

FROM :DesignPlace

FAX NO. :2084786830

Jul. 13 2006 11:00AM P2



811 West Cedar St. • Pocatello, Idaho 83201
(p) 208-478-4613 • (f) 208-478-4617 • www.bengllc.com

July 7, 2006

State of Idaho, Dept. of Water Resources
Erin Retelle
Sr. Water Resources Agent
322 E. Front St
PO Box 83720
Boise, ID 83720-0098

RE:Application for Permit 22-13529

Dear Mr. Retelle,

In response to the information, justification and calculations requested by your office, the following data should answer your questions. Based on the requirements for the selected equipment, 0.18 cfs of water needs to be used for heating and cooling purposes in the new Telephone Company offices located in Driggs. The units are Carrier ground source heat pumps, manufactured by Climate Master Corp., which use an open water loop as their heat source or heat sink depending on the time of year. I have attached a copy of the Mechanical Equipment Schedule from the design drawing M5.0 which lists the equipment, size, and water flow rates. The required water flows are listed in the "Notes" column of the list.

For the eight units to operate properly, a specific water flow must be maintained. Six (6) of the units have a capacity of 60,000 Btu/hr and require 15 gpm of water for proper operation. One of the units has a capacity of 48,000 Btu/hr with a requirement of 12 gpm. The last unit has a capacity of 30,000 Btu/hr with a requirement of 7.5 gpm. The minimum Coefficient of Performance for these units in accordance with ARI/ISO standards is 4.2. I have attached some pages from Carrier's operations manual with the flows highlighted.

This gives a minimum flow requirement of 109.5 gpm which converts to 0.24 cfs. Once this water flows through the equipment, it is returned to the ground through an injection well. None of the well water requested will be used for any domestic or irrigation purposes. It must be noted that these units will not require a constant water flow and will cycle on and off throughout the day. When the units are not operating, no water is used. A control valve opens and closes as the units cycle on and off.

I hope this letter supplies the information you need. Please contact me if you have any further questions.

Sincerely,

Christopher A. Jensen, P.E.
Senior Mechanical Engineer

FROM :DesignPlace

FAX NO. : 2084786830

Jul. 13 2006 11:00AM P3

MECHANICAL EQUIPMENT SCHEDULE

DESCRIPTION	MFG R & CAT. NO.	HEAT		COOL TONS	FAN			POWER				DIMENSIONS			WT LBS	OSA CFM	NOTES
		MBTU	KW		CFM	ESP	RPM	V	PH	MCA	MCOP	L	H	D			
HEAT PUMP UNIT	CLIMATE MASTER NO. GR060	56.0	-	5.0	2000	0.60	-	208 230	3	22.7	35	25.4	21.3	71.1	323	200	(1) 15 GPM 20.2' @ 1 PSI
			-		1100	-	-								170		
			-		2000	-	-								200		
			-		1740	-	-								175		
			-		1725	-	-								175		
	CLIMATE MASTER NO. GR048	46.0	-	4.5	1650	-	-			19.2	30	22.4	19.3	61.1	267	165	(1) 12 GPM 13.7' @ 1 PSI
	CLIMATE MASTER GR030	27.0	-	3.0	1000	-	-		1	20.6	30	22.4	19.3	52.1	229	100	(1) 7.5 GPM 8.5' @ 1 PSI
	CLIMATE MASTER NO. GR060	56.0	-	5.0	2000	-	-		3	22.7	35	25.4	21.3	71.1	323	200	(1) 15 GPM 20.2' @ 1 PSI
HEAT PUMP UNIT	BRYANT 614F024A	17.6	-	2.0	800	-	-	208 230	1	15	15	26	12	26	30	80	(3)

FROM :DesignPlace

FAX NO. :2084786830

Jul. 13 2006 11:01AM P4

Model number nomenclature



50RHC,RVC STANDARD EFFICIENCY

Aquazone™ Water Source Heat Pump
50RH - Horizontal Configuration
50RV - Vertical Configuration

Efficiency Type
C - Standard efficiency

Size - Nominal Tons

*006 - 1/2
009 - 3/4
012 - 1
018 - 1-1/2
024 - 2
030 - 2-1/2
036 - 3
1041 - 3-1/2
042 - 2-1/2
048 - 4
060 - 5

Airflow Configuration

50RHC Units

Code	Return	Discharge
S	Left	Right
E	Left	Back
Z	Right	Left
B	Right	Back

50RHC High-Static Units

Code	Return	Discharge
D	Left	Right
F	Left	Back
A	Right	Left
C	Right	Back

50RVC Units

Code	Return	Discharge
F	Front	Top
L	Left	Top
R	Right	Top

50RVC High-Static Units

Code	Return	Discharge
M	Left	Top
G	Right	Top
H	Front	Top

Controls

C - Complete C Microprocessor Control
D - Deluxe D Microprocessor Control
L - Complete C with LON
M - Deluxe D with LON
TTP - PremierLink™ DDC Control

Water Circuit Options
0 - None

Operating Range
3 - Standard Range (60 to 95 F)
4 - Standard Range (60 to 95 F)
with Mute Package

Packing
1 - Single Pack

Revision Code
0 - Current Revision

V-Ph-Hz
1 - 575-3-60
3 - 208/230-1-60
4 - 265-1-60
5 - 208/230-3-60
6 - 480-3-60

Heat Exchanger
A - Copper with E-Coated Air Coil
C - Copper
D - Copper with E-Coated Air Coil
and Modulating Reheat
E - Copper and Modulating Reheat
J - Cupro-Nickel with E-Coated
Air Coil
N - Cupro-Nickel

LEGEND

LON - Local Operating Network,
via LONWORKS®
Open System Protocol

*Horizontal only.

†Vertical only.

**Available in sizes 018-030 only.

††Available with Complete C only.

***Must order Deluxe D controls. Available on
sizes 50RVC018-036 and 50RVC042-060 only.



ARI/ISO capacity ratings

50RHC,RVC	LIQUID FLOW (Gpm)	AIRFLOW (cfm)	WATER LOOP HEAT PUMP			
			Cooling 68 F		Heating 68 F	
			TC Btu/h	EER Btu/h/W	TO Btu/h	COP
006	1.7	220	6,400	12.5	8,300	4.2
009	2.3	325	8,300	12.7	10,800	4.3
012	3.0	400	11,500	12.7	14,300	4.2
018	4.5	600	18,200	12.3	22,000	4.2
024	6.0	800	23,800	13.0	27,800	4.8
036	7.5	1000	28,000	12.2	33,500	4.4
036	9.5	1200	38,000	12.0	46,500	4.2
041	10.5	1325	37,700	12.0	47,500	4.2
042	11.0	1350	41,000	12.0	52,600	4.2
048	12.0	1600	47,100	12.2	58,200	4.4
060	15.0	2000	58,000	12.0	76,800	4.2

LEGEND

COP - Coefficient Performance
EER - Energy Efficiency Ratio
TO - Total Capacity

NOTES:

1. A water-to-air heat pump using water or brine circulating in a common piping loop functioning as a heat source/heat sink.
2. The temperature of the water or brine loop is usually mechanically controlled within a temperature range of 60 F to 90 F.
3. Certified in accordance with the ARI/ISO Standard 13258-1 Certification Program, which replaces ARI Standard 320.
4. Cooling capacities based upon 80.6 F db (dry bulb), 68.2 F wb (wet bulb) entering-air temperature.
5. Heating capacities based upon 68 F db, 59 F wb entering-air temperature.
6. All ratings based upon 208 volt operation.
7. 50RHC,RVC units are designed for use in water loop heat pump applications only.



FROM :DesignPlace

FAX NO. :2084786830

Jul. 13 2006 11:01AM P5

Performance data (cont)



50RHC,RVC060 — 2000 CFM NOMINAL AIRFLOW

EWT (F)	GPM	PRESSURE DROP		COOLING				HEATING		
		PSI	Ft Wg	TC	TSC	kW	THR	TC	kW	THA
60	7.5	4.4	10.1	60.5	43.1	4.36	75.4	69.0	5.02	45.9
	11.3	7.8	17.5	61.2	43.2	4.17	75.5	67.4	5.17	48.8
	15.0	11.5	26.7	61.6	43.3	4.08	75.5	69.8	5.25	51.9
70	7.5	4.2	9.7	59.0	42.9	4.68	74.9	72.6	5.34	54.4
	11.3	7.3	16.9	60.1	43.1	4.46	75.3	77.0	5.49	58.2
	15.0	11.1	25.6	60.5	43.2	4.36	75.4	79.2	5.56	60.2
80	7.5	4.1	9.4	58.8	42.4	5.04	74.0	80.8	5.61	61.5
	11.3	7.1	16.4	58.3	42.8	4.80	74.7	84.4	5.74	64.8
	15.0	10.8	25.0	59.0	42.9	4.68	74.9	86.2	5.80	66.4
85	7.5	4.0	9.3	55.4	42.0	5.23	73.3	83.9	5.73	64.4
	11.3	7.0	16.2	57.2	42.5	4.98	74.1	87.3	5.84	67.4
	15.0	10.7	24.6	57.9	42.7	4.86	74.5	88.7	5.89	68.7
90	7.5	4.0	9.2	53.9	41.4	5.44	72.4	86.8	5.82	66.9
	11.3	6.9	16.0	55.8	42.1	5.17	73.5	89.5	5.91	69.4
	15.0	10.5	24.3	56.7	42.4	5.04	73.9	90.8	5.95	70.9
95	7.5	3.9	9.1	52.1	40.5	5.66	71.4	Operation Not Recommended		
	11.3	6.8	15.8	54.3	41.6	5.38	72.7			
	15.0	10.4	24.0	55.3	42.0	5.24	73.2			

LEGEND

EWT — Entering Water Temperature (F)
 GPM — Gallons Per Minute
 TC — Total Capacity (MBtu/h)
 THA — Total Heat of Absorption (MBtu/h)
 THR — Total Heat of Rejection (MBtu/h)
 TSC — Total Sensible Capacity (MBtu/h)

NOTES:

1. Interpolation is permissible, extrapolation is not.
2. All entering air conditions are 80 F db (dry bulb) and 67 F wb (wet bulb) in cooling and 70 F db in heating.
3. All performance data is based upon the lower voltage of dual voltage rated units.
4. See Performance Correction tables for operating conditions other than those listed above.
5. Data table does not reflect ISO pump or fan corrections.
6. Performance capacities shown in thousands of Btu/h.

FROM :DesignPlace

FAX NO. :2084786830

Jul. 13 2006 11:01AM P6



50RHC,RVC048 — 1600 CFM NOMINAL AIRFLOW

EWT (F)	GPM	PRESSURE DROP		COOLING				HEATING		
		PSI	FT Wg	TC	TSC	KW	THR	TC	KW	THA
60	8.0	1.2	2.9	50.2	35.8	3.67	62.7	52.1	3.70	39.5
	9.0	2.9	6.7	50.9	36.1	3.48	62.8	54.6	3.78	41.7
	12.0	5.3	12.3	51.2	36.3	3.39	62.8	56.0	3.84	42.9
70*	8.0	1.2	2.8	48.8	35.4	3.98	62.3	57.4	3.89	44.1
	9.0	2.8	6.5	49.8	35.8	3.76	62.6	59.9	3.98	46.3
	12.0	5.1	11.8	50.2	35.8	3.68	62.7	61.1	4.02	47.4
80	8.0	1.2	2.7	48.6	34.8	4.25	61.1	62.0	4.05	48.2
	9.0	2.7	6.3	48.2	35.3	4.05	62.0	64.2	4.13	50.1
	12.0	5.0	11.5	48.8	35.4	3.95	62.3	65.2	4.16	51.0
85*	8.0	1.2	2.7	45.2	34.3	4.38	60.2	64.0	4.12	49.9
	9.0	2.7	6.2	47.1	34.9	4.20	61.4	66.0	4.18	51.7
	12.0	4.9	11.3	47.9	35.2	4.10	61.8	66.9	4.21	52.6
90	8.0	1.1	2.6	43.5	33.5	4.51	58.9	65.7	4.18	51.5
	9.0	2.7	6.1	45.7	34.5	4.34	60.5	67.6	4.23	53.1
	12.0	4.8	11.2	46.7	34.8	4.24	61.1	68.4	4.25	53.9
95	8.0	1.1	2.6	41.8	32.8	4.62	57.4	Operation Not Recommended		
	9.0	2.6	6.1	44.1	33.8	4.47	59.3			
	12.0	4.8	11.0	45.2	34.3	4.38	60.2			

LEGEND

EWT — Entering Water Temperature (F)
 GPM — Gallons Per Minute
 TC — Total Capacity (MBtu/h)
 THA — Total Heat of Absorption (MBtu/h)
 THR — Total Heat of Rejection (MBtu/h)
 TSC — Total Sensible Capacity (MBtu/h)

*API 320 points (bold printing) are shown for comparison purposes only. These are not certified data points.

NOTES:

1. Interpolation is permissible, extrapolation is not.
2. All entering air conditions are 80 F db (dry bulb) and 67 F wb (wet bulb) in cooling and 70 F db in heating.
3. All performance data is based upon the lower voltage of dual voltage rated units.
4. See Performance Correction tables for operating conditions other than those listed above.
5. Data table does not reflect ISO pump or fan corrections.
6. Performance capacities shown in thousands of Btu/h.

FROM :DesignPlace

FAX NO. :2084786830

Jul. 13 2006 11:02AM P7

**50RHC,RVC030 — 1000 CFM NOMINAL AIRFLOW**

EWT (F)	GPM	PRESSURE DROP		COOLING				HEATING		
		PSI	FT Wg	TC	TSC	KW	THR	TC	KW	THA
60	3.8	1.8	9.6	28.8	21.9	2.00	35.7	31.2	2.22	23.6
	5.6	2.8	6.5	29.2	21.5	1.91	35.7	32.1	2.24	24.5
	7.5	4.4	10.1	29.4	21.7	1.87	35.7	32.8	2.25	24.9
70*	3.8	1.5	9.5	28.1	21.0	2.17	35.5	33.9	2.26	25.5
	5.6	2.7	6.2	28.7	21.2	2.06	35.7	34.1	2.28	26.3
	7.5	4.2	9.7	28.9	21.3	2.01	35.7	34.6	2.29	26.7
80	3.8	1.5	9.4	26.9	20.4	2.34	34.9	35.0	2.30	27.2
	5.6	2.6	6.1	27.7	20.8	2.23	35.4	35.8	2.33	27.9
	7.5	4.1	9.4	28.1	20.9	2.18	35.5	36.2	2.34	28.2
85*	3.8	1.4	9.3	26.2	20.1	2.49	34.5	35.8	2.33	27.9
	5.6	2.6	6.0	27.1	20.5	2.32	35.0	36.6	2.36	28.5
	7.5	4.0	9.3	27.5	20.7	2.27	35.3	36.9	2.37	28.8
90	3.8	1.4	9.3	25.4	19.7	2.50	33.9	36.6	2.36	28.5
	5.6	2.6	8.9	26.4	20.1	2.41	34.6	37.2	2.38	29.1
	7.5	4.0	9.2	26.8	20.4	2.35	34.9	37.5	2.40	29.3
95	3.8	1.4	9.2	24.5	19.2	2.57	33.3	Operation Not Recommended		
	5.6	2.5	8.8	25.6	19.7	2.48	34.1			
	7.5	3.9	9.1	26.1	20.0	2.44	34.4			

LEGEND

EWT — Entering Water Temperature (F)
 GPM — Gallons Per Minute
 TC — Total Capacity (MBtuh)
 THA — Total Heat of Absorption (MBtuh)
 THR — Total Heat of Rejection (MBtuh)
 TSC — Total Sensible Capacity (MBtuh)

*ARI 320 points (bold printing) are shown for comparison purposes only. These are not certified data points.

NOTES:

1. Interpolation is permissible, extrapolation is not.
2. All entering air conditions are 80 F db (dry bulb) and 67 F wb (wet bulb) in cooling and 70 F db in heating.
3. All performance data is based upon the lower voltage of dual voltage rated units.
4. See Performance Correction tables for operating conditions other than those listed above.
5. Data table does not reflect ISO pump or fan corrections.
6. Performance capacities shown in thousands of Btuh.