE PROPANE GAS — FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST S/KWH	PROPANE GAS COST - S/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	$ 410	417	431	445	452	466	479	486	500	521	549	549	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 459	466	479	493	500	514	528	535	549	570	598	598	
	.07	$ 514	521	535	549	556	570	584	591	605	626	653	653	
	.08	$ 570	577	591	605	612	626	639	646	660	681	709	709	
	.09	$ 626	633	646	660	667	681	695	702	716	737	765	765	
	.10	$ 674	681	695	709	716	730	744	751	765	786	813	813	
	.12	$ 786	793	806	820	827	841	855	862	876	897	925	925	
	.14	$ 890	897	911	925	932	946	959	966	980	1001	1029	1029	BALANCE POINT 16 DEG.F.
	.16	$ 1001	1008	1022	1036	1043	1057	1071	1078	1092	1112	1140	1140	
30,000		$ 535	577	626	667	709	758	799	848	890	980	1071	1071	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 486	500	521	535	556	570	591	605	626	660	695	695	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 542	556	577	591	612	626	646	660	681	716	751	751	
	.07	$ 598	612	633	646	667	681	702	716	737	772	806	806	
	.08	$ 653	667	688	702	723	737	758	772	793	827	862	862	
	.09	$ 702	716	737	751	772	786	806	820	841	876	911	911	
	.10	$ 758	772	793	806	827	841	862	876	897	932	966	966	
	.12	$ 869	883	904	918	939	952	973	987	1008	1043	1078	1078	
	.14	$ 973	987	1008	1022	1043	1057	1078	1092	1112	1147	1182	1182	BALANCE POINT 20 DEG.F.
	.16	$ 1085	1099	1119	1133	1154	1168	1189	1203	1224	1259	1293	1293	
35,000		$ 626	674	730	779	834	883	939	987	1043	1147	1252	1252	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 563	591	619	646	674	695	723	751	779	827	883	883	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 619	646	674	702	730	751	779	806	834	883	939	939	
	.07	$ 667	695	723	751	779	799	827	855	883	932	987	987	
	.08	$ 716	744	772	799	827	848	876	904	932	980	1036	1036	
	.09	$ 765	793	820	848	876	897	925	952	980	1029	1085	1085	
	.10	$ 820	848	876	904	932	952	980	1008	1036	1085	1140	1140	
	.12	$ 918	946	973	1001	1029	1050	1078	1106	1133	1182	1238	1238	
	.14	$ 1022	1050	1078	1106	1133	1154	1182	1210	1238	1286	1342	1342	BALANCE POINT 24 DEG.F.
	.16	$ 1119	1147	1175	1203	1231	1252	1279	1307	1335	1384	1439	1439	
40,000		$ 709	772	834	890	952	1008	1071	1126	1189	1307	1426	1426	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 660	702	737	772	813	848	883	925	959	1036	1112	1112	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 702	744	779	813	855	890	925	966	1001	1078	1154	1154	
	.07	$ 744	786	820	855	897	932	966	1008	1043	1119	1196	1196	
	.08	$ 786	827	862	897	939	973	1008	1050	1085	1161	1238	1238	
	.09	$ 827	869	904	939	980	1015	1050	1092	1126	1203	1279	1279	
	.10	$ 869	911	946	980	1022	1057	1092	1133	1168	1245	1321	1321	
	.12	$ 952	994	1029	1064	1106	1140	1175	1217	1252	1328	1405	1405	
	.14	$ 1043	1085	1119	1154	1196	1231	1266	1307	1342	1419	1495	1495	BALANCE POINT 27 DEG.F.
	.16	$ 1126	1168	1203	1238	1279	1314	1349	1391	1426	1502	1579	1579	
50,000		$ 890	966	1043	1112	1189	1266	1335	1412	1488	1634	1787	1787	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 813	862	911	952	1001	1050	1099	1140	1189	1279	1377	1377	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 862	911	959	1001	1050	1099	1147	1189	1238	1328	1426	1426	
	.07	$ 918	966	1015	1057	1106	1154	1203	1245	1293	1384	1481	1481	
	.08	$ 966	1015	1064	1106	1154	1203	1252	1293	1342	1432	1530	1530	
	.09	$ 1015	1064	1112	1154	1203	1252	1300	1342	1391	1481	1579	1579	
	.10	$ 1071	1119	1168	1210	1259	1307	1356	1398	1446	1537	1634	1634	
	.12	$ 1168	1217	1266	1307	1356	1405	1453	1495	1544	1634	1732	1732	
	.14	$ 1272	1321	1370	1412	1460	1509	1558	1599	1648	1739	1836	1836	BALANCE POINT 31 DEG.F.
	.16	$ 1377	1426	1474	1516	1565	1613	1662	1704	1752	1843	1940	1940	

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 S/KWH
$	49	59	69	79	89	99	118	138	158	<--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 HEATNG 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 — 30UHPQA/A36AQ-A
HEAT PUMP MODEL: OUTDOOR 30UHPQA — INDOOR A36AQ-A
ARI RATED COOLING CAP.: BTUH(95) 28200, SEER 9.19
ARI RATED HEATING CAP.: BTUH (47) 29800, COP(47) 3.00, HSPF 6.90 MIN.DHR REG IV
BTUH (17) 16400, COP(17) 2.10
FURNACE TYPE ELECTRIC — FURNACE EFFICIENCY 100.00 % AFUE

HEAT LOSS BTUH	ELEC. COST $/KWH	HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY	
35,000		--- THEORETICAL ANNUAL HEATING COST ---		
	.05	$ 626	1085	
	.06	$ 751	1300	
	.07	$ 876	1516	
	.08	$ 1001	1732	
	.09	$ 1126	1947	
	.10	$ 1259	2170	
	.12	$ 1502	2601	
	.14	$ 1752	3039	BALANCE POINT 18 DEG.F.
	.16	$ 2003	3471	
40,000		--- THEORETICAL ANNUAL HEATING COST ---		
	.05	$ 723	1238	
	.06	$ 869	1488	
	.07	$ 1008	1732	
	.08	$ 1154	1982	
	.09	$ 1307	2232	
	.10	$ 1446	2476	
	.12	$ 1732	2977	
	.14	$ 2031	3471	BALANCE POINT 21 DEG.F.
	.16	$ 2316	3965	
50,000		--- THEORETICAL ANNUAL HEATING COST ---		
	.05	$ 939	1544	
	.06	$ 1126	1857	
	.07	$ 1314	2170	
	.08	$ 1495	2476	
	.09	$ 1683	2789	
	.10	$ 1871	3095	
	.12	$ 2253	3721	
	.14	$ 2622	4340	BALANCE POINT 27 DEG.F.
	.16	$ 2998	4959	
60,000		--- THEORETICAL ANNUAL HEATING COST ---		
	.05	$ 1175	1857	
	.06	$ 1405	2232	
	.07	$ 1641	2601	
	.08	$ 1878	2977	
	.09	$ 2107	3345	
	.10	$ 2344	3721	
	.12	$ 2810	4465	
	.14	$ 3283	5210	BALANCE POINT 31 DEG.F.
	.16	$ 3749	5954	
70,000		--- THEORETICAL ANNUAL HEATING COST ---		
	.05	$ 1426	2170	
	.06	$ 1711	2601	
	.07	$ 1996	3039	
	.08	$ 2281	3471	
	.09	$ 2566	3902	
	.10	$ 2852	4340	
	.12	$ 3422	5210	
	.14	$ 3992	6079	BALANCE POINT 34 DEG.F.
	.16	$ 4570	6942	

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
$	61	73	85	98	110	122	147	171	196	<--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 — 30UHPQA/A36AQ-A

HEAT PUMP MODEL: OUTDOOR 30UHPQA — INDOOR A36AQ-A

ARI RATED COOLING CAP.: BTUH(95) 28200, SEER 9.19

ARI RATED HEATING CAP.: BTUH (47) 29800, COP(47) 3.00, HSPF 6.90 MIN.DHR REG IV

BTUH (17) 16400, COP(17) 2.10

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	$ 396	403	417	431	445	459	466	479	493	507	528	556	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 452	459	473	486	500	514	521	535	549	563	584	612	
	.07	$ 514	521	535	549	563	577	584	598	612	626	646	674	
	.08	$ 577	584	598	612	626	639	646	660	674	688	709	737	
	.09	$ 633	639	653	667	681	695	702	716	730	744	765	793	
	.10	$ 695	702	716	730	744	758	765	779	793	806	827	855	
	.12	$ 820	827	841	855	869	883	890	904	918	932	952	980	
	.14	$ 939	946	959	973	987	1001	1008	1022	1036	1050	1071	1099	BALANCE POINT 14 DEG.F.
	.16	$ 1057	1064	1078	1092	1106	1119	1126	1140	1154	1168	1189	1217	
35,000		$ 326	375	424	473	521	563	612	660	709	758	848	946	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 431	452	466	486	507	528	542	563	584	598	639	674	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 493	514	528	549	570	591	605	626	646	660	702	737	
	.07	$ 549	570	584	605	626	646	660	681	702	716	758	793	
	.08	$ 612	633	646	667	688	709	723	744	765	779	820	855	
	.09	$ 674	695	709	730	751	772	786	806	827	841	883	918	
	.10	$ 730	751	765	786	806	827	841	862	883	897	939	973	
	.12	$ 848	869	883	904	925	946	959	980	1001	1015	1057	1092	
	.14	$ 973	994	1008	1029	1050	1071	1085	1106	1126	1140	1182	1217	BALANCE POINT 18 DEG.F.
	.16	$ 1092	1112	1126	1147	1168	1189	1203	1224	1245	1259	1300	1335	
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	$ 556	577	598	619	639	660	681	702	723	751	793	834	
	.07	$ 626	646	667	688	709	730	751	772	793	820	862	904	
	.08	$ 688	709	730	751	772	793	813	834	855	883	925	966	
	.09	$ 758	779	799	820	841	862	883	904	925	952	994	1036	
	.10	$ 820	841	862	883	904	925	946	966	987	1015	1057	1099	
	.12	$ 959	980	1001	1022	1043	1064	1085	1106	1126	1154	1196	1238	
	.14	$ 1092	1112	1133	1154	1175	1196	1217	1238	1259	1286	1328	1370	BALANCE POINT 21 DEG.F.
	.16	$ 1224	1245	1266	1286	1307	1328	1349	1370	1391	1419	1460	1502	
50,000		$ 473	542	605	674	744	813	876	946	1015	1085	1217	1356	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 549	591	633	674	716	758	799	841	883	925	1015	1099	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 598	639	681	723	765	806	848	890	932	973	1064	1147	
	.07	$ 646	688	730	772	813	855	897	939	980	1022	1112	1196	
	.08	$ 702	744	786	827	869	911	952	994	1036	1078	1168	1252	
	.09	$ 751	793	834	876	918	959	1001	1043	1085	1126	1217	1300	
	.10	$ 799	841	883	925	966	1008	1050	1092	1133	1175	1266	1349	
	.12	$ 897	939	980	1022	1064	1106	1147	1189	1231	1272	1363	1446	
	.14	$ 1001	1043	1085	1126	1168	1210	1252	1293	1335	1377	1467	1551	BALANCE POINT 27 DEG.F.
	.16	$ 1099	1140	1182	1224	1266	1307	1349	1391	1432	1474	1565	1648	
60,000		$ 563	646	730	813	890	973	1057	1133	1217	1300	1460	1627	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 646	695	751	799	848	904	952	1001	1057	1106	1210	1307	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 702	751	806	855	904	959	1008	1057	1112	1161	1266	1363	
	.07	$ 765	813	869	918	966	1022	1071	1119	1175	1224	1328	1426	
	.08	$ 820	869	925	973	1022	1078	1126	1175	1231	1279	1384	1481	
	.09	$ 876	925	980	1029	1078	1133	1182	1231	1286	1335	1439	1537	
	.10	$ 939	987	1043	1092	1140	1196	1245	1293	1349	1398	1502	1599	
	.12	$ 1057	1106	1161	1210	1259	1314	1363	1412	1467	1516	1620	1718	
	.14	$ 1168	1217	1272	1321	1370	1426	1474	1523	1579	1627	1732	1829	BALANCE POINT 31 DEG.F.
	.16	$ 1286	1335	1391	1439	1488	1544	1592	1641	1697	1745	1850	1947	
70,000		$ 660	758	848	946	1043	1133	1231	1328	1419	1516	1704	1899	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 723	793	862	932	1001	1071	1140	1210	1279	1349	1488	1634	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 772	841	911	980	1050	1119	1189	1259	1328	1398	1537	1683	
	.07	$ 813	883	952	1022	1092	1161	1231	1300	1370	1439	1579	1725	
	.08	$ 862	932	1001	1071	1140	1210	1279	1349	1419	1488	1627	1773	
	.09	$ 911	980	1050	1119	1189	1259	1328	1398	1467	1537	1676	1822	
	.10	$ 952	1022	1092	1161	1231	1300	1370	1439	1509	1579	1718	1864	
	.12	$ 1050	1119	1189	1259	1328	1398	1467	1537	1606	1676	1815	1961	
	.14	$ 1140	1210	1279	1349	1419	1488	1558	1627	1697	1766	1905	2052	BALANCE POINT 34 DEG.F.
	.16	$ 1231	1300	1370	1439	1509	1579	1648	1718	1787	1857	1996	2142	

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
$ 723	772	813	862	911	952	1050	1140	1231	

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BARD MANUFACTURING COMPANY

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

REGION 5 — 30UHPQA/A36AQ-A
HEAT PUMP MODEL: OUTDOOR 30UHPQA — INDOOR A36AQ-A
ARI RATED COOLING CAP.: BTUH(95) 28200, SEER 9.19
ARI RATED HEATING CAP.: BTUH (47) 29800, COP(47) 3.00, HSPF 6.90 MIN.DHR REG IV
BTUH (17) 16400, 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	$ 431	452	466	486	507	521	542	556	577	598	612	633	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 486	507	521	542	563	577	598	612	633	653	667	688	
	.07	$ 549	570	584	605	626	639	660	674	695	716	730	751	
	.08	$ 612	633	646	667	688	702	723	737	758	779	793	813	
	.09	$ 667	688	702	723	744	758	779	793	813	834	848	869	
	.10	$ 730	751	765	786	806	820	841	855	876	897	911	932	
	.12	$ 855	876	890	911	932	946	966	980	1001	1022	1036	1057	
	.14	$ 973	994	1008	1029	1050	1064	1085	1099	1119	1140	1154	1175	BALANCE POINT 14 DEG.F.
	.16	$ 1092	1112	1126	1147	1168	1182	1203	1217	1238	1259	1272	1293	
35,000		$ 473	542	612	681	751	820	890	952	1022	1092	1161	1231	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 486	514	542	570	598	626	653	681	709	730	758	786	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 549	577	605	633	660	688	716	744	772	793	820	848	
	.07	$ 605	633	660	688	716	744	772	799	827	848	876	904	
	.08	$ 667	695	723	751	779	806	834	862	890	911	939	966	
	.09	$ 730	758	786	813	841	869	897	925	952	973	1001	1029	
	.10	$ 786	813	841	869	897	925	952	980	1008	1029	1057	1085	
	.12	$ 904	932	959	987	1015	1043	1071	1099	1126	1147	1175	1203	
	.14	$ 1029	1057	1085	1112	1140	1168	1196	1224	1252	1272	1300	1328	BALANCE POINT 18 DEG.F.
	.16	$ 1147	1175	1203	1231	1259	1286	1314	1342	1370	1391	1419	1446	
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	$ 619	653	681	716	744	779	806	834	869	897	932	959	
	.07	$ 688	723	751	786	813	848	876	904	939	966	1001	1029	
	.08	$ 751	786	813	848	876	911	939	966	1001	1029	1064	1092	
	.09	$ 820	855	883	918	946	980	1008	1036	1071	1099	1133	1161	
	.10	$ 883	918	946	980	1008	1043	1071	1099	1133	1161	1196	1224	
	.12	$ 1022	1057	1085	1119	1147	1182	1210	1238	1272	1300	1335	1363	
	.14	$ 1154	1189	1217	1252	1279	1314	1342	1370	1405	1432	1467	1495	BALANCE POINT 21 DEG.F.
	.16	$ 1286	1321	1349	1384	1412	1446	1474	1502	1537	1565	1599	1627	
50,000		$ 681	779	876	973	1071	1168	1266	1363	1467	1565	1662	1759	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 674	737	799	862	925	980	1043	1106	1168	1231	1286	1349	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 723	786	848	911	973	1029	1092	1154	1217	1279	1335	1398	
	.07	$ 772	834	897	959	1022	1078	1140	1203	1266	1328	1384	1446	
	.08	$ 827	890	952	1015	1078	1133	1196	1259	1321	1384	1439	1502	
	.09	$ 876	939	1001	1064	1126	1182	1245	1307	1370	1432	1488	1551	
	.10	$ 925	987	1050	1112	1175	1231	1293	1356	1419	1481	1537	1599	
	.12	$ 1022	1085	1147	1210	1272	1328	1391	1453	1516	1579	1634	1697	
	.14	$ 1126	1189	1252	1314	1377	1432	1495	1558	1620	1683	1739	1801	BALANCE POINT 27 DEG.F.
	.16	$ 1224	1286	1349	1412	1474	1530	1592	1655	1718	1780	1836	1899	
60,000		$ 820	939	1050	1168	1286	1405	1523	1641	1759	1878	1996	2107	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 806	876	952	1022	1099	1175	1245	1321	1391	1467	1537	1613	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 862	932	1008	1078	1154	1231	1300	1377	1446	1523	1592	1669	
	.07	$ 925	994	1071	1140	1217	1293	1363	1439	1509	1586	1655	1732	
	.08	$ 980	1050	1126	1196	1272	1349	1419	1495	1565	1641	1711	1787	
	.09	$ 1036	1106	1182	1252	1328	1405	1474	1551	1620	1697	1766	1843	
	.10	$ 1099	1168	1245	1314	1391	1467	1537	1613	1683	1759	1829	1905	
	.12	$ 1217	1286	1363	1432	1509	1586	1655	1732	1801	1878	1947	2024	
	.14	$ 1328	1398	1474	1544	1620	1697	1766	1843	1912	1989	2059	2135	BALANCE POINT 31 DEG.F.
	.16	$ 1446	1516	1592	1662	1739	1815	1885	1961	2031	2107	2177	2253	
70,000		$ 952	1092	1231	1363	1502	1641	1780	1912	2052	2191	2323	2462	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 939	1036	1140	1238	1342	1439	1544	1641	1745	1850	1947	2052	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 987	1085	1189	1286	1391	1488	1592	1690	1794	1899	1996	2100	
	.07	$ 1029	1126	1231	1328	1432	1530	1634	1732	1836	1940	2038	2142	
	.08	$ 1078	1175	1279	1377	1481	1579	1683	1780	1885	1989	2086	2191	
	.09	$ 1126	1224	1328	1426	1530	1627	1732	1829	1933	2038	2135	2239	
	.10	$ 1168	1266	1370	1467	1572	1669	1773	1871	1975	2079	2177	2281	
	.12	$ 1266	1363	1467	1565	1669	1766	1871	1968	2072	2177	2274	2379	
	.14	$ 1356	1453	1558	1655	1759	1857	1961	2059	2163	2267	2365	2469	BALANCE POINT 34 DEG.F.
	.16	$ 1446	1544	1648	1745	1850	1947	2052	2149	2253	2358	2455	2559	

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
$ 431	486	549	612	667	730	855	973	1092	

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 — 30UHPQA/A36AQ-A

HEAT PUMP MODEL: OUTDOOR 30UHPQA — INDOOR A36AQ-A

ARI RATED COOLING CAP.: BTUH(95) 28200, SEER 9.19

ARI RATED HEATING CAP.: BTUH (47) 29800, COP(47) 3.00, HSPF 6.90 MIN.DHR REG IV

BTUH (17) 16400, COP(17) 2.10

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	$ 473	486	500	514	528	542	556	570	584	612	633	633	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 528	542	556	570	584	598	612	626	639	667	688	688	
	.07	$ 591	605	619	633	646	660	674	688	702	730	751	751	
	.08	$ 653	667	681	695	709	723	737	751	765	793	813	813	
	.09	$ 709	723	737	751	765	779	793	806	820	848	869	869	
	.10	$ 772	786	799	813	827	841	855	869	883	911	932	932	
	.12	$ 897	911	925	939	952	966	980	994	1008	1036	1057	1057	
	.14	$ 1015	1029	1043	1057	1071	1085	1099	1112	1126	1154	1175	1175	BALANCE POINT 14 DEG.F.
	.16	$ 1133	1147	1161	1175	1189	1203	1217	1231	1245	1272	1293	1293	
35,000		$ 626	674	730	779	834	883	939	987	1043	1147	1252	1252	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 549	570	591	612	633	653	674	695	716	751	793	793	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 612	633	653	674	695	716	737	758	779	813	855	855	
	.07	$ 667	688	709	730	751	772	793	813	834	869	911	911	
	.08	$ 730	751	772	793	813	834	855	876	897	932	973	973	
	.09	$ 793	813	834	855	876	897	918	939	959	994	1036	1036	
	.10	$ 848	869	890	911	932	952	973	994	1015	1050	1092	1092	
	.12	$ 966	987	1008	1029	1050	1071	1092	1112	1133	1168	1210	1210	
	.14	$ 1092	1112	1133	1154	1175	1196	1217	1238	1259	1293	1335	1335	BALANCE POINT 18 DEG.F.
	.16	$ 1210	1231	1252	1272	1293	1314	1335	1356	1377	1412	1453	1453	
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	$ 688	709	737	758	779	806	827	855	876	925	973	973	
	.07	$ 758	779	806	827	848	876	897	925	946	994	1043	1043	
	.08	$ 820	841	869	890	911	939	959	987	1008	1057	1106	1106	
	.09	$ 890	911	939	959	980	1008	1029	1057	1078	1126	1175	1175	
	.10	$ 952	973	1001	1022	1043	1071	1092	1119	1140	1189	1238	1238	
	.12	$ 1092	1112	1140	1161	1182	1210	1231	1259	1279	1328	1377	1377	
	.14	$ 1224	1245	1272	1293	1314	1342	1363	1391	1412	1460	1509	1509	BALANCE POINT 21 DEG.F.
	.16	$ 1356	1377	1405	1426	1446	1474	1495	1523	1544	1592	1641	1641	
50,000		$ 890	966	1043	1112	1189	1266	1335	1412	1488	1634	1787	1787	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 806	855	904	946	994	1043	1092	1133	1182	1272	1370	1370	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 855	904	952	994	1043	1092	1140	1182	1231	1321	1419	1419	
	.07	$ 904	952	1001	1043	1092	1140	1189	1231	1279	1370	1467	1467	
	.08	$ 959	1008	1057	1099	1147	1196	1245	1286	1335	1426	1523	1523	
	.09	$ 1008	1057	1106	1147	1196	1245	1293	1335	1384	1474	1572	1572	
	.10	$ 1057	1106	1154	1196	1245	1293	1342	1384	1432	1523	1620	1620	
	.12	$ 1154	1203	1252	1293	1342	1391	1439	1481	1530	1620	1718	1718	
	.14	$ 1259	1307	1356	1398	1446	1495	1544	1586	1634	1725	1822	1822	BALANCE POINT 27 DEG.F.
	.16	$ 1356	1405	1453	1495	1544	1592	1641	1683	1732	1822	1919	1919	
60,000		$ 1071	1161	1252	1335	1426	1516	1606	1697	1787	1968	2142	2142	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 959	1015	1071	1133	1189	1245	1300	1356	1412	1523	1634	1634	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1015	1071	1126	1189	1245	1300	1356	1412	1467	1579	1690	1690	
	.07	$ 1078	1133	1189	1252	1307	1363	1419	1474	1530	1641	1752	1752	
	.08	$ 1133	1189	1245	1307	1363	1419	1474	1530	1586	1697	1808	1808	
	.09	$ 1189	1245	1300	1363	1419	1474	1530	1586	1641	1752	1864	1864	
	.10	$ 1252	1307	1363	1426	1481	1537	1592	1648	1704	1815	1926	1926	
	.12	$ 1370	1426	1481	1544	1599	1655	1711	1766	1822	1933	2045	2045	
	.14	$ 1481	1537	1592	1655	1711	1766	1822	1878	1933	2045	2156	2156	BALANCE POINT 31 DEG.F.
	.16	$ 1599	1655	1711	1773	1829	1885	1940	1996	2052	2163	2274	2274	
70,000		$ 1252	1356	1460	1565	1669	1773	1878	1982	2086	2295	2504	2504	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1154	1231	1307	1384	1460	1537	1613	1690	1773	1926	2079	2079	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1203	1279	1356	1432	1509	1586	1662	1739	1822	1975	2128	2128	
	.07	$ 1245	1321	1398	1474	1551	1627	1704	1780	1864	2017	2170	2170	
	.08	$ 1293	1370	1446	1523	1599	1676	1752	1829	1912	2065	2219	2219	
	.09	$ 1342	1419	1495	1572	1648	1725	1801	1878	1961	2114	2267	2267	
	.10	$ 1384	1460	1537	1613	1690	1766	1843	1919	2003	2156	2309	2309	
	.12	$ 1481	1558	1634	1711	1787	1864	1940	2017	2100	2253	2406	2406	
	.14	$ 1572	1648	1725	1801	1878	1954	2031	2107	2191	2344	2497	2497	BALANCE POINT 34 DEG.F.
	.16	$ 1662	1739	1815	1892	1968	2045	2121	2198	2281	2434	2587	2587	

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
$ 1154	1231	1307	1384	1460	1537	1613	1690	1773	1926	2079	2079	
$ 1203	1279	1356	1432	1509	1586	1662	1739	1822	1975	2128	2128	
$ 1245	1321	1398	1474	1551	1627	1704	1780	1864	2017	2170	2170	
$ 1293	1370	1446	1523	1599	1676	1752	1829	1912	2065	2219	2219	
$ 1342	1419	1495	1572	1648	1725	1801	1878	1961	2114	2267	2267	
$ 1384	1460	1537	1613	1690	1766	1843	1919	2003	2156	2309	2309	
$ 1481	1558	1634	1711	1787	1864	1940	2017	2100	2253	2406	2406	
$ 1572	1648	1725	1801	1878	1954	2031	2107	2191	2344	2497	2497	
$ 1662	1739	1815	1892	1968	2045	2121	2198	2281	2434	2587	2587	

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BARD MANUFACTURING COMPANY

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

REGION 5 30UHPQA/A42AS-A
HEAT PUMP MODEL: OUTDOOR 30UHPQA INDOOR A42AS-A
ARI RATED COOLING CAP.: BTUH(95) 28600, SEER 9.50
ARI RATED HEATING CAP.: BTUH (47) 29400, COP(47) 3.00, HSPF 7.00 MIN.DHR REG IV
BTUH (17) 16700, 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	$ 528	925	
	.06	$ 633	1112	
	.07	$ 737	1300	
	.08	$ 841	1488	
	.09	$ 952	1669	
	.10	$ 1057	1857	
	.12	$ 1259	2232	
	.14	$ 1467	2601	BALANCE POINT 14 DEG.F.
	.16	$ 1683	2977	
35,000				
	.05	$ 619	1085	
	.06	$ 744	1300	
	.07	$ 862	1516	
	.08	$ 987	1732	
	.09	$ 1112	1947	
	.10	$ 1231	2170	
	.12	$ 1481	2601	
	.14	$ 1732	3039	BALANCE POINT 17 DEG.F.
	.16	$ 1975	3471	
40,000				
	.05	$ 716	1238	
	.06	$ 855	1488	
	.07	$ 1001	1732	
	.08	$ 1140	1982	
	.09	$ 1286	2232	
	.10	$ 1426	2476	
	.12	$ 1718	2977	
	.14	$ 2003	3471	BALANCE POINT 21 DEG.F.
	.16	$ 2281	3965	
50,000				
	.05	$ 925	1544	
	.06	$ 1112	1857	
	.07	$ 1293	2170	
	.08	$ 1474	2476	
	.09	$ 1662	2789	
	.10	$ 1850	3095	
	.12	$ 2212	3721	
	.14	$ 2587	4340	BALANCE POINT 26 DEG.F.
	.16	$ 2963	4959	
60,000				
	.05	$ 1154	1857	
	.06	$ 1391	2232	
	.07	$ 1620	2601	
	.08	$ 1850	2977	
	.09	$ 2086	3345	
	.10	$ 2316	3721	
	.12	$ 2782	4465	
	.14	$ 3241	5210	BALANCE POINT 31 DEG.F.
	.16	$ 3707	5954	

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	
	.05	.06	.07	.08	.09	.10	.12	.14	.16	<--ELECTRIC RATE $/KWH
$	60	72	84	96	108	120	144	168	192	<--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 30UHPQA/A42AS-A
HEAT PUMP MODEL: OUTDOOR 30UHPQA INDOOR A42AS-A
ARI RATED COOLING CAP.: BTUH(95) 28600, SEER 9.50
ARI RATED HEATING CAP.: BTUH (47) 29400, COP(47) 3.00, HSPF 7.00 MIN.DHR REG IV
BTUH (17) 16700, COP(17) 2.10
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	$ 389	396	410	424	438	452	459	473	486	500	521	549	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 452	459	473	486	500	514	521	535	549	563	584	612	
	.07	$ 507	514	528	542	556	570	577	591	605	619	639	667	
	.08	$ 570	577	591	605	619	633	639	653	667	681	702	730	
	.09	$ 626	633	646	660	674	688	695	709	723	737	758	786	
	.10	$ 688	695	709	723	737	751	758	772	786	799	820	848	
	.12	$ 806	813	827	841	855	869	876	890	904	918	939	966	
	.14	$ 932	939	952	966	980	994	1001	1015	1029	1043	1064	1092	BALANCE POINT 14 DEG.F.
	.16	$ 1050	1057	1071	1085	1099	1112	1119	1133	1147	1161	1182	1210	
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	BALANCE POINT 17 DEG.F.
	.16	$ 1078	1099	1112	1133	1154	1175	1189	1210	1231	1245	1286	1321	
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	BALANCE POINT 21 DEG.F.
	.16	$ 1210	1231	1252	1272	1293	1314	1335	1356	1377	1405	1446	1488	
50,000		$ 473	542	605	674	744	813	876	946	1015	1085	1217	1356	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 563	598	633	667	702	737	772	806	841	876	946	1008	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 626	660	695	730	765	799	834	869	904	939	1008	1071	
	.07	$ 695	730	765	799	834	869	904	939	973	1008	1078	1140	
	.08	$ 758	793	827	862	897	932	966	1001	1036	1071	1140	1203	
	.09	$ 820	855	890	925	959	994	1029	1064	1099	1133	1203	1266	
	.10	$ 890	925	959	994	1029	1064	1099	1133	1168	1203	1272	1335	
	.12	$ 1022	1057	1092	1126	1161	1196	1231	1266	1300	1335	1405	1467	
	.14	$ 1147	1182	1217	1252	1286	1321	1356	1391	1426	1460	1530	1592	BALANCE POINT 26 DEG.F.
	.16	$ 1279	1314	1349	1384	1419	1453	1488	1523	1558	1592	1662	1725	
60,000		$ 563	646	730	813	890	973	1057	1133	1217	1300	1460	1627	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 639	688	744	793	841	897	946	994	1050	1099	1203	1300	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 695	744	799	848	897	952	1001	1050	1106	1154	1259	1356	
	.07	$ 758	806	862	911	959	1015	1064	1112	1168	1217	1321	1419	
	.08	$ 813	862	918	966	1015	1071	1119	1168	1224	1272	1377	1474	
	.09	$ 869	918	973	1022	1071	1126	1175	1224	1279	1328	1432	1530	
	.10	$ 925	973	1029	1078	1126	1182	1231	1279	1335	1384	1488	1586	
	.12	$ 1043	1092	1147	1196	1245	1300	1349	1398	1453	1502	1606	1704	
	.14	$ 1154	1203	1259	1307	1356	1412	1460	1509	1565	1613	1718	1815	BALANCE POINT 31 DEG.F.
	.16	$ 1272	1321	1377	1426	1474	1530	1579	1627	1683	1732	1836	1933	

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
$	60	72	84	96	108	120	144	168	192	<--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 — 30UHPQA/A42AS-A

HEAT PUMP MODEL: OUTDOOR 30UHPQA — INDOOR A42AS-A

ARI RATED COOLING CAP.: BTUH(95) 28600, SEER 9.50

ARI RATED HEATING CAP.: BTUH (47) 29400, COP(47) 3.00, HSPF 7.00 MIN.DHR REG IV

BTUH (17) 16700, 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	$ 486	507	521	542	563	577	598	612	633	653	667	688	
	.07	$ 542	563	577	598	619	633	653	667	688	709	723	744	
	.08	$ 605	626	639	660	681	695	716	730	751	772	786	806	
	.09	$ 660	681	695	716	737	751	772	786	806	827	841	862	
	.10	$ 723	744	758	779	799	813	834	848	869	890	904	925	
	.12	$ 841	862	876	897	918	932	952	966	987	1008	1022	1043	
	.14	$ 966	987	1001	1022	1043	1057	1078	1092	1112	1133	1147	1168	BALANCE POINT 14 DEG.F.
	.16	$ 1085	1106	1119	1140	1161	1175	1196	1210	1231	1252	1266	1286	
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	
	.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	BALANCE POINT 17 DEG.F.
	.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	
	.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	BALANCE POINT 21 DEG.F.
	.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	$ 674	723	772	820	869	918	966	1015	1064	1112	1168	1217	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 737	786	834	883	932	980	1029	1078	1126	1175	1231	1279	
	.07	$ 806	855	904	952	1001	1050	1099	1147	1196	1245	1300	1349	
	.08	$ 869	918	966	1015	1064	1112	1161	1210	1259	1307	1363	1412	
	.09	$ 932	980	1029	1078	1126	1175	1224	1272	1321	1370	1426	1474	
	.10	$ 1001	1050	1099	1147	1196	1245	1293	1342	1391	1439	1495	1544	
	.12	$ 1133	1182	1231	1279	1328	1377	1426	1474	1523	1572	1627	1676	
	.14	$ 1259	1307	1356	1405	1453	1502	1551	1599	1648	1697	1752	1801	BALANCE POINT 26 DEG.F.
	.16	$ 1391	1439	1488	1537	1586	1634	1683	1732	1780	1829	1885	1933	
60,000		$ 820	939	1050	1168	1286	1405	1523	1641	1759	1878	1996	2107	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 799	869	946	1015	1092	1168	1238	1314	1384	1460	1530	1606	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 855	925	1001	1071	1147	1224	1293	1370	1439	1516	1586	1662	
	.07	$ 918	987	1064	1133	1210	1286	1356	1432	1502	1579	1648	1725	
	.08	$ 973	1043	1119	1189	1266	1342	1412	1488	1558	1634	1704	1780	
	.09	$ 1029	1099	1175	1245	1321	1398	1467	1544	1613	1690	1759	1836	
	.10	$ 1085	1154	1231	1300	1377	1453	1523	1599	1669	1745	1815	1892	
	.12	$ 1203	1272	1349	1419	1495	1572	1641	1718	1787	1864	1933	2010	
	.14	$ 1314	1384	1460	1530	1606	1683	1752	1829	1899	1975	2045	2121	BALANCE POINT 31 DEG.F.
	.16	$ 1432	1502	1579	1648	1725	1801	1871	1947	2017	2093	2163	2239	

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
$	60	72	84	96	108	120	144	168	192	<--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 HEATNG 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 — 30UHPQA/A42AS-A

HEAT PUMP MODEL: OUTDOOR 30UHPQA — INDOOR A42AS-A

ARI RATED COOLING CAP.: BTUH(95) 28600, SEER 9.50

ARI RATED HEATING CAP.: BTUH (47) 29400, COP(47) 3.00, HSPF 7.00 MIN.DHR REG IV

BTUH (17) 16700, COP(17) 2.10

FURNACE TYPE PROPANE GAS — FURNACE EFFICIENCY 78.00 % AFUE

HEAT LOSS BTUH	ELEC. COST S/KWH	PROPANE GAS COST - S/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
	.06	$ 528	542	556	570	584	598	612	626	639	667	688	688	S PER YEAR
	.07	$ 584	598	612	626	639	653	667	681	695	723	744	744	
	.08	$ 646	660	674	688	702	716	730	744	758	786	806	806	
	.09	$ 702	716	730	744	758	772	786	799	813	841	862	862	
	.10	$ 765	779	793	806	820	834	848	862	876	904	925	925	
	.12	$ 883	897	911	925	939	952	966	980	994	1022	1043	1043	
	.14	$ 1008	1022	1036	1050	1064	1078	1092	1106	1119	1147	1168	1168	BALANCE POINT 14 DEG.F.
	.16	$ 1126	1140	1154	1168	1182	1196	1210	1224	1238	1266	1286	1286	
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
	.06	$ 605	626	646	667	688	709	730	751	772	806	848	848	S PER YEAR
	.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	
	.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	BALANCE POINT 17 DEG.F.
	.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
	.06	$ 681	702	730	751	772	799	820	848	869	918	966	966	S PER YEAR
	.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	
	.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	BALANCE POINT 21 DEG.F.
	.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	$ 779	813	855	890	925	966	1001	1043	1078	1154	1231	1231	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
	.06	$ 841	876	918	952	987	1029	1064	1106	1140	1217	1293	1293	S PER YEAR
	.07	$ 911	946	987	1022	1057	1099	1133	1175	1210	1286	1363	1363	
	.08	$ 973	1008	1050	1085	1119	1161	1196	1238	1272	1349	1426	1426	
	.09	$ 1036	1071	1112	1147	1182	1224	1259	1300	1335	1412	1488	1488	
	.10	$ 1106	1140	1182	1217	1252	1293	1328	1370	1405	1481	1558	1558	
	.12	$ 1238	1272	1314	1349	1384	1426	1460	1502	1537	1613	1690	1690	
	.14	$ 1363	1398	1439	1474	1509	1551	1586	1627	1662	1739	1815	1815	BALANCE POINT 26 DEG.F.
	.16	$ 1495	1530	1572	1606	1641	1683	1718	1759	1794	1871	1947	1947	
60,000		$ 1071	1161	1252	1335	1426	1516	1606	1697	1787	1968	2142	2142	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 952	1008	1064	1126	1182	1238	1293	1349	1405	1516	1627	1627	THEORETICAL HEATING COST * FURN.+ HEAT PUMP
	.06	$ 1008	1064	1119	1182	1238	1293	1349	1405	1460	1572	1683	1683	S PER YEAR
	.07	$ 1071	1126	1182	1245	1300	1356	1412	1467	1523	1634	1745	1745	
	.08	$ 1126	1182	1238	1300	1356	1412	1467	1523	1579	1690	1801	1801	
	.09	$ 1182	1238	1293	1356	1412	1467	1523	1579	1634	1745	1857	1857	
	.10	$ 1238	1293	1349	1412	1467	1523	1579	1634	1690	1801	1912	1912	
	.12	$ 1356	1412	1467	1530	1586	1641	1697	1752	1808	1919	2031	2031	
	.14	$ 1467	1523	1579	1641	1697	1752	1808	1864	1919	2031	2142	2142	BALANCE POINT 31 DEG.F.
	.16	$ 1586	1641	1697	1759	1815	1871	1926	1982	2038	2149	2260	2260	

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 S/KWH
$	60	72	84	96	108	120	144	168	192	<--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 HEATNG 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 — 36UHPQA/A36AQ-A
HEAT PUMP MODEL: OUTDOOR 36UHPQA — INDOOR A36AQ-A
ARI RATED COOLING CAP.: BTUH(95) 33000, SEER 8.69
ARI RATED HEATING CAP.: BTUH (47) 33600, COP(47) 2.90, HSPF 6.90 MIN.DHR REG IV
BTUH (17) 20000, 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	
35,000				
	.05	$ 605	1085	
	.06	$ 730	1300	
	.07	$ 848	1516	
	.08	$ 973	1732	
	.09	$ 1092	1947	
	.10	$ 1217	2170	
	.12	$ 1453	2601	
	.14	$ 1690	3039	BALANCE POINT 13 DEG.F.
	.16	$ 1933	3471	
40,000				
	.05	$ 695	1238	
	.06	$ 834	1488	
	.07	$ 973	1732	
	.08	$ 1112	1982	
	.09	$ 1259	2232	
	.10	$ 1391	2476	
	.12	$ 1669	2977	
	.14	$ 1947	3471	BALANCE POINT 16 DEG.F.
	.16	$ 2225	3965	
50,000				
	.05	$ 890	1544	
	.06	$ 1071	1857	
	.07	$ 1245	2170	
	.08	$ 1432	2476	
	.09	$ 1606	2789	
	.10	$ 1787	3095	
	.12	$ 2142	3721	
	.14	$ 2504	4340	BALANCE POINT 22 DEG.F.
	.16	$ 2858	4959	
60,000				
	.05	$ 1112	1857	
	.06	$ 1335	2232	
	.07	$ 1551	2601	
	.08	$ 1773	2977	
	.09	$ 1996	3345	
	.10	$ 2219	3721	
	.12	$ 2664	4465	
	.14	$ 3109	5210	BALANCE POINT 27 DEG.F.
	.16	$ 3554	5954	
70,000				
	.05	$ 1349	2170	
	.06	$ 1613	2601	
	.07	$ 1885	3039	
	.08	$ 2156	3471	
	.09	$ 2420	3902	
	.10	$ 2692	4340	
	.12	$ 3234	5210	
	.14	$ 3770	6079	BALANCE POINT 31 DEG.F.
	.16	$ 4305	6942	

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

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

REGION 5 — 36UHPQA/A36AQ-A
HEAT PUMP MODEL: OUTDOOR 36UHPQA — INDOOR A36AQ-A
ARI RATED COOLING CAP.: BTUH(95) 33000, SEER 8.69
ARI RATED HEATING CAP.: BTUH (47) 33600, COP(47) 2.90, HSPF 6.90 MIN.DHR REG IV
BTUH (17) 20000, 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	
35,000		$ 326	375	424	473	521	563	612	660	709	758	848	946	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 459	473	486	500	514	528	542	556	577	591	619	646	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 528	542	556	570	584	598	612	626	646	660	688	716	
	.07	$ 598	612	626	639	653	667	681	695	716	730	758	786	
	.08	$ 674	688	702	716	730	744	758	772	793	806	834	862	
	.09	$ 744	758	772	786	799	813	827	841	862	876	904	932	
	.10	$ 813	827	841	855	869	883	897	911	932	946	973	1001	
	.12	$ 952	966	980	994	1008	1022	1036	1050	1071	1085	1112	1140	
	.14	$ 1099	1112	1126	1140	1154	1168	1182	1196	1217	1231	1259	1286	BALANCE POINT 13 DEG.F.
	.16	$ 1238	1252	1266	1279	1293	1307	1321	1335	1356	1370	1398	1426	
40,000		$ 375	431	486	542	591	646	702	758	813	862	973	1085	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 514	528	549	563	577	598	612	633	646	660	695	730	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 598	612	633	646	660	681	695	716	730	744	779	813	
	.07	$ 674	688	709	723	737	758	772	793	806	820	855	890	
	.08	$ 751	765	786	799	813	834	848	869	883	897	932	966	
	.09	$ 834	848	869	883	897	918	932	952	966	980	1015	1050	
	.10	$ 911	925	946	959	973	994	1008	1029	1043	1057	1092	1126	
	.12	$ 1071	1085	1106	1119	1133	1154	1168	1189	1203	1217	1252	1286	
	.14	$ 1231	1245	1266	1279	1293	1314	1328	1349	1363	1377	1412	1446	BALANCE POINT 16 DEG.F.
	.16	$ 1391	1405	1426	1439	1453	1474	1488	1509	1523	1537	1572	1606	
50,000		$ 473	542	605	674	744	813	876	946	1015	1085	1217	1356	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 584	619	653	688	723	758	793	827	862	897	966	1029	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 653	688	723	758	793	827	862	897	932	966	1036	1099	
	.07	$ 723	758	793	827	862	897	932	966	1001	1036	1106	1168	
	.08	$ 793	827	862	897	932	966	1001	1036	1071	1106	1175	1238	
	.09	$ 855	890	925	959	994	1029	1064	1099	1133	1168	1238	1300	
	.10	$ 925	959	994	1029	1064	1099	1133	1168	1203	1238	1307	1370	
	.12	$ 1064	1099	1133	1168	1203	1238	1272	1307	1342	1377	1446	1509	
	.14	$ 1203	1238	1272	1307	1342	1377	1412	1446	1481	1516	1586	1648	BALANCE POINT 22 DEG.F.
	.16	$ 1342	1377	1412	1446	1481	1516	1551	1586	1620	1655	1725	1787	
60,000		$ 563	646	730	813	890	973	1057	1133	1217	1300	1460	1627	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 660	709	765	813	862	918	966	1015	1071	1119	1224	1321	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 723	772	827	876	925	980	1029	1078	1133	1182	1286	1384	
	.07	$ 786	834	890	939	987	1043	1092	1140	1196	1245	1349	1446	
	.08	$ 841	890	946	994	1043	1099	1147	1196	1252	1300	1405	1502	
	.09	$ 904	952	1008	1057	1106	1161	1210	1259	1314	1363	1467	1565	
	.10	$ 966	1015	1071	1119	1168	1224	1272	1321	1377	1426	1530	1627	
	.12	$ 1092	1140	1196	1245	1293	1349	1398	1446	1502	1551	1655	1752	
	.14	$ 1210	1259	1314	1363	1412	1467	1516	1565	1620	1669	1773	1871	BALANCE POINT 27 DEG.F.
	.16	$ 1335	1384	1439	1488	1537	1592	1641	1690	1745	1794	1899	1996	
70,000		$ 660	758	848	946	1043	1133	1231	1328	1419	1516	1704	1899	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 765	820	883	939	1001	1057	1119	1175	1238	1293	1419	1537	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 834	890	952	1008	1071	1126	1189	1245	1307	1363	1488	1606	
	.07	$ 904	959	1022	1078	1140	1196	1259	1314	1377	1432	1558	1676	
	.08	$ 973	1029	1092	1147	1210	1266	1328	1384	1446	1502	1627	1745	
	.09	$ 1043	1099	1161	1217	1279	1335	1398	1453	1516	1572	1697	1815	
	.10	$ 1112	1168	1231	1286	1349	1405	1467	1523	1586	1641	1766	1885	
	.12	$ 1252	1307	1370	1426	1488	1544	1606	1662	1725	1780	1905	2024	
	.14	$ 1391	1446	1509	1565	1627	1683	1745	1801	1864	1919	2045	2163	BALANCE POINT 31 DEG.F.
	.16	$ 1530	1586	1648	1704	1766	1822	1885	1940	2003	2059	2184	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	
										<--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.

BARD MANUFACTURING COMPANY

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

REGION 5 — 36UHPQA/A36AQ-A

HEAT PUMP MODEL: OUTDOOR 36UHPQA — INDOOR A36AQ-A

ARI RATED COOLING CAP.: BTUH(95) 33000, SEER 8.69

ARI RATED HEATING CAP.: BTUH (47) 33600, COP(47) 2.90, HSPF 6.90 MIN.DHR REG IV
BTUH (17) 20000, COP(17) 2.20

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	$ 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	$ 946	1015	1092	1161	1238	1314	1384	1460	1530	1606	1676	1752	
	.08	$ 1001	1071	1147	1217	1293	1370	1439	1516	1586	1662	1732	1808	
	.09	$ 1064	1133	1210	1279	1356	1432	1502	1579	1648	1725	1794	1871	
	.10	$ 1126	1196	1272	1342	1419	1495	1565	1641	1711	1787	1857	1933	
	.12	$ 1252	1321	1398	1467	1544	1620	1690	1766	1836	1912	1982	2059	
	.14	$ 1370	1439	1516	1586	1662	1739	1808	1885	1954	2031	2100	2177	BALANCE POINT 27 DEG.F.
	.16	$ 1495	1565	1641	1711	1787	1864	1933	2010	2079	2156	2225	2302	
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	1272	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	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	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	
										<--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.

BARD MANUFACTURING COMPANY

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

REGION 5 — 36UHPQA/A36AQ-A
HEAT PUMP MODEL: OUTDOOR 36UHPQA — INDOOR A36AQ-A
ARI RATED COOLING CAP.: BTUH(95) 33000, SEER 8.69
ARI RATED HEATING CAP.: BTUH (47) 33600, COP(47) 2.90, HSPF 6.90 MIN.DHR REG IV
BTUH (17) 20000, COP(17) 2.20
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	$ 549	563	577	598	612	626	646	660	674	709	737	737	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 619	633	646	667	681	695	716	730	744	779	806	806	
	.07	$ 688	702	716	737	751	765	786	799	813	848	876	876	
	.08	$ 765	779	793	813	827	841	862	876	890	925	952	952	
	.09	$ 834	848	862	883	897	911	932	946	959	994	1022	1022	
	.10	$ 904	918	932	952	966	980	1001	1015	1029	1064	1092	1092	
	.12	$ 1043	1057	1071	1092	1106	1119	1140	1154	1168	1203	1231	1231	
	.14	$ 1189	1203	1217	1238	1252	1266	1286	1300	1314	1349	1377	1377	BALANCE POINT 13 DEG.F.
	.16	$ 1328	1342	1356	1377	1391	1405	1426	1439	1453	1488	1516	1516	
40,000		$ 709	772	834	890	952	1008	1071	1126	1189	1307	1426	1426	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 619	633	653	674	688	709	723	744	765	799	834	834	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 702	716	737	758	772	793	806	827	848	883	918	918	
	.07	$ 779	793	813	834	848	869	883	904	925	959	994	994	
	.08	$ 855	869	890	911	925	946	959	980	1001	1036	1071	1071	
	.09	$ 939	952	973	994	1008	1029	1043	1064	1085	1119	1154	1154	
	.10	$ 1015	1029	1050	1071	1085	1106	1119	1140	1161	1196	1231	1231	
	.12	$ 1175	1189	1210	1231	1245	1266	1279	1300	1321	1356	1391	1391	
	.14	$ 1335	1349	1370	1391	1405	1426	1439	1460	1481	1516	1551	1551	BALANCE POINT 16 DEG.F.
	.16	$ 1495	1509	1530	1551	1565	1586	1599	1620	1641	1676	1711	1711	
50,000		$ 890	966	1043	1112	1189	1266	1335	1412	1488	1634	1787	1787	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 799	834	876	911	946	987	1022	1064	1099	1175	1252	1252	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 869	904	946	980	1015	1057	1092	1133	1168	1245	1321	1321	
	.07	$ 939	973	1015	1050	1085	1126	1161	1203	1238	1314	1391	1391	
	.08	$ 1008	1043	1085	1119	1154	1196	1231	1272	1307	1384	1460	1460	
	.09	$ 1071	1106	1147	1182	1217	1259	1293	1335	1370	1446	1523	1523	
	.10	$ 1140	1175	1217	1252	1286	1328	1363	1405	1439	1516	1592	1592	
	.12	$ 1279	1314	1356	1391	1426	1467	1502	1544	1579	1655	1732	1732	
	.14	$ 1419	1453	1495	1530	1565	1606	1641	1683	1718	1794	1871	1871	BALANCE POINT 22 DEG.F.
	.16	$ 1558	1592	1634	1669	1704	1745	1780	1822	1857	1933	2010	2010	
60,000		$ 1071	1161	1252	1335	1426	1516	1606	1697	1787	1968	2142	2142	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 973	1029	1085	1147	1203	1259	1314	1370	1426	1537	1648	1648	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1036	1092	1147	1210	1266	1321	1377	1432	1488	1599	1711	1711	
	.07	$ 1099	1154	1210	1272	1328	1384	1439	1495	1551	1662	1773	1773	
	.08	$ 1154	1210	1266	1328	1384	1439	1495	1551	1606	1718	1829	1829	
	.09	$ 1217	1272	1328	1391	1446	1502	1558	1613	1669	1780	1892	1892	
	.10	$ 1279	1335	1391	1453	1509	1565	1620	1676	1732	1843	1954	1954	
	.12	$ 1405	1460	1516	1579	1634	1690	1745	1801	1857	1968	2079	2079	
	.14	$ 1523	1579	1634	1697	1752	1808	1864	1919	1975	2086	2198	2198	BALANCE POINT 27 DEG.F.
	.16	$ 1648	1704	1759	1822	1878	1933	1989	2045	2100	2212	2323	2323	
70,000		$ 1252	1356	1460	1565	1669	1773	1878	1982	2086	2295	2504	2504	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1126	1196	1259	1328	1391	1453	1523	1586	1648	1780	1912	1912	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1196	1266	1328	1398	1460	1523	1592	1655	1718	1850	1982	1982	
	.07	$ 1266	1335	1398	1467	1530	1592	1662	1725	1787	1919	2052	2052	
	.08	$ 1335	1405	1467	1537	1599	1662	1732	1794	1857	1989	2121	2121	
	.09	$ 1405	1474	1537	1606	1669	1732	1801	1864	1926	2059	2191	2191	
	.10	$ 1474	1544	1606	1676	1739	1801	1871	1933	1996	2128	2260	2260	
	.12	$ 1613	1683	1745	1815	1878	1940	2010	2072	2135	2267	2399	2399	
	.14	$ 1752	1822	1885	1954	2017	2079	2149	2212	2274	2406	2538	2538	BALANCE POINT 31 DEG.F.
	.16	$ 1892	1961	2024	2093	2156	2219	2288	2351	2413	2545	2678	2678	

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.

BARD MANUFACTURING COMPANY

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

REGION 5 — 36UHPQA/A42AS-A

HEAT PUMP MODEL: OUTDOOR 36UHPQA — INDOOR A42AS-A

ARI RATED COOLING CAP.: BTUH(95) 33400, SEER 9.30

ARI RATED HEATING CAP.: BTUH (47) 34800, COP(47) 3.00, HSPF 7.00 MIN.DHR REG IV

BTUH (17) 20400, COP(17) 2.00

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	
40,000	.05	$ 716	1238	
	.06	$ 855	1488	
	.07	$ 1001	1732	
	.08	$ 1140	1982	
	.09	$ 1286	2232	
	.10	$ 1432	2476	
	.12	$ 1718	2977	
	.14	$ 2003	3471	BALANCE POINT 16 DEG.F.
	.16	$ 2295	3965	
50,000	.05	$ 911	1544	
	.06	$ 1092	1857	
	.07	$ 1272	2170	
	.08	$ 1453	2476	
	.09	$ 1641	2789	
	.10	$ 1822	3095	
	.12	$ 2184	3721	
	.14	$ 2552	4340	BALANCE POINT 22 DEG.F.
	.16	$ 2914	4959	
60,000	.05	$ 1126	1857	
	.06	$ 1349	2232	
	.07	$ 1572	2601	
	.08	$ 1801	2977	
	.09	$ 2024	3345	
	.10	$ 2246	3721	
	.12	$ 2698	4465	
	.14	$ 3151	5210	BALANCE POINT 27 DEG.F.
	.16	$ 3596	5954	
70,000	.05	$ 1363	2170	
	.06	$ 1627	2601	
	.07	$ 1905	3039	
	.08	$ 2170	3471	
	.09	$ 2448	3902	
	.10	$ 2712	4340	
	.12	$ 3262	5210	
	.14	$ 3805	6079	BALANCE POINT 31 DEG.F.
	.16	$ 4347	6942	
80,000	.05	$ 1613	2476	
	.06	$ 1926	2977	
	.07	$ 2253	3471	
	.08	$ 2573	3965	
	.09	$ 2893	4465	
	.10	$ 3220	4959	
	.12	$ 3867	5954	
	.14	$ 4507	6942	BALANCE POINT 34 DEG.F.
	.16	$ 5147	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
$	71	86	100	114	129	143	172	201	229	<--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 — 36UHPQA/A42AS-A

HEAT PUMP MODEL: OUTDOOR 36UHPQA — INDOOR A42AS-A

ARI RATED COOLING CAP.: BTUH(95) 33400, SEER 9.30

ARI RATED HEATING CAP.: BTUH (47) 34800, COP(47) 3.00, HSPF 7.00 MIN.DHR REG IV
BTUH (17) 20400, 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	1.00	
35,000		$ 326	375	424	473	521	563	612	660	709	758	848	946	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 466	479	493	507	521	535	549	563	584	598	626	653	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 535	549	563	577	591	605	619	633	653	667	695	723	
	.07	$ 605	619	633	646	660	674	688	702	723	737	765	793	
	.08	$ 681	695	709	723	737	751	765	779	799	813	841	869	
	.09	$ 751	765	779	793	806	820	834	848	869	883	911	939	
	.10	$ 820	834	848	862	876	890	904	918	939	952	980	1008	
	.12	$ 966	980	994	1008	1022	1036	1050	1064	1085	1099	1126	1154	
	.14	$ 1112	1126	1140	1154	1168	1182	1196	1210	1231	1245	1272	1300	BALANCE POINT 13 DEG.F.
	.16	$ 1252	1266	1279	1293	1307	1321	1335	1349	1370	1384	1412	1439	
40,000		$ 375	431	486	542	591	646	702	758	813	862	973	1085	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 521	535	556	570	584	605	619	639	653	667	702	737	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 598	612	633	646	660	681	695	716	730	744	779	813	
	.07	$ 681	695	716	730	744	765	779	799	813	827	862	897	
	.08	$ 765	779	799	813	827	848	862	883	897	911	946	980	
	.09	$ 841	855	876	890	904	925	939	959	973	987	1022	1057	
	.10	$ 925	939	959	973	987	1008	1022	1043	1057	1071	1106	1140	
	.12	$ 1085	1099	1119	1133	1147	1168	1182	1203	1217	1231	1266	1300	
	.14	$ 1245	1259	1279	1293	1307	1328	1342	1363	1377	1391	1426	1460	BALANCE POINT 16 DEG.F.
	.16	$ 1405	1419	1439	1453	1467	1488	1502	1523	1537	1551	1586	1620	
50,000		$ 473	542	605	674	744	813	876	946	1015	1085	1217	1356	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 577	612	646	681	716	751	786	820	855	890	959	1022	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 646	681	716	751	786	820	855	890	925	959	1029	1092	
	.07	$ 709	744	779	813	848	883	918	952	987	1022	1092	1154	
	.08	$ 779	813	848	883	918	952	987	1022	1057	1092	1161	1224	
	.09	$ 848	883	918	952	987	1022	1057	1092	1126	1161	1231	1293	
	.10	$ 918	952	987	1022	1057	1092	1126	1161	1196	1231	1300	1363	
	.12	$ 1050	1085	1119	1154	1189	1224	1259	1293	1328	1363	1432	1495	
	.14	$ 1189	1224	1259	1293	1328	1363	1398	1432	1467	1502	1572	1634	BALANCE POINT 22 DEG.F.
	.16	$ 1328	1363	1398	1432	1467	1502	1537	1572	1606	1641	1711	1773	
60,000		$ 563	646	730	813	890	973	1057	1133	1217	1300	1460	1627	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 653	702	758	806	855	911	959	1008	1064	1112	1217	1314	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 709	758	813	862	911	966	1015	1064	1119	1168	1272	1370	
	.07	$ 772	820	876	925	973	1029	1078	1126	1182	1231	1335	1432	
	.08	$ 827	876	932	980	1029	1085	1133	1182	1238	1286	1391	1488	
	.09	$ 890	939	994	1043	1092	1147	1196	1245	1300	1349	1453	1551	
	.10	$ 946	994	1050	1099	1147	1203	1252	1300	1356	1405	1509	1606	
	.12	$ 1064	1112	1168	1217	1266	1321	1370	1419	1474	1523	1627	1725	
	.14	$ 1182	1231	1286	1335	1384	1439	1488	1537	1592	1641	1745	1843	BALANCE POINT 27 DEG.F.
	.16	$ 1307	1356	1412	1460	1509	1565	1613	1662	1718	1766	1871	1968	
70,000		$ 660	758	848	946	1043	1133	1231	1328	1419	1516	1704	1899	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 758	813	876	932	994	1050	1112	1168	1231	1286	1412	1530	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 820	876	939	994	1057	1112	1175	1231	1293	1349	1474	1592	
	.07	$ 890	946	1008	1064	1126	1182	1245	1300	1363	1419	1544	1662	
	.08	$ 959	1015	1078	1133	1196	1252	1314	1370	1432	1488	1613	1732	
	.09	$ 1022	1078	1140	1196	1259	1314	1377	1432	1495	1551	1676	1794	
	.10	$ 1092	1147	1210	1266	1328	1384	1446	1502	1565	1620	1745	1864	
	.12	$ 1224	1279	1342	1398	1460	1516	1579	1634	1697	1752	1878	1996	
	.14	$ 1363	1419	1481	1537	1599	1655	1718	1773	1836	1892	2017	2135	BALANCE POINT 31 DEG.F.
	.16	$ 1495	1551	1613	1669	1732	1787	1850	1905	1968	2024	2149	2267	
80,000		$ 758	862	973	1085	1189	1300	1405	1516	1627	1732	1947	2170	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 827	904	987	1064	1147	1224	1307	1384	1467	1544	1704	1864	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 876	952	1036	1112	1196	1272	1356	1432	1516	1592	1752	1912	
	.07	$ 932	1008	1092	1168	1252	1328	1412	1488	1572	1648	1808	1968	
	.08	$ 980	1057	1140	1217	1300	1377	1460	1537	1620	1697	1857	2017	
	.09	$ 1036	1112	1196	1272	1356	1432	1516	1592	1676	1752	1912	2072	
	.10	$ 1085	1161	1245	1321	1405	1481	1565	1641	1725	1801	1961	2121	
	.12	$ 1189	1266	1349	1426	1509	1586	1669	1745	1829	1905	2065	2225	
	.14	$ 1293	1370	1453	1530	1613	1690	1773	1850	1933	2010	2170	2330	BALANCE POINT 34 DEG.F.
	.16	$ 1398	1474	1558	1634	1718	1794	1878	1954	2038	2114	2274	2434	

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 — 36UHPQA/A42AS-A

HEAT PUMP MODEL: OUTDOOR 36UHPQA — INDOOR A42AS-A

ARI RATED COOLING CAP.: BTUH(95) 33400, SEER 9.30

ARI RATED HEATING CAP.: BTUH (47) 34800, COP(47) 3.00, HSPF 7.00 MIN.DHR REG IV
BTUH (17) 20400, 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	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	$ 507	528	549	570	591	612	633	653	674	695	716	744	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 577	598	619	639	660	681	702	723	744	765	786	813	
	.07	$ 646	667	688	709	730	751	772	793	813	834	855	883	
	.08	$ 723	744	765	786	806	827	848	869	890	911	932	959	
	.09	$ 793	813	834	855	876	897	918	939	959	980	1001	1029	
	.10	$ 862	883	904	925	946	966	987	1008	1029	1050	1071	1099	
	.12	$ 1008	1029	1050	1071	1092	1112	1133	1154	1175	1196	1217	1245	
	.14	$ 1154	1175	1196	1217	1238	1259	1279	1300	1321	1342	1363	1391	BALANCE POINT 13 DEG.F.
	.16	$ 1293	1314	1335	1356	1377	1398	1419	1439	1460	1481	1502	1530	
40,000		$ 542	626	702	779	855	939	1015	1092	1168	1252	1328	1405	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 570	598	619	646	667	695	716	737	765	786	813	834	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 646	674	695	723	744	772	793	813	841	862	890	911	
	.07	$ 730	758	779	806	827	855	876	897	925	946	973	994	
	.08	$ 813	841	862	890	911	939	959	980	1008	1029	1057	1078	
	.09	$ 890	918	939	966	987	1015	1036	1057	1085	1106	1133	1154	
	.10	$ 973	1001	1022	1050	1071	1099	1119	1140	1168	1189	1217	1238	
	.12	$ 1133	1161	1182	1210	1231	1259	1279	1300	1328	1349	1377	1398	
	.14	$ 1293	1321	1342	1370	1391	1419	1439	1460	1488	1509	1537	1558	BALANCE POINT 16 DEG.F.
	.16	$ 1453	1481	1502	1530	1551	1579	1599	1620	1648	1669	1697	1718	
50,000		$ 681	779	876	973	1071	1168	1266	1363	1467	1565	1662	1759	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 688	737	786	834	883	932	980	1029	1078	1126	1182	1231	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 758	806	855	904	952	1001	1050	1099	1147	1196	1252	1300	
	.07	$ 820	869	918	966	1015	1064	1112	1161	1210	1259	1314	1363	
	.08	$ 890	939	987	1036	1085	1133	1182	1231	1279	1328	1384	1432	
	.09	$ 959	1008	1057	1106	1154	1203	1252	1300	1349	1398	1453	1502	
	.10	$ 1029	1078	1126	1175	1224	1272	1321	1370	1419	1467	1523	1572	
	.12	$ 1161	1210	1259	1307	1356	1405	1453	1502	1551	1599	1655	1704	
	.14	$ 1300	1349	1398	1446	1495	1544	1592	1641	1690	1739	1794	1843	BALANCE POINT 22 DEG.F.
	.16	$ 1439	1488	1537	1586	1634	1683	1732	1780	1829	1878	1933	1982	
60,000		$ 820	939	1050	1168	1286	1405	1523	1641	1759	1878	1996	2107	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 813	883	959	1029	1106	1182	1252	1328	1398	1474	1544	1620	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 869	939	1015	1085	1161	1238	1307	1384	1453	1530	1599	1676	
	.07	$ 932	1001	1078	1147	1224	1300	1370	1446	1516	1592	1662	1739	
	.08	$ 987	1057	1133	1203	1279	1356	1426	1502	1572	1648	1718	1794	
	.09	$ 1050	1119	1196	1266	1342	1419	1488	1565	1634	1711	1780	1857	
	.10	$ 1106	1175	1252	1321	1398	1474	1544	1620	1690	1766	1836	1912	
	.12	$ 1224	1293	1370	1439	1516	1592	1662	1739	1808	1885	1954	2031	
	.14	$ 1342	1412	1488	1558	1634	1711	1780	1857	1926	2003	2072	2149	BALANCE POINT 27 DEG.F.
	.16	$ 1467	1537	1613	1683	1759	1836	1905	1982	2052	2128	2198	2274	
70,000		$ 952	1092	1231	1363	1502	1641	1780	1912	2052	2191	2323	2462	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 939	1022	1112	1196	1279	1370	1453	1537	1620	1711	1794	1878	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1001	1085	1175	1259	1342	1432	1516	1599	1683	1773	1857	1940	
	.07	$ 1071	1154	1245	1328	1412	1502	1586	1669	1752	1843	1926	2010	
	.08	$ 1140	1224	1314	1398	1481	1572	1655	1739	1822	1912	1996	2079	
	.09	$ 1203	1286	1377	1460	1544	1634	1718	1801	1885	1975	2059	2142	
	.10	$ 1272	1356	1446	1530	1613	1704	1787	1871	1954	2045	2128	2212	
	.12	$ 1405	1488	1579	1662	1745	1836	1919	2003	2086	2177	2260	2344	
	.14	$ 1544	1627	1718	1801	1885	1975	2059	2142	2225	2316	2399	2483	BALANCE POINT 31 DEG.F.
	.16	$ 1676	1759	1850	1933	2017	2107	2191	2274	2358	2448	2532	2615	
80,000		$ 1092	1252	1405	1565	1718	1878	2031	2191	2344	2504	2657	2817	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1071	1189	1300	1419	1537	1648	1766	1885	1996	2114	2225	2344	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1119	1238	1349	1467	1586	1697	1815	1933	2045	2163	2274	2392	
	.07	$ 1175	1293	1405	1523	1641	1752	1871	1989	2100	2219	2330	2448	
	.08	$ 1224	1342	1453	1572	1690	1801	1919	2038	2149	2267	2379	2497	
	.09	$ 1279	1398	1509	1627	1745	1857	1975	2093	2205	2323	2434	2552	
	.10	$ 1328	1446	1558	1676	1794	1905	2024	2142	2253	2372	2483	2601	
	.12	$ 1432	1551	1662	1780	1899	2010	2128	2246	2358	2476	2587	2705	
	.14	$ 1537	1655	1766	1885	2003	2114	2232	2351	2462	2580	2692	2810	BALANCE POINT 34 DEG.F.
	.16	$ 1641	1759	1871	1989	2107	2219	2337	2455	2566	2685	2796	2914	

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

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BARD MANUFACTURING COMPANY

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

REGION 5 — 36UHPQA/A42AS-A
HEAT PUMP MODEL: OUTDOOR 36UHPQA — INDOOR A42AS-A
ARI RATED COOLING CAP.: BTUH(95) 33400, SEER 9.30
ARI RATED HEATING CAP.: BTUH (47) 34800, COP(47) 3.00, HSPF 7.00 MIN.DHR REG IV
BTUH (17) 20400, 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	
35,000		$ 626	674	730	779	834	883	939	987	1043	1147	1252	1252	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 556	570	584	605	619	633	653	667	681	716	744	744	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 626	639	653	674	688	702	723	737	751	786	813	813	
	.07	$ 695	709	723	744	758	772	793	806	820	855	883	883	
	.08	$ 772	786	799	820	834	848	869	883	897	932	959	959	
	.09	$ 841	855	869	890	904	918	939	952	966	1001	1029	1029	
	.10	$ 911	925	939	959	973	987	1008	1022	1036	1071	1099	1099	
	.12	$ 1057	1071	1085	1106	1119	1133	1154	1168	1182	1217	1245	1245	
	.14	$ 1203	1217	1231	1252	1266	1279	1300	1314	1328	1363	1391	1391	BALANCE POINT 13 DEG.F.
	.16	$ 1342	1356	1370	1391	1405	1419	1439	1453	1467	1502	1530	1530	
40,000		$ 709	772	834	890	952	1008	1071	1126	1189	1307	1426	1426	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 626	639	660	681	695	716	730	751	772	806	841	841	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 702	716	737	758	772	793	806	827	848	883	918	918	
	.07	$ 786	799	820	841	855	876	890	911	932	966	1001	1001	
	.08	$ 869	883	904	925	939	959	973	994	1015	1050	1085	1085	
	.09	$ 946	959	980	1001	1015	1036	1050	1071	1092	1126	1161	1161	
	.10	$ 1029	1043	1064	1085	1099	1119	1133	1154	1175	1210	1245	1245	
	.12	$ 1189	1203	1224	1245	1259	1279	1293	1314	1335	1370	1405	1405	
	.14	$ 1349	1363	1384	1405	1419	1439	1453	1474	1495	1530	1565	1565	BALANCE POINT 16 DEG.F.
	.16	$ 1509	1523	1544	1565	1579	1599	1613	1634	1655	1690	1725	1725	
50,000		$ 890	966	1043	1112	1189	1266	1335	1412	1488	1634	1787	1787	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 793	827	869	904	939	980	1015	1057	1092	1168	1245	1245	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 862	897	939	973	1008	1050	1085	1126	1161	1238	1314	1314	
	.07	$ 925	959	1001	1036	1071	1112	1147	1189	1224	1300	1377	1377	
	.08	$ 994	1029	1071	1106	1140	1182	1217	1259	1293	1370	1446	1446	
	.09	$ 1064	1099	1140	1175	1210	1252	1286	1328	1363	1439	1516	1516	
	.10	$ 1133	1168	1210	1245	1279	1321	1356	1398	1432	1509	1586	1586	
	.12	$ 1266	1300	1342	1377	1412	1453	1488	1530	1565	1641	1718	1718	
	.14	$ 1405	1439	1481	1516	1551	1592	1627	1669	1704	1780	1857	1857	BALANCE POINT 22 DEG.F.
	.16	$ 1544	1579	1620	1655	1690	1732	1766	1808	1843	1919	1996	1996	
60,000		$ 1071	1161	1252	1335	1426	1516	1606	1697	1787	1968	2142	2142	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 966	1022	1078	1140	1196	1252	1307	1363	1419	1530	1641	1641	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1022	1078	1133	1196	1252	1307	1363	1419	1474	1586	1697	1697	
	.07	$ 1085	1140	1196	1259	1314	1370	1426	1481	1537	1648	1759	1759	
	.08	$ 1140	1196	1252	1314	1370	1426	1481	1537	1592	1704	1815	1815	
	.09	$ 1203	1259	1314	1377	1432	1488	1544	1599	1655	1766	1878	1878	
	.10	$ 1259	1314	1370	1432	1488	1544	1599	1655	1711	1822	1933	1933	
	.12	$ 1377	1432	1488	1551	1606	1662	1718	1773	1829	1940	2052	2052	
	.14	$ 1495	1551	1606	1669	1725	1780	1836	1892	1947	2059	2170	2170	BALANCE POINT 27 DEG.F.
	.16	$ 1620	1676	1732	1794	1850	1905	1961	2017	2072	2184	2295	2295	
70,000		$ 1252	1356	1460	1565	1669	1773	1878	1982	2086	2295	2504	2504	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1119	1189	1252	1321	1384	1446	1516	1579	1641	1773	1905	1905	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1182	1252	1314	1384	1446	1509	1579	1641	1704	1836	1968	1968	
	.07	$ 1252	1321	1384	1453	1516	1579	1648	1711	1773	1905	2038	2038	
	.08	$ 1321	1391	1453	1523	1586	1648	1718	1780	1843	1975	2107	2107	
	.09	$ 1384	1453	1516	1586	1648	1711	1780	1843	1905	2038	2170	2170	
	.10	$ 1453	1523	1586	1655	1718	1780	1850	1912	1975	2107	2239	2239	
	.12	$ 1586	1655	1718	1787	1850	1912	1982	2045	2107	2239	2372	2372	
	.14	$ 1725	1794	1857	1926	1989	2052	2121	2184	2246	2379	2511	2511	BALANCE POINT 31 DEG.F.
	.16	$ 1857	1926	1989	2059	2121	2184	2253	2316	2379	2511	2643	2643	
80,000		$ 1426	1551	1669	1787	1905	2024	2142	2260	2385	2622	2858	2858	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1321	1412	1495	1586	1676	1759	1850	1940	2024	2198	2379	2379	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1370	1460	1544	1634	1725	1808	1899	1989	2072	2246	2427	2427	
	.07	$ 1426	1516	1599	1690	1780	1864	1954	2045	2128	2302	2483	2483	
	.08	$ 1474	1565	1648	1739	1829	1912	2003	2093	2177	2351	2532	2532	
	.09	$ 1530	1620	1704	1794	1885	1968	2059	2149	2232	2406	2587	2587	
	.10	$ 1579	1669	1752	1843	1933	2017	2107	2198	2281	2455	2636	2636	
	.12	$ 1683	1773	1857	1947	2038	2121	2212	2302	2385	2559	2740	2740	
	.14	$ 1787	1878	1961	2052	2142	2225	2316	2406	2490	2664	2845	2845	BALANCE POINT 34 DEG.F.
	.16	$ 1892	1982	2065	2156	2246	2330	2420	2511	2594	2768	2949	2949	

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 S/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 — 42UHPQA/A61AQ-A

HEAT PUMP MODEL: OUTDOOR 42UHPQA — INDOOR A61AQ-A

ARI RATED COOLING CAP.: BTUH(95) 44000, 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	BALANCE POINT 16 DEG.F.
	.16	$ 2678	4959	
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	BALANCE POINT 22 DEG.F.
	.16	$ 3283	5954	
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	BALANCE POINT 26 DEG.F.
	.16	$ 3951	6942	
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	BALANCE POINT 30 DEG.F.
	.16	$ 4681	7936	
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	BALANCE POINT 33 DEG.F.
	.16	$ 5446	8931	

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
$	77	93	109	124	140	155	186	218	249	<--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 — 42UHPQA/A61AQ-A
HEAT PUMP MODEL: OUTDOOR 42UHPQA — INDOOR A61AQ-A
ARI RATED COOLING CAP.: BTUH(95) 44000, 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 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	BALANCE POINT 11 DEG.F.
	.16	$ 1467	1481	1495	1502	1516	1530	1544	1551	1565	1579	1599	1627	
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	1029	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	BALANCE POINT 16 DEG.F.
	.16	$ 1620	1641	1662	1683	1704	1725	1745	1766	1787	1808	1850	1892	
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	BALANCE POINT 22 DEG.F.
	.16	$ 1495	1537	1579	1620	1662	1704	1745	1787	1829	1864	1947	2031	
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	BALANCE POINT 26 DEG.F.
	.16	$ 1711	1759	1808	1857	1905	1954	1996	2045	2093	2142	2239	2337	
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	BALANCE POINT 30 DEG.F.
	.16	$ 1620	1690	1759	1822	1892	1961	2031	2093	2163	2232	2365	2504	
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	BALANCE POINT 33 DEG.F.
	.16	$ 1502	1592	1683	1773	1864	1954	2038	2128	2219	2309	2490	2671	

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

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BARD MANUFACTURING COMPANY

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

REGION 5 42UHPQA/A61AQ-A
HEAT PUMP MODEL: OUTDOOR 42UHPQA INDOOR A61AQ-A
ARI RATED COOLING CAP.: BTUH(95) 44000, 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 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	
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	BALANCE POINT 11 DEG.F.
	.16	$ 1509	1523	1544	1558	1579	1592	1613	1627	1648	1662	1683	1697	
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	BALANCE POINT 16 DEG.F.
	.16	$ 1683	1718	1745	1773	1808	1836	1864	1899	1926	1954	1989	2017	
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	BALANCE POINT 22 DEG.F.
	.16	$ 1627	1683	1745	1801	1864	1919	1982	2038	2100	2156	2219	2274	
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	BALANCE POINT 26 DEG.F.
	.16	$ 1857	1926	1996	2065	2135	2205	2274	2344	2413	2483	2552	2622	
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	BALANCE POINT 30 DEG.F.
	.16	$ 1829	1926	2031	2128	2225	2323	2420	2518	2615	2712	2810	2907	
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	BALANCE POINT 33 DEG.F.
	.16	$ 1780	1905	2038	2170	2302	2427	2559	2692	2817	2949	3081	3206	

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 — 42UHPQA/A61AQ-A

HEAT PUMP MODEL: OUTDOOR 42UHPQA — INDOOR A61AQ-A

ARI RATED COOLING CAP.: BTUH(95) 44000, 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	ELEC. 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	BALANCE POINT 11 DEG.F.
	.16	$ 1544	1558	1572	1586	1599	1613	1627	1634	1648	1676	1704	1704	
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	BALANCE POINT 16 DEG.F.
	.16	$ 1752	1773	1794	1815	1843	1864	1885	1912	1933	1982	2024	2024	
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	BALANCE POINT 22 DEG.F.
	.16	$ 1752	1794	1843	1885	1933	1975	2024	2065	2114	2205	2295	2295	
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	BALANCE POINT 26 DEG.F.
	.16	$ 2010	2059	2114	2163	2219	2274	2323	2379	2427	2532	2643	2643	
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	BALANCE POINT 30 DEG.F.
	.16	$ 2045	2114	2191	2267	2337	2413	2490	2566	2636	2789	2935	2935	
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	BALANCE POINT 33 DEG.F.
	.16	$ 2059	2156	2253	2358	2455	2552	2650	2754	2852	3046	3248	3248	

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 48UHPQA/A61AQ-A
HEAT PUMP MODEL: OUTDOOR 48UHPQA 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	--- THEORETICAL ANNUAL HEATING COST --- HEAT PUMP WITH ELECTRIC HEAT	ELECTRIC HEAT ONLY	
70,000				
	.05	$ 1238	2170	
	.06	$ 1488	2601	
	.07	$ 1739	3039	
	.08	$ 1982	3471	
	.09	$ 2232	3902	
	.10	$ 2476	4340	
	.12	$ 2977	5210	
	.14	$ 3471	6079	BALANCE POINT 22 DEG.F.
	.16	$ 3965	6942	
80,000				
	.05	$ 1453	2476	
	.06	$ 1739	2977	
	.07	$ 2031	3471	
	.08	$ 2323	3965	
	.09	$ 2608	4465	
	.10	$ 2900	4959	
	.12	$ 3485	5954	
	.14	$ 4062	6942	BALANCE POINT 26 DEG.F.
	.16	$ 4639	7936	
90,000				
	.05	$ 1676	2789	
	.06	$ 2017	3345	
	.07	$ 2351	3902	
	.08	$ 2692	4465	
	.09	$ 3018	5022	
	.10	$ 3359	5578	
	.12	$ 4034	6698	
	.14	$ 4709	7811	BALANCE POINT 29 DEG.F.
	.16	$ 5377	8931	
100,000				
	.05	$ 1919	3095	
	.06	$ 2295	3721	
	.07	$ 2678	4340	
	.08	$ 3060	4959	
	.09	$ 3450	5578	
	.10	$ 3832	6197	
	.12	$ 4598	7443	
	.14	$ 5363	8681	BALANCE POINT 32 DEG.F.
	.16	$ 6135	9926	
110,000				
	.05	$ 2170	3408	
	.06	$ 2608	4090	
	.07	$ 3039	4771	
	.08	$ 3478	5453	
	.09	$ 3909	6135	
	.10	$ 4347	6823	
	.12	$ 5210	8187	
	.14	$ 6086	9550	BALANCE POINT 34 DEG.F.
	.16	$ 6949	10914	

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
$	95	114	133	152	171	190	228	266	304	<--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 — 48UHPQA/A61AQ-A

HEAT PUMP MODEL: OUTDOOR 48UHPQA — 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 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	
50,000		$ 473	542	605	674	744	813	876	946	1015	1085	1217	1356	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 646	667	688	709	730	751	772	793	813	834	876	918	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 744	765	786	806	827	848	869	890	911	932	973	1015	
	.07	$ 841	862	883	904	925	946	966	987	1008	1029	1071	1112	
	.08	$ 946	966	987	1008	1029	1050	1071	1092	1112	1133	1175	1217	
	.09	$ 1043	1064	1085	1106	1126	1147	1168	1189	1210	1231	1272	1314	
	.10	$ 1140	1161	1182	1203	1224	1245	1266	1286	1307	1328	1370	1412	
	.12	$ 1342	1363	1384	1405	1426	1446	1467	1488	1509	1530	1572	1613	
	.14	$ 1537	1558	1579	1599	1620	1641	1662	1683	1704	1725	1766	1808	BALANCE POINT 13 DEG.F.
	.16	$ 1739	1759	1780	1801	1822	1843	1864	1885	1905	1926	1968	2010	
60,000		$ 563	646	730	813	890	973	1057	1133	1217	1300	1460	1627	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 730	758	793	820	855	890	918	952	987	1015	1085	1147	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 834	862	897	925	959	994	1022	1057	1092	1119	1189	1252	
	.07	$ 932	959	994	1022	1057	1092	1119	1154	1189	1217	1286	1349	
	.08	$ 1036	1064	1099	1126	1161	1196	1224	1259	1293	1321	1391	1453	
	.09	$ 1133	1161	1196	1224	1259	1293	1321	1356	1391	1419	1488	1551	
	.10	$ 1238	1266	1300	1328	1363	1398	1426	1460	1495	1523	1592	1655	
	.12	$ 1439	1467	1502	1530	1565	1599	1627	1662	1697	1725	1794	1857	
	.14	$ 1634	1662	1697	1725	1759	1794	1822	1857	1892	1919	1989	2052	BALANCE POINT 17 DEG.F.
	.16	$ 1836	1864	1899	1926	1961	1996	2024	2059	2093	2121	2191	2253	
70,000		$ 660	758	848	946	1043	1133	1231	1328	1419	1516	1704	1899	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 799	848	897	946	994	1043	1085	1133	1182	1231	1328	1426	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 897	946	994	1043	1092	1140	1182	1231	1279	1328	1426	1523	
	.07	$ 987	1036	1085	1133	1182	1231	1272	1321	1370	1419	1516	1613	
	.08	$ 1078	1126	1175	1224	1272	1321	1363	1412	1460	1509	1606	1704	
	.09	$ 1175	1224	1272	1321	1370	1419	1460	1509	1558	1606	1704	1801	
	.10	$ 1266	1314	1363	1412	1460	1509	1551	1599	1648	1697	1794	1892	
	.12	$ 1453	1502	1551	1599	1648	1697	1739	1787	1836	1885	1982	2079	
	.14	$ 1641	1690	1739	1787	1836	1885	1926	1975	2024	2072	2170	2267	BALANCE POINT 22 DEG.F.
	.16	$ 1829	1878	1926	1975	2024	2072	2114	2163	2212	2260	2358	2455	
80,000		$ 758	862	973	1085	1189	1300	1405	1516	1627	1732	1947	2170	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 904	959	1015	1071	1126	1175	1231	1286	1342	1398	1509	1613	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1008	1064	1119	1175	1231	1279	1335	1391	1446	1502	1613	1718	
	.07	$ 1112	1168	1224	1279	1335	1384	1439	1495	1551	1606	1718	1822	
	.08	$ 1217	1272	1328	1384	1439	1488	1544	1599	1655	1711	1822	1926	
	.09	$ 1321	1377	1432	1488	1544	1592	1648	1704	1759	1815	1926	2031	
	.10	$ 1426	1481	1537	1592	1648	1697	1752	1808	1864	1919	2031	2135	
	.12	$ 1634	1690	1745	1801	1857	1905	1961	2017	2072	2128	2239	2344	
	.14	$ 1843	1899	1954	2010	2065	2114	2170	2225	2281	2337	2448	2552	BALANCE POINT 26 DEG.F.
	.16	$ 2052	2107	2163	2219	2274	2323	2379	2434	2490	2545	2657	2761	
90,000		$ 848	973	1099	1217	1342	1460	1586	1704	1829	1947	2198	2441	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 966	1043	1119	1196	1272	1349	1426	1502	1572	1648	1801	1954	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1050	1126	1203	1279	1356	1432	1509	1586	1655	1732	1885	2038	
	.07	$ 1140	1217	1293	1370	1446	1523	1599	1676	1745	1822	1975	2128	
	.08	$ 1224	1300	1377	1453	1530	1606	1683	1759	1829	1905	2059	2212	
	.09	$ 1314	1391	1467	1544	1620	1697	1773	1850	1919	1996	2149	2302	
	.10	$ 1398	1474	1551	1627	1704	1780	1857	1933	2003	2079	2232	2385	
	.12	$ 1572	1648	1725	1801	1878	1954	2031	2107	2177	2253	2406	2559	
	.14	$ 1745	1822	1899	1975	2052	2128	2205	2281	2351	2427	2580	2733	BALANCE POINT 29 DEG.F.
	.16	$ 1919	1996	2072	2149	2225	2302	2379	2455	2525	2601	2754	2907	
100,000		$ 946	1085	1217	1356	1488	1627	1759	1899	2031	2170	2441	2712	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1029	1126	1231	1328	1426	1530	1627	1732	1829	1926	2128	2330	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1092	1189	1293	1391	1488	1592	1690	1794	1892	1989	2191	2392	
	.07	$ 1154	1252	1356	1453	1551	1655	1752	1857	1954	2052	2253	2455	
	.08	$ 1224	1321	1426	1523	1620	1725	1822	1926	2024	2121	2323	2525	
	.09	$ 1286	1384	1488	1586	1683	1787	1885	1989	2086	2184	2385	2587	
	.10	$ 1349	1446	1551	1648	1745	1850	1947	2052	2149	2246	2448	2650	
	.12	$ 1481	1579	1683	1780	1878	1982	2079	2184	2281	2379	2580	2782	
	.14	$ 1606	1704	1808	1905	2003	2107	2205	2309	2406	2504	2705	2907	BALANCE POINT 32 DEG.F.
	.16	$ 1739	1836	1940	2038	2135	2239	2337	2441	2538	2636	2838	3039	

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	<--THEORETICAL AIR CONDITIONING COST

<--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 48UHPQA/A61AQ-A
HEAT PUMP MODEL: OUTDOOR 48UHPQA 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 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	
50,000		$ 681	779	876	973	1071	1168	1266	1363	1467	1565	1662	1759	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 709	744	772	799	834	862	890	925	952	980	1015	1043	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 806	841	869	897	932	959	987	1022	1050	1078	1112	1140	
	.07	$ 904	939	966	994	1029	1057	1085	1119	1147	1175	1210	1238	
	.08	$ 1008	1043	1071	1099	1133	1161	1189	1224	1252	1279	1314	1342	
	.09	$ 1106	1140	1168	1196	1231	1259	1286	1321	1349	1377	1412	1439	
	.10	$ 1203	1238	1266	1293	1328	1356	1384	1419	1446	1474	1509	1537	
	.12	$ 1405	1439	1467	1495	1530	1558	1586	1620	1648	1676	1711	1739	
	.14	$ 1599	1634	1662	1690	1725	1752	1780	1815	1843	1871	1905	1933	BALANCE POINT 13 DEG.F.
	.16	$ 1801	1836	1864	1892	1926	1954	1982	2017	2045	2072	2107	2135	
60,000		$ 820	939	1050	1168	1286	1405	1523	1641	1759	1878	1996	2107	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 827	876	918	966	1015	1057	1106	1154	1196	1245	1293	1342	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 932	980	1022	1071	1119	1161	1210	1259	1300	1349	1398	1446	
	.07	$ 1029	1078	1119	1168	1217	1259	1307	1356	1398	1446	1495	1544	
	.08	$ 1133	1182	1224	1272	1321	1363	1412	1460	1502	1551	1599	1648	
	.09	$ 1231	1279	1321	1370	1419	1460	1509	1558	1599	1648	1697	1745	
	.10	$ 1335	1384	1426	1474	1523	1565	1613	1662	1704	1752	1801	1850	
	.12	$ 1537	1586	1627	1676	1725	1766	1815	1864	1905	1954	2003	2052	
	.14	$ 1732	1780	1822	1871	1919	1961	2010	2059	2100	2149	2198	2246	BALANCE POINT 17 DEG.F.
	.16	$ 1933	1982	2024	2072	2121	2163	2212	2260	2302	2351	2399	2448	
70,000		$ 952	1092	1231	1363	1502	1641	1780	1912	2052	2191	2323	2462	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 946	1015	1085	1154	1224	1293	1363	1432	1502	1572	1641	1711	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1043	1112	1182	1252	1321	1391	1460	1530	1599	1669	1739	1808	
	.07	$ 1133	1203	1272	1342	1412	1481	1551	1620	1690	1759	1829	1899	
	.08	$ 1224	1293	1363	1432	1502	1572	1641	1711	1780	1850	1919	1989	
	.09	$ 1321	1391	1460	1530	1599	1669	1739	1808	1878	1947	2017	2086	
	.10	$ 1412	1481	1551	1620	1690	1759	1829	1899	1968	2038	2107	2177	
	.12	$ 1599	1669	1739	1808	1878	1947	2017	2086	2156	2225	2295	2365	
	.14	$ 1787	1857	1926	1996	2065	2135	2205	2274	2344	2413	2483	2552	BALANCE POINT 22 DEG.F.
	.16	$ 1975	2045	2114	2184	2253	2323	2392	2462	2532	2601	2671	2740	
80,000		$ 1092	1252	1405	1565	1718	1878	2031	2191	2344	2504	2657	2817	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1071	1154	1231	1307	1391	1467	1544	1627	1704	1787	1864	1940	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1175	1259	1335	1412	1495	1572	1648	1732	1808	1892	1968	2045	
	.07	$ 1279	1363	1439	1516	1599	1676	1752	1836	1912	1996	2072	2149	
	.08	$ 1384	1467	1544	1620	1704	1780	1857	1940	2017	2100	2177	2253	
	.09	$ 1488	1572	1648	1725	1808	1885	1961	2045	2121	2205	2281	2358	
	.10	$ 1592	1676	1752	1829	1912	1989	2065	2149	2225	2309	2385	2462	
	.12	$ 1801	1885	1961	2038	2121	2198	2274	2358	2434	2518	2594	2671	
	.14	$ 2010	2093	2170	2246	2330	2406	2483	2566	2643	2726	2803	2879	BALANCE POINT 26 DEG.F.
	.16	$ 2219	2302	2379	2455	2538	2615	2692	2775	2852	2935	3012	3088	
90,000		$ 1231	1405	1579	1759	1933	2107	2288	2462	2636	2817	2991	3165	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1203	1314	1419	1530	1641	1752	1864	1968	2079	2191	2302	2413	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1286	1398	1502	1613	1725	1836	1947	2052	2163	2274	2385	2497	
	.07	$ 1377	1488	1592	1704	1815	1926	2038	2142	2253	2365	2476	2587	
	.08	$ 1460	1572	1676	1787	1899	2010	2121	2225	2337	2448	2559	2671	
	.09	$ 1551	1662	1766	1878	1989	2100	2212	2316	2427	2538	2650	2761	
	.10	$ 1634	1745	1850	1961	2072	2184	2295	2399	2511	2622	2733	2845	
	.12	$ 1808	1919	2024	2135	2246	2358	2469	2573	2685	2796	2907	3018	
	.14	$ 1982	2093	2198	2309	2420	2532	2643	2747	2858	2970	3081	3192	BALANCE POINT 29 DEG.F.
	.16	$ 2156	2267	2372	2483	2594	2705	2817	2921	3032	3144	3255	3366	
100,000		$ 1363	1565	1759	1954	2149	2344	2538	2733	2935	3130	3325	3519	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1335	1481	1627	1773	1912	2059	2205	2351	2490	2636	2782	2928	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1398	1544	1690	1836	1975	2121	2267	2413	2552	2698	2845	2991	
	.07	$ 1460	1606	1752	1899	2038	2184	2330	2476	2615	2761	2907	3053	
	.08	$ 1530	1676	1822	1968	2107	2253	2399	2545	2685	2831	2977	3123	
	.09	$ 1592	1739	1885	2031	2170	2316	2462	2608	2747	2893	3039	3185	
	.10	$ 1655	1801	1947	2093	2232	2379	2525	2671	2810	2956	3102	3248	
	.12	$ 1787	1933	2079	2225	2365	2511	2657	2803	2942	3088	3234	3380	
	.14	$ 1912	2059	2205	2351	2490	2636	2782	2928	3067	3213	3359	3505	BALANCE POINT 32 DEG.F.
	.16	$ 2045	2191	2337	2483	2622	2768	2914	3060	3199	3345	3491	3638	

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
$	95	114	133	152	171	190	228	266	304	<--THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY

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

REGION 5 — 48UHPQA/A61AQ-A

HEAT PUMP MODEL: OUTDOOR 48UHPQA — 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 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	
50,000		$ 890	966	1043	1112	1189	1266	1335	1412	1488	1634	1787	1787	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 779	799	820	841	869	890	911	939	959	1008	1050	1050	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 876	897	918	939	966	987	1008	1036	1057	1106	1147	1147	
	.07	$ 973	994	1015	1036	1064	1085	1106	1133	1154	1203	1245	1245	
	.08	$ 1078	1099	1119	1140	1168	1189	1210	1238	1259	1307	1349	1349	
	.09	$ 1175	1196	1217	1238	1266	1286	1307	1335	1356	1405	1446	1446	
	.10	$ 1272	1293	1314	1335	1363	1384	1405	1432	1453	1502	1544	1544	
	.12	$ 1474	1495	1516	1537	1565	1586	1606	1634	1655	1704	1745	1745	
	.14	$ 1669	1690	1711	1732	1759	1780	1801	1829	1850	1899	1940	1940	BALANCE POINT 13 DEG.F.
	.16	$ 1871	1892	1912	1933	1961	1982	2003	2031	2052	2100	2142	2142	
60,000		$ 1071	1161	1252	1335	1426	1516	1606	1697	1787	1968	2142	2142	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 925	959	994	1036	1071	1106	1140	1175	1210	1279	1349	1349	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1029	1064	1099	1140	1175	1210	1245	1279	1314	1384	1453	1453	
	.07	$ 1126	1161	1196	1238	1272	1307	1342	1377	1412	1481	1551	1551	
	.08	$ 1231	1266	1300	1342	1377	1412	1446	1481	1516	1586	1655	1655	
	.09	$ 1328	1363	1398	1439	1474	1509	1544	1579	1613	1683	1752	1752	
	.10	$ 1432	1467	1502	1544	1579	1613	1648	1683	1718	1787	1857	1857	
	.12	$ 1634	1669	1704	1745	1780	1815	1850	1885	1919	1989	2059	2059	
	.14	$ 1829	1864	1899	1940	1975	2010	2045	2079	2114	2184	2253	2253	BALANCE POINT 17 DEG.F.
	.16	$ 2031	2065	2100	2142	2177	2212	2246	2281	2316	2385	2455	2455	
70,000		$ 1252	1356	1460	1565	1669	1773	1878	1982	2086	2295	2504	2504	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1099	1147	1203	1252	1307	1363	1412	1467	1516	1620	1732	1732	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1196	1245	1300	1349	1405	1460	1509	1565	1613	1718	1829	1829	
	.07	$ 1286	1335	1391	1439	1495	1551	1599	1655	1704	1808	1919	1919	
	.08	$ 1377	1426	1481	1530	1586	1641	1690	1745	1794	1899	2010	2010	
	.09	$ 1474	1523	1579	1627	1683	1739	1787	1843	1892	1996	2107	2107	
	.10	$ 1565	1613	1669	1718	1773	1829	1878	1933	1982	2086	2198	2198	
	.12	$ 1752	1801	1857	1905	1961	2017	2065	2121	2170	2274	2385	2385	
	.14	$ 1940	1989	2045	2093	2149	2205	2253	2309	2358	2462	2573	2573	BALANCE POINT 22 DEG.F.
	.16	$ 2128	2177	2232	2281	2337	2392	2441	2497	2545	2650	2761	2761	
80,000		$ 1426	1551	1669	1787	1905	2024	2142	2260	2385	2622	2858	2858	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1245	1300	1363	1426	1481	1544	1606	1662	1725	1843	1961	1961	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1349	1405	1467	1530	1586	1648	1711	1766	1829	1947	2065	2065	
	.07	$ 1453	1509	1572	1634	1690	1752	1815	1871	1933	2052	2170	2170	
	.08	$ 1558	1613	1676	1739	1794	1857	1919	1975	2038	2156	2274	2274	
	.09	$ 1662	1718	1780	1843	1899	1961	2024	2079	2142	2260	2379	2379	
	.10	$ 1766	1822	1885	1947	2003	2065	2128	2184	2246	2365	2483	2483	
	.12	$ 1975	2031	2093	2156	2212	2274	2337	2392	2455	2573	2692	2692	
	.14	$ 2184	2239	2302	2365	2420	2483	2545	2601	2664	2782	2900	2900	BALANCE POINT 26 DEG.F.
	.16	$ 2392	2448	2511	2573	2629	2692	2754	2810	2872	2991	3109	3109	
90,000		$ 1606	1739	1878	2010	2142	2281	2413	2545	2678	2949	3220	3220	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1439	1523	1606	1690	1773	1857	1940	2024	2107	2274	2441	2441	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1523	1606	1690	1773	1857	1940	2024	2107	2191	2358	2525	2525	
	.07	$ 1613	1697	1780	1864	1947	2031	2114	2198	2281	2448	2615	2615	
	.08	$ 1697	1780	1864	1947	2031	2114	2198	2281	2365	2532	2698	2698	
	.09	$ 1787	1871	1954	2038	2121	2205	2288	2372	2455	2622	2789	2789	
	.10	$ 1871	1954	2038	2121	2205	2288	2372	2455	2538	2705	2872	2872	
	.12	$ 2045	2128	2212	2295	2379	2462	2545	2629	2712	2879	3046	3046	
	.14	$ 2219	2302	2385	2469	2552	2636	2719	2803	2886	3053	3220	3220	BALANCE POINT 29 DEG.F.
	.16	$ 2392	2476	2559	2643	2726	2810	2893	2977	3060	3227	3394	3394	
100,000		$ 1787	1933	2086	2232	2385	2532	2678	2831	2977	3276	3575	3575	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1648	1759	1871	1975	2086	2198	2309	2420	2525	2747	2970	2970	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1711	1822	1933	2038	2149	2260	2372	2483	2587	2810	3032	3032	
	.07	$ 1773	1885	1996	2100	2212	2323	2434	2545	2650	2872	3095	3095	
	.08	$ 1843	1954	2065	2170	2281	2392	2504	2615	2719	2942	3165	3165	
	.09	$ 1905	2017	2128	2232	2344	2455	2566	2678	2782	3005	3227	3227	
	.10	$ 1968	2079	2191	2295	2406	2518	2629	2740	2845	3067	3290	3290	
	.12	$ 2100	2212	2323	2427	2538	2650	2761	2872	2977	3199	3422	3422	
	.14	$ 2225	2337	2448	2552	2664	2775	2886	2998	3102	3325	3547	3547	BALANCE POINT 32 DEG.F.
	.16	$ 2358	2469	2580	2685	2796	2907	3018	3130	3234	3457	3679	3679	

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	
	.05	.06	.07	.08	.09	.10	.12	.14	.16	<--ELECTRIC RATE $/KWH
$	95	114	133	152	171	190	228	266	304	<--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 60UHPQA/A61AQ-A
HEAT PUMP MODEL: OUTDOOR 60UHPQA INDOOR A61AQ-A
ARI RATED COOLING CAP.: BTUH(95) 58000, SEER10.70
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	$ 1370	2476	
	.06	$ 1641	2977	
	.07	$ 1912	3471	
	.08	$ 2191	3965	
	.09	$ 2455	4465	
	.10	$ 2733	4959	
	.12	$ 3283	5954	
	.14	$ 3825	6942	BALANCE POINT 19 DEG.F.
	.16	$ 4382	7936	
90,000				
	.05	$ 1558	2789	
	.06	$ 1878	3345	
	.07	$ 2184	3902	
	.08	$ 2504	4465	
	.09	$ 2810	5022	
	.10	$ 3130	5578	
	.12	$ 3756	6698	
	.14	$ 4382	7811	BALANCE POINT 23 DEG.F.
	.16	$ 5008	8931	
100,000				
	.05	$ 1773	3095	
	.06	$ 2128	3721	
	.07	$ 2483	4340	
	.08	$ 2838	4959	
	.09	$ 3192	5578	
	.10	$ 3547	6197	
	.12	$ 4257	7443	
	.14	$ 4966	8681	BALANCE POINT 25 DEG.F.
	.16	$ 5676	9926	
110,000				
	.05	$ 1989	3408	
	.06	$ 2385	4090	
	.07	$ 2789	4771	
	.08	$ 3192	5453	
	.09	$ 3589	6135	
	.10	$ 3985	6823	
	.12	$ 4785	8187	
	.14	$ 5578	9550	BALANCE POINT 28 DEG.F.
	.16	$ 6378	10914	
130,000				
	.05	$ 2462	4027	
	.06	$ 2949	4834	
	.07	$ 3443	5641	
	.08	$ 3937	6448	
	.09	$ 4431	7255	
	.10	$ 4924	8062	
	.12	$ 5905	9676	
	.14	$ 6893	11289	BALANCE POINT 32 DEG.F.
	.16	$ 7874	12903	

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
$	108	130	151	173	195	216	260	303	346	<--THEORETICAL AIR CONDITIONING COST

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BARD MANUFACTURING COMPANY

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

REGION 5 60UHPQA/A61AQ-A
HEAT PUMP MODEL: OUTDOOR 60UHPQA INDOOR A61AQ-A
ARI RATED COOLING CAP.: BTUH(95) 58000, SEER10.70
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 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	
60,000		$ 563	646	730	813	890	973	1057	1133	1217	1300	1460	1627	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 744	772	793	820	848	869	897	918	946	973	1022	1071	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 855	883	904	932	959	980	1008	1029	1057	1085	1133	1182	
	.07	$ 973	1001	1022	1050	1078	1099	1126	1147	1175	1203	1252	1300	
	.08	$ 1085	1112	1133	1161	1189	1210	1238	1259	1286	1314	1363	1412	
	.09	$ 1196	1224	1245	1272	1300	1321	1349	1370	1398	1426	1474	1523	
	.10	$ 1314	1342	1363	1391	1419	1439	1467	1488	1516	1544	1592	1641	
	.12	$ 1544	1572	1592	1620	1648	1669	1697	1718	1745	1773	1822	1871	
	.14	$ 1766	1794	1815	1843	1871	1892	1919	1940	1968	1996	2045	2093	BALANCE POINT 12 DEG.F.
	.16	$ 1996	2024	2045	2072	2100	2121	2149	2170	2198	2225	2274	2323	
70,000		$ 660	758	848	946	1043	1133	1231	1328	1419	1516	1704	1899	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 848	883	911	939	966	994	1029	1057	1085	1112	1175	1231	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 980	1015	1043	1071	1099	1126	1161	1189	1217	1245	1307	1363	
	.07	$ 1112	1147	1175	1203	1231	1259	1293	1321	1349	1377	1439	1495	
	.08	$ 1238	1272	1300	1328	1356	1384	1419	1446	1474	1502	1565	1620	
	.09	$ 1370	1405	1432	1460	1488	1516	1551	1579	1606	1634	1697	1752	
	.10	$ 1502	1537	1565	1592	1620	1648	1683	1711	1739	1766	1829	1885	
	.12	$ 1759	1794	1822	1850	1878	1905	1940	1968	1996	2024	2086	2142	
	.14	$ 2024	2059	2086	2114	2142	2170	2205	2232	2260	2288	2351	2406	BALANCE POINT 16 DEG.F.
	.16	$ 2281	2316	2344	2372	2399	2427	2462	2490	2518	2545	2608	2664	
80,000		$ 758	862	973	1085	1189	1300	1405	1516	1627	1732	1947	2170	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 925	973	1015	1057	1099	1140	1182	1231	1272	1314	1398	1488	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1050	1099	1140	1182	1224	1266	1307	1356	1398	1439	1523	1613	
	.07	$ 1182	1231	1272	1314	1356	1398	1439	1488	1530	1572	1655	1745	
	.08	$ 1307	1356	1398	1439	1481	1523	1565	1613	1655	1697	1780	1871	
	.09	$ 1432	1481	1523	1565	1606	1648	1690	1739	1780	1822	1905	1996	
	.10	$ 1558	1606	1648	1690	1732	1773	1815	1864	1905	1947	2031	2121	
	.12	$ 1808	1857	1899	1940	1982	2024	2065	2114	2156	2198	2281	2372	
	.14	$ 2059	2107	2149	2191	2232	2274	2316	2365	2406	2448	2532	2622	BALANCE POINT 19 DEG.F.
	.16	$ 2309	2358	2399	2441	2483	2525	2566	2615	2657	2698	2782	2872	
90,000		$ 848	973	1099	1217	1342	1460	1586	1704	1829	1947	2198	2441	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 994	1057	1119	1182	1238	1300	1363	1426	1488	1551	1669	1794	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1112	1175	1238	1300	1356	1419	1481	1544	1606	1669	1787	1912	
	.07	$ 1224	1286	1349	1412	1467	1530	1592	1655	1718	1780	1899	2024	
	.08	$ 1335	1398	1460	1523	1579	1641	1704	1766	1829	1892	2010	2135	
	.09	$ 1446	1509	1572	1634	1690	1752	1815	1878	1940	2003	2121	2246	
	.10	$ 1565	1627	1690	1752	1808	1871	1933	1996	2059	2121	2239	2365	
	.12	$ 1787	1850	1912	1975	2031	2093	2156	2219	2281	2344	2462	2587	
	.14	$ 2017	2079	2142	2205	2260	2323	2385	2448	2511	2573	2692	2817	BALANCE POINT 23 DEG.F.
	.16	$ 2239	2302	2365	2427	2483	2545	2608	2671	2733	2796	2914	3039	
100,000		$ 946	1085	1217	1356	1488	1627	1759	1899	2031	2170	2441	2712	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1099	1168	1238	1300	1370	1439	1509	1579	1648	1711	1850	1989	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1224	1293	1363	1426	1495	1565	1634	1704	1773	1836	1975	2114	
	.07	$ 1342	1412	1481	1544	1613	1683	1752	1822	1892	1954	2093	2232	
	.08	$ 1467	1537	1606	1669	1739	1808	1878	1947	2017	2079	2219	2358	
	.09	$ 1592	1662	1732	1794	1864	1933	2003	2072	2142	2205	2344	2483	
	.10	$ 1718	1787	1857	1919	1989	2059	2128	2198	2267	2330	2469	2608	
	.12	$ 1961	2031	2100	2163	2232	2302	2372	2441	2511	2573	2712	2852	
	.14	$ 2212	2281	2351	2413	2483	2552	2622	2692	2761	2824	2963	3102	BALANCE POINT 25 DEG.F.
	.16	$ 2455	2525	2594	2657	2726	2796	2865	2935	3005	3067	3206	3345	
110,000		$ 1043	1189	1342	1488	1641	1787	1940	2086	2232	2385	2685	2984	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1154	1245	1342	1432	1523	1620	1711	1808	1899	1989	2177	2365	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1259	1349	1446	1537	1627	1725	1815	1912	2003	2093	2281	2469	
	.07	$ 1356	1446	1544	1634	1725	1822	1912	2010	2100	2191	2379	2566	
	.08	$ 1460	1551	1648	1739	1829	1926	2017	2114	2205	2295	2483	2671	
	.09	$ 1558	1648	1745	1836	1926	2024	2114	2212	2302	2392	2580	2768	
	.10	$ 1662	1752	1850	1940	2031	2128	2219	2316	2406	2497	2685	2872	
	.12	$ 1864	1954	2052	2142	2232	2330	2420	2518	2608	2698	2886	3074	
	.14	$ 2065	2156	2253	2344	2434	2532	2622	2719	2810	2900	3088	3276	BALANCE POINT 28 DEG.F.
	.16	$ 2267	2358	2455	2545	2636	2733	2824	2921	3012	3102	3290	3478	

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
$	108	130	151	173	195	216	260	303	346	<--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 60UHPQA/A61AQ-A
HEAT PUMP MODEL: OUTDOOR 60UHPQA INDOOR A61AQ-A
ARI RATED COOLING CAP.: BTUH(95) 58000, SEER10.70
ARI RATED HEATING CAP.: BTUH (47) 61000, COP(47) 3.20, HSPF 7.50 MIN.DHR REC IV
BTUH (17) 35500, COP(17) 2.20
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	
60,000		$ 820	939	1050	1168	1286	1405	1523	1641	1759	1878	1996	2107	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 820	862	897	932	966	1001	1043	1078	1112	1147	1182	1217	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 932	973	1008	1043	1078	1112	1154	1189	1224	1259	1293	1328	
	.07	$ 1050	1092	1126	1161	1196	1231	1272	1307	1342	1377	1412	1446	
	.08	$ 1161	1203	1238	1272	1307	1342	1384	1419	1453	1488	1523	1558	
	.09	$ 1272	1314	1349	1384	1419	1453	1495	1530	1565	1599	1634	1669	
	.10	$ 1391	1432	1467	1502	1537	1572	1613	1648	1683	1718	1752	1787	
	.12	$ 1620	1662	1697	1732	1766	1801	1843	1878	1912	1947	1982	2017	
	.14	$ 1843	1885	1919	1954	1989	2024	2065	2100	2135	2170	2205	2239	BALANCE POINT 12 DEG.F.
	.16	$ 2072	2114	2149	2184	2219	2253	2295	2330	2365	2399	2434	2469	
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	$ 1071	1112	1161	1203	1245	1286	1328	1370	1412	1453	1495	1537	
	.07	$ 1203	1245	1293	1335	1377	1419	1460	1502	1544	1586	1627	1669	
	.08	$ 1328	1370	1419	1460	1502	1544	1586	1627	1669	1711	1752	1794	
	.09	$ 1460	1502	1551	1592	1634	1676	1718	1759	1801	1843	1885	1926	
	.10	$ 1592	1634	1683	1725	1766	1808	1850	1892	1933	1975	2017	2059	
	.12	$ 1850	1892	1940	1982	2024	2065	2107	2149	2191	2232	2274	2316	
	.14	$ 2114	2156	2205	2246	2288	2330	2372	2413	2455	2497	2538	2580	BALANCE POINT 16 DEG.F.
	.16	$ 2372	2413	2462	2504	2545	2587	2629	2671	2712	2754	2796	2838	
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	$ 1182	1245	1307	1370	1432	1495	1558	1620	1683	1745	1808	1871	
	.07	$ 1314	1377	1439	1502	1565	1627	1690	1752	1815	1878	1940	2003	
	.08	$ 1439	1502	1565	1627	1690	1752	1815	1878	1940	2003	2065	2128	
	.09	$ 1565	1627	1690	1752	1815	1878	1940	2003	2065	2128	2191	2253	
	.10	$ 1690	1752	1815	1878	1940	2003	2065	2128	2191	2253	2316	2379	
	.12	$ 1940	2003	2065	2128	2191	2253	2316	2379	2441	2504	2566	2629	
	.14	$ 2191	2253	2316	2379	2441	2504	2566	2629	2692	2754	2817	2879	BALANCE POINT 19 DEG.F.
	.16	$ 2441	2504	2566	2629	2692	2754	2817	2879	2942	3005	3067	3130	
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	$ 1300	1391	1481	1572	1655	1745	1836	1926	2010	2100	2191	2281	
	.07	$ 1412	1502	1592	1683	1766	1857	1947	2038	2121	2212	2302	2392	
	.08	$ 1523	1613	1704	1794	1878	1968	2059	2149	2232	2323	2413	2504	
	.09	$ 1634	1725	1815	1905	1989	2079	2170	2260	2344	2434	2525	2615	
	.10	$ 1752	1843	1933	2024	2107	2198	2288	2379	2462	2552	2643	2733	
	.12	$ 1975	2065	2156	2246	2330	2420	2511	2601	2685	2775	2865	2956	
	.14	$ 2205	2295	2385	2476	2559	2650	2740	2831	2914	3005	3095	3185	BALANCE POINT 23 DEG.F.
	.16	$ 2427	2518	2608	2698	2782	2872	2963	3053	3137	3227	3318	3408	
100,000		$ 1363	1565	1759	1954	2149	2344	2538	2733	2935	3130	3325	3519	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1307	1405	1509	1606	1704	1801	1899	2003	2100	2198	2295	2392	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1432	1530	1634	1732	1829	1926	2024	2128	2225	2323	2420	2518	
	.07	$ 1551	1648	1752	1850	1947	2045	2142	2246	2344	2441	2538	2636	
	.08	$ 1676	1773	1878	1975	2072	2170	2267	2372	2469	2566	2664	2761	
	.09	$ 1801	1899	2003	2100	2198	2295	2392	2497	2594	2692	2789	2886	
	.10	$ 1926	2024	2128	2225	2323	2420	2518	2622	2719	2817	2914	3012	
	.12	$ 2170	2267	2372	2469	2566	2664	2761	2865	2963	3060	3158	3255	
	.14	$ 2420	2518	2622	2719	2817	2914	3012	3116	3213	3311	3408	3505	BALANCE POINT 25 DEG.F.
	.16	$ 2664	2761	2865	2963	3060	3158	3255	3359	3457	3554	3651	3749	
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	$ 1544	1683	1815	1947	2086	2219	2351	2490	2622	2754	2893	3025	
	.07	$ 1641	1780	1912	2045	2184	2316	2448	2587	2719	2852	2991	3123	
	.08	$ 1745	1885	2017	2149	2288	2420	2552	2692	2824	2956	3095	3227	
	.09	$ 1843	1982	2114	2246	2385	2518	2650	2789	2921	3053	3192	3325	
	.10	$ 1947	2086	2219	2351	2490	2622	2754	2893	3025	3158	3297	3429	
	.12	$ 2149	2288	2420	2552	2692	2824	2956	3095	3227	3359	3498	3631	
	.14	$ 2351	2490	2622	2754	2893	3025	3158	3297	3429	3561	3700	3832	BALANCE POINT 28 DEG.F.
	.16	$ 2552	2692	2824	2956	3095	3227	3359	3498	3631	3763	3902	4034	

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
$	108	130	151	173	195	216	260	303	346	<--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 HEATNG 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 — 60UHPQA/A61AQ-A
HEAT PUMP MODEL: OUTDOOR 60UHPQA — INDOOR A61AQ-A
ARI RATED COOLING CAP.: BTUH(95) 58000, SEER10.70
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 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	
60,000		$ 1071	1161	1252	1335	1426	1516	1606	1697	1787	1968	2142	2142	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 897	925	952	980	1008	1036	1064	1092	1119	1175	1231	1231	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1008	1036	1064	1092	1119	1147	1175	1203	1231	1286	1342	1342	
	.07	$ 1126	1154	1182	1210	1238	1266	1293	1321	1349	1405	1460	1460	
	.08	$ 1238	1266	1293	1321	1349	1377	1405	1432	1460	1516	1572	1572	
	.09	$ 1349	1377	1405	1432	1460	1488	1516	1544	1572	1627	1683	1683	
	.10	$ 1467	1495	1523	1551	1579	1606	1634	1662	1690	1745	1801	1801	
	.12	$ 1697	1725	1752	1780	1808	1836	1864	1892	1919	1975	2031	2031	BALANCE POINT 12 DEG.F.
	.14	$ 1919	1947	1975	2003	2031	2059	2086	2114	2142	2198	2253	2253	
	.16	$ 2149	2177	2205	2232	2260	2288	2316	2344	2372	2427	2483	2483	
70,000		$ 1252	1356	1460	1565	1669	1773	1878	1982	2086	2295	2504	2504	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1029	1064	1099	1126	1161	1189	1224	1259	1286	1356	1419	1419	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1161	1196	1231	1259	1293	1321	1356	1391	1419	1488	1551	1551	
	.07	$ 1293	1328	1363	1391	1426	1453	1488	1523	1551	1620	1683	1683	
	.08	$ 1419	1453	1488	1516	1551	1579	1613	1648	1676	1745	1808	1808	
	.09	$ 1551	1586	1620	1648	1683	1711	1745	1780	1808	1878	1940	1940	
	.10	$ 1683	1718	1752	1780	1815	1843	1878	1912	1940	2010	2072	2072	
	.12	$ 1940	1975	2010	2038	2072	2100	2135	2170	2198	2267	2330	2330	BALANCE POINT 16 DEG.F.
	.14	$ 2205	2239	2274	2302	2337	2365	2399	2434	2462	2532	2594	2594	
	.16	$ 2462	2497	2532	2559	2594	2622	2657	2692	2719	2789	2852	2852	
80,000		$ 1426	1551	1669	1787	1905	2024	2142	2260	2385	2622	2858	2858	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1196	1238	1286	1335	1384	1432	1474	1523	1572	1669	1759	1759	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1321	1363	1412	1460	1509	1558	1599	1648	1697	1794	1885	1885	
	.07	$ 1453	1495	1544	1592	1641	1690	1732	1780	1829	1926	2017	2017	
	.08	$ 1579	1620	1669	1718	1766	1815	1857	1905	1954	2052	2142	2142	
	.09	$ 1704	1745	1794	1843	1892	1940	1982	2031	2079	2177	2267	2267	
	.10	$ 1829	1871	1919	1968	2017	2065	2107	2156	2205	2302	2392	2392	
	.12	$ 2079	2121	2170	2219	2267	2316	2358	2406	2455	2552	2643	2643	BALANCE POINT 19 DEG.F.
	.14	$ 2330	2372	2420	2469	2518	2566	2608	2657	2705	2803	2893	2893	
	.16	$ 2580	2622	2671	2719	2768	2817	2858	2907	2956	3053	3144	3144	
90,000		$ 1606	1739	1878	2010	2142	2281	2413	2545	2678	2949	3220	3220	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1377	1439	1509	1579	1648	1711	1780	1850	1919	2052	2184	2184	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1495	1558	1627	1697	1766	1829	1899	1968	2038	2170	2302	2302	
	.07	$ 1606	1669	1739	1808	1878	1940	2010	2079	2149	2281	2413	2413	
	.08	$ 1718	1780	1850	1919	1989	2052	2121	2191	2260	2392	2525	2525	
	.09	$ 1829	1892	1961	2031	2100	2163	2232	2302	2372	2504	2636	2636	
	.10	$ 1947	2010	2079	2149	2219	2281	2351	2420	2490	2622	2754	2754	
	.12	$ 2170	2232	2302	2372	2441	2504	2573	2643	2712	2845	2977	2977	BALANCE POINT 23 DEG.F.
	.14	$ 2399	2462	2532	2601	2671	2733	2803	2872	2942	3074	3206	3206	
	.16	$ 2622	2685	2754	2824	2893	2956	3025	3095	3165	3297	3429	3429	
100,000		$ 1787	1933	2086	2232	2385	2532	2678	2831	2977	3276	3575	3575	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1523	1592	1669	1745	1822	1899	1975	2045	2121	2274	2420	2420	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1648	1718	1794	1871	1947	2024	2100	2170	2246	2399	2545	2545	
	.07	$ 1766	1836	1912	1989	2065	2142	2219	2288	2365	2518	2664	2664	
	.08	$ 1892	1961	2038	2114	2191	2267	2344	2413	2490	2643	2789	2789	
	.09	$ 2017	2086	2163	2239	2316	2392	2469	2538	2615	2768	2914	2914	
	.10	$ 2142	2212	2288	2365	2441	2518	2594	2664	2740	2893	3039	3039	
	.12	$ 2385	2455	2532	2608	2685	2761	2838	2907	2984	3137	3283	3283	BALANCE POINT 25 DEG.F.
	.14	$ 2636	2705	2782	2858	2935	3012	3088	3158	3234	3387	3533	3533	
	.16	$ 2879	2949	3025	3102	3178	3255	3332	3401	3478	3631	3777	3777	
110,000		$ 1968	2128	2295	2455	2622	2782	2949	3116	3276	3603	3937	3937	<--THEORETICAL HEATING COST * FURNACE ONLY
	.05	$ 1732	1829	1933	2038	2142	2239	2344	2448	2552	2754	2956	2956	THEORETICAL HEATING COST * FURN.+ HEAT PUMP $ PER YEAR
	.06	$ 1836	1933	2038	2142	2246	2344	2448	2552	2657	2858	3060	3060	
	.07	$ 1933	2031	2135	2239	2344	2441	2545	2650	2754	2956	3158	3158	
	.08	$ 2038	2135	2239	2344	2448	2545	2650	2754	2858	3060	3262	3262	
	.09	$ 2135	2232	2337	2441	2545	2643	2747	2852	2956	3158	3359	3359	
	.10	$ 2239	2337	2441	2545	2650	2747	2852	2956	3060	3262	3464	3464	
	.12	$ 2441	2538	2643	2747	2852	2949	3053	3158	3262	3464	3665	3665	BALANCE POINT 28 DEG.F.
	.14	$ 2643	2740	2845	2949	3053	3151	3255	3359	3464	3665	3867	3867	
	.16	$ 2845	2942	3046	3151	3255	3352	3457	3561	3665	3867	4069	4069	

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	<--THEORETICAL AIR CONDITIONING COST

<--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.