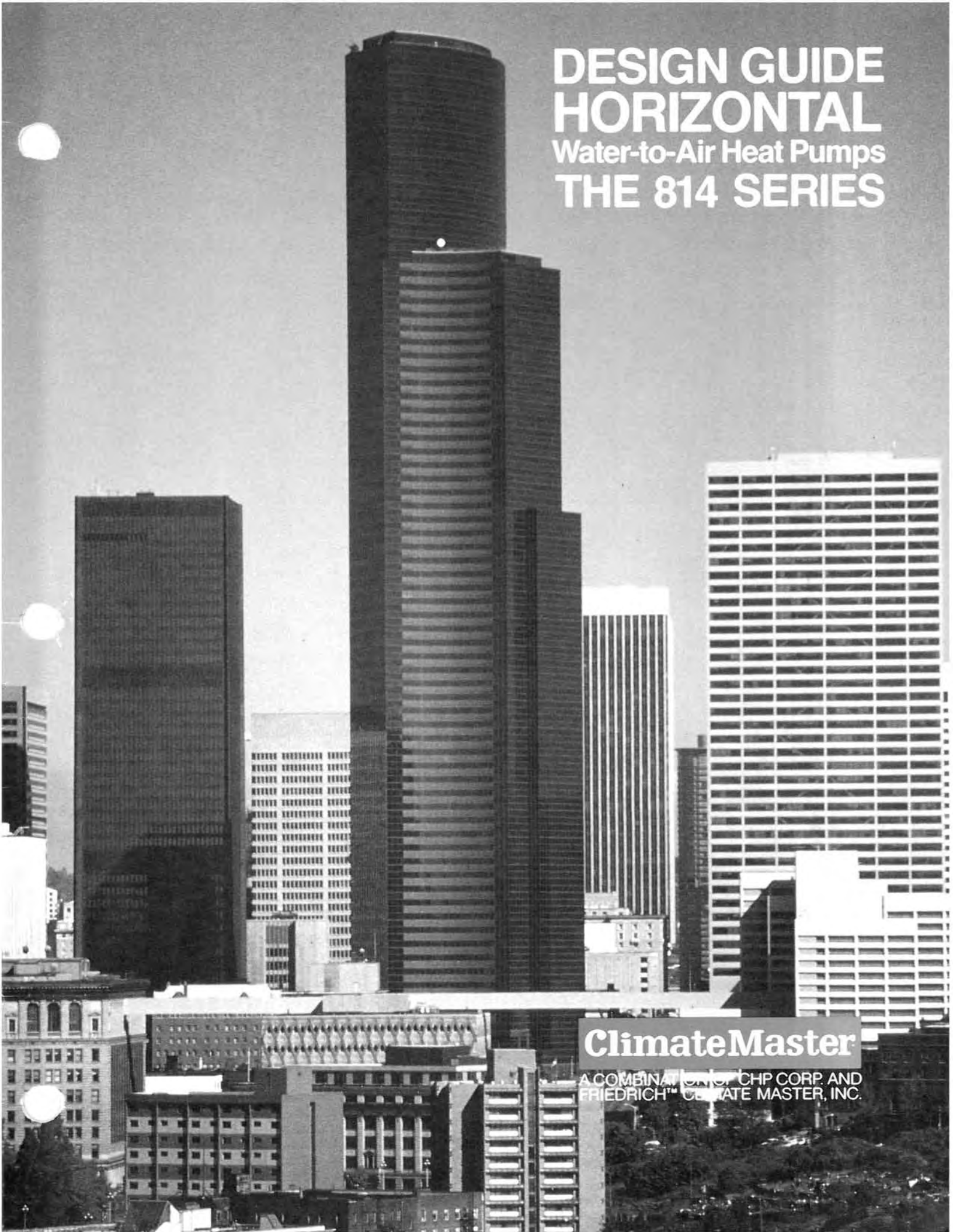


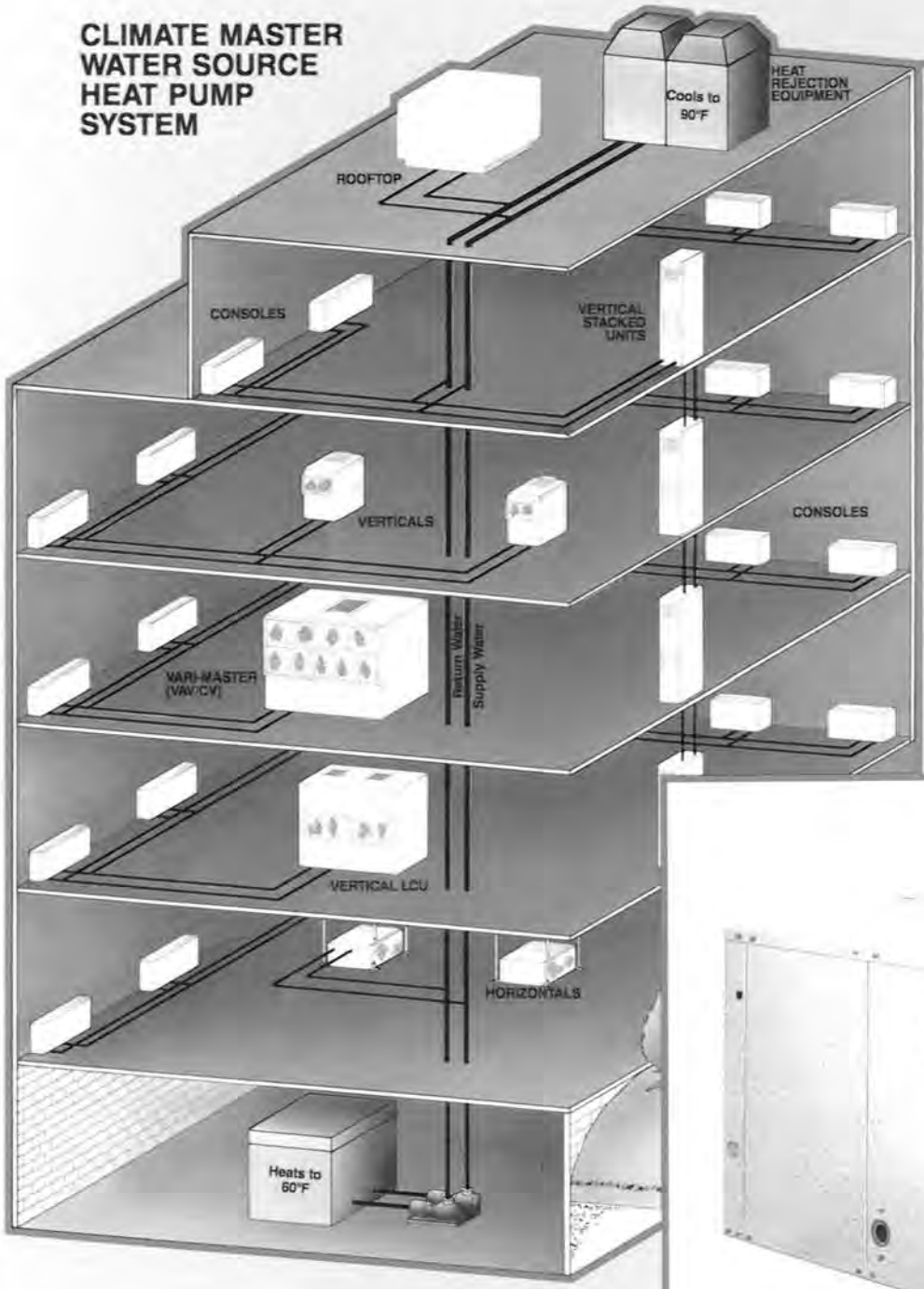
DESIGN GUIDE
HORIZONTAL
Water-to-Air Heat Pumps
THE 814 SERIES

ClimateMaster

A COMBINATION OF CHP CORP. AND FRIEDRICH™ CLIMATE MASTER, INC.

THE NATURAL SOLUTION ... USING 814 HO

CLIMATE MASTER WATER SOURCE HEAT PUMP SYSTEM



Climate Master has experience, equipment, service and support that no one can match. We have the largest selection of units and ship more water source equipment that any other manufacturer in the world. Climate Master is "The world leader in the water source heat pump industry."

RIZONTALS SUSPENDED FROM CEILINGS

A DECENTRALIZED APPROACH

Our equipment is applied at the point of need and thereby provides unparalleled individual comfort control. Our economies of operation are superior because we always operate at peak efficiency with this decentralized approach.

WATER SOURCE HEAT PUMP SYSTEMS

Designed for year around heating and cooling of both new and renovated commercial, industrial and multi-family buildings, our water source heat pump systems offer lower first costs, flexibility of control, and high economies of operation.

A non-insulated two pipe continuous loop system carries moderate temperature water to and from each unit. All units function independently, either adding heat to or removing heat from the water loop. This not only provides independent zone control, it also assures maximum efficiency with the potential of continuous heat recovery.

A typical system includes some type of heat rejection equipment along with a heat adder to maintain the moderate loop temperatures. Optional storage tanks and solar collectors can be added to reduce heater and cooler operation.

814 HORIZONTAL WATER-TO-AIR HEAT PUMPS

Climate Master 814 horizontal water-to-air heat pumps meet the most demanding requirements for greater energy efficiencies in new and renovated multi-room structures. The 814 units are typically ceiling hung, completely concealed with conditioned air ducted into individual rooms and areas. Each unit is usually separately controlled to maintain a specific comfort zone. Typical installations include commercial, industrial and multi-family dwellings.

First costs and operating costs are significantly lower than equipment with comparable flexibility. These unitary packaged units require no outside wall penetration. They are part of a decentralized system that provides complete, individualized climate conditioning. While console units are normally applied on the building perimeter, these versatile units typically serve core areas.

Operating efficiencies are excellent for both cooling and heating cycles with EER's as high as 11.8 and COP's up to 3.9. Noise problems are minimized. The units are quiet with the compressor located in an insulated compartment, totally isolated from the air stream. Each unit is manufactured using top quality components, factory tested and quality assured by Climate Master.

For additional options and product specifications, see page 20.

WARRANTY

Climate Master warrants 814 products to be free from defects in material and workmanship under normal use and maintenance. This limited warranty covers replacement or repair, at our option, of all parts for 12 months. The costs of labor, refrigerant materials, service and transportation are not included. See Terms of Limited Warranty for details.

PERFORMANCE CHARTS

814-009

COOLING PERFORMANCE TABLE / HEATING PERFORMANCE TABLE

Water Flow GPM	Entering Water Temp. °F	Total Cooling BTUH	Sensible Cooling BTUH	Heat of Rejection BTUH	Power Input Watts	Leaving Water Temp. °F	Total Heating BTUH	Heat of Absorption BTUH	Power Input Watts	Leaving Water Temp. °F	P.D. Feet of Water
1.1	60°	8900	6300	11289	700	80.5°	7900	5443	720	50.1°	3.31
1.7	60°	9000	6200	11287	670	73.3°	8500	5940	750	53.0°	7.25
2.3	60°	9000	6100	11218	650	69.8°	8700	6106	760	54.7°	12.49
2.9	60°	9000	6100	11184	640	67.7°	8900	6272	770	55.7°	18.96
1.1	70°	8800	6300	11360	750	90.7°	9000	6372	770	58.4°	3.31
1.7	70°	8900	6300	11357	720	83.4°	9400	6670	800	62.2°	7.25
2.3	70°	8900	6300	11289	700	79.8°	9600	6835	810	64.0°	12.49
2.9	70°	8900	6300	11255	690	77.8°	9700	6935	810	65.2°	18.96
1.1	85°	8400	6300	11199	820	105.4°	10100	7267	830	71.8°	3.31
1.7	85°	8600	6300	11296	790	98.3°	10400	7533	840	76.1°	7.25
2.3	85°	8700	6300	11328	770	95.0°	10600	7699	850	78.3°	12.49
2.9	85°	8800	6300	11394	760	92.9°	10600	7699	850	79.7°	18.96
1.1	90°	8300	6300	11167	840	110.3°	10400	7533	840	76.3°	3.31
1.7	90°	8500	6300	11265	810	103.3°	10700	7799	850	80.8°	7.25
2.3	90°	8600	6300	11296	790	99.8°	10800	7865	860	83.2°	12.49
2.9	90°	8700	6300	11362	780	97.8°	10800	7865	860	84.6°	18.96
1.1	95°	8100	6200	11069	870	115.1°	10700	7799	850	80.8°	3.31
1.7	95°	8400	6300	11233	830	108.2°	10900	7965	860	85.6°	7.25
2.3	95°	8500	6300	11299	820	104.8°	11000	8065	860	88.0°	12.49
2.9	95°	8500	6300	11265	810	102.8°	11000	8065	860	89.4°	18.96

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR TEMPERATURE

Entering Air °F WB	Total Cooling Capacity	Sensible Capacity Entering Air Dry Bulb 70°DB	75°DB	80°DB	85°DB	90°DB	Heat of Rejection	Power Input	Entering Air °F DB	Total Heating Capacity	Heat of Absorption	Power Input
61°	.875	.871	1.086				.900	.958	60°	1.050	1.097	.940
64°	.940	.719	.935	1.150	1.365		.953	.984	65°	1.027	1.053	.970
67°	1.000	.570	.785	1.000	1.215	1.430	1.000	1.000	70°	1.000	1.000	1.000
70°	1.054		.637	.852	1.067	1.282	1.050	1.016	75°	.971	.951	1.030
73°	1.102			.706	.921	1.136	1.086	1.032	80°	.938	.892	1.060

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR FLOW

Total Enter CFM	Total Cool Capacity	Sensible Capacity	Heat of Rejection	Cool Input Watts	Total Heat Capacity	Heat of Absorption	Heat Input Watts
225	.965	.923	.962	.960	.965	.936	1.050
250	.977	.948	.980	.973	.977	.951	1.033
275	.988	.974	.989	.987	.988	.980	1.017
300	1.000	1.000	1.000	1.000	1.000	1.000	1.000
325	1.012	1.026	1.015	1.013	1.012	1.024	.983
350	1.023	1.052	1.024	1.027	1.023	1.053	.976

ARI RATED: **11.3 EER, 2.3 COP**

Bold Face = ARI Conditions

EXAMPLE SELECTION

To estimate the performance of a Model 814-009 under the following conditions:

COOLING MODE—Return Air of 85°F EDB, 70°F EWB, EWT of 90°F at 2.9 GPM and 356 CFM.

HEATING MODE—Same conditions, plus Return Air of 75°F EDB and EWT of 60°F.

Step 1

COOLING	From Chart	Correction Factors Air Temp	Air Flow	
Total Capacity BTUH	8700	×1.054	×1.026	=9408.21 Total Cooling
Sensible Capacity BTUH	6300	×1.067	×1.058	=7111.98 Sensible Cooling
Power Input Watts	780	×1.016	×1.030	= 816.25 Cooling Watts
HEATING				
Total Capacity BTUH	8900	× .971	×1.026	= 8866.59 Total Heating
Power Input Watts	770	×1.030	× .948	= 751.86 Heating Watts

Step 2

Total Cooling + (Watts ×3.413) = Heat of Rejection
9408.21 + (816.25×3.413) = 12194.07 BTUH

Total Heating − (Watts ×3.413) = Heat of Absorption
8866.59 − (751.86×3.413) = 6303.77 BTUH

Note: Heat of Rejection and Heat of Absorption factors are for quick estimation only. See the above example for exact formulas.

DESIGN POINT DATA

Design Point Data is a IBM compatible software package that contains a complete, up-to-date catalog for all Climate Master equipment. By varying the entering conditions, ratings and data are immediately calculated and displayed at the selected design point, then printed and/or saved. DPD saves time and assures calculation accuracy.

Bold Face = ARI Conditions

PERFORMANCE CHARTS

814-011

COOLING PERFORMANCE TABLE

Water Flow GPM	Entering Water Temp. °F	Total Cooling BTUH	Sensible Cooling BTUH	Heat of Rejection BTUH	Power Input Watts	Leaving Water Temp. °F
1.4	60°	11100	7800	14138	890	80.2°
2.1	60°	11100	7700	14001	850	73.3°
2.8	60°	11100	7600	13933	830	70.0°
3.5	60°	11100	7600	13899	820	67.9°
1.4	70°	10900	7900	14142	950	90.2°
2.1	70°	11000	7800	14106	910	83.4°
2.8	70°	11100	7800	14138	890	80.1°
3.5	70°	11100	7800	14103	880	78.1°
1.4	85°	10500	7800	14050	1040	105.1°
2.1	85°	10700	7900	14113	1000	98.4°
2.8	85°	10800	7900	14145	980	95.0°
3.5	85°	10900	7900	14211	970	93.1°
1.4	90°	10300	7800	13952	1070	109.9°
2.1	90°	10600	7800	14115	1030	103.4°
2.8	90°	10700	7900	14147	1010	100.1°
3.5	90°	10700	7900	14113	1000	98.1°
1.4	95°	10100	7700	13854	1100	114.8°
2.1	95°	10400	7800	14018	1060	108.4°
2.8	95°	10500	7800	14050	1040	105.0°
3.5	95°	10600	7900	14115	1030	103.1°

HEATING PERFORMANCE TABLE

Total Heating BTUH	Heat of Absorption BTUH	Power Input Watts	Leaving Water Temp. °F	P.D. Feet of Water
11600	8187	1000	48.3°	3.66
12400	8850	1040	51.6°	7.60
12700	9116	1050	53.5°	12.75
12900	9282	1060	54.7°	19.06
13100	9448	1070	56.5°	3.66
13700	9946	1100	60.5°	7.60
14000	10212	1110	62.8°	12.75
14100	10277	1120	64.1°	19.06
14800	10909	1140	69.4°	3.66
15200	11241	1160	74.3°	7.60
15400	11407	1170	76.9°	12.75
15500	11507	1170	78.4°	19.06
15200	11241	1160	73.9°	3.66
15600	11573	1180	79.0°	7.60
15700	11673	1180	81.7°	12.75
15800	11773	1180	83.3°	19.06
15600	11573	1180	78.5°	3.66
15900	11839	1190	83.7°	7.60
16000	11939	1190	86.5°	12.75
16100	12039	1190	88.1°	19.06

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR TEMPERATURE

Entering Air °F WB	Total Cooling Capacity	Sensible Capacity Entering Air Dry Bulb 70°DB	75°DB	80°DB	85°DB	90°DB	Heat of Rejection	Power Input
61°	.875	.871	1.086				.898	.968
64°	.940	.719	.935	1.150	1.365		.954	.984
67°	1.000	.570	.785	1.000	1.215	1.430	1.000	1.000
70°	1.054		.637	.852	1.067	1.282	1.046	1.016
73°	1.102			.706	.921	1.136	1.089	1.032

Entering Air °F DB	Total Heating Capacity	Heat of Absorption	Power Input
60°	1.050	1.087	.940
65°	1.027	1.048	.970
70°	1.000	1.000	1.000
75°	.971	.950	1.030
80°	.938	.891	1.060

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR FLOW

Total Entering CFM	Total Cool Capacity	Sensible Capacity	Heat of Rejection	Cool Input Watts	Total Heat Capacity	Heat of Absorption	Heat Input Watts
280	.958	.907	.961	.952	.958	.921	1.060
310	.969	.930	.969	.964	.969	.940	1.045
340	.979	.954	.983	.976	.979	.960	1.030
370	.990	.977	.990	.988	.990	.979	1.015
400	1.000	1.000	1.000	1.000	1.000	1.000	1.000
430	1.010	1.023	1.011	1.012	1.011	1.018	.985

ARI RATED: **11.0 EER, 3.7 COP**

Bold Face = ARI Conditions

814-013

COOLING PERFORMANCE TABLE

Water Flow GPM	Entering Water Temp. °F	Total Cooling BTUH	Sensible Cooling BTUH	Heat of Rejection BTUH	Power Input Watts	Leaving Water Temp. °F
1.8	60°	12705	8686	16403	1084	78.23°
2.7	60°	12749	8609	16285	1036	72.06°
3.6	60°	12750	8556	16206	1013	69.00°
4.5	60°	12745	8520	16152	998	67.18°
1.8	70°	12536	8730	16478	1155	88.31°
2.7	70°	12662	8711	16442	1108	82.18°
3.6	70°	12704	8687	16404	1084	79.11°
4.5	70°	12723	8668	16375	1070	77.28°
1.8	85°	12050	8622	16358	1262	103.18°
2.7	85°	12298	8696	16445	1215	97.18°
3.6	85°	12402	8718	16469	1191	94.15°
4.5	85°	12458	8726	16476	1177	92.32°
1.8	90°	11825	8537	16256	1298	108.06°
2.7	90°	12115	8644	16384	1251	102.14°
3.6	90°	12240	8681	16428	1227	99.13°
4.5	90°	12308	8699	16448	1213	97.31°
1.8	95°	11570	8426	16123	1334	112.91°
2.7	95°	11901	8567	16292	1287	107.07°
3.6	95°	12046	8621	16356	1263	104.09°
4.5	95°	12127	8648	16389	1249	102.28°

HEATING PERFORMANCE TABLE

Total Heating BTUH	Heat of Absorption BTUH	Power Input Watts	Leaving Water Temp. °F	P.D. Feet of Water
11736	7843	1140	46.96°	6.71
12436	8123	1264	50.79°	13.91
12776	8242	1328	52.90°	23.35
12976	8307	1368	54.23°	34.89
13278	8770	1321	55.25°	6.71
13828	8923	1437	59.76°	13.91
14094	8979	1499	62.17°	23.35
14250	9006	1537	63.67°	34.89
15048	9599	1597	68.28°	6.71
15385	9582	1700	73.60°	13.91
15546	9552	1756	76.36°	23.35
15638	9526	1791	78.05°	34.89
15491	9722	1690	72.79°	6.71
15761	9655	1789	78.33°	13.91
15888	9599	1843	81.17°	23.35
15961	9557	1876	82.91°	34.89
15858	9765	1785	77.38°	6.71
16064	9653	1878	83.10°	13.91
16159	9573	1930	86.02°	23.35
16213	9517	1962	87.79°	34.89

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR TEMPERATURE

Entering Air °F WB	Total Cooling Capacity	Sensible Capacity Entering Air Dry Bulb 70°DB	75°DB	80°DB	85°DB	90°DB	Heat of Rejection	Power Input
62°	.898	.820	1.035				.956	.973
64°	.941	.719	.934	1.149			.974	.984
67°	1.001	.569	.784	.999	1.214		1.000	1.000
70°	1.055		.636	.851	1.066	1.281	1.025	1.016
73°	1.103			.705	.920	1.135	1.048	1.032

Entering Air °F DB	Total Heating Capacity	Heat of Absorption	Power Input
60°	1.051	1.119	.940
65°	1.027	1.057	.970
70°	1.001	1.000	1.000
75°	.971	.949	1.030
80°	.939	.901	1.060

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR FLOW

Total Entering CFM	Total Cool Capacity	Sensible Capacity	Heat of Rejection	Cool Input Watts	Total Heat Capacity	Heat of Absorption	Heat Input Watts
425	.991	.980	.990	.989	.991	1.022	1.013
435	.994	.986	.993	.993	.994	1.015	1.009
445	.997	.993	.997	.996	.997	1.007	1.004
455	1.000	1.000	1.000	1.000	1.000	1.000	1.000
465	1.003	1.007	1.003	1.004	1.003	.993	.996
475	1.006	1.014	1.007	1.007	1.006	.985	.991

ARI RATED: **10.4 EER, 3.3 COP**

Bold Face = ARI Conditions

PERFORMANCE CHARTS

814-019

COOLING PERFORMANCE TABLE / HEATING PERFORMANCE TABLE

Water Flow GPM	Entering Water Temp. °F	Total Cooling BTUH	Sensible Cooling BTUH	Heat of Rejection BTUH	Power Input Watts	Leaving Water Temp. °F	Total Heating BTUH	Heat of Absorption BTUH	Power Input Watts	Leaving Water Temp. °F	P.D. Feet of Water
2.3	60°	19000	13400	24529	1620	81.3°	18100	12707	1580	49.0°	6.13
3.6	60°	19000	13200	24256	1540	73.5°	19400	13803	1640	52.3°	13.73
4.9	60°	19000	13100	24120	1500	69.8°	20000	14300	1670	54.2°	23.91
6.2	60°	19000	13000	24051	1480	67.8°	20200	14466	1680	55.3°	36.52
2.3	70°	18700	13500	24604	1730	91.4°	20400	14632	1690	57.3°	6.13
3.6	70°	18900	13400	24531	1650	83.6°	21600	15661	1740	61.3°	13.73
4.9	70°	19000	13300	24495	1610	80.0°	22000	15993	1760	63.5°	23.91
6.2	70°	19000	13300	24427	1590	77.9°	22200	16159	1770	64.8°	36.52
2.3	85°	17900	13400	24351	1890	106.2°	23200	17022	1810	70.2°	6.13
3.6	85°	18400	13500	24578	1810	98.7°	23800	17520	1840	75.3°	13.73
4.9	85°	18600	13500	24541	1770	95.0°	24200	17886	1850	77.7°	23.91
6.2	85°	18600	13500	24573	1750	92.9°	24400	18052	1860	79.2°	36.52
2.3	90°	17600	13300	24221	1940	111.1°	23800	17520	1840	74.8°	6.13
3.6	90°	18100	13400	24448	1860	103.6°	24400	18052	1860	80.0°	13.73
4.9	90°	18300	13500	24512	1820	100.0°	24800	18418	1870	82.5°	23.91
6.2	90°	18400	13500	24543	1800	97.9°	24800	18384	1880	84.1°	36.52
2.3	95°	17200	13100	24026	2000	115.9°	24400	18052	1860	79.3°	6.13
3.6	95°	17800	13300	24319	1910	108.5°	25000	18584	1880	84.7°	13.73
4.9	95°	18000	13400	24416	1880	105.0°	25200	18749	1890	87.3°	23.91
6.2	95°	18100	13400	24414	1850	102.9°	25200	18749	1890	89.0°	36.52

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR TEMPERATURE

Entering Air °F WB	Total Cooling Capacity	Sensible Capacity Entering Air Dry Bulb 70°DB	75°DB	80°DB	85°DB	90°DB	Heat of Rejection	Power Input	Entering Air °F DB	Total Heating Capacity	Heat of Absorption	Power Input
61°	.875	.871	1.086				.896	.968	60°	1.050	1.088	.940
64°	.940	.719	.935	1.150	1.365		.954	.984	65°	1.027	1.044	.970
67°	1.000	.570	.785	1.000	1.215	1.430	1.000	1.000	70°	1.000	1.000	1.000
70°	1.054		.637	.852	1.067	1.282	1.043	1.016	75°	.971	.944	1.030
73°	1.102			.706	.921	1.136	1.084	1.032	80°	.938	.894	1.060

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR FLOW

Total Entering CFM	Total Cool Capacity	Sensible Capacity	Heat of Rejection	Cool Input Watts	Total Heat Capacity	Heat of Absorption	Heat Input Watts
460	.952	.894	.954	.945	.952	.907	1.069
520	.964	.920	.962	.959	.964	.932	1.051
580	.976	.947	.978	.973	.976	.950	1.034
640	.988	.973	.986	.986	.988	.975	1.017
700	1.000	1.000	1.000	1.000	1.000	1.000	1.000
760	1.012	1.027	1.011	1.014	1.012	1.019	.983

ARI RATED: **10.5 EER, 3.7 COP**

Bold Face = ARI Conditions

814-023

COOLING PERFORMANCE TABLE / HEATING PERFORMANCE TABLE

Water Flow GPM	Entering Water Temp. °F	Total Cooling BTUH	Sensible Cooling BTUH	Heat of Rejection BTUH	Power Input Watts	Leaving Water Temp. °F	Total Heating BTUH	Heat of Absorption BTUH	Power Input Watts	Leaving Water Temp. °F	P.D. Feet of Water
2.9	60°	23600	16600	29675	1780	80.5°	21000	15061	1740	49.6°	10.49
4.4	60°	23600	16400	29402	1700	73.4°	22400	16257	1800	52.6°	22.21
5.9	60°	23600	16200	29266	1660	69.9°	23000	16788	1820	54.3°	37.65
7.4	60°	23600	16200	29163	1630	67.9°	23400	17120	1840	55.4°	56.61
2.9	70°	23200	16800	29685	1900	90.5°	23800	17486	1850	57.9°	10.49
4.4	70°	23600	16700	29812	1820	83.6°	24800	18315	1900	61.7°	22.21
5.9	70°	23600	16600	29675	1780	80.1°	25400	18813	1930	63.7°	37.65
7.4	70°	23600	16500	29573	1750	78.0°	25600	18979	1940	64.9°	56.61
2.9	85°	22400	16700	29465	2070	105.3°	26800	20008	1990	71.2°	10.49
4.4	85°	22800	16800	29592	1990	98.5°	27600	20740	2010	75.6°	22.21
5.9	85°	23000	16800	29655	1950	95.0°	28000	21072	2030	77.9°	37.65
7.4	85°	23200	16800	29787	1930	93.1°	28200	21272	2030	79.3°	56.61
2.9	90°	22000	16500	29270	2130	110.2°	27600	20706	2020	75.7°	10.49
4.4	90°	22400	16700	29397	2050	103.4°	28200	21237	2040	80.3°	22.21
5.9	90°	22800	16800	29660	2010	100.1°	28600	21603	2050	82.7°	37.65
7.4	90°	22800	16800	29592	1990	98.0°	28600	21603	2050	84.2°	56.61
2.9	95°	21400	16400	28874	2190	114.9°	28200	21237	2040	80.4°	10.49
4.4	95°	22000	16600	29201	2110	108.3°	28800	21769	2060	85.1°	22.21
5.9	95°	22400	16700	29465	2070	105.0°	29000	21969	2060	87.6°	37.65
7.4	95°	22600	16700	29563	2040	103.0°	29200	22135	2070	89.0°	56.61

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR TEMPERATURE

Entering Air °F WB	Total Cooling Capacity	Sensible Capacity Entering Air Dry Bulb 70°DB	75°DB	80°DB	85°DB	90°DB	Heat of Rejection	Power Input	Entering Air °F DB	Total Heating Capacity	Heat of Absorption	Power Input
61°	.875	.871	1.086				.897	.968	60°	1.050	1.084	.940
64°	.940	.719	.935	1.150	1.365		.951	.984	65°	1.027	1.047	.970
67°	1.000	.570	.785	1.000	1.215	1.430	1.000	1.000	70°	1.000	1.000	1.000
70°	1.054		.637	.852	1.067	1.282	1.045	1.016	75°	.971	.951	1.030
73°	1.102			.706	.921	1.136	1.086	1.032	80°	.938	.893	1.060

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR FLOW

Total Entering CFM	Total Cool Capacity	Sensible Capacity	Heat of Rejection	Cool Input Watts	Total Heat Capacity	Heat of Absorption	Heat Input Watts
575	.961	.913	.958	.955	.961	.925	1.056
650	.974	.942	.971	.970	.974	.951	1.038
725	.987	.971	.985	.985	.987	.973	1.019
800	1.000	1.000	1.000	1.000	1.000	1.000	1.000
875	1.013	1.029	1.012	1.015	1.013	1.026	.981
920	1.026	1.058	1.025	1.030	1.026	1.047	.963

ARI RATED: **11.8 EER, 3.9 COP**

Bold Face = ARI Conditions

PERFORMANCE CHARTS

814-027

COOLING PERFORMANCE TABLE / HEATING PERFORMANCE TABLE

Water Flow GPM	Entering Water Temp. °F	Total Cooling BTUH	Sensible Cooling BTUH	Heat of Rejection BTUH	Power Input Watts	Leaving Water Temp. °F	Total Heating BTUH	Heat of Absorption BTUH	Power Input Watts	Leaving Water Temp. °F	P.D. Feet of Water
3.4	60°	27600	19500	34870	2130	80.5°	24600	17569	2060	49.7°	4.18
5.2	60°	27800	19200	34728	2030	73.4°	26200	18930	2130	52.7°	8.98
7.0	60°	27800	19100	34558	1980	69.9°	26800	19394	2170	54.5°	15.34
8.8	60°	27800	19000	34455	1950	67.8°	27200	19760	2180	55.5°	23.16
3.4	70°	27200	19700	34948	2270	90.6°	27600	20091	2200	58.2°	4.18
5.2	70°	27600	19600	35006	2170	83.5°	29000	21287	2260	61.8°	8.98
7.0	70°	27600	19500	34836	2120	80.0°	29600	21818	2280	63.8°	15.34
8.8	70°	27800	19400	34933	2090	77.9°	30000	22150	2300	65.0°	23.16
3.4	85°	26200	19600	34664	2480	105.4°	31200	23179	2350	71.4°	4.18
5.2	85°	26800	19700	34923	2380	98.4°	32200	24043	2390	75.8°	8.98
7.0	85°	27000	19700	34952	2330	95.0°	32600	24375	2410	78.0°	15.34
8.8	85°	27200	19700	35050	2300	93.0°	32800	24575	2410	79.4°	23.16
3.4	90°	25800	19400	34469	2540	110.3°	32200	24043	2390	75.9°	4.18
5.2	90°	26400	19600	34762	2450	103.4°	33000	24741	2420	80.5°	8.98
7.0	90°	26600	19700	34791	2400	99.9°	33200	24906	2430	82.9°	15.34
8.8	90°	26800	19700	34889	2370	97.9°	33400	25072	2440	84.3°	23.16
3.4	95°	25200	19200	34142	2620	115.1°	33000	24741	2420	80.4°	4.18
5.2	95°	26000	19500	34601	2520	108.3°	33600	25272	2440	85.3°	8.98
7.0	95°	26200	19600	34630	2470	104.9°	33800	25438	2450	87.7°	15.34
8.8	95°	26400	19600	34728	2440	102.9°	34000	25638	2450	89.2°	23.16

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR TEMPERATURE

Entering Air °F WB	Total Cooling Capacity	Sensible Capacity Entering Air Dry Bulb 70°DB	75°DB	80°DB	85°DB	90°DB	Heat of Rejection	Power Input	Entering Air °F DB	Total Heating Capacity	Heat of Absorption	Power Input
61°	.875	.871	1.086				.898	.968	60°	1.050	1.091	.940
64°	.940	.719	.935	1.150	1.365		.950	.984	65°	1.027	1.045	.970
67°	1.000	.570	.785	1.000	1.215	1.430	1.000	1.000	70°	1.000	1.000	1.000
70°	1.054		.637	.852	1.067	1.282	1.047	1.016	75°	.971	.944	1.030
73°	1.102			.706	.921	1.136	1.087	1.032	80°	.938	.894	1.060

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR FLOW

Total Entering CFM	Total Cool Capacity	Sensible Capacity	Heat of Rejection	Cool Input Watts	Total Heat Capacity	Heat of Absorption	Heat Input Watts
680	.960	.912	.961	.955	.960	.926	1.057
770	.973	.941	.973	.970	.973	.944	1.038
860	.987	.971	.990	.985	.987	.972	1.019
950	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1040	1.013	1.029	1.013	1.015	1.013	1.027	.981
990	1.027	1.059	1.030	1.030	1.027	1.045	.962

ARI RATED: **11.6 EER, 3.8 COP**

Bold Face = ARI Conditions

814-031

COOLING PERFORMANCE TABLE / HEATING PERFORMANCE TABLE

Water Flow GPM	Entering Water Temp. °F	Total Cooling BTUH	Sensible Cooling BTUH	Heat of Rejection BTUH	Power Input Watts	Leaving Water Temp. °F	Total Heating BTUH	Heat of Absorption BTUH	Power Input Watts	Leaving Water Temp. °F	P.D. Feet of Water
4.2	60°	31800	22400	40742	2620	79.4°	33000	23512	2780	48.8°	4.82
6.2	60°	32000	22000	40601	2520	73.1°	35000	25239	2860	51.9°	9.72
8.2	60°	32000	21800	40396	2460	69.9°	35800	25834	2920	53.7°	16.07
10.2	60°	32000	21800	40294	2430	67.9°	36400	26366	2940	54.8°	23.80
4.2	70°	31400	22600	40956	2800	89.5°	37200	27098	2960	57.1°	4.82
6.2	70°	31600	22400	40815	2700	83.2°	38500	28124	3040	60.9°	9.72
8.2	70°	31800	22400	40810	2640	80.0°	39500	29056	3060	62.9°	16.07
10.2	70°	31800	22200	40674	2600	78.0°	40000	29488	3080	64.2°	23.80
4.2	85°	30200	22400	40644	3060	104.4°	42000	31147	3180	70.2°	4.82
6.2	85°	30800	22600	40902	2960	98.2°	43000	32010	3220	74.7°	9.72
8.2	85°	31000	22600	40898	2900	95.0°	43500	32442	3240	77.1°	16.07
10.2	85°	31200	22600	40961	2860	93.0°	43500	32442	3240	78.6°	23.80
4.2	90°	29600	22400	40385	3160	109.2°	43000	32010	3220	74.8°	4.82
6.2	90°	30400	22600	40776	3040	103.2°	44000	32874	3260	79.4°	9.72
8.2	90°	30600	22600	40771	2980	99.9°	44500	33374	3260	81.9°	16.07
10.2	90°	30800	22600	40902	2960	98.0°	44500	33305	3280	83.5°	23.80
4.2	95°	29000	22000	40058	3240	114.1°	44000	32874	3260	79.3°	4.82
6.2	95°	29800	22400	40449	3120	108.0°	45000	33805	3280	84.1°	9.72
8.2	95°	30200	22400	40712	3080	104.9°	45000	33805	3280	86.8°	16.07
10.2	95°	30400	22600	40776	3040	103.0°	45500	34237	3300	88.3°	23.80

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR TEMPERATURE

Entering Air °F WB	Total Cooling Capacity	Sensible Capacity Entering Air Dry Bulb 70°DB	75°DB	80°DB	85°DB	90°DB	Heat of Rejection	Power Input	Entering Air °F DB	Total Heating Capacity	Heat of Absorption	Power Input
61°	.875	.871	1.086				.900	.968	60°	1.050	1.088	.940
64°	.940	.719	.935	1.150	1.365		.954	.984	65°	1.027	1.046	.970
67°	1.000	.570	.785	1.000	1.215	1.430	1.000	1.000	70°	1.000	1.000	1.000
70°	1.054		.637	.852	1.067	1.282	1.051	1.016	75°	.971	.950	1.030
73°	1.102			.706	.921	1.136	1.088	1.032	80°	.938	.895	1.060

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR FLOW

Total Entering CFM	Total Cool Capacity	Sensible Capacity	Heat of Rejection	Cool Input Watts	Total Heat Capacity	Heat of Absorption	Heat Input Watts
800	.962	.915	.966	.956	.962	.929	1.055
900	.975	.944	.978	.971	.975	.950	1.036
1000	.987	.972	.990	.985	.987	.971	1.018
1100	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1200	1.013	1.028	1.015	1.015	1.013	1.019	.982
1140	1.025	1.056	1.027	1.029	1.025	1.046	.964

ARI RATED: **10.7 EER, 3.8 COP**

Bold Face = ARI Conditions

PERFORMANCE CHARTS

814-036

COOLING PERFORMANCE TABLE / HEATING PERFORMANCE TABLE

Water Flow GPM	Entering Water Temp. °F	Total Cooling BTUH	Sensible Cooling BTUH	Heat of Rejection BTUH	Power Input Watts	Leaving Water Temp. °F	Total Heating BTUH	Heat of Absorption BTUH	Power Input Watts	Leaving Water Temp. °F	P.D. Feet of Water
4.6	60°	36874	26578	46838	2920	80.36°	34899	25191	2844	44.83°	1.90
7.0	60°	37017	26234	46523	2785	73.29°	37226	26325	3194	49.36°	4.04
9.4	60°	37023	26020	46305	2720	69.85°	38324	26814	3372	51.85°	6.86
11.8	60°	37006	25879	46155	2681	67.82°	38960	27082	3480	53.40°	10.33
4.6	70°	36362	26837	46982	3112	90.43°	39601	28323	3304	52.78°	1.90
7.0	70°	36758	26685	46919	2977	83.41°	41441	29032	3636	58.16°	4.04
9.4	70°	36887	26561	46824	2912	79.96°	42304	29313	3806	61.00°	6.86
11.8	70°	36944	26473	46748	2873	77.92°	42802	29457	3910	62.75°	10.33
4.6	85°	34920	26677	46523	3400	105.23°	45025	31346	4008	65.42°	1.90
7.0	85°	35693	26837	46838	3265	98.38°	46170	31472	4306	71.81°	4.04
9.4	85°	36007	26860	46928	3200	94.98°	46697	31465	4463	75.06°	6.86
11.8	85°	36174	26858	46961	3161	92.96°	46996	31437	4559	77.03°	10.33
4.6	90°	34259	26468	46189	3496	110.08°	46390	31896	4247	69.83°	1.90
7.0	90°	35158	26738	46630	3361	103.32°	47316	31848	4532	76.48°	4.04
9.4	90°	35534	26814	46782	3296	99.95°	47737	31753	4683	79.84°	6.86
11.8	90°	35737	26842	46852	3257	97.94°	47974	31672	4777	81.87°	10.33
4.6	95°	33508	26177	45766	3592	114.90°	47530	32211	4488	74.33°	1.90
7.0	95°	34533	26561	46333	3457	108.24°	48246	32001	4760	81.22°	4.04
9.4	95°	34971	26691	46546	3392	104.90°	48564	31823	4905	84.67°	6.86
11.8	95°	35210	26750	46653	3353	102.91°	48740	31693	4995	86.74°	10.33

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR TEMPERATURE

Entering Air °F WB	Total Cooling Capacity	Sensible Capacity Entering Air Dry Bulb 70°DB	75°DB	80°DB	85°DB	90°DB	Heat of Rejection	Power Input	Entering Air °F DB	Total Heating Capacity	Heat of Absorption	Power Input
62°	.948	.820	1.035				.968	.973	60°	1.034	1.047	.978
64°	.969	.719	.934	1.149			.980	.984	65°	1.016	1.022	.989
67°	1.000	.569	.784	.999	1.214		1.000	1.000	70°	1.000	1.000	1.000
70°	1.031		.636	.851	1.066	1.281	1.020	1.016	75°	.987	.979	1.011
73°	1.064			.705	.920	1.135	1.039	1.032	80°	.977	.961	1.022

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR FLOW

Total Entering CFM	Total Cool Capacity	Sensible Capacity	Heat of Rejection	Cool Input Watts	Total Heat Capacity	Heat of Absorption	Heat Input Watts
900	.961	.913	.956	.955	.961	1.000	.989
1050	.978	.950	.975	.974	.978	1.000	.994
1150	.989	.975	.988	.987	.989	1.000	.997
1250	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1350	1.011	1.025	1.012	1.013	1.011	1.000	1.003
1500	1.028	1.062	1.031	1.032	1.028	1.000	1.008

ARI RATED: **11.3 EER, 3.9 COP**

Bold Face = ARI Conditions

814-042

COOLING PERFORMANCE TABLE / HEATING PERFORMANCE TABLE

Water Flow GPM	Entering Water Temp. °F	Total Cooling BTUH	Sensible Cooling BTUH	Heat of Rejection BTUH	Power Input Watts	Leaving Water Temp. °F	Total Heating BTUH	Heat of Absorption BTUH	Power Input Watts	Leaving Water Temp. °F	P.D. Feet of Water
5.1	60°	42474	30754	53867	3338	81.12°	44049	32530	3375	42.73°	1.77
7.9	60°	42668	30334	53502	3174	73.54°	47261	34193	3829	48.04°	3.89
10.7	60°	42678	30074	53245	3096	69.95°	48734	34893	4055	50.89°	6.72
13.5	60°	42660	29904	53070	3050	67.86°	49575	35273	4191	52.66°	10.22
5.1	70°	41853	31036	53991	3556	91.17°	50113	36692	3932	50.35°	1.77
7.9	70°	42358	30855	53937	3393	83.65°	52656	37767	4362	56.67°	3.89
10.7	70°	42517	30704	53829	3314	80.06°	53815	38187	4579	59.94°	6.72
13.5	70°	42585	30597	53741	3269	77.96°	54473	38402	4709	61.93°	10.22
5.1	85°	40141	30821	53398	3884	105.94°	57129	40799	4785	62.60°	1.77
7.9	85°	41114	31028	53811	3720	98.62°	58717	41066	5172	70.13°	3.89
10.7	85°	41496	31056	53926	3642	95.08°	59427	41096	5371	73.89°	6.72
13.5	85°	41695	31052	53969	3596	93.00°	59824	41083	5491	76.14°	10.22
5.1	90°	39363	30568	52992	3993	110.78°	58903	41585	5074	66.90°	1.77
7.9	90°	40492	30913	53562	3829	103.56°	60190	41608	5445	74.76°	3.89
10.7	90°	40948	31004	53751	3751	100.05°	60758	41520	5637	78.64°	6.72
13.5	90°	41190	31037	53837	3706	97.98°	61073	41435	5754	80.95°	10.22
5.1	95°	38481	30219	52483	4102	115.58°	60389	42071	5367	71.32°	1.77
7.9	95°	39766	30706	53208	3939	108.47°	61387	41867	5719	79.46°	3.89
10.7	95°	40296	30863	53472	3860	104.99°	61818	41666	5904	83.45°	6.72
13.5	95°	40582	30933	53601	3815	102.94°	62051	41516	6017	85.81°	10.22

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR TEMPERATURE

Entering Air °F WB	Total Cooling Capacity	Sensible Capacity Entering Air Dry Bulb 70°DB	75°DB	80°DB	85°DB	90°DB	Heat of Rejection	Power Input	Entering Air °F DB	Total Heating Capacity	Heat of Absorption	Power Input
62°	.928	.820	1.035				.966	.977	60°	1.040	1.031	.930
64°	.959	.719	.934	1.149			.981	.987	65°	1.025	1.064	.965
67°	1.000	.569	.784	.999	1.214		1.002	1.002	70°	1.000	1.000	1.000
70°	1.033		.636	.851	1.066	1.281	1.021	1.018	75°	.965	.940	1.035
73°	1.059			.705	.920	1.135	1.039	1.033	80°	.919	.883	1.070

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR FLOW

Total Entering CFM	Total Cool Capacity	Sensible Capacity	Heat of Rejection	Cool Input Watts	Total Heat Capacity	Heat of Absorption	Heat Input Watts
1000	.957	.904	.952	.950	.957	1.009	.994
1250	.981	.957	.979	.978	.981	1.004	.997
1350	.990	.979	.989	.989	.990	1.002	.999
1450	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1500	1.005	1.011	1.005	1.006	1.005	.999	1.001
1575	1.012	1.027	1.013	1.014	1.012	.997	1.002

ARI RATED: **11.4 EER, 4.1 COP**

Bold Face = ARI Conditions

PERFORMANCE CHARTS

814-048

COOLING PERFORMANCE TABLE / HEATING PERFORMANCE TABLE

Water Flow GPM	Entering Water Temp. °F	Total Cooling BTUH	Sensible Cooling BTUH	Heat of Rejection BTUH	Power Input Watts	Leaving Water Temp. °F	Total Heating BTUH	Heat of Absorption BTUH	Power Input Watts	Leaving Water Temp. °F	P.D. Feet of Water
6.2	60°	49667	36165	63377	4017	80.44°	46932	33567	3916	44.86°	2.84
9.4	60°	49863	35676	62944	3833	73.39°	50021	35044	4388	49.36°	6.00
12.6	60°	49873	35373	62645	3742	69.94°	51489	35683	4631	51.83°	10.16
15.8	60°	49852	35173	62440	3688	67.90°	52343	36033	4779	53.37°	15.28
6.2	70°	48974	36550	63585	4281	90.51°	53252	37726	4549	52.82°	2.84
9.4	70°	49509	36322	63491	4097	83.51°	55691	38639	4996	58.15°	6.00
12.6	70°	49685	36141	63358	4006	80.06°	56843	39000	5228	60.98°	10.16
15.8	70°	49763	36014	63252	3952	78.01°	57511	39184	5370	62.72°	15.28
6.2	85°	47025	36375	62987	4677	105.32°	60539	41707	5518	65.47°	2.84
9.4	85°	48067	36573	63400	4493	98.49°	62050	41850	5919	71.80°	6.00
12.6	85°	48493	36595	63517	4402	95.06°	62753	41827	6131	75.04°	10.16
15.8	85°	48720	36585	63560	4348	93.05°	63153	41782	6262	77.01°	15.28
6.2	90°	46132	36104	62545	4809	110.18°	62371	42417	5847	69.88°	2.84
9.4	90°	47344	36452	63128	4625	103.43°	63592	42330	6230	76.47°	6.00
12.6	90°	47853	36547	63328	4534	100.05°	64152	42192	6434	79.82°	10.16
15.8	90°	48129	36579	63420	4480	98.03°	64469	42076	6561	81.84°	15.28
6.2	95°	45118	35720	61981	4941	114.99°	63900	42810	6179	74.39°	2.84
9.4	95°	46499	36224	62733	4757	108.35°	64841	42511	6543	81.20°	6.00
12.6	95°	47092	36393	63017	4666	105.00°	65264	42263	6739	84.64°	10.16
15.8	95°	47417	36468	63159	4612	102.99°	65499	42082	6861	86.71°	15.28

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR TEMPERATURE

Entering Air °F WB	Total Cooling Capacity	Sensible Capacity Entering Air Dry Bulb 70°DB	75°DB	80°DB	85°DB	90°DB	Heat of Rejection	Power Input	Entering Air °F DB	Total Heating Capacity	Heat of Absorption	Power Input
62°	.915	.820	1.035				.940	.947	60°	1.007	1.075	.953
64°	.951	.719	.934	1.149			.964	.968	65°	1.004	1.036	.977
67°	1.000	.569	.784	.999	1.214		1.000	.998	70°	1.000	1.000	1.000
70°	1.043		.636	.851	1.066	1.281	1.034	1.031	75°	.995	.966	1.024
73°	1.080			.705	.920	1.135	1.066	1.062	80°	.989	.934	1.047

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR FLOW

Total Entering CFM	Total Cool Capacity	Sensible Capacity	Heat of Rejection	Cool Input Watts	Total Heat Capacity	Heat of Absorption	Heat Input Watts
1400	.972	.938	.969	.968	.972	.992	.986
1500	.980	.956	.978	.977	.980	.994	.990
1600	.988	.973	.987	.986	.988	.996	.994
1750	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1950	1.016	1.035	1.018	1.018	1.016	1.005	1.008
2130	1.030	1.067	1.034	1.035	1.030	1.009	1.015

ARI RATED: **11.0 EER, 3.8 COP**

Bold Face = ARI Conditions

814-060

COOLING PERFORMANCE TABLE / HEATING PERFORMANCE TABLE

Water Flow GPM	Entering Water Temp. °F	Total Cooling BTUH	Sensible Cooling BTUH	Heat of Rejection BTUH	Power Input Watts	Leaving Water Temp. °F	Total Heating BTUH	Heat of Absorption BTUH	Power Input Watts	Leaving Water Temp. °F	P.D. Feet of Water
8.0	60°	63509	45813	80728	5045	80.18°	61819	44221	5156	44.55°	2.90
12.2	60°	63749	45215	80178	4814	73.14°	65911	46166	5785	49.19°	6.19
16.4	60°	63757	44844	79800	4701	69.73°	67836	46998	6105	51.73°	10.54
20.6	60°	63728	44600	79543	4634	67.72°	68950	47452	6299	53.31°	15.89
8.0	70°	62637	46273	80990	5377	90.25°	70115	49681	5987	52.47°	2.90
12.2	70°	63310	46003	80873	5146	83.26°	73348	50880	6583	57.98°	6.19
16.4	70°	63529	45787	80706	5033	79.84°	74861	51347	6889	60.87°	10.54
20.6	70°	63625	45633	80574	4966	77.82°	75732	51585	7075	62.65°	15.89
8.0	85°	60167	46015	80219	5875	105.05°	79677	54907	7258	65.08°	2.90
12.2	85°	61489	46281	80751	5644	98.24°	81687	55085	7794	71.61°	6.19
16.4	85°	62024	46318	80901	5531	94.87°	82610	55049	8075	74.93°	10.54
20.6	85°	62307	46312	80956	5464	92.86°	83133	54986	8247	76.93°	15.89
8.0	90°	59033	45660	79652	6041	109.91°	82083	55840	7689	69.48°	2.90
12.2	90°	60571	46117	80400	5810	103.18°	83707	55713	8202	76.28°	6.19
16.4	90°	61212	46243	80656	5697	99.84°	84443	55523	8473	79.70°	10.54
20.6	90°	61558	46289	80773	5630	97.84°	84857	55369	8640	81.76°	15.89
8.0	95°	57744	45165	78930	6208	114.73°	84089	56358	8125	73.98°	2.90
12.2	95°	59498	45817	79894	5976	108.10°	85343	55947	8613	81.01°	6.19
16.4	95°	60245	46036	80255	5863	104.79°	85899	55614	8874	84.52°	10.54
20.6	95°	60653	46135	80435	5796	102.81°	86206	55372	9034	86.63°	15.89

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR TEMPERATURE

Entering Air °F WB	Total Cooling Capacity	Sensible Capacity Entering Air Dry Bulb 70°DB	75°DB	80°DB	85°DB	90°DB	Heat of Rejection	Power Input	Entering Air °F DB	Total Heating Capacity	Heat of Absorption	Power Input
62°	.915	.820	1.035				.950	.960	60°	1.013	1.081	.951
64°	.951	.719	.934	1.149			.969	.974	65°	1.007	1.039	.976
67°	1.000	.569	.784	.999	1.214		.997	.996	70°	1.000	1.000	1.000
70°	1.043		.636	.851	1.066	1.281	1.023	1.017	75°	.994	.964	1.025
73°	1.080			.705	.920	1.135	1.048	1.038	80°	.987	.930	1.049

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR FLOW

Total Entering CFM	Total Cool Capacity	Sensible Capacity	Heat of Rejection	Cool Input Watts	Total Heat Capacity	Heat of Absorption	Heat Input Watts
1700	.979	.954	.977	.976	.979	.998	.993
1750	.983	.961	.981	.980	.983	.998	.994
1850	.990	.977	.988	.988	.990	.999	.996
2000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2100	1.007	1.016	1.008	1.008	1.007	1.001	1.003
2200	1.014	1.031	1.016	1.016	1.014	1.001	1.005

ARI RATED: **11.2 EER, 3.8 COP**

Bold Face = ARI Conditions

PERFORMANCE CHARTS

814-096

COOLING PERFORMANCE TABLE

Water Flow GPM	Entering Water Temp. °F	Total Cooling BTUH	Sensible Cooling BTUH	Heat of Rejection BTUH	Power Input Watts	Leaving Water Temp. °F
12.1	60°	99261	72368	126771	8060	80.95°
18.7	60°	99698	71345	125873	7669	73.46°
25.3	60°	99719	70719	125256	7482	69.90°
31.9	60°	99675	70311	124837	7372	67.83°
12.1	70°	97826	73098	127138	8588	91.01°
18.7	70°	98983	72630	126960	8197	83.58°
25.3	70°	99347	72259	126686	8010	80.01°
31.9	70°	99504	71998	126469	7900	77.93°
12.1	85°	93854	72686	125869	9380	105.80°
18.7	85°	96089	73124	126769	8989	98.56°
25.3	85°	96970	73171	127011	8802	95.84°
31.9	85°	97429	73150	127096	8692	92.97°
12.1	90°	92045	72121	124961	9644	110.65°
18.7	90°	94639	72880	126220	9253	103.50°
25.3	90°	95692	73075	126634	9066	100.01°
31.9	90°	96252	73140	126820	8956	97.95°
12.1	95°	89993	71330	123810	9908	115.46°
18.7	95°	92947	72421	125429	9517	108.41°
25.3	95°	94171	72769	126015	9330	104.96°
31.9	95°	94832	72922	126302	9220	102.92°

HEATING PERFORMANCE TABLE

Total Heating BTUH	Heat of Absorption BTUH	Power Input Watts	Leaving Water Temp. °F	P.D. Feet of Water
93416	66911	7766	44.56°	2.84
99990	70069	8767	49.31°	6.23
103022	71389	9268	51.86°	10.73
104759	72101	9569	53.43°	16.28
106153	75312	9036	52.45°	2.84
111343	77271	9883	58.09°	6.23
113724	78017	10462	61.01°	10.73
115081	78391	10750	62.78°	16.28
120863	83385	10981	65.02°	2.84
124082	83710	11829	71.73°	6.23
125533	83665	12267	75.08°	10.73
126347	83572	12533	77.08°	16.28
124571	84838	11642	69.41°	2.84
127171	84676	12451	76.40°	6.23
128329	84391	12874	79.86°	10.73
128972	84155	13131	81.91°	16.28
127670	85655	12310	73.90°	2.84
129676	85042	13078	81.13°	6.23
130550	84532	13483	84.68°	10.73
131027	84161	13731	86.79°	16.28

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR TEMPERATURE

Entering Air °F WB	Total Cooling Capacity	Sensible Capacity Entering Air Dry Bulb 70°DB	75°DB	80°DB	85°DB	90°DB	Heat of Rejection	Power Input
62°	.915	.820	1.035				.940	.947
64°	.951	.719	.934	1.149			.964	.968
67°	1.000	.569	.784	.999	1.214		1.000	.999
70°	1.043		.636	.851	1.066	1.281	1.034	1.031
73°	1.080			.705	.920	1.135	1.066	1.062

Entering Air °F DB	Total Heating Capacity	Heat of Absorption	Power Input
60°	1.007	1.075	.953
65°	1.004	1.036	.977
70°	1.000	1.000	1.000
75°	.995	.966	1.024
80°	.989	.934	1.047

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR FLOW

Total Entering CFM	Total Cool Capacity	Sensible Capacity	Heat of Rejection	Cool Input Watts
3000	.984	.964	.982	.981
3200	.992	.982	.991	.991
3300	.996	.991	.995	.995
3400	1.000	1.000	1.000	1.000
3800	1.016	1.036	1.018	1.019
4200	1.033	1.073	1.037	1.038

Total Heat Capacity	Heat of Absorption	Heat Input Watts
.984	.995	.992
.992	.998	.996
.996	.999	.998
1.000	1.000	1.000
1.015	1.005	1.008
1.033	1.010	1.016

ARI RATED: **11.0 EER, 3.8 COP**

Bold Face=ARI Conditions

814-120

COOLING PERFORMANCE TABLE

Water Flow GPM	Entering Water Temp. °F	Total Cooling BTUH	Sensible Cooling BTUH	Heat of Rejection BTUH	Power Input Watts	Leaving Water Temp. °F
15.9	60°	126990	91635	161460	10100	80.31°
24.3	60°	127484	90431	160357	9632	73.20°
32.7	60°	127501	89686	159598	9404	69.76°
41.1	60°	127443	89196	159081	9270	67.74°
15.9	70°	125231	92541	161969	10764	90.37°
24.3	70°	126599	92003	161740	10296	83.31°
32.7	70°	127042	91569	161406	10069	79.87°
41.1	70°	127235	91261	161140	9934	77.84°
15.9	85°	120267	92005	160405	11760	105.18°
24.3	85°	122946	92551	161487	11292	98.29°
32.7	85°	124025	92626	161791	11065	94.90°
41.1	85°	124596	92614	161902	10930	92.88°
15.9	90°	117992	91289	159263	12092	110.03°
24.3	90°	121108	92219	160782	11625	103.23°
32.7	90°	122400	92475	161299	11397	99.87°
41.1	90°	123096	92568	161535	11263	97.86°
15.9	95°	115406	90291	157811	12425	114.85°
24.3	95°	118959	91616	159767	11957	108.15°
32.7	95°	120464	92058	160496	11729	104.82°
41.1	95°	121286	92259	160858	11595	102.83°

HEATING PERFORMANCE TABLE

Total Heating BTUH	Heat of Absorption BTUH	Power Input Watts	Leaving Water Temp. °F	P.D. Feet of Water
123488	88365	10291	44.47°	3.00
131760	92304	11561	49.16°	6.44
135638	93982	12205	51.70°	10.99
137879	94896	12594	53.29°	16.58
140111	99312	11954	52.38°	3.00
146648	101742	13157	57.93°	6.44
149696	102686	13774	60.84°	10.99
151448	103164	14147	62.63°	16.58
159280	109801	14497	64.96°	3.00
163344	110169	15580	71.56°	6.44
165204	110099	16146	74.90°	10.99
166257	109973	16491	76.91°	16.58
164105	111678	15361	69.36°	3.00
167390	111429	16397	76.22°	6.44
168875	111050	16943	79.67°	10.99
169706	110739	17277	81.74°	16.58
168131	112723	16234	73.85°	3.00
170668	111901	17218	80.95°	6.44
171790	111233	17743	84.49°	10.99
172407	110748	18066	86.61°	16.58

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR TEMPERATURE

Entering Air °F WB	Total Cooling Capacity	Sensible Capacity Entering Air Dry Bulb 70°DB	75°DB	80°DB	85°DB	90°DB	Heat of Rejection	Power Input
62°	.915	.820	1.035				.950	.961
64°	.951	.719	.934	1.149			.970	.975
67°	1.000	.569	.784	.999	1.214		.997	.996
70°	1.043		.636	.851	1.066	1.281	1.023	1.018
73°	1.080			.705	.920	1.135	1.048	1.039

Entering Air °F DB	Total Heating Capacity	Heat of Absorption	Power Input
60°	1.013	1.081	.951
65°	1.007	1.039	.976
70°	1.000	1.000	1.000
75°	.994	.964	1.025
80°	.987	.930	1.049

CORRECTION FACTORS FOR VARIATION IN ENTERING AIR FLOW

Total Entering CFM	Total Cool Capacity	Sensible Capacity	Heat of Rejection	Cool Input Watts
3200	.972	.938	.969	.968
3400	.979	.954	.977	.976
3600	.986	.969	.984	.984
4000	1.000	1.000	1.000	1.000
4200	1.007	1.016	1.008	1.008
4400	1.014	1.031	1.016	1.016

Total Heat Capacity	Heat of Absorption	Heat Input Watts
.972	.997	.990
.979	.998	.993
.986	.999	.995
1.000	1.000	1.000
1.007	1.001	1.003
1.014	1.001	1.005

ARI RATED: **11.2 EER, 3.8 COP**

Bold Face=ARI Conditions

GENERAL DATA CHART

Model Number	Voltages	Phase	Min. CRC Ampacity	Max. Fuse	Comp LRA (ea.)	Comp RLA (ea.)	Blower FLA	Total FLA	Blower Diameter	Blower Width	Blower HP	Type	Ship Wt. Lbs.
814-009	208/230	1	5.5	15	20.0	3.9	0.6	4.5	6.75	6.5	1/12	A	130
	265		4.2		16.0	3.0	0.4	3.4					
814-011	208/230	1	6.7	15	31.0	4.8	0.7	5.5	6.75	6.5	1/12	A	135
	265		5.3		22.9	3.8	0.6	4.4					
814-013	208/230	1	8.0	15	31.0	5.8	0.7	6.5	6.75	6.5	1/10	A	140
	265		6.5		27.0	4.7	0.6	5.3					
814-019	208/230	1	11.5	20	43.3	8.5	0.9	9.4	7.625	7.0	1/8	A	205
	265		9.6	15	36.0	7.1	0.7	7.8					
814-023	208/230	1	14.9	25	48.0	10.6	1.6	12.2	7.625	7.0	1/5	A	220
	265		12.6	20	37.0	9.3	0.9	10.3					
814-027	208/230	1	16.0	25	54.0	11.5	1.6	13.1	9.0	7.0	1/5	A	235
	265		13.9	20	45.0	10.3	1.0	11.3					
814-031	208/230	1	21.3	35	65.0	15.3	2.2	17.5	9.0	7.0	1/3	A	245
	265	1	19.2	30	55.0	13.9	1.8	15.7					
	208/230	3	15.5	25	60.0	10.6	2.2	12.8					
	460	3	6.8	10	28.0	4.5	1.1	5.6					
814-036	208/230	1	22.6	35	78.0	15.5	3.2	18.7	9.0	7.0	1/2	B	235
	265	1	20.8	30	73.8	14.1	3.2	17.3					
	208/230	3	16.5	25	59.5	10.6	3.2	13.8					
	460	3	7.6	15	30.7	4.6	1.8	6.4					
814-042	208/230	1	25.3	40	88.0	17.7	3.2	20.8	9.0	8.0	1/2	B	240
	208/230	3	17.7	25	65.1	11.6	3.2	14.7					
	460	3	8.2	15	32.8	5.1	1.8	6.9					
814-048	208/230	1	32.3	50	95.4	21.5	5.4	26.9	10	10	3/4	B	300
	208/230	3	22.7	35	82.0	13.8	5.4	19.2					
	460	3	10.9	15	41.0	6.9	2.2	9.1					
814-060	208/230	1	40.3	60	125.0	27.6	5.8	33.4	12	10	1	B	357
	208/230	3	26.0	40	90.0	16.1	5.8	21.9					
	460	3	12.3	15	45.0	7.7	2.6	10.3					
814-096	208/230	3	36.8	50	82.0	13.8	5.7	33.3	10	10	1 1/2	C	665
	460		18.6	25	41.0	6.9	2.6	16.4					
814-120	208/230	3	46.4	60	90.0 (2)	16.1 (2)	7.5	39.7	(2) 12	(2) 10	2	C	675
	460		22.3	20	45.0 (2)	7.7 (2)	3.4	18.8					

A = Direct Drive, 2 Speed Taps
B = Direct Drive, 3 Speed Taps
C = Belt Drive, Variable Pitch Sheaves, 2 Compressors

BLOWER PERFORMANCE

BLOWER PERFORMANCE CHART

Model Number	Fan Speed	CFM at External Static Pressure I.W.G.									Minimum CFM
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	
814-009	High Low	420 380	340 305	290 —							290
814-011	High Low	420 380	340 305	290 —							290
814-013	High Low	475 415	455 395	425 —							395
814-019	High Low	780 700	750 680	710 640	660 —						640
814-023	High Low	920 800	830 740	750 660							660
814-027	High Low	990 870	930 820	870 770	820 —						770
814-031	High Low	1140 1100	1060 1010	980 930							930
814-036	High Medium Low	1500 1360 1290	1420 1310 1240	1340 1250 1190	1250 1190 1120	1170 1110 1030	1080 1000 —				900
814-042	High Medium Low	1580 1490 1210	1510 1415 1170	1425 1335 1125	1340 1255 1080	1250 1170 1040	1165 1085 1000				1000
814-048	High Medium Low	2130 1980 1810	2050 1900 1730	1960 1810 1650	1860 1720 1570	1750 1620 1490	1630 1520 1400				1400
814-060	High Medium Low	2200 2110 2060	2140 2050 2000	2080 2000 1940	2010 1940 1880	1940 1870 1820	1860 1800 1760	1700			1700

The blower performance is based on wet coil and clear filter.
For 208 Volt operation, static pressure is reduced by—.05 (High)
—.10 (Med.)
—.15 (Low)

SCFM Air Flow		EXTERNAL STATIC PRESSURE													
		.2	.3	.4	.5	.6	.7	.8	.9	1	1.1	1.2	1.3	1.4	1.5
Model 814-096															
3000	BHP	.79	.85	.91	.97	1.03	1.09	1.15	1.21	1.27	1.33	1.39	1.45	1.51	1.57
	RPM	998	1041	1084	1125	1165	1204	1242	1279	1316	1352	1387	1422	1456	1490
	TURNS OUT		5	4	3.5	2.5	2	1	.5	0					
3200	BHP	.93	1.00	1.06	1.12	1.19	1.25	1.31	1.38	1.44	1.51	1.57	1.64	1.70	1.76
	RPM	1046	1087	1127	1166	1205	1242	1279	1315	1350	1385	1419	1452	1485	1518
	TURNS OUT	5	4	3.5	2.5	2	1	.5	0						
3400	BHP	1.09	1.16	1.23	1.29	1.36	1.43	1.49	1.56	1.63	1.70	1.77	1.83	1.90	1.97
	RPM	1094	1133	1172	1209	1246	1282	1317	1351	1386	1419	1452	1484	1516	1548
	TURNS OUT	4	3	2.5	2	1	.5	0							
3600	BHP	1.27	1.34	1.41	1.48	1.55	1.62	1.69	1.76	1.83	1.91	1.98	—	—	—
	RPM	1143	1180	1216	1252	1287	1322	1356	1389	1422	1454	1486	—	—	—
	TURNS OUT	3	2.5	1.5	1	.5							—	—	—
3800	BHP	1.46	1.53	1.61	1.68	1.76	1.83	1.91	1.98	—	—	—	—	—	—
	RPM	1191	1227	1262	1296	1330	1363	1396	1428	—	—	—	—	—	—
	TURNS OUT	2	1.5	1	0					—	—	—	—	—	—
4000	BHP	1.67	1.75	1.82	1.90	1.98	—	—	—	—	—	—	—	—	—
	RPM	1240	1274	1307	1340	1373	—	—	—	—	—	—	—	—	—
	TURNS OUT	1	.5	0			—	—	—	—	—	—	—	—	—
4200	BHP	1.90	1.98	—	—	—	—	—	—	—	—	—	—	—	—
	RPM	1288	1321	—	—	—	—	—	—	—	—	—	—	—	—
	TURNS OUT	0		—	—	—	—	—	—	—	—	—	—	—	—
Model 814-120															
3200	BHP	.81	.85	.89	.93	.97	1.01	1.05	1.09	1.13	1.17	1.21	1.25	1.29	1.32
	RPM	996	1027	1057	1086	1114	1142	1169	1195	1221	1246	1271	1296	1319	1343
	TURNS OUT		5	4.5	4	3.5	3	2.5	2	1.5	1	.5	0		
3400	BHP	.95	.99	1.03	1.08	1.12	1.16	1.21	1.25	1.29	1.33	1.37	1.42	1.46	1.50
	RPM	1044	1073	1102	1130	1157	1184	1210	1236	1261	1285	1309	1333	1356	1379
	TURNS OUT	5	4.5	4	3.5	3	2.5	2	1.5	1	.5	0			
3600	BHP	1.10	1.15	1.19	1.24	1.29	1.33	1.38	1.42	1.47	1.51	1.56	1.60	1.65	1.69
	RPM	1092	1120	1147	1174	1201	1226	1252	1276	1300	1324	1348	1371	1393	1415
	TURNS OUT	4	3.5	3	2.5	2	1.5	1	.5	0					
3800	BHP	1.27	1.32	1.37	1.42	1.47	1.52	1.56	1.61	1.66	1.71	1.75	1.80	1.85	1.90
	RPM	1139	1166	1193	1219	1244	1269	1293	1317	1341	1364	1387	1409	1431	1452
	TURNS OUT	3	2.5	2	1.5	1	.5	0	0						
4000	BHP	1.46	1.51	1.56	1.61	1.67	1.72	1.77	1.82	1.87	1.92	1.97	2.02	—	—
	RPM	1187	1213	1238	1263	1288	1312	1336	1359	1382	1404	1426	1448	—	—
	TURNS OUT	2	1.5	1.5	1	.5	0							—	—
4200	BHP	1.66	1.72	1.77	1.83	1.88	1.94	1.99	2.04	—	—	—	—	—	—
	RPM	1234	1260	1284	1308	1332	1355	1378	1400	—	—	—	—	—	—
	TURNS OUT	1.5	1	.5	0					—	—	—	—	—	—
4400	BHP	1.89	1.92	2.00	—	—	—	—	—	—	—	—	—	—	—
	RPM	1282	1306	1330	—	—	—	—	—	—	—	—	—	—	—
	TURNS OUT	0			—	—	—	—	—	—	—	—	—	—	—

Special sheaves required, RPM above/below RPM range of standard sheaves.
2 hp motor required, BHP required is greater than standard motor.
Special sheaves and 2 hp motor required.

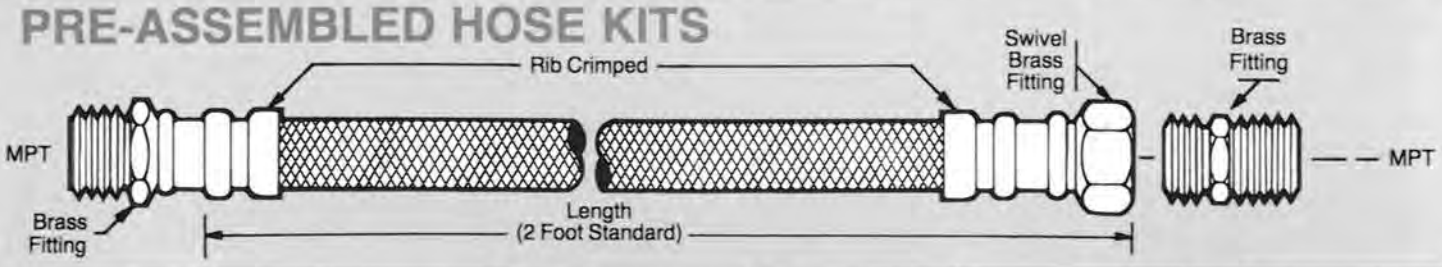
OPTIONS

814 CONTROL OPTIONS	009 thru 031 Units	036 thru 042 Units	048 thru 120 Units
THERMOSTATS			
Manual Changeover	X	X	X
Auto Changeover	X	X	X
Programmable Solid State	X	X	X
Thermostat Covers	X	X	X
UNIT MOUNTED RELAYS			
Random start relay	X	X	X
Shut down relay	X	X	X
Program relay	X	X	X
Demand relay	X	X	X
PLC RECEIVERS—UNIT MOUNTED		X	X
REMOTE PROGRAM CONTROL BOX			
Program relay	X	X	X
Night setback t'stat	X	X	X
Occupied override timer	X	X	X
BOILERLESS OPERATION	X	X	X
MASTER-SLAVE OPTION	X	X	X
RESET FROM POWER SUPPLY ONLY	X	X	X
SERVICE SIGNAL			
To thermostat	X	X	X
To remote alarm	X	X	X
Note: For 2 stage units, consult factory.			

814 REFRIGERANT CIRCUIT OPTIONS			
COOLING ONLY UNITS	X	X	X
CUPRO-NICKEL COIL	X	X	X
LOW TEMPERATURE ADDITION	15 and larger	X	X

814 CABINET AND PIPING OPTIONS			
AIR FLOW PATTERNS			
Left inlet—right discharge	X	Standard	Standard
Right inlet—left discharge	Standard	X	—
Right inlet—rear discharge	X	X	—
Left inlet—rear discharge	X	X	—
PRE-ASSEMBLED HOSE KITS	X	X	X

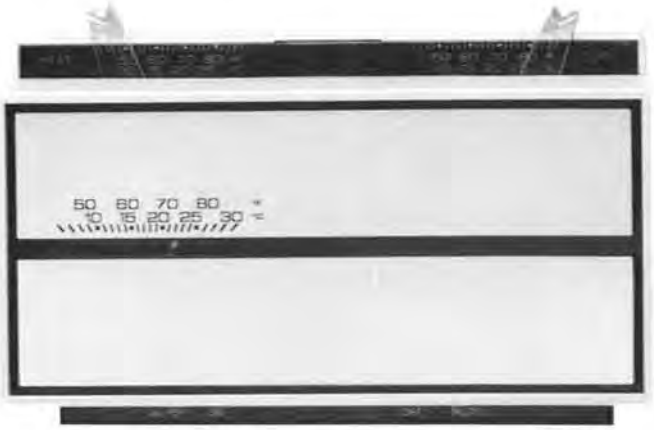
PRE-ASSEMBLED HOSE KITS



			Galvanized Braid			Stainless Steel Braid*		
Hose Size	Outside Diameter	Min. Bend Radius	Part Number	Operating Pressure (PSI)	Bursting Pressure (PSI)	Part Number	Operating Pressure (PSI)	Bursting Pressure (PSI)
½"	23/32"	2⅞"	AK5042	300	1200	AK5032	375	1500
¾"	1⅛"	4½"	AK7542	225	900	AK7532	300	1200
1"	1⅜"	5½"	AK1042	175	700	AK1042	225	900
1¼"	1 1/16"	6¾"	AK1212	150	600	AK1222	200	800

*Optional—on order only.

MANUAL AND AUTO CHANGEOVER THERMOSTATS



AT5854

AT4175

MCO Single Stage with integral setback—AT5930 with AQ5215 Subbase

ACO Single Stage with integral setback—AT5930 with AQ5315 Subbase

*Celsius scale available

*MCO Single Stage—AT4175
*ACO Single Stage—AT5854 with AQ5386 Subbase
*MCO Two Stage—AT5411 with AQ5204 Subbase
*ACO Two Stage—AT5411 with AQ5303 Subbase

PROGRAMMABLE SOLID STATE

MCO/ACO Single or Two Stage MASTERSTAT™—AT0901 (shown)

SECURITY COVERS

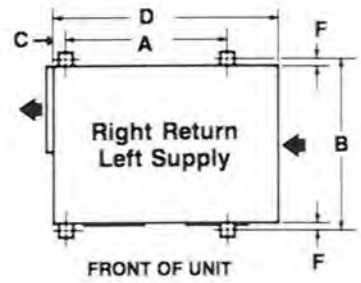
Locking cover with external thermometer—AM5417 (shown)
Locking cover with internal thermometer—AM5409
Universal plastic cover with lock—clear—AM5045
Universal plastic cover with lock—beige—AM5060

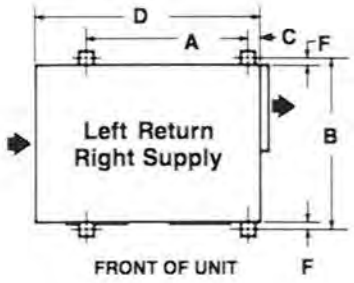
MASTER AUTOMATIC CONTROL SYSTEM LOOP CONTROL PANEL

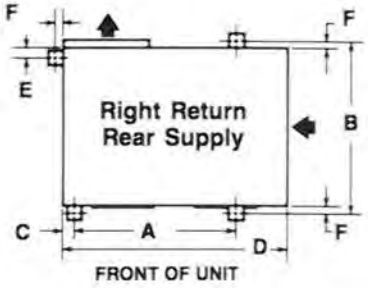
- Shutdown signal if loop problem
- Main/Standby Pump Control
- Boiler and Tower Control

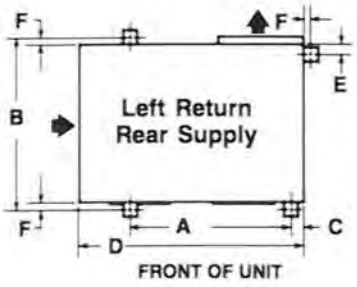
HANGER BRACKET DIMENSIONS

814-009, 011 and 013

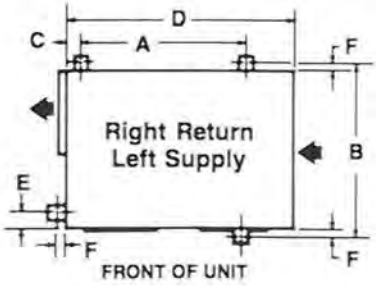


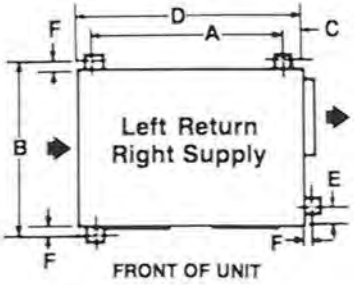


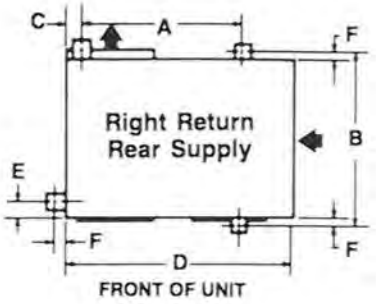


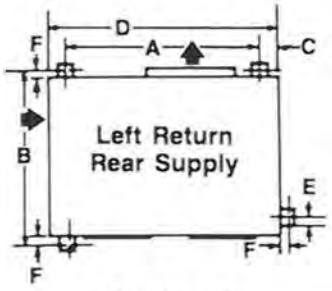


814-019, 023, 027 and 031







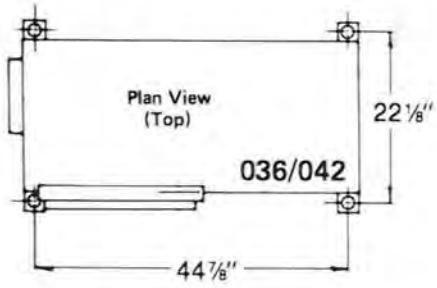


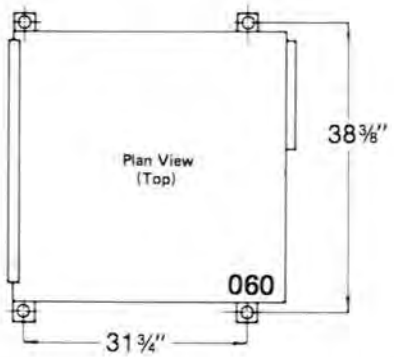
MODEL	DIMENSIONS					
	A	B	C	D	E	F
009, 011, 013	22 37/64	24	1¾	31½	1⅝	1
019, 023, 027 & 031	31¾	27	1⅜	41	1 9/16	1

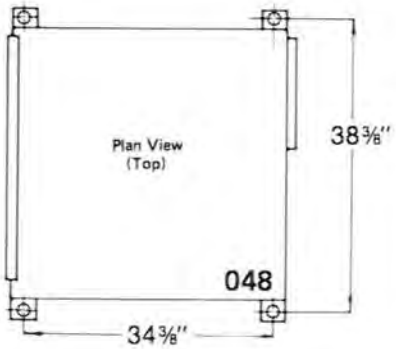
All dimensions in inches

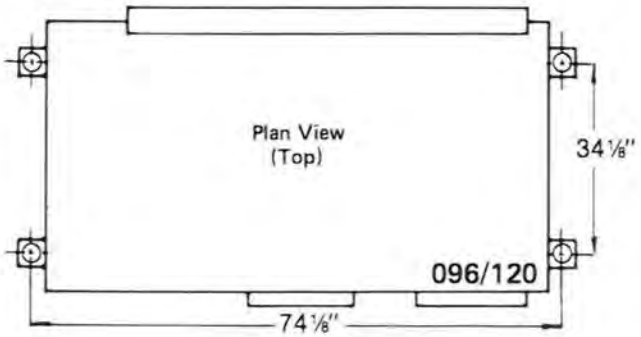
DIMENSIONS

814-036, 042, 048, 060, 096 and 120



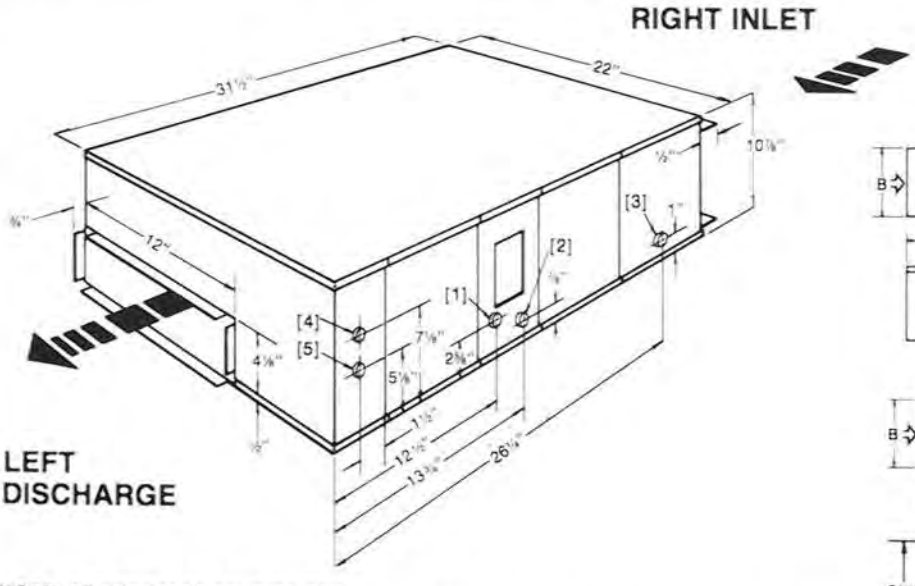






814-009, 011 and 013

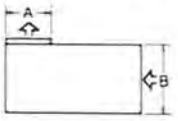
Dimensions	
A	12"
B	22"
C	1"



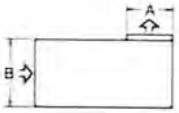
NOTE: All side panels are removable.

Legend:
[1] Water Inlet..... ½" FPT
[2] Water Outlet..... ½" FPT
[3] Condensate Drain ..... ¾" FPT
[4] High Voltage Access..... ⅞" Dia.
[5] Low Voltage Access ..... ⅞" Dia.
CAP Control Access Panel
BSP Blower Service Panel
CSP Compressor Service Panel

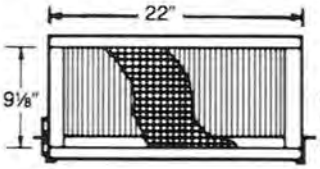
Left inlet—right discharge



Right inlet—rear discharge



Left inlet—rear discharge



FLANGED
FILTER RACK

Filter Size
10" × 22" × 1"
One (1) required.

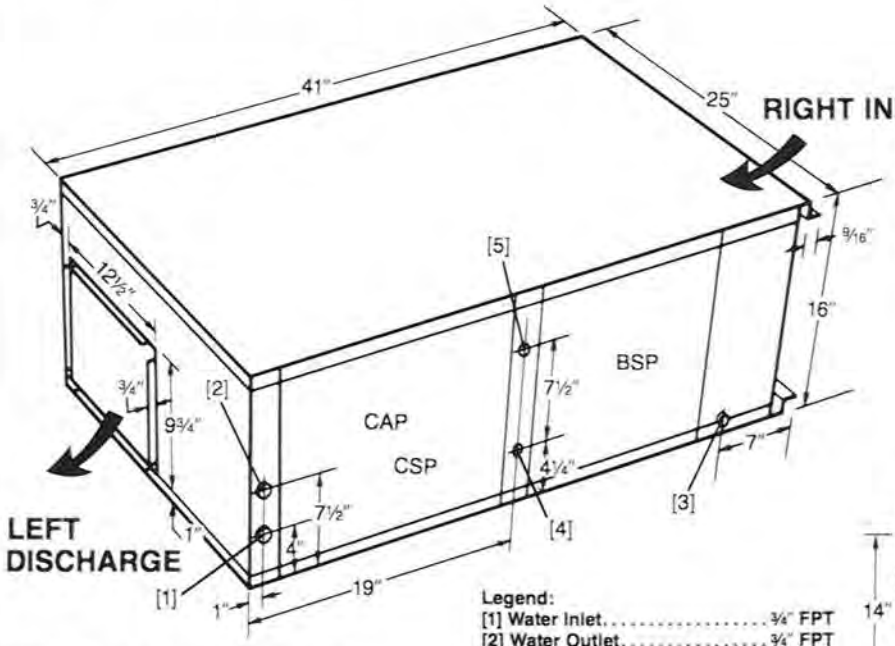
VIEW AT INLET

NOTE: Leave one end of duct collar open for filter removal.

DIMENSIONS

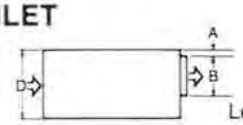
814-019, 023, 027 and 031

Dimensions	
A	¾"
B	12½"
C	¾"
D	25"

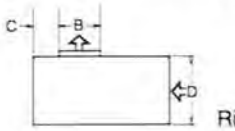


NOTE: All side panels are removable.

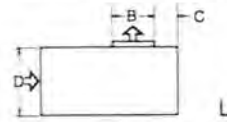
Legend:
[1] Water Inlet ..... ¾" FPT
[2] Water Outlet ..... ¾" FPT
[3] Condensate Drain ..... ¾" FPT
[4] High Voltage Access ..... ⅞" Dia.
[5] Low Voltage Access ..... ⅞" Dia.
CAP Control Access Panel
BSP Blower Service Panel
CSP Compressor Service Panel



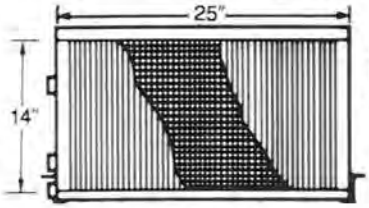
Left inlet—right discharge



Right inlet—rear discharge



Left inlet—rear discharge



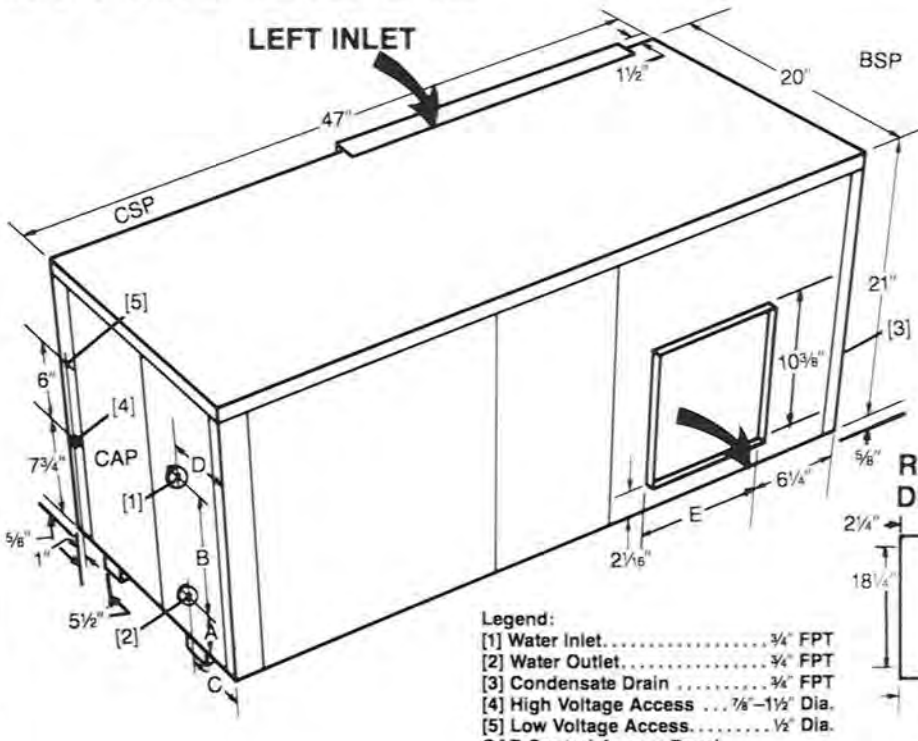
Filter Size
16" × 25" × 1"
One (1) required.

FLANGED
FILTER RACK

VIEW AT INLET
NOTE: Leave one end of duct collar open for filter removal.

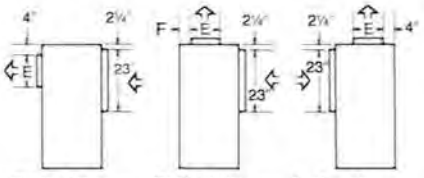
814-036 and 042

Dimensions		
	814-036	814-042
A	3⅝"	3⅝"
B	13⅜"	13⅜"
C	3¾"	3¾"
D	2¼"	2¼"
E	9⅜"	10¾"
F	4"	3½"



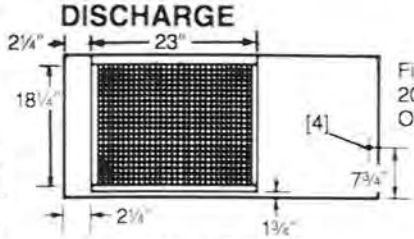
NOTE: All side panels are removable.

Legend:
[1] Water Inlet ..... ¾" FPT
[2] Water Outlet ..... ¾" FPT
[3] Condensate Drain ..... ¾" FPT
[4] High Voltage Access ... ⅞"–1½" Dia.
[5] Low Voltage Access ..... ½" Dia.
CAP Control Access Panel
BSP Blower Service Panel
CSP Compressor Service Panel



Right inlet— left discharge | Right inlet— rear discharge | Left inlet— rear discharge

RIGHT
DISCHARGE



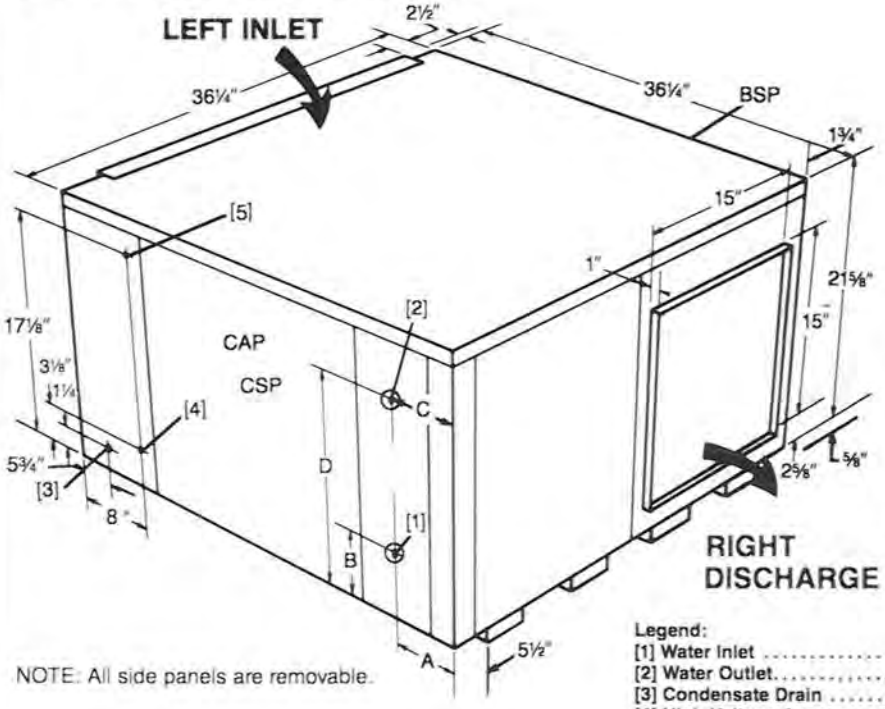
Filter Size
20" × 25" × 1"
One (1) required.

FLANGED
FILTER RACK

VIEW AT INLET
NOTE: Leave one end of duct collar open for filter removal.

814-048 and 060

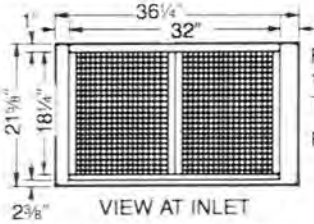
Dimensions		
	814-048	814-060
A	4⅞"	5⅛"
B	3⅞"	2 13/16"
C	3⅜"	1⅞"
D	17¾"	18 3/16"



RIGHT DISCHARGE

NOTE: All side panels are removable.

Legend:
[1] Water Inlet ..... 1" FPT
[2] Water Outlet..... 1" FPT
[3] Condensate Drain ..... ¾" FPT
[4] High Voltage Access ... ⅞"–1⅛" K.O.
[5] Low Voltage Access ..... ½" Dia.
CAP Control Access Panel
BSP Blower Service Panel
CSP Compressor Service Panel

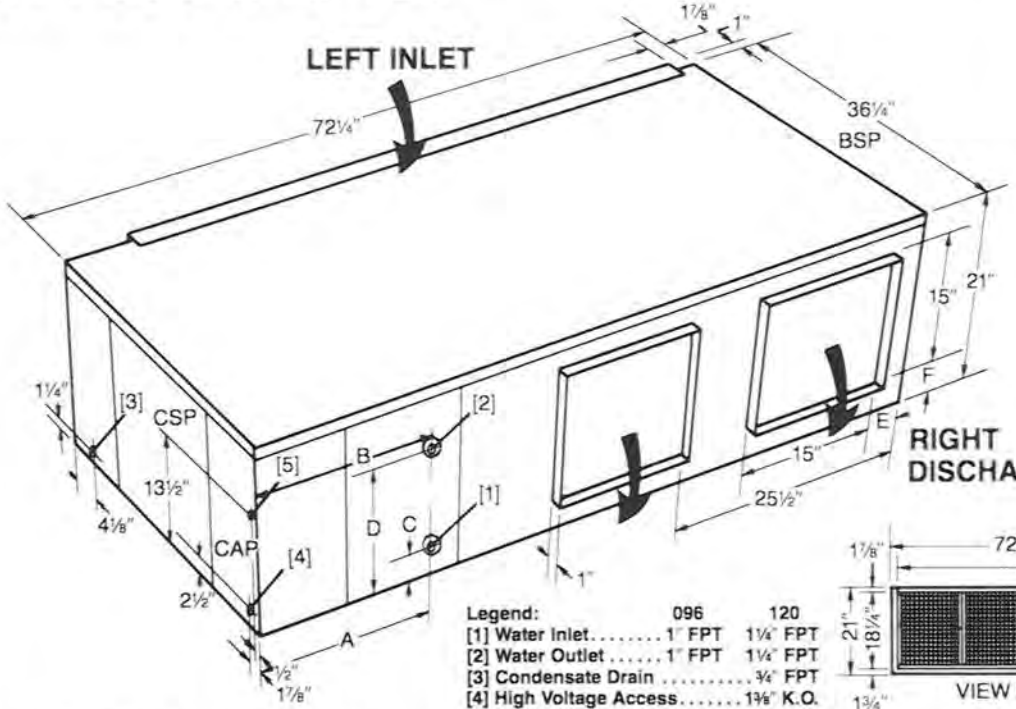


Filter Size
16" × 20" × 1"
Two (2) required.
FLANGED

NOTE: Leave one end of duct collar open for filter removal.

814-096 and 120

Dimensions		
	814-096	814-120
A	18¼"	18 5/16"
B	18¼"	22 5/16"
C	3¼"	3¼"
D	14⅜"	18⅝"
E	3¼"	2⅝"
F	3¼"	4¼"

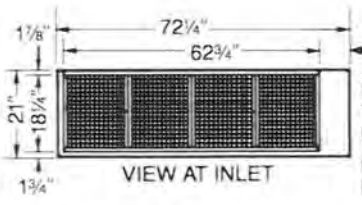


RIGHT DISCHARGE

NOTE: All side panels are removable.

Legend:	096	120
[1] Water Inlet	1" FPT	1¼" FPT
[2] Water Outlet	1" FPT	1¼" FPT
[3] Condensate Drain	¾" FPT	
[4] High Voltage Access	1⅜" K.O.	
[5] Low Voltage Access	½" Dia.	

CAP Control Access Panel
BSP Blower Service Panel
CSP Compressor Service Panel



Filter Size
16" × 20" × 1"
Four (4) required.
FLANGED
FILTER RACK

NOTE: Leave one end of duct collar open for filter removal.

SPECIFICATIONS

All units must carry ARI Certification (Per Standard 320) and UL listing via appropriate labeling. The Manufacturer's warranty, unit serviceability and project start-up assistance shall be given economic consideration in bids. Tabulated efficiency and capacity shall be considered minimum.

CABINETS

Cabinets shall be of heavy gauge galvanized steel. The interior side of the cabinet shall be insulated with ½" fiberglass. There shall be an insulated partition between the blower and compressor compartments to minimize compressor sound transmission. All water connections shall be female pipe threaded and mounted flush to the cabinet exterior. Service panels shall be easily removable, and sufficiently large to allow access to all components. All units over 14000 BTUH capacity shall allow sufficient service access to replace the compressor without unit removal. Standard construction shall include a factory mounted discharge air duct collar, return air filter rack and throw away filter.

HANGER/VIBRATION ISOLATOR KIT

The units shall be provided with hardware to facilitate suspended installation and minimize vibration.

REFRIGERANT CIRCUIT

Hermetic compressors shall be internally sprung and externally isolated to minimize sound transmission. Coaxial (tube in tube) refrigerant-to-water heat exchanger shall be of copper inner water tube and steel refrigerant outer tube design, rated to withstand 450 PSI refrigerant working pressure and 150 PSI water pressure.

The fin-tube refrigerant to air heat exchanger shall be of aluminum fin and copper tube construction rated to withstand 425 PSI refrigerant working pressure. A four-way solenoid activated refrigerant reversing valve shall allow heating operation should the solenoid fail to function. R-22 refrigerant charge shall be precisely metered and the refrigerant metering device (capillary tubes or expansion valves) shall be selected for optimum performance. Refrigerant high and low pressure cut-outs (36 and larger) shall protect the system against hazardous operation. All interconnecting tubing shall be copper. Access fittings shall be factory installed on the high and low refrigerant lines to facilitate field service.

ELECTRICAL

Single phase blower motors shall be PSC type. All units through five ton capacities shall be direct drive with multi-speed taps. All units over 5 ton nominal capacity shall be belt driven with variable-pitch sheaves. All compressor and blower motors shall be individually protected against current and/or heat overload. Blower motors shall be permanently lubricated.

CONTROLS

Unit control shall be 24 volt. The compressor lock-out circuit shall allow reset at the remote thermostat or via the main power breaker.

OPTIONS

REFRIGERANT CIRCUIT

CUPRO-NICKEL EXCHANGER The coaxial refrigerant-to-water exchanger shall be 90/10 cupro-nickel inner water tube and a steel refrigerant outer tube design.

COOLING ONLY MODELS The unit shall be designed to perform in the cooling mode only. Heating shall be supplied by others.

CONTROL OPTIONS

REMOTE THERMOSTAT The unit shall be provided with a 24 volt heat anticipating type wall thermostat,

a) manual changeover type. The thermostat shall be a manual changeover type with OFF, HEAT, COOL selector switch and a fan OFF, AUTO selector switch.

b) programmable solid state type. The manual changeover type thermostat shall be of solid state microelectronics designed to change temperature up to twice a day, five or seven days a week. The offset temperature difference shall be adjustable from 0 to 15 degrees.

c) auto changeover type. The thermostat shall be an auto changeover type with an OFF, AUTO selector switch and a fan OFF, AUTO selector switch.

THERMOSTAT COVER The thermostat shall be covered with a plastic cover with a tumbler type key lock designed to deter any unauthorized tampering with zone temperature.

PROGRAM RELAY The unit shall have a factory mounted relay that accepts a 24 or 115 volt signal from a centrally located time clock which establishes the occupied/unoccupied modes.

PROGRAM CONTROL BOX The unit shall have a factory wired, externally mounted program control box with a program relay. The box will accept an override timer. The zero to two hour timer shall override any occupied/unoccupied signal. The box will accept a thermostat to establish a night setback temperature with a minimum space temperature of 50°F.

RANDOM START RELAY The unit shall be provided with a factory mounted random start relay which randomly delays the normal start of the compressor.

POWER SUPPLY RESET The unit shall be wired so that the compressor lock-out circuit shall allow reset only from the main power breaker (Non UL Option).

Continuing engineering research results in steady improvements. Therefore, these ratings and specifications are subject to change without notice.

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ClimateMaster

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