

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 37-22576
Exam Date: 08/01/2019

1. Current Owner:
JIM LUCKMAN PO BOX 4068 HAILEY ID 83333
2. Accompanied by: Jim Luckman
Phone No: (208) 788-3033
Address: 50 Cottonwood Creek Circle, Hailey ID 83333
Relationship to permit Holder: Permit Holder

3. SOURCE:
GROUND WATER

Method of Determination: On-site Inspection

B. OVERLAP REVIEW

1. Other water rights with the same place of use: No Overlap

Water Right No.	Source	Purpose of Use	Basis
N/A			

Comments: Domestic well is a separate well with no recorded water right

2. Other water rights with the same point-of-diversion: NO Overlap

Water Right No.	Source	Purpose of Use	Basis
N/A			

Comments: N/A

C. DIVERSION AND DELIVERY SYSTEM

1. LOCATION OF POINT(S) OF DIVERSION:

GROUND WATER SW¼ NE¼, Sec. 29, Twp 03N, Rge 18E, B.M. BLAINE County

Method of Determination: On-site Inspection and GPS

PLACE OF USE: HEATING

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
03N	18E	29			X														

PLACE OF USE: COOLING

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
03N	18E	29			X														

Method of Determination: On-site Inspection

3.

Delivery System Diagram Attached (required). Indicate all major components and distances between components.

X Indicate weir size/pipe as applicable.

Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required). Scale must be

X 1:24,000 or greater.X Aerial Photo Attached (required for irrigation of 10+ acres).X Photo of Diversion and System Attached

4.

Well or Diversion ID No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
D0057121					

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
N/A						

2. Measurements: No measurement required per IDAPA 37.03.02 Beneficial Use Examination Rules as the permitted flow rate of 0.16 cfs falls below the 0.24 cfs or greater flow rate amount requiring measurement.

E. FLOW CALCULATIONS

_____ Additional Computation Sheets Attached

Measured Method:

F. VOLUME CALCULATIONS

1. Volume Calculations for irrigation: N/A

$$V_{IR} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) =$$

$$V_{DR} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 =$$

$$V = \text{Smaller of } V_{IR} \text{ and } V_{DR} =$$

2. Volume Calculations for Other Uses: Heating and cooling

$$(0.16 \text{ cfs}) 217 \text{ avg days} \leq \text{freezing in Ketchum}^* (0.50 \text{ avg system operation time}^{\wedge}) 1.9835 \text{ acre feet per day} = 34.4 \text{ AF}$$

$$(0.16 \text{ cfs}) 148 \text{ avg days} > \text{freezing in Ketchum}^* (0.30 \text{ avg system operation time}^{\wedge}) 1.9835 \text{ acre feet per day} = 14.1 \text{ AF}$$

$$34.4 \text{ AF} + 14.1 \text{ AF} = \underline{\underline{48.5 \text{ AF}}}$$

* Based on graph of weather averages for Ketchum (<https://usclimatedata.com/ketchum/idaho/united-stses/usid0280>)

[^] Based on information provided by Property Owner

G. NARRATIVE/REMARKS/COMMENTS

I met with Jim Luckman on 8/1/2019. He showed me his domestic well, heating and cooling production well and two injection wells. I then went into his crawl space to look at his heating and cooling system. I found eight FHP AP049-1HZN heat pumps. After that, we walked around the property and we discussed the square footage (8,138 sf) and how often the system operates and is actively pumping water from the production well. Mr. Luckman indicated that the system probably operates on average about 30% of the time in the summer season for cooling and more like 50% of the time in the colder months when used for heating. Mr. Luckman also indicated that he and his wife live there year round and that the guest house has an electric furnace and is not connected to the heating and cooling system utilized in the main home.

The system pumps water from the well and then through the heat pumps where the heating/cooling value is extracted from the water, and then is returned to the aquifer through two injection wells. Per specifications for the FHP units, the maximum flow rate through the units while in operation is 9 gallons per minute. With 8 units in operation, that is equivalent to a maximum flow rate of 72 gallons per minute or 0.16 cfs, which also happens to be the permitted flow rate.

The original application for permit requested heating from 1/1 to 12/31, which implies the system will be in use for cooling during the warmer months as these heat pumps are designed for both heating and cooling purposes. When I was in the crawl space, the system was in operation and I asked Mr. Luckman if they were heating or cooling the house at that time, and he indicated that the system was cooling the house. I am recommending this to be licensed as both heating and cooling uses.

I recommend the permitted flow rate of 0.16 cfs and a total volume of 48.5 af for heating and cooling.

Have conditions of permit approval been met? ☒ Yes ☐ No

H. RECOMMENDATIONS**1. Recommended Amounts**

<u>Beneficial Use</u>	<u>Period of Use</u>	<u>Rate of Diversion</u>	<u>Annual Volume</u>
HEATING	01/01 to 12/31	0.16 CFS	48.5 AF
COOLING	01/01 to 12/31	0.16 CFS	48.5 AF

Totals: 0.16 CFS 48.5 AF

2. Recommended Amendments

☐ Change P.D. as reflected above ☐ Add P.D. as reflected above ☒ None

☐ Change P.U. as reflected above ☐ Add P.U. as reflected above ☒ None

I. AUTHENTICATION

Bill Mills - Water Resource Agent, Senior

Field Examiner's Name Bill Mills Date 8-6-2019

Reviewer _____ Date _____



Figure 1: Production well



Figure 2: 1st injection well



Figure 3: 2nd injection well



Figure 4: One of the eight heat pumps

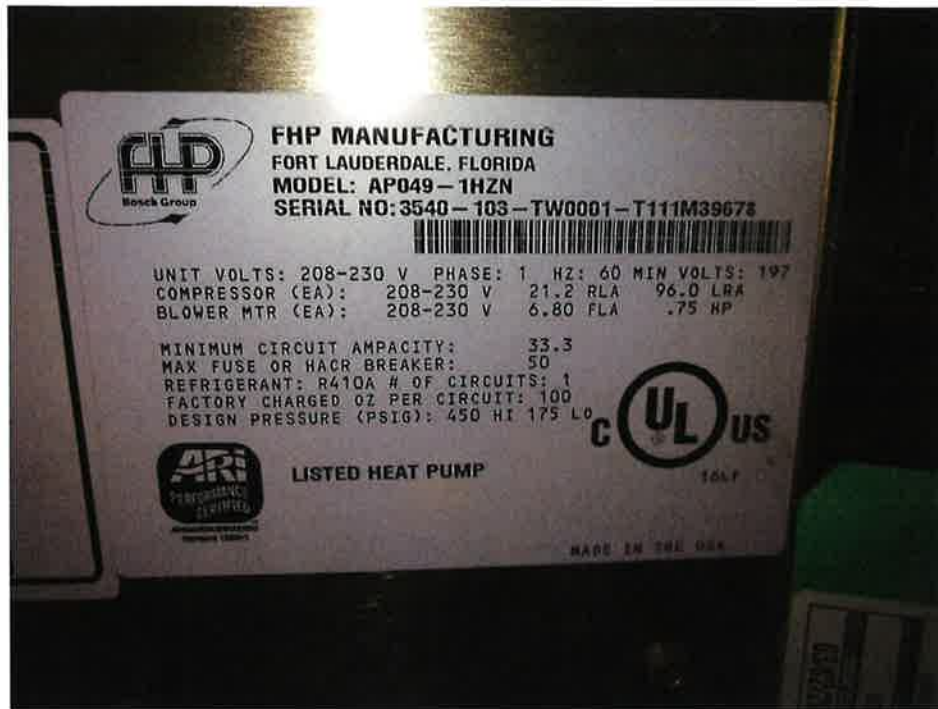


Figure 5: Model & serial number tag on heat pump

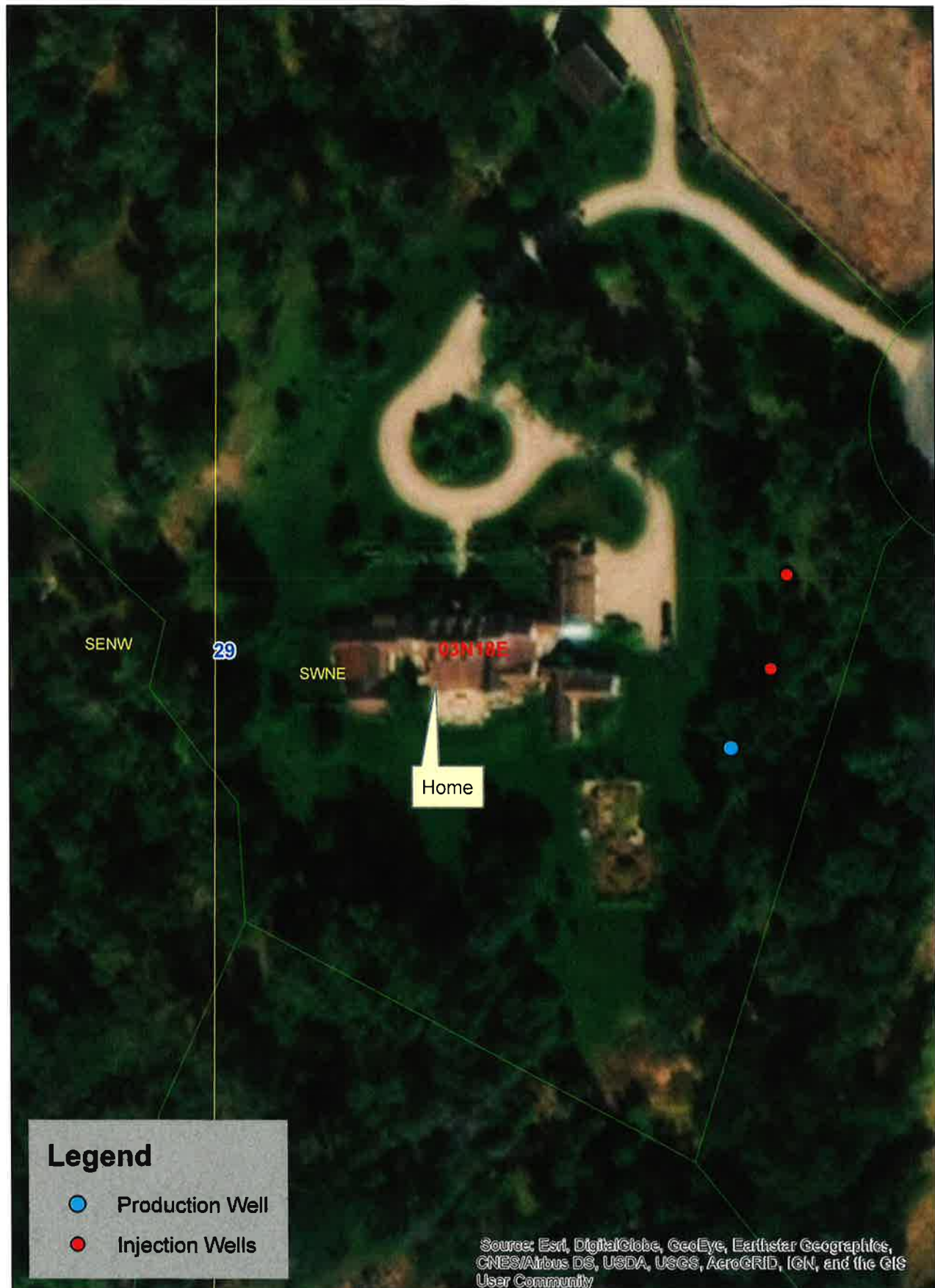


Figure 6: Front of home



Figure 7: Back of home

System Diagram





PACKAGED UNITS SPECIFICATION DATA SHEET

FHP MANUFACTURING HIGH-EFFICIENCY WATER SOURCE HEAT PUMPS

AP035

aquarius II

ELECTRICAL SPECIFICATIONS

Electrical Characteristics	Elect. Symbol	Compressor		Blower		Loop Pump		Min. Circuit Amps	Max. Fuse/Breaker
		RLA	LRA	FLA	HP	FLA	HP		
208/230-1-60	-1	16.7	82.0	4.3	1/2	-	-	27.0	40

MECHANICAL SPECIFICATIONS

Refrigerant: R-410A			
Air Coil			
Square Feet	Rows Deep	Tube O.D.	Fins/Inch
4.5	3	3/8	14
Water Coil			
Type		Work Press	
Coaxial		450 psig	
Blower Size		Compr Type	
9 x 7 DD		Scroll	
Net Weight		Ship Weight	
290 lbs		315 lbs	

BLOWER PERFORMANCE

Available External Static Pressure (Inches of Water, Gauge. Wet Coil and Filter Included)												
Blower Speed	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00	1.10	1.20
+						1380						
Norm						1200						
-						1020						



ISO 13256-1 CERTIFIED PERFORMANCE DATA Rated at 1200 CFM and 9.0 GPM

Water Loop				Ground Water				Ground Loop			
Cooling		Heating		Cooling		Heating		Cooling		Heating	
Capacity	EER	Capacity	COP	Capacity	EER	Capacity	COP	Capacity	EER	Capacity	COP
36,600	16.0	43,000	5.1	41,200	23.5	36,200	4.7	38,200	18.4	28,200	4.1

FLUID PRESSURE DROP

Fluid Flow (GPM)	Pressure Drop	
	(FOH)	(PSIG)
5	2.0	0.9
7	3.6	1.6
9	5.7	2.5
11	8.2	3.5
13	11.1	4.8

CAPACITY DATA - FULL LOAD

COOLING All performance at 1200 CFM and 9.0 GPM EFT Range (Standard) 50°F to 100°F

Entering Fluid Temp. (°F)	Entering Air Temp. (°F)	Total Capacity (MBtuH)	Sensible Capacity (MBtuH)	Sensible to Total Ratio	Power Input (kW)	Heat of Reject (MBtuH)	EER
50°	70°db 61°wb	36.10	23.53	0.65	1.67	41.81	21.6
60°		34.64	22.76	0.66	1.86	41.00	18.6
70°		33.18	22.08	0.67	2.05	40.19	16.2
85°		30.99	21.16	0.68	2.34	38.97	13.3
100°		28.80	20.36	0.71	2.62	37.75	11.0
50°	75°db 63°wb	38.68	28.14	0.73	1.68	44.43	23.0
60°		37.12	27.23	0.73	1.87	43.52	19.8
70°		35.56	26.41	0.74	2.06	42.61	17.2
85°		33.22	25.33	0.76	2.35	41.24	14.1
100°		30.87	24.37	0.79	2.64	39.87	11.7
50°	80°db 67°wb	42.47	31.08	0.73	1.70	48.26	25.0
60°		40.75	30.08	0.74	1.89	47.20	21.6
70°		39.04	29.17	0.75	2.08	46.14	18.8
85°		36.47	27.98	0.77	2.37	44.56	15.4
100°		33.91	26.92	0.79	2.66	42.97	12.8
50°	85°db 71°wb	46.25	34.05	0.74	1.71	52.08	27.1
60°		44.39	32.95	0.74	1.90	50.88	23.3
70°		42.52	31.96	0.75	2.10	49.68	20.3
85°		39.73	30.65	0.77	2.39	47.88	16.6
100°		36.94	29.49	0.80	2.68	46.08	13.8

Units are complete packages containing compressor, reversing valve, expansion valve metering device, ECM fan motor and heat exchangers. Also included are safety controls: Overload protection for motors, high and low refrigerant pressure switches and solid state lock-out circuit. Optional UL approved internal electric heater, factory installed with primary thermal overload protection and magnetic contactors (208/230-1-60 only) optional UL approved internal Heat Recovery Package and/or Ground Loop Pump with purge connections available

Performance based on ARI/ISO rated air flow, fluid flow and voltage. For conditions other than rated, consult the FHP EAD selection software. Due to variations in installation actual performance may vary marginally from tabulated values.

As a result of continuing research and development, specifications are subject to change without notice.
AP035.2IP60 Rev: 1-08

HEATING EFT Range (Standard) 25°F to 80°F

Entering Fluid Temp. (°F)	Entering Air Temp. (°F)	Total Capacity (MBtuH)	Power Input (kW)	Heat of Abs. (MBtuH)	COP
50°	60°	38.04	2.33	30.08	4.8
60°		42.34	2.47	33.92	5.0
70°		46.64	2.60	37.75	5.2
80°		50.93	2.74	41.59	5.5
50°	70°	35.97	2.37	27.87	4.4
60°		40.03	2.51	31.46	4.7
70°		44.09	2.65	35.05	4.9
80°		48.16	2.79	38.64	5.1
50°	80°	33.55	2.42	25.27	4.1
60°		37.33	2.57	28.57	4.3
70°		41.11	2.71	31.87	4.4
80°		44.89	2.85	35.17	4.6

LOW TEMP HEATING Antifreeze Required

25°	60°	26.76	1.99	19.96	3.9
30°		28.87	2.06	21.83	4.1
40°		33.08	2.20	25.58	4.4
25°	70°	25.32	2.03	18.39	3.7
30°		27.31	2.10	20.15	3.8
40°		31.29	2.24	23.66	4.1
25°	80°	23.62	2.07	16.55	3.3
30°		25.47	2.14	18.16	3.5
40°		29.18	2.28	21.39	3.7

FHP MANUFACTURING COMPANY

601 N.W. 65th Court - Fort Lauderdale, FL 33309

Phone: (954) 776-5471 - Fax: (800) 776-5529

<http://www.fhp-mfg.com>

Field Exam 37-22576

Operating Pressures & Temperatures

Environmentally Safe R-410A Refrigerant

			OPERATING DATA							
			COOLING				HEATING			
MODEL	ENTERING WATER TEMP. °F	WATER FLOW GPM	SUCTION PRESSURE PSIG	DISCHARGE PRESSURE PSIG	WATER TEMP RISE °F	AIR TEMP DROP °F	SUCTION PRESSURE PSIG	DISCHARGE PRESSURE PSIG	WATER TEMP DROP °F	AIR TEMP RISE °F
AP035 Full Load	30°	4.5					74-90	244-299	3-4	13-15
		9.0					78-95	251-306	2-3	13-16
	40°	4.5	122-149	183-224	14-18	19-23	87-106	257-314	4-5	15-18
		9.0	117-143	172-210	8-10	20-24	91-111	263-322	3-3	16-19
	50°	4.5	131-160	214-261	14-18	18-22	95-105	269-329	5-6	17-20
		9.0	126-154	201-245	8-10	19-24	100-125	276-337	3-4	18-22
	60°	4.5	136-166	244-298	14-17	18-22	111-136	282-344	6-7	19-23
		9.0	131-160	230-281	8-10	19-23	117-143	289-353	4-5	20-24
	70°	4.5	141-172	275-336	14-17	17-21	124-152	294-360	7-8	21-25
		9.0	135-165	258-316	8-10	18-22	131-160	302-369	5-6	22-27
	80°	4.5	145-178	310-378	14-17	17-20	136-166	307-375	8-9	23-28
		9.0	140-171	291-356	8-10	18-22	143-175	314-384	5-6	24-30
	90°	4.5	150-183	349-426	14-17	16-20	149-182	319-390	8-10	25-30
		9.0	144-176	328-401	8-9	17-21	156-191	327-400	6-7	26-32
	100°	4.5	155-189	392-480	13-16	16-19				
		9.0	149-182	369-451	8-9	17-21				
AP049 Part Load	30°	6.0					64-78	248-303	5-6	15-18
		12.0					67-82	254-311	3-4	16-19
	40°	6.0	109-134	183-224	18-22	19-23	75-91	261-319	6-8	17-21
		12.0	105-128	172-210	10-12	20-25	79-96	267-327	4-5	18-23
	50°	6.0	118-144	214-261	18-22	19-23	78-90	273-334	8-10	20-24
		12.0	113-138	201-245	10-12	20-24	82-95	280-342	5-7	21-26
	60°	6.0	122-149	244-298	17-21	18-22	96-117	286-349	9-11	22-27
		12.0	117-143	230-281	10-12	19-24	101-123	293-358	6-8	24-29
	70°	6.0	126-154	275-336	17-21	18-22	107-131	299-365	11-13	25-30
		12.0	121-148	258-316	10-12	19-23	113-138	306-374	7-9	26-32
	80°	6.0	130-159	310-378	17-21	17-21	117-143	311-380	12-15	27-33
		12.0	132-153	291-356	10-12	18-22	123-151	319-390	8-10	29-35
	90°	6.0	134-164	349-426	17-20	17-20	128-157	324-396	13-16	29-36
		12.0	129-158	328-401	9-12	18-22	135-165	332-406	9-11	31-38
	100°	6.0	139-170	392-480	16-20	16-20				
		12.0	133-163	369-451	9-11	17-21				
AP049 Full Load	30°	6.0					71-87	277-339	6-7	15-19
		12.0					75-92	284-347	4-5	16-20
	40°	6.0	118-144	194-237	21-25	19-23	84-102	291-356	7-9	18-22
		12.0	113-138	182-223	12-14	20-24	88-108	299-365	5-6	19-23
	50°	6.0	127-155	226-276	21-25	18-22	92-110	305-373	9-11	20-25
		12.0	122-149	213-260	12-14	19-24	98-120	313-383	6-7	21-26
	60°	6.0	131-160	259-316	21-25	18-22	108-132	320-391	10-13	23-28
		12.0	126-154	243-297	12-14	19-23	113-138	328-400	7-9	24-29
	70°	6.0	136-166	291-355	20-25	17-21	120-147	334-408	12-15	25-31
		12.0	130-159	273-334	12-14	18-22	126-154	342-418	8-10	27-32
	80°	6.0	140-171	328-401	20-24	17-20	131-161	348-425	14-17	27-34
		12.0	135-165	308-377	11-14	18-22	138-169	356-436	9-11	29-36
	90°	6.0	145-177	369-451	20-24	16-20	144-176	362-442	15-18	30-37
		12.0	139-170	347-424	11-14	17-21	151-185	371-453	10-12	32-39
	100°	6.0	149-183	415-508	19-24	16-19				
		12.0	143-175	391-477	11-14	17-21				

This chart shows approximate temperatures and pressures for a unit in good repair. The values shown are meant as a guide only and should not be used to estimate system charge. This chart assumes rated air flow and 80° d.b./67° w.b. entering air temperature in cooling, 70° d.b. entering air temperature in heating. Heating data at entering fluid temperatures below 50° assumes the use of antifreeze.

As a result of continuing research and development, specifications are subject to change without notice.

970-292 Revised 1-12

Field Exam 37-22576

Temperature - Precipitation - Sunshine - Snowfall

US Climate Data on  

[Home](#) [United States](#) [Idaho](#)

[Monthly](#) [Daily](#) [History](#) [Geo & Map](#)

You are here: [United States](#) > [Idaho](#) > [Ketchum](#)

Climate Ketchum - Idaho

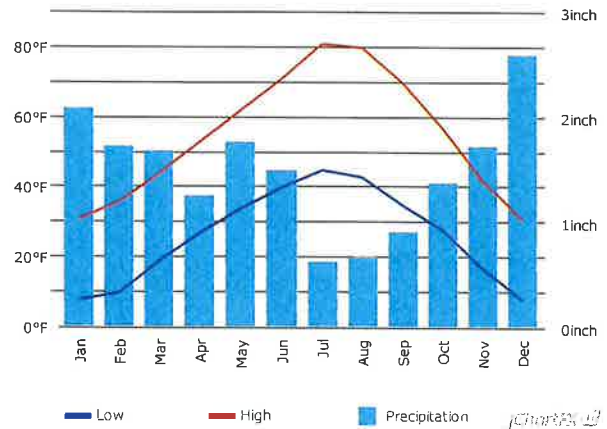
°C | °F

	Jan	Feb	Mar	Apr	May	Jun
Average high in °F:	31	36	44	53	62	71
Average low in °F:	8	10	19	27	34	40
Av. precipitation in inch:	2.09	1.73	1.69	1.26	1.77	1.5
Days with precipitation:	-	-	-	-	-	-
Hours of sunshine:	-	-	-	-	-	-
Average snowfall in inch:	26	20	12	4	0	0
	Jul	Aug	Sep	Oct	Nov	Dec
Average high in °F:	81	80	70	57	42	31
Average low in °F:	45	43	35	28	17	8
Av. precipitation in inch:	0.63	0.67	0.91	1.38	1.73	2.6
Days with precipitation:	-	-	-	-	-	-
Hours of sunshine:	-	-	-	-	-	-
Average snowfall in inch:	0	0	0	2	17	32

Ketchum weather averages

Annual high temperature:	54.8°F
Annual low temperature:	26.2°F
Average temperature:	40.5°F
Average annual precipitation - rainfall:	17.96 inch
Days per year with precipitation - rainfall:	-
Annual hours of sunshine:	-
Av. annual snowfall:	113 inch

Ketchum Climate Graph - Idaho Climate Chart



Climate data for ketchum ranger stn, Longitude: -114.36, Latitude: 43.6841
Average weather Ketchum, ID - 83353 - 1981-2010 normals

Jan: January, Feb: February, Mar: March, Apr: April, May: May, Jun: June, Jul: July, Aug: August, Sep: September, Oct: October, Nov: November, Dec: December

[Climograph of Ketchum on your website](#)

