

RECEIVED

FEB 25 2013

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCESIdent. No. 37-22814

APPLICATION FOR PERMIT

To appropriate the public waters of the State of Idaho

DEPT. OF WATER RESOURCES

SOUTHERN REGION

1. Name of applicant(s) Cooper Family Gift Trust Phone 314-397-7583Name connector (check one): ☒ and ☐ or ☐ and/orMailing address: 26 Dromara Drive City St. LouisState MO Zip 63124 Email: _____2. Source of water supply Ground water which is a tributary of n/a

3. Location of point(s) of diversion:

Twp	Rge	Sec	Govt Lot	¼	¼	¼	County	Source	Local name or tag #
4n	18e	29			sw	nw	Blaine	ground water	

4. Water will be used for the following purposes:

Amount 0.13 for Heating purposes from Jan 1 to Dec 31 (both dates inclusive)
(cfs or acre-feet per year)Amount 0.13 for Cooling purposes from Jan 1 to Dec 31 (both dates inclusive)
(cfs or acre-feet per year)Amount _____ for _____ purposes from _____ to _____ (both dates inclusive)
(cfs or acre-feet per year)Amount _____ for _____ purposes from _____ to _____ (both dates inclusive)
(cfs or acre-feet per year)5. Total quantity to be appropriated is (a) 0.13 cubic feet per second (cfs) and/or (b) _____ acre-feet per year (af).

6. Proposed diverting works:

a. Describe type and size of devices used to divert water from the source. Production well : 3hp variable frequency drive pump

b. Height of storage dam _____ feet; active reservoir capacity _____ acre-feet; total reservoir capacity _____ acre-feet. If the reservoir will be filled more than once each year, describe the refill plan in item 11.

For dams 10 feet or more in height OR reservoirs with a total storage capacity of 50 acre-feet or more, submit a separate Application for Construction or Enlargement of a New or Existing Dam. Application required? ☐ Yes ☐ No

c. Proposed well diameter is _____ inches; proposed depth of well is _____ feet.

d. Is ground water with a temperature of greater than 85°F being sought? ☐ Yes ☒ Noe. If well is already drilled, when? 10/15/2012; drilling firm Dirt Works : Co. # 652;Well was drilled for (well owner) Jim and Stacey Cooper; Drilling Permit No. 0062142

7. Description of proposed uses (if irrigation only, go to item 8):

a. Hydropower; show total feet of head and proposed capacity in kW. _____

b. Stockwatering; list number and kind of livestock. _____

c. Municipal; show name of municipality or the applicant's qualifications as a municipal provider. _____

d. Domestic; show number of households 1e. Other; describe fully. Use is for Ground water heat source pump for heating and cooling. This will be a nonconsumptive system with injection well.

8. Description of place of use:

- a. If water is for irrigation, indicate acreage in each subdivision in the tabulation below.
- b. If water is used for other purposes, place a symbol of the use (example: D for Domestic) in the corresponding place of use below. See instructions for standard symbols.

TWP	RGE	SEC	NE				NW				SW				SE				TOTALS
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
4n	18e	29							g/l										
4n	18e	30				g/l													

Total number of acres to be irrigated: _____

9. Describe any other water rights used for the same purposes as described above. Include water delivered by a municipality, canal company, or irrigation district. If this application is for domestic purposes, do you intend to use this water, water from another source, or both, to irrigate your lawn, garden, and/or landscaping? This water is intended for heating and cooling only and will be re-injected. Another well will be used for domestic use and lawn irrigation.
10. a. Who owns the property at the point of diversion? Cooper Family Gift Trust
- b. Who owns the land to be irrigated or place of use? Cooper Family Gift Trust
- c. If the property is owned by a person other than the applicant, describe the arrangement enabling the applicant to make this filing: _____
11. Describe your proposal in narrative form, and provide additional explanation for any of the items above. Attach additional pages if necessary. _____
12. Time required for completion of works and application of water to proposed beneficial use is 2 years (minimum 1 year).
13. **MAP OF PROPOSED PROJECT REQUIRED** - Attach an 8½" x 11" map clearly identifying the proposed point of diversion, place of use, section #, township & range. A photocopy of a USGS 7.5 minute topographic quadrangle map is preferred.

The information contained in this application is true to the best of my knowledge. I understand that any willful misrepresentations made in this application may result in rejection of the application or cancellation of an approval.


Signature of Applicant

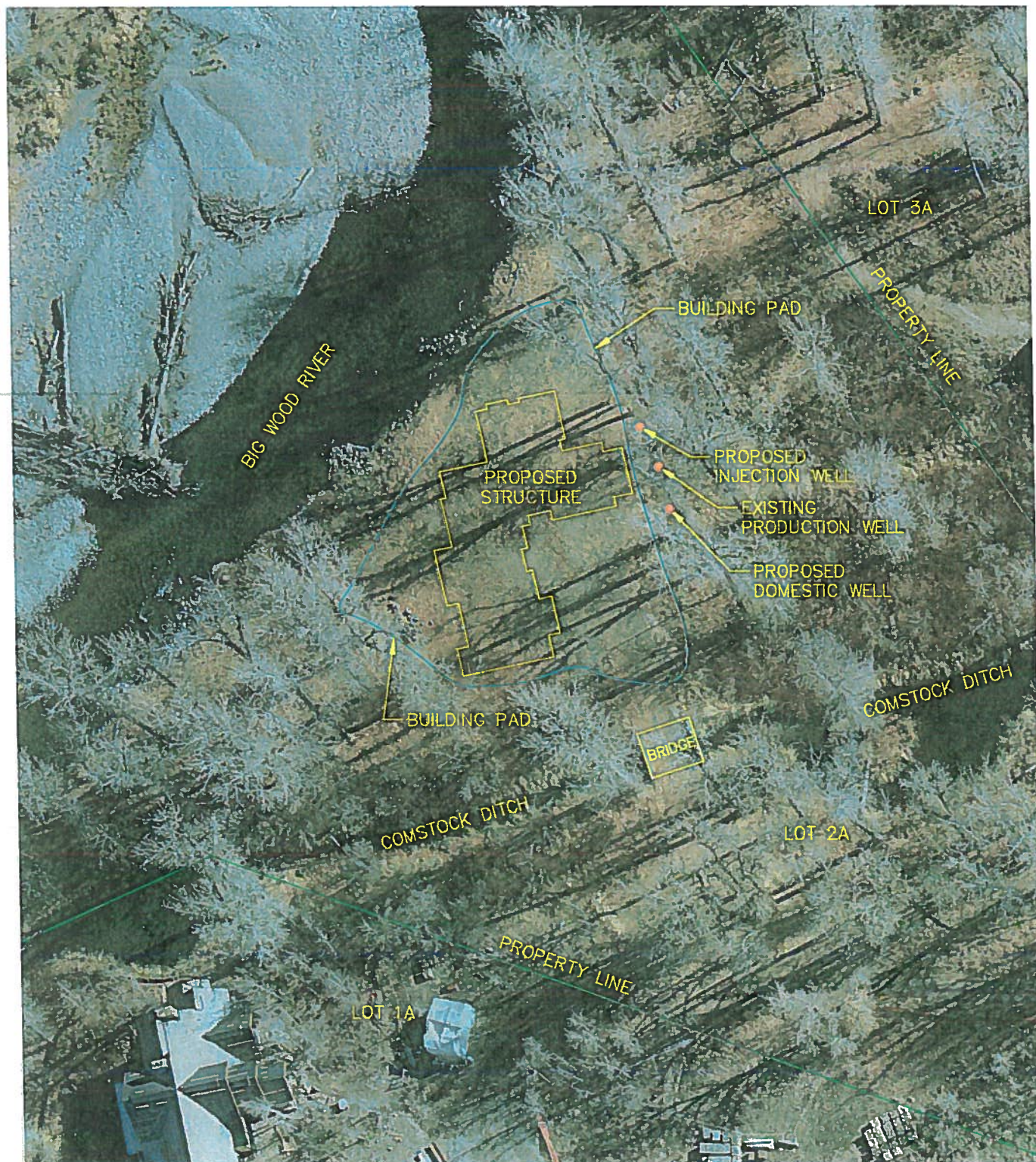
Stacy Cooper
Print Name (and title, if applicable)

Signature of Applicant

Print Name (and title, if applicable)

For Department Use:

Received by N. ERICKSON Date 2/28/13 Time 2:15 Preliminary check by N. ERICKSON
Fee \$ 100.00 Receipted by N. ERICKSON Receipt No. SO33079 Date 2/28/13



GRAPHIC SCALE
1 inch = 60 ft.

REUSE OF DRAWINGS
These drawings, or any portion thereof, shall not be used on any Project or extension of this Project except by agreement in writing with Galena Engineering, Inc.

Galena
Engineering
Inc.

Civil Engineers & Land Surveyors
880 Second Avenue North
P.O. Box 425
Ketchikan, Idaho 83340
(208) 724-4728
(208) 724-4783 fax
email galena@galena-engineering.com

AN EXHIBIT MAP SHOWING PROPOSED WELL LOCATIONS AT
LOT 2A RIVER'S EDGE RANCH AMENDED 2008
LOCATED WITHIN SECTION 29 & 30, T.4N., R.18E., B.M., BLAINE COUNTY, IDAHO
PREPARED FOR JAMES AND STACY COOPER

PROJECT INFORMATION

P:\edskproj\4425-04\DWG\Topo\DW well exhibit.dwg 1/22/2013 10:25:37 AM MST

SHT 1 OF 1

37-22814

Matt Spence

From: Matt Spence
Sent: Thursday, January 17, 2013 11:15 AM
To: nathan.erickson@idwr.idaho.gov
Cc: gilman (mike@leegilman.com)
Subject: Cooper Residence Heat Pump Specs
Attachments: Bosch 201208311803480.TWSeries_SpecGuide_REV03-12.pdf

Hi Nathan,

We are using two TW071 for the house heat/cooling
We are using one TW061 for the hot tub.

If there is anything else, please let me know.

Matt

Matt Spence

Lee Gilman Builders

C-208.309.0586

O-208.726.3300



Please consider the environment before printing this email



BOSCH

GUIDE SPECIFICATIONS

TW Series Two Stage Water-to-Water Reverse Cycle Chillers & Low Temp Boilers

TW025-122 Reverse Cycle Chillers / Low Temperature Boilers

GENERAL

Units shall be Underwriter Laboratories (UL) listed for safety on all models. Each unit shall be run tested at the factory, pallet mounted and stretch wrapped. The units shall be manufactured in an ISO 9001:2000 certified facility, designed to operate with entering fluid temperatures between 20°F (-7°C) and 120°F (49°C) as manufactured by Bosch in Fort Lauderdale, Florida. Refrigerant shall be R-410A.

CASING & CABINET

The cabinet shall be fabricated from heavy gauge steel finished with a vinyl coated black cabinet and a silver brushed aluminum front panel. The interior shall be insulated with ½" (12.7mm) thick foil faced glass fiber. All units shall allow sufficient service access to replace the compressor without unit removal. The compressor shall be covered with a multi-density sound absorbing blanket and have a floating base pan to minimize noise transmission.

REFRIGERATION CIRCUITS

All units shall contain a hermetically sealed refrigerant circuit(s) including two stage operation, scroll compressor(s), bidirectional thermal expansion valve metering device, coaxial style fluid-to-refrigerant heat exchangers, refrigerant reversing valve and service ports. Compressor shall be high efficiency, two stage scroll type (except TW122 which contains single stage scrolls compressor but has two refrigeration circuits), designed for heat pump duty, quiet operation and mounted on rubber vibration isolators. Compressor motors shall be equipped with overload protection. Refrigerant reversing valves shall be pilot operated sliding piston type with replaceable encapsulated magnetic coils energized only during the chiller cycle. The coaxial water-to-refrigerant heat exchanger shall be constructed of a convoluted copper (optional cupronickel) inner tube and steel outer tube with a designed refrigerant working pressure of 600 PSIG (4100kPa) and a designed water side working pressure of no less than 400 PSIG (2750kPa). Due to their susceptibility to fouling, brazed plate heat exchangers are not acceptable. The fluid-to-refrigerant heat exchangers shall be insulated to prevent condensation at low fluid temperatures.

ELECTRICAL

Controls and safety devices will be factory wired and mounted within the unit. Controls shall include comfort alert module, compressor contactor, 24V transformer, reversing valve coil and solid state lockout controller (UPM) The UPM controller shall include the following features: Anti-short cycle time delay, random start, brown out/surge/power interruption protection, 120 second low pressure switch bypass timer, shutdown on high or low refrigerant pressure safety switch inputs, shutdown for the optional freezestat, 24 VAC alarm output for remote fault indication, unit reset at thermostat or disconnect, ability to defeat time delays for servicing and automatic intelligent reset. The UPM shall automatically reset after a safety shut down and restart the unit, if the cause of the shut down no longer exists, after the anti-short cycle and random start timers expire. Should a fault re-occur within 60 minutes after reset, then a permanent lockout will occur. A light emitting diode (LED) shall annunciate the following alarms: high refrigerant pressure, low refrigerant pressure and low water temperature (when equipped with the optional low water temperature sensor). The LED will display each fault condition as soon as the fault occurs. If a permanent lockout occurs, then the fault LED will display the type of fault until the unit is reset.

Safety devices include a low pressure cutout set a 40 PSIG (280 kPa) for loss of charge protection (freezestat and/or high discharge gas temperature sensor are not acceptable) and a high pressure cutout control set at 600 PSIG (4100 kPa). An optional energy management relay that allows unit control by an external source shall be factory installed. A terminal block with screw terminals shall be provided for control wiring.

PIPING

Water piping connections shall be female pipe thread with a single set of source and load connections flush mounted to the unit cabinet.

HEAT RECOVERY PACKAGE

208/230 volt units shall be equipped with an optional factory installed internal heat recovery kit for domestic hot water production. This kit shall include a vented, double walled coaxial water to refrigerant heat exchanger, circuit breaker protected circulating pump, high water temperature safety cutoff and a low refrigerant temperature cutout.

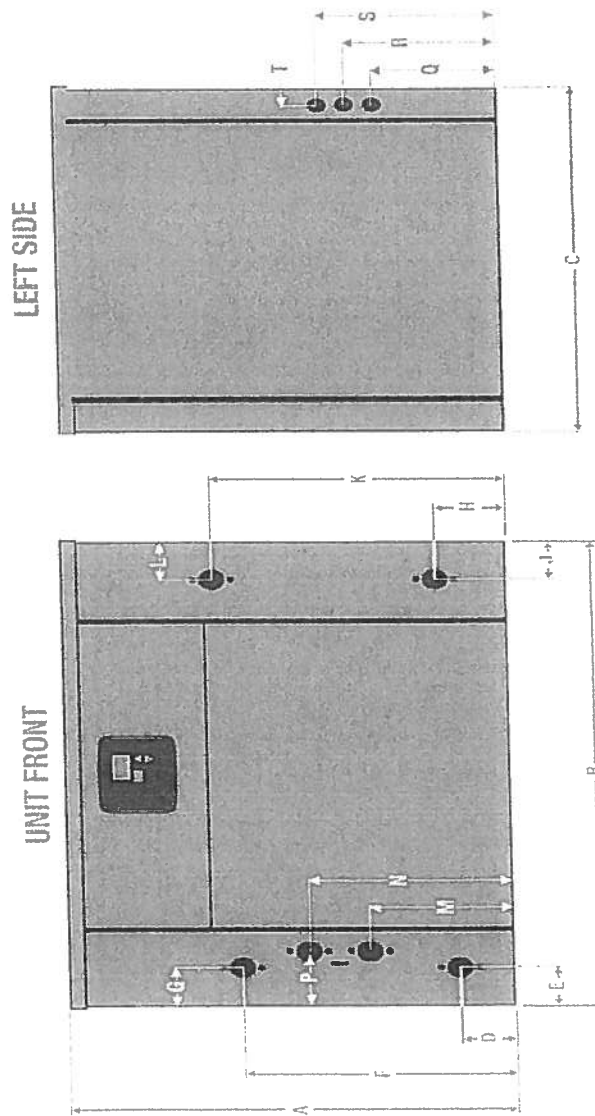
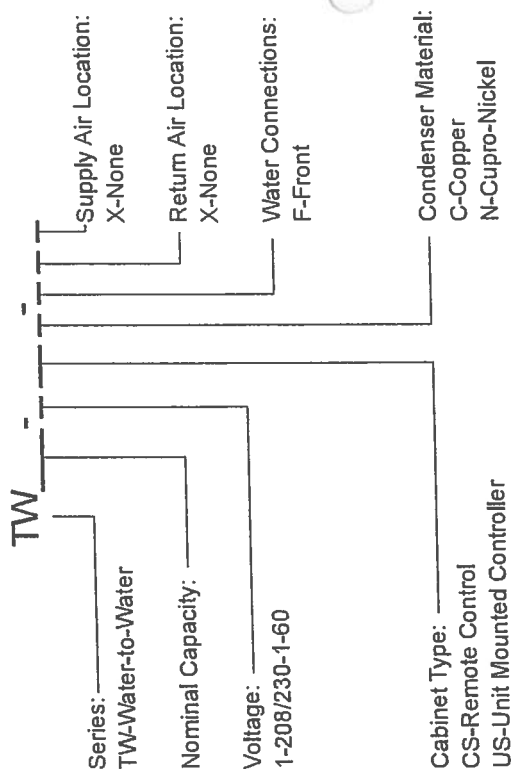


TW025-071 Series
Two Stage Reverse Cycle Chillers

MODEL	Dimensions																			HRP Conn.
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	Water Conn.	
	Height	Width	Depth																	
TW025	24.12	32.50	24.00	2.70	2.50	13.70	2.50	3.25	1.95	14.25	1.95	7.15	11.00	4.25	6.55	8.05	9.55	1.25	3/4 FTP	1/2 FPT
TW035	24.12	32.50	24.00	2.30	2.30	14.30	2.35	3.70	2.55	15.70	2.55	7.15	11.00	4.25	6.55	8.05	9.55	1.25	3/4 FTP	1/2 FPT
TW049	24.12	32.50	24.00	2.30	2.60	14.30	2.65	3.70	2.65	15.70	2.65	7.15	11.00	4.25	6.55	8.05	9.55	1.25	1 FPT	1/2 FPT
TW061	24.12	32.50	24.00	2.30	2.60	14.30	2.65	3.20	2.65	15.20	2.65	7.15	11.00	4.25	6.55	8.05	9.55	1.25	1 FPT	1/2 FPT
TW071	24.12	32.50	24.00	3.00	2.25	17.25	2.25	3.25	2.25	17.00	2.25	7.15	11.00	4.25	6.55	8.05	9.55	1.25	1 FPT	1/2 FPT

<http://www.bosch-climate.us>

TTW Series Reverse Cycle Chiller Nomenclature

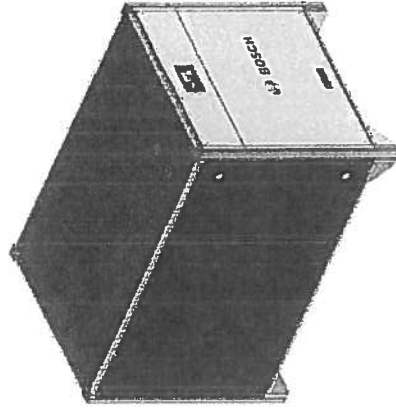




FHP Manufacturing Co.
601 N.W. 65th Court
Fort Lauderdale, FL 33309
Phone: (954) 776-5471
Fax: (800) 776-5529
<http://www.bosch-climate.us>

TW122 Series

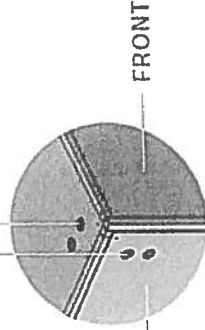
Two Stage Reverse Cycle Chillers



MODEL	Dimensions												Water Conn.
	A	B	C	D	E	F	G	H	J	K	L	M	
TW122	37.50	27.62	7.00	8.38	9.25	33.50	20.75	13.50	17.50	3.50	46.00	28.00	1 1/4" FPT

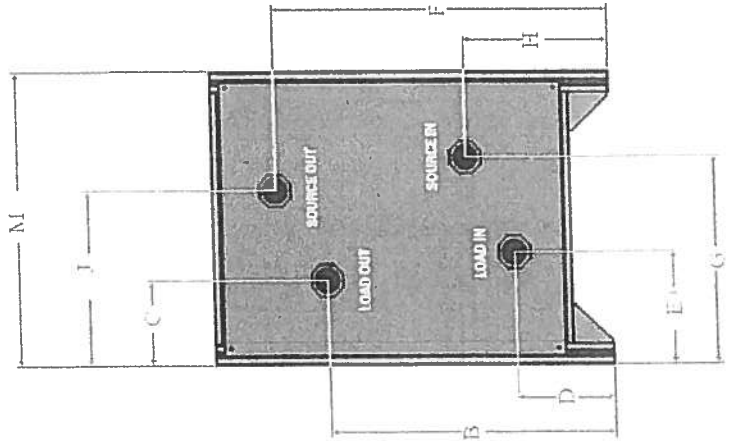
NOTES: All dimensions within $\pm 0.125"$.
Specifications subject to change without notice.

ELECTRICAL CONNECTIONS

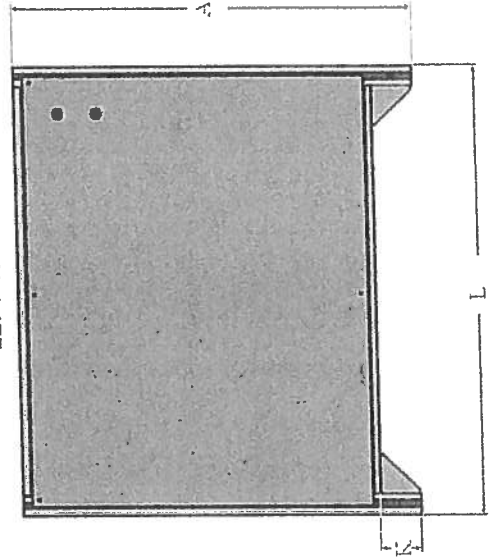


LEFT SIDE FRONT

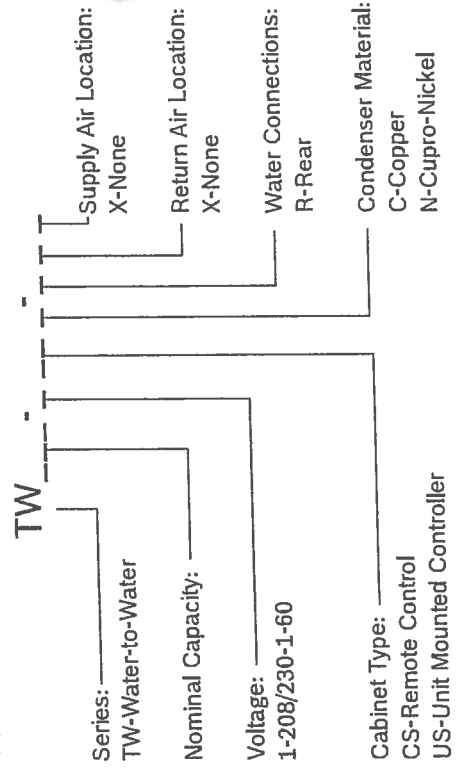
UNIT REAR



LEFT SIDE



TW Series Reverse Cycle Chiller Nomenclature



**BOSCH WATER COOLED CHILLERS AND LOW TEMP BOILERS****SPECIFICATION DATA SHEET****TW025****TW SERIES****ELECTRICAL SPECIFICATIONS**

		Compressor		Min. Circuit Ampacity	Max. Fuse Size
		RLA	LRA		
208/230-1-60	-1	11.7	58.3	14.6	25

FLUID FLOW & PRESSURE DROP

Chilled Fluid Side (@ 55°F)		Cond. Fluid Side (@ 85°F)	
Flow (GPM)	ΔP (FOH)	Flow (GPM)	ΔP (FOH)
3.0	1.29	3.0	1.17
4.0	2.18	4.0	1.97
5.0	3.27	5.0	2.96
6.0	4.55	6.0	4.12
8.0	7.67	8.0	6.94

**CHILLER PERFORMANCE - PART LOAD**

Based on 5 GPM chilled fluid & 10°F condenser fluid temp. rise.

Leaving Load Fluid (°F)	Entering Source Fluid (°F)	Total Capacity (Tons)	Total Capacity (MBtuH)	Power Input (kW)	EER	Heat Rejection (MBtuH)
40°	75°	1.27	15.24	0.89	17.06	18.28
	80°	1.24	14.93	0.97	15.41	18.23
	85°	1.22	14.58	1.05	13.92	18.16
	90°	1.18	14.21	1.13	12.56	18.07
	95°	1.15	13.81	1.22	11.32	17.97
42°	75°	1.32	15.82	0.89	17.75	18.86
	80°	1.29	15.50	0.97	16.03	18.80
	85°	1.26	15.14	1.05	14.47	18.71
	90°	1.23	14.75	1.13	13.05	18.60
	95°	1.19	14.33	1.22	11.77	18.49
44°	75°	1.37	16.43	0.89	18.46	19.47
	80°	1.34	16.09	0.97	16.66	19.38
	85°	1.31	15.71	1.04	15.03	19.28
	90°	1.28	15.30	1.13	13.56	19.15
	95°	1.24	14.87	1.22	12.23	19.02
45°	75°	1.39	16.74	0.89	18.82	19.77
	80°	1.37	16.39	0.96	16.98	19.68
	85°	1.33	16.00	1.04	15.32	19.57
	90°	1.30	15.59	1.13	13.82	19.43
	95°	1.26	15.14	1.22	12.46	19.29
46°	75°	1.98	23.78	1.62	4.29	18.24
	80°	1.98	23.78	1.62	4.29	18.24
	85°	1.98	23.78	1.62	4.29	18.24
	90°	1.98	23.78	1.62	4.29	18.24
	95°	1.98	23.78	1.62	4.29	18.24
48°	75°	1.47	17.70	0.89	19.94	20.73
	80°	1.44	17.32	0.96	17.99	20.61
	85°	1.41	16.91	1.04	16.22	20.46
	90°	1.37	16.47	1.13	14.63	20.31
	95°	1.33	16.00	1.21	13.19	20.14
50°	75°	1.53	18.37	0.89	20.72	21.39
	80°	1.50	17.97	0.96	18.68	21.25
	85°	1.46	17.54	1.04	16.85	21.09
	90°	1.42	17.07	1.12	15.19	20.91
	95°	1.38	16.59	1.21	13.70	20.72

HEATING PERFORMANCE

Based on 10°F load temp. rise & 5 GPM source fluid flow.

Leaving Load Fluid (°F)	Entering Source Fluid (°F)	Total Capacity (MBtuH)	Power Input (kW)	COP	Heat of Abs. (MBtuH)
100°	35°	15.80	1.22	3.81	11.65
	40°	16.86	1.20	4.10	12.75
	50°	19.21	1.18	4.77	15.18
	60°	21.92	1.16	5.55	17.97
	70°	25.03	1.13	6.47	21.16
110°	35°	15.78	1.41	3.28	10.97
	40°	16.77	1.40	3.52	12.01
	50°	19.00	1.37	4.07	14.33
	60°	21.57	1.34	4.71	16.99
	70°	24.53	1.32	5.46	20.04
120°	35°	15.76	1.62	2.85	10.23
	40°	16.70	1.61	3.05	11.22
	50°	18.80	1.58	3.50	13.42
	60°	21.23	1.55	4.02	15.95
	70°	24.02	1.52	4.64	18.85
125°	35°	15.77	1.74	2.66	9.84
	40°	16.68	1.72	2.84	10.81
	50°	18.71	1.69	3.25	12.95
	60°	21.07	1.66	3.73	15.42
	70°	23.78	1.62	4.29	18.24

Units are complete packages featuring 2 stage operation and containing refrigeration compressor, reversing valve, expansion valve metering device and water to refrigerant heat exchangers. Also included are safety controls: Overload protection for compressor, high and low refrigerant pressure switches and a lock-out control circuit.

FHP Manufacturing Company

601 N.W. 65th Court

Fort Lauderdale, FL 33309

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

<http://www.bosch-climate.us>

BOSCH WATER COOLED CHILLERS AND LOW TEMP BOILERS **SPECIFICATION DATA SHEET**

TW025 **TW SERIES**

ELECTRICAL SPECIFICATIONS

Electrical Characteristics	Elect. Symbol	Compressor		Min. Circuit Ampacity	Max. Fuse Size
		RLA	LRA		
208/230-1-60	-1	11.7	58.3	14.6	25

FLUID FLOW & PRESSURE DROP

Chilled Fluid Side (@ 55°F)		Cond. Fluid Side (@ 85°F)	
Flow (GPM)	ΔP (FOH)	Flow (GPM)	ΔP (FOH)
3.0	1.28	3.0	1.16
4.0	2.17	4.0	1.96
5.0	3.26	5.0	2.95
6.0	4.54	6.0	4.10
8.0	7.64	8.0	6.92



CHILLER PERFORMANCE - FULL LOAD

Based on 5 GPM chilled fluid & 10°F condenser fluid temp. rise.

Leaving Load Fluid (°F)	Entering Source Fluid (°F)	Total Capacity (Tons)	Total Capacity (MBtuH)	Power Input (kW)	EER	Heat Rejection (MBtuH)
40°	75°	1.77	21.23	1.36	15.65	25.86
	80°	1.73	20.72	1.44	14.37	25.64
	85°	1.68	20.18	1.53	13.15	25.42
	90°	1.63	19.61	1.63	12.00	25.19
	95°	1.59	19.02	1.74	10.93	24.96
42°	75°	1.83	21.95	1.36	16.14	26.59
	80°	1.78	21.42	1.45	14.81	26.35
	85°	1.74	20.86	1.54	13.56	26.11
	90°	1.69	20.28	1.64	12.38	25.86
	95°	1.64	19.67	1.74	11.28	25.62
44°	75°	1.89	22.68	1.36	16.63	27.34
	80°	1.84	22.14	1.45	15.26	27.08
	85°	1.80	21.56	1.54	13.98	26.82
	90°	1.75	20.96	1.64	12.76	26.56
	95°	1.69	20.33	1.75	11.63	26.29
45°	75°	1.92	23.06	1.37	16.87	27.72
	80°	1.88	22.50	1.45	15.49	27.46
	85°	1.83	21.92	1.54	14.19	27.19
	90°	1.78	21.31	1.64	12.96	26.92
	95°	1.72	20.67	1.75	11.81	26.64
46°	75°	1.96	23.50	1.36	17.30	28.14
	80°	1.91	22.94	1.45	15.90	27.87
	85°	1.86	22.33	1.54	14.50	27.57
	90°	1.81	21.73	1.64	13.30	27.31
	95°	1.76	21.07	1.74	12.10	27.01
48°	75°	2.02	24.21	1.37	17.63	28.90
	80°	1.97	23.63	1.46	16.19	28.61
	85°	1.92	23.02	1.55	14.83	28.31
	90°	1.86	22.38	1.65	13.55	28.01
	95°	1.81	21.71	1.76	12.35	27.71
50°	75°	2.08	25.01	1.38	18.15	29.71
	80°	2.03	24.41	1.46	16.67	29.40
	85°	1.98	23.77	1.56	15.26	29.09
	90°	1.93	23.11	1.66	13.95	28.77
	95°	1.87	22.42	1.76	12.71	28.44

HEATING PERFORMANCE

Based on 10°F load temp. rise & 5 GPM source fluid flow.

Leaving Load Fluid (°F)	Entering Source Fluid (°F)	Total Capacity (MBtuH)	Power Input (kW)	COP	Heat of Abs. (MBtuH)
100°	35°	21.77	1.67	3.83	16.09
	40°	23.11	1.66	4.08	17.45
	50°	26.05	1.65	4.62	20.42
	60°	29.36	1.65	5.22	23.73
	70°	33.08	1.65	5.87	27.44
110°	35°	21.60	1.90	3.33	15.12
	40°	22.87	1.89	3.55	16.43
	50°	25.67	1.88	4.01	19.27
	60°	28.84	1.87	4.51	22.45
	70°	32.41	1.88	5.05	26.00
120°	35°	21.45	2.16	2.91	14.08
	40°	22.65	2.15	3.09	15.32
	50°	25.30	2.13	3.48	18.03
	60°	28.31	2.13	3.90	21.05
	70°	31.72	2.14	4.35	24.43
125°	35°	21.38	2.30	2.72	13.53
	40°	22.55	2.29	2.89	14.74
	50°	25.12	2.27	3.24	17.37
	60°	28.05	2.27	3.63	20.32
	70°	31.37	2.27	4.04	23.61

Units are complete packages featuring 2 stage operation and containing refrigeration compressor, reversing valve, expansion valve metering device and water to refrigerant heat exchangers. Also included are safety controls: Overload protection for compressor, high and low refrigerant pressure switches and a lock-out control circuit.

FHP Manufacturing Company

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**BOSCH WATER COOLED CHILLERS AND LOW TEMP BOILERS****SPECIFICATION DATA SHEET****TW035****TW SERIES****ELECTRICAL SPECIFICATIONS**

Electrical Characteristics	Elect. Symbol	Compressor		Min. Circuit Ampacity	Max. Fuse Size
		RLA	LRA		
208/230-1-60	-1	15.3	83	19.1	35

FLUID FLOW & PRESSURE DROP

Chilled Fluid Side (@ 55°F)		Cond. Fluid Side (@ 85°F)	
Flow (GPM)	ΔP (FOH)	Flow (GPM)	ΔP (FOH)
4.5	3.00	4.5	2.71
6.0	5.05	6.0	4.56
7.5	7.56	7.5	6.84
9.0	10.53	9.0	9.52
12.0	17.75	12.0	16.06

**CHILLER PERFORMANCE - PART LOAD**

Based on 5.3 GPM chilled fluid & 10°F condenser fluid temp. rise.

Leaving Load Fluid (°F)	Entering Source Fluid (°F)	Total Capacity (Tons)	Total Capacity (MBtuH)	Power Input (kW)	EER	Heat Rejection (MBtuH)
40°	75°	1.73	20.76	1.31	15.82	25.24
	80°	1.69	20.33	1.40	14.47	25.12
	85°	1.65	19.85	1.50	13.20	24.98
	90°	1.61	19.34	1.61	12.01	24.83
	95°	1.57	18.78	1.72	10.89	24.66
42°	75°	1.79	21.50	1.31	16.46	25.95
	80°	1.75	21.05	1.40	15.05	25.82
	85°	1.71	20.56	1.50	13.73	25.67
	90°	1.67	20.03	1.60	12.49	25.50
	95°	1.62	19.46	1.72	11.33	25.32
44°	75°	1.85	22.25	1.30	17.13	26.68
	80°	1.82	21.79	1.39	15.66	26.53
	85°	1.77	21.28	1.49	14.28	26.37
	90°	1.73	20.74	1.60	12.99	26.18
	95°	1.68	20.15	1.71	11.78	25.99
45°	75°	1.89	22.64	1.30	17.47	27.06
	80°	1.85	22.16	1.39	15.97	26.90
	85°	1.80	21.65	1.49	14.56	26.72
	90°	1.76	21.10	1.59	13.24	26.53
	95°	1.71	20.51	1.71	12.01	26.33
46°	75°	1.92	23.05	1.13	17.90	27.45
	80°	1.88	22.57	1.38	16.40	27.27
	85°	1.84	22.02	1.48	14.83	27.08
	90°	1.79	21.46	1.59	13.50	26.89
	95°	1.74	20.87	1.70	12.03	26.68
48°	75°	1.99	23.82	1.28	18.56	28.20
	80°	1.94	23.32	1.38	16.95	28.02
	85°	1.90	22.78	1.48	15.44	27.82
	90°	1.85	22.21	1.58	14.04	27.60
	95°	1.80	21.59	1.70	12.74	27.38
50°	75°	2.05	24.64	1.28	19.32	28.99
	80°	2.01	24.12	1.37	17.64	28.78
	85°	1.96	23.56	1.47	16.07	28.57
	90°	1.91	22.97	1.57	14.61	28.34
	95°	1.86	22.34	1.69	13.25	28.09

HEATING PERFORMANCE

Based on 10°F load temp. rise & 5.3 GPM source fluid flow.

Leaving Load Fluid (°F)	Entering Source Fluid (°F)	Total Capacity (MBtuH)	Power Input (kW)	COP	Heat of Abs. (MBtuH)
100°	35°	21.57	1.70	3.73	15.78
	40°	22.93	1.68	4.01	17.21
	50°	25.87	1.63	4.65	20.31
	60°	29.11	1.57	5.44	23.75
	70°	32.67	1.49	6.41	27.57
110°	35°	21.42	1.95	3.23	14.79
	40°	22.74	1.92	3.46	16.18
	50°	25.58	1.87	4.00	19.19
	60°	28.71	1.81	4.65	22.54
	70°	32.13	1.73	5.45	26.24
120°	35°	21.23	2.23	2.79	13.61
	40°	22.51	2.21	2.99	14.97
	50°	25.26	2.15	3.44	17.91
	60°	28.27	2.08	3.97	21.15
	70°	31.56	2.00	4.63	24.74
125°	35°	21.12	2.39	2.59	12.95
	40°	22.38	2.37	2.77	14.30
	50°	25.08	2.31	3.18	17.20
	60°	28.03	2.24	3.67	20.39
	70°	31.26	2.15	4.26	23.92

Units are complete packages featuring 2 stage operation and containing refrigeration compressor, reversing valve, expansion valve metering device and water to refrigerant heat exchangers. Also included are safety controls: Overload protection for compressor, high and low refrigerant pressure switches and a lock-out control circuit.

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BOSCH WATER COOLED CHILLERS AND LOW TEMP BOILERS **SPECIFICATION DATA SHEET**

TW035 **TW SERIES**

ELECTRICAL SPECIFICATIONS

Electrical Characteristics	Elect. Symbol	Compressor		Min. Circuit Ampacity	Max. Fuse Size
		RLA	LRA		
208/230-1-60	-1	15.3	83	19.1	35

FLUID FLOW & PRESSURE DROP

Chilled Fluid Side (@ 55°F)		Cond. Fluid Side (@ 85°F)	
Flow (GPM)	ΔP (FOH)	Flow (GPM)	ΔP (FOH)
4.5	2.98	4.5	2.69
6.0	5.04	6.0	4.55
7.5	7.55	7.5	6.83
9.0	10.52	9.0	9.51
12.0	17.71	12.0	16.02



CHILLER PERFORMANCE - FULL LOAD

Based on 5.3 GPM chilled fluid & 10°F condenser fluid temp. rise.

Leaving Load Fluid (°F)	Entering Source Fluid (°F)	Total Capacity (Tons)	Total Capacity (MBtuH)	Power Input (kW)	EER	Heat Rejection (MBtuH)
40°	75°	2.37	28.43	1.98	14.39	35.17
	80°	2.31	27.73	2.09	13.25	34.88
	85°	2.25	27.01	2.22	12.17	34.58
	90°	2.19	26.26	2.36	11.14	34.30
	95°	2.12	25.48	2.50	10.17	34.02
42°	75°	2.45	29.37	1.99	14.78	36.14
	80°	2.39	28.65	2.10	13.61	35.83
	85°	2.33	27.90	2.23	12.51	35.51
	90°	2.26	27.13	2.37	11.46	35.20
	95°	2.19	26.32	2.52	10.47	34.90
44°	75°	2.53	30.33	2.00	15.19	37.14
	80°	2.47	29.58	2.11	13.99	36.80
	85°	2.40	28.81	2.24	12.86	36.46
	90°	2.33	28.01	2.38	11.78	36.13
	95°	2.27	27.19	2.53	10.76	35.80
45°	75°	2.57	30.82	2.00	15.39	37.65
	80°	2.51	30.06	2.12	14.18	37.30
	85°	2.44	29.28	2.25	13.03	36.94
	90°	2.37	28.47	2.38	11.94	36.60
	95°	2.30	27.63	2.53	10.91	36.26
46°	75°	2.61	31.32	2.01	15.60	38.17
	80°	2.55	30.54	2.13	14.40	37.79
	85°	2.48	29.74	2.25	13.20	37.43
	90°	2.41	28.92	2.39	12.10	37.07
	95°	2.34	28.07	2.54	11.10	36.72
48°	75°	2.69	32.33	2.02	16.03	39.21
	80°	2.63	31.53	2.14	14.77	38.82
	85°	2.56	30.71	2.26	13.57	38.43
	90°	2.49	29.86	2.40	12.45	38.05
	95°	2.42	28.98	2.55	11.38	37.67
50°	75°	2.78	33.36	2.03	16.46	40.28
	80°	2.71	32.55	2.15	15.17	39.87
	85°	2.64	31.70	2.27	13.95	39.45
	90°	2.57	30.82	2.41	12.79	39.04
	95°	2.49	29.91	2.56	11.69	38.64

HEATING PERFORMANCE

Based on 10°F load temp. rise & 5.3 GPM source fluid flow.

Leaving Load Fluid (°F)	Entering Source Fluid (°F)	Total Capacity (MBtuH)	Power Input (kW)	COP	Heat of Abs. (MBtuH)
100°	35°	29.26	2.30	3.73	21.41
	40°	31.03	2.31	3.94	23.15
	50°	34.85	2.32	4.41	26.95
	60°	39.09	2.32	4.93	31.16
	70°	43.77	2.33	5.52	35.84
110°	35°	29.13	2.61	3.27	20.21
	40°	30.82	2.62	3.45	21.89
	50°	34.48	2.62	3.85	25.53
	60°	38.54	2.63	4.30	29.58
	70°	43.02	2.62	4.80	34.07
120°	35°	29.09	2.98	2.86	18.91
	40°	30.69	2.98	3.02	20.51
	50°	34.17	2.98	3.36	23.99
	60°	38.02	2.98	3.74	27.85
	70°	42.30	2.97	4.17	32.15
125°	35°	29.10	3.19	2.67	18.22
	40°	30.66	3.19	2.82	19.78
	50°	34.04	3.19	3.13	23.17
	60°	37.79	3.18	3.48	26.94
	70°	41.95	3.17	3.88	31.13

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BOSCH WATER COOLED CHILLERS AND LOW TEMP BOILERS SPECIFICATION DATA SHEET

TW049

TW SERIES

ELECTRICAL SPECIFICATIONS

Electrical Characteristics	Elect. Symbol	Compressor		Min. Circuit Ampacity	Max. Fuse Size
		RLA	LRA		
208/230-1-60	-1	21.2	96	26.5	45

FLUID FLOW & PRESSURE DROP

Chilled Fluid Side (@ 55°F)		Cond. Fluid Side (@ 85°F)	
Flow (GPM)	ΔP (FOH)	Flow (GPM)	ΔP (FOH)
6.0	2.72	6.0	2.46
8.0	4.59	8.0	4.15
10.0	6.87	10.0	6.22
12.0	9.56	12.0	8.65
16.0	16.09	16.0	14.56



CHILLER PERFORMANCE - PART LOAD

Based on 8.1 GPM chilled fluid & 10°F condenser fluid temp. rise.

Leaving Load Fluid (°F)	Entering Source Fluid (°F)	Total Capacity (Tons)	Total Capacity (MBtuH)	Power Input (kW)	EER	Heat Rejection (MBtuH)
40°	75°	2.36	28.26	1.75	16.12	34.25
	80°	2.30	27.63	1.88	14.72	34.03
	85°	2.24	26.93	2.01	13.41	33.79
	90°	2.18	26.19	2.15	12.17	33.53
	95°	2.12	25.38	2.30	11.02	33.25
42°	75°	2.44	29.24	1.75	16.75	35.19
	80°	2.38	28.58	1.87	15.29	34.96
	85°	2.32	27.87	2.00	13.92	34.70
	90°	2.26	27.10	2.14	12.64	34.42
	95°	2.19	26.28	2.30	11.44	34.12
44°	75°	2.52	30.23	1.74	17.40	36.16
	80°	2.46	29.55	1.86	15.88	35.91
	85°	2.40	28.82	1.99	14.46	35.63
	90°	2.34	28.04	2.14	13.13	35.33
	95°	2.27	27.20	2.29	11.88	35.01
45°	75°	2.56	30.74	1.73	17.74	36.66
	80°	2.50	30.05	1.86	16.18	36.39
	85°	2.44	29.31	1.99	14.73	36.10
	90°	2.38	28.52	2.13	13.38	35.79
	95°	2.31	27.66	2.28	12.11	35.46
46°	75°	2.60	31.25	1.73	18.10	37.15
	80°	2.54	30.54	1.85	16.50	36.86
	85°	2.49	29.82	1.99	15.00	36.60
	90°	2.42	29.02	2.22	13.60	36.27
	95°	2.35	28.16	2.28	12.30	35.94
48°	75°	2.69	32.31	1.72	18.79	38.18
	80°	2.63	31.59	1.84	17.14	37.87
	85°	2.57	30.81	1.98	15.59	37.55
	90°	2.50	29.98	2.12	14.16	37.21
	95°	2.42	29.10	2.27	12.81	36.85
50°	75°	2.78	33.39	1.71	19.53	39.22
	80°	2.72	32.64	1.83	17.81	38.90
	85°	2.65	31.84	1.97	16.20	38.55
	90°	2.58	30.99	2.11	14.70	38.18
	95°	2.51	30.09	2.26	13.31	37.80

HEATING PERFORMANCE

Based on 10°F load temp. rise & 8.1 GPM source fluid flow.

Leaving Load Fluid (°F)	Entering Source Fluid (°F)	Total Capacity (MBtuH)	Power Input (kW)	COP	Heat of Abs. (MBtuH)
100°	35°	29.32	2.28	3.76	21.53
	40°	31.16	2.26	4.04	23.45
	50°	35.12	2.20	4.67	27.61
	60°	39.50	2.13	5.44	32.24
	70°	44.33	2.03	6.39	37.39
110°	35°	28.99	2.62	3.24	20.05
	40°	30.77	2.59	3.48	21.92
	50°	34.60	2.53	4.00	25.96
	60°	38.82	2.45	4.64	30.45
	70°	43.46	2.35	5.41	35.42
120°	35°	28.58	3.01	2.78	18.30
	40°	30.31	2.98	2.98	20.13
	50°	34.02	2.92	3.42	24.07
	60°	38.07	2.83	3.94	28.42
	70°	42.52	2.72	4.57	33.23
125°	35°	28.35	3.23	2.57	17.33
	40°	30.06	3.20	2.75	19.14
	50°	33.70	3.13	3.16	23.02
	60°	37.68	3.04	3.63	27.31
	70°	42.03	2.93	4.20	32.03

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BOSCH WATER COOLED CHILLERS AND LOW TEMP BOILERS

SPECIFICATION DATA SHEET

TW061

TW SERIES

ELECTRICAL SPECIFICATIONS

Electrical Characteristics	Elect. Symbol	Compressor		Min. Circuit Ampacity	Max. Fuse Size
		RLA	LRA		
208/230-1-60	-1	27.1	152.9	33.9	60

FLUID FLOW & PRESSURE DROP

Chilled Fluid Side (@ 55°F)		Cond. Fluid Side (@ 85°F)	
Flow (GPM)	ΔP (FOH)	Flow (GPM)	ΔP (FOH)
7.5	4.44	7.5	4.02
10.0	7.50	10.0	6.79
12.5	11.24	12.5	10.17
15.0	15.64	15.0	14.16
20.0	26.32	20.0	23.83



CHILLER PERFORMANCE - PART LOAD

Based on 10.5 GPM chilled fluid & 10°F condenser fluid temp. rise.

Leaving Load Fluid (°F)	Entering Source Fluid (°F)	Total Capacity (Tons)	Total Capacity (MBtuH)	Power Input (kW)	EER	Heat Rejection (MBtuH)
40°	75°	2.99	35.88	2.10	17.11	43.03
	80°	2.90	34.78	2.24	15.51	42.43
	85°	2.80	33.64	2.40	14.03	41.82
	90°	2.70	32.44	2.56	12.66	41.19
	95°	2.60	31.18	2.74	11.39	40.52
42°	75°	3.11	37.35	2.09	17.88	44.47
	80°	3.02	36.22	2.23	16.21	43.84
	85°	2.92	35.05	2.39	14.67	43.20
	90°	2.82	33.83	2.55	13.24	42.54
	95°	2.71	32.54	2.73	11.92	41.85
44°	75°	3.24	38.85	2.08	18.68	45.95
	80°	3.14	37.70	2.23	16.93	45.29
	85°	3.04	36.50	2.38	15.32	44.62
	90°	2.94	35.25	2.55	13.84	43.93
	95°	2.83	33.93	2.72	12.46	43.22
45°	75°	3.30	39.63	2.08	19.09	46.71
	80°	3.20	38.45	2.22	17.30	46.03
	85°	3.10	37.23	2.38	15.66	45.35
	90°	3.00	35.97	2.54	14.14	44.64
	95°	2.89	34.64	2.72	12.74	43.91
46°	75°	3.37	40.41	2.07	19.50	47.47
	80°	3.27	39.23	2.22	17.70	46.80
	85°	3.16	37.96	2.37	16.00	46.06
	90°	3.06	36.70	2.54	14.50	45.37
	95°	2.94	35.33	2.72	13.00	44.60
48°	75°	3.50	42.00	2.06	20.37	49.03
	80°	3.40	40.77	2.21	18.45	48.31
	85°	3.29	39.50	2.37	16.70	47.57
	90°	3.18	38.19	2.53	15.09	46.82
	95°	3.07	36.81	2.71	13.60	46.05
50°	75°	3.64	43.64	2.05	21.26	50.64
	80°	3.53	42.37	2.20	19.25	49.88
	85°	3.42	41.06	2.36	17.42	49.10
	90°	3.31	39.71	2.52	15.74	48.32
	95°	3.19	38.30	2.70	14.19	47.51

HEATING PERFORMANCE

Based on 10°F load temp. rise & 10.5 GPM source fluid flow.

Capacity		Abs.			
		34.79	2.74	3.73	25.46
		37.59	2.70	4.07	28.37
		43.63	2.63	4.85	34.64
		50.31	2.56	5.76	41.58
		57.70	2.48	6.82	49.24
		33.74	3.13	3.15	23.04
		36.49	3.10	3.45	25.92
		42.38	3.02	4.11	32.08
		48.85	2.94	4.87	38.83
		55.96	2.85	5.75	46.22
		32.47	3.60	2.64	20.18
		35.19	3.56	2.90	23.05
		40.96	3.47	3.46	29.13
		47.24	3.37	4.10	35.72
		54.08	3.28	4.83	42.88
		31.74	3.87	2.41	18.55
		34.45	3.82	2.64	21.42
		40.17	3.72	3.17	27.48
		46.36	3.62	3.75	34.01
		53.08	3.52	4.42	41.07

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BOSCH WATER COOLED CHILLERS AND LOW TEMP BOILERS **SPECIFICATION DATA SHEET**

TW061 **TW SERIES**

ELECTRICAL SPECIFICATIONS

Electrical Characteristics	Elect. Symbol	Compressor		Min. Circuit Ampacity	Max. Fuse Size
		RLA	LRA		
208/230-1-60	-1	27.1	152.9	33.9	60

FLUID FLOW & PRESSURE DROP

Chilled Fluid Side (@ 55°F)		Cond. Fluid Side (@ 85°F)	
Flow (GPM)	ΔP (FOH)	Flow (GPM)	ΔP (FOH)
7.5	4.42	7.5	3.99
10.0	7.46	10.0	6.74
12.5	11.20	12.5	10.13
15.0	15.59	15.0	14.10
20.0	26.26	20.0	23.76



CHILLER PERFORMANCE - FULL LOAD

Based on 10.5 GPM chilled fluid & 10°F condenser fluid temp. rise.

Leaving Load Fluid (°F)	Entering Source Fluid (°F)	Total Capacity (Tons)	Total Capacity (MBtuH)	Power Input (kW)	EER	Heat Rejection (MBtuH)
40°	75°	4.06	48.67	3.34	14.56	60.07
	80°	3.95	47.43	3.54	13.40	59.51
	85°	3.85	46.15	3.75	12.31	58.95
	90°	3.74	44.82	3.98	11.27	58.39
	95°	3.62	43.44	4.22	10.29	57.84
42°	75°	4.20	50.43	3.35	15.04	61.88
	80°	4.10	49.16	3.55	13.85	61.27
	85°	3.99	47.83	3.76	12.72	60.66
	90°	3.87	46.45	3.99	11.65	60.06
	95°	3.75	45.02	4.23	10.64	59.46
44°	75°	4.35	52.24	3.37	15.52	63.73
	80°	4.24	50.92	3.56	14.30	63.07
	85°	4.13	49.54	3.77	13.13	62.41
	90°	4.01	48.12	4.00	12.03	61.76
	95°	3.89	46.64	4.24	10.99	61.12
45°	75°	4.43	53.16	3.37	15.76	64.66
	80°	4.32	51.81	3.57	14.52	63.98
	85°	4.20	50.41	3.78	13.35	63.30
	90°	4.08	48.97	4.00	12.23	62.63
	95°	3.96	47.46	4.25	11.17	61.96
46°	75°	4.51	54.08	3.38	16.00	65.61
	80°	4.41	52.91	3.58	14.80	65.11
	85°	4.28	51.32	3.78	13.60	64.23
	90°	4.15	49.83	4.01	12.40	63.51
	95°	4.02	48.30	4.25	11.40	62.81
48°	75°	4.66	55.97	3.39	16.50	67.54
	80°	4.55	54.55	3.59	15.21	66.78
	85°	4.42	53.08	3.80	13.98	66.03
	90°	4.30	51.56	4.02	12.82	65.28
	95°	4.17	49.99	4.27	11.72	64.54
50°	75°	4.82	57.89	3.41	17.00	69.50
	80°	4.70	56.42	3.60	15.68	68.70
	85°	4.58	54.90	3.81	14.42	67.90
	90°	4.44	53.34	4.03	13.22	67.10
	95°	4.31	51.71	4.28	12.09	66.31

HEATING PERFORMANCE

Based on 10°F load temp. rise & 10.5 GPM source fluid flow.

Leaving Load Fluid (°F)	Entering Source Fluid (°F)	Total Capacity (MBtuH)	Power Input (kW)	COP	Heat of Abs. (MBtuH)
100°	35°	49.67	3.99	3.65	36.06
	40°	52.97	3.99	3.90	39.37
	50°	60.12	3.97	4.43	46.56
	60°	68.00	3.96	5.03	54.47
	70°	76.59	3.96	5.67	63.08
110°	35°	49.31	4.51	3.20	33.93
	40°	52.46	4.51	3.41	37.08
	50°	59.27	4.49	3.87	43.95
	60°	66.79	4.47	4.38	51.53
	70°	75.00	4.46	4.93	59.79
120°	35°	49.00	5.11	2.81	31.56
	40°	51.98	5.11	2.98	34.56
	50°	58.46	5.09	3.37	41.10
	60°	65.60	5.06	3.80	48.32
	70°	73.42	5.04	4.27	56.22
125°	35°	48.86	5.44	2.63	30.29
	40°	51.76	5.44	2.79	33.21
	50°	58.06	5.42	3.14	39.57
	60°	65.02	5.40	3.53	46.61
	70°	72.64	5.37	3.97	54.32

Units are complete packages featuring 2 stage operation and containing refrigeration compressor, reversing valve, expansion valve metering device and water to refrigerant heat exchangers. Also included are safety controls: Overload protection for compressor, high and low refrigerant pressure switches and a lock-out control circuit.

FHP Manufacturing Company

601 N.W. 65th Court
Fort Lauderdale, FL 33309
Phone: (954) 776-5471 Fax: (800) 776-5529
<http://www.bosch-climate.us>



BOSCH WATER COOLED CHILLERS AND LOW TEMP BOILERS

SPECIFICATION DATA SHEET

TW071

TW SERIES

ELECTRICAL SPECIFICATIONS

Electrical Characteristics	Elect. Symbol	Compressor		Min. Circuit Ampacity	Max. Fuse Size
		RLA	LRA		
208/230-1-60	-1	29.7	179.2	37.1	60

FLUID FLOW & PRESSURE DROP

Chilled Fluid Side (@ 55°F)		Cond. Fluid Side (@ 85°F)	
Flow (GPM)	ΔP (FOH)	Flow (GPM)	ΔP (FOH)
9.0	4.05	9.0	3.66
12.0	6.83	12.0	6.18
15.0	10.24	15.0	9.27
18.0	14.25	18.0	12.89
24.0	23.97	24.0	21.70



CHILLER PERFORMANCE - PART LOAD

Based on 11.0 GPM chilled fluid & 10°F condenser fluid temp. rise.

Leaving Load Fluid (°F)	Entering Source Fluid (°F)	Total Capacity (Tons)	Total Capacity (MBtuH)	Power Input (kW)	EER	Heat Rejection (MBtuH)
40°	75°	3.60	43.25	2.70	16.04	52.45
	80°	3.52	42.19	2.89	14.59	52.05
	85°	3.42	41.09	3.10	13.26	51.66
	90°	3.33	39.96	3.32	12.05	51.27
	95°	3.23	38.79	3.55	10.93	50.90
42°	75°	3.74	44.92	2.68	16.77	54.06
	80°	3.65	43.82	2.87	15.25	53.62
	85°	3.56	42.69	3.08	13.87	53.18
	90°	3.46	41.51	3.29	12.60	52.75
	95°	3.36	40.31	3.52	11.44	52.33
44°	75°	3.89	46.65	2.66	17.53	55.73
	80°	3.79	45.51	2.85	15.95	55.25
	85°	3.69	44.33	3.06	14.50	54.76
	90°	3.59	43.12	3.27	13.18	54.28
	95°	3.49	41.87	3.50	11.96	53.81
45°	75°	3.96	47.53	2.65	17.92	56.58
	80°	3.86	46.37	2.84	16.30	56.08
	85°	3.76	45.17	3.05	14.83	55.57
	90°	3.66	43.94	3.26	13.48	55.06
	95°	3.56	42.67	3.49	12.23	54.57
46°	75°	4.03	48.41	2.64	18.30	57.43
	80°	3.94	47.23	2.84	16.70	56.91
	85°	3.84	46.02	3.04	15.20	56.38
	90°	3.73	44.78	3.25	13.80	55.87
	95°	3.63	43.51	3.48	12.50	55.37
48°	75°	4.19	50.26	2.63	19.13	59.23
	80°	4.09	49.04	2.82	17.41	58.65
	85°	3.98	47.77	3.02	15.84	58.07
	90°	3.87	46.48	3.23	14.40	57.49
	95°	3.76	45.14	3.45	13.07	56.92
50°	75°	4.35	52.15	2.61	19.97	61.06
	80°	4.24	50.88	2.80	18.17	60.43
	85°	4.13	49.57	3.00	16.54	59.80
	90°	4.02	48.23	3.21	15.04	59.17
	95°	3.90	46.85	3.43	13.66	58.55

HEATING PERFORMANCE

Based on 10°F load temp. rise & 11.0 GPM source fluid flow.

Leaving Load Fluid (°F)	Entering Source Fluid (°F)	Total Capacity (MBtuH)	Power Input (kW)	COP	Heat of Abs. (MBtuH)
100°	35°	44.44	3.58	3.64	32.24
	40°	47.30	3.50	3.96	35.35
	50°	53.68	3.35	4.69	42.24
	60°	61.01	3.20	5.58	50.08
	70°	69.37	3.06	6.64	58.92
110°	35°	44.34	4.10	3.17	30.36
	40°	47.03	4.01	3.44	33.35
	50°	53.05	3.84	4.05	39.95
	60°	59.99	3.67	4.79	47.48
	70°	67.93	3.50	5.68	55.98
120°	35°	44.37	4.70	2.77	28.33
	40°	46.88	4.60	2.99	31.18
	50°	52.52	4.40	3.50	37.50
	60°	59.05	4.20	4.12	44.70
	70°	66.54	4.01	4.86	52.86
125°	35°	44.44	5.04	2.59	27.26
	40°	46.87	4.93	2.79	30.04
	50°	52.31	4.72	3.25	36.21
	60°	58.62	4.51	3.81	43.25
	70°	65.89	4.30	4.49	51.22

Units are complete packages featuring 2 stage operation and containing refrigeration compressor, reversing valve, expansion valve metering device and water to refrigerant heat exchangers. Also included are safety controls: Overload protection for compressor, high and low refrigerant pressure switches and a lock-out control circuit.

FHP Manufacturing Company

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BOSCH WATER COOLED CHILLERS AND LOW TEMP BOILERS **SPECIFICATION DATA SHEET**

TW071 **TW SERIES**

ELECTRICAL SPECIFICATIONS

Electrical Characteristics	Elect. Symbol	Compressor		Min. Circuit Ampacity	Max. Fuse Size
		RLA	LRA		
208/230-1-60	-1	29.7	179.2	37.1	60

FLUID FLOW & PRESSURE DROP

Chilled Fluid Side (@ 55°F)		Cond. Fluid Side (@ 85°F)	
Flow (GPM)	ΔP (FOH)	Flow (GPM)	ΔP (FOH)
9.0	4.03	9.0	3.64
12.0	6.80	12.0	6.15
15.0	10.21	15.0	9.23
18.0	14.21	18.0	12.85
24.0	23.93	24.0	21.65



CHILLER PERFORMANCE - FULL LOAD

Based on 11.0 GPM chilled fluid & 10°F condenser fluid temp. rise.

Leaving Load Fluid (°F)	Entering Source Fluid (°F)	Total Capacity (Tons)	Total Capacity (MBtuH)	Power Input (kW)	EER	Heat Rejection (MBtuH)
40°	75°	4.71	56.58	3.99	14.17	70.20
	80°	4.60	55.15	4.21	13.11	69.50
	85°	4.47	53.67	4.43	12.12	68.78
	90°	4.34	52.13	4.66	11.19	68.03
	95°	4.21	50.54	4.90	10.31	67.27
42°	75°	4.88	58.51	4.01	14.58	72.20
	80°	4.75	57.03	4.23	13.50	71.45
	85°	4.63	55.50	4.45	12.48	70.68
	90°	4.49	53.91	4.68	11.52	69.88
	95°	4.36	52.27	4.93	10.61	69.07
44°	75°	5.04	60.50	4.03	15.01	74.25
	80°	4.91	58.97	4.25	13.89	73.45
	85°	4.78	57.39	4.47	12.84	72.63
	90°	4.65	55.74	4.70	11.85	71.79
	95°	4.50	54.04	4.95	10.92	70.93
45°	75°	5.13	61.51	4.04	15.22	75.30
	80°	5.00	59.96	4.26	14.09	74.48
	85°	4.86	58.35	4.48	13.03	73.63
	90°	4.72	56.68	4.71	12.02	72.76
	95°	4.58	54.95	4.96	11.08	71.87
46°	75°	5.21	62.56	4.05	15.40	76.38
	80°	5.08	60.96	4.27	14.30	75.51
	85°	4.94	59.31	4.49	13.20	74.62
	90°	4.80	57.61	4.72	12.20	73.72
	95°	4.65	55.86	4.97	11.20	72.82
48°	75°	5.39	64.63	4.07	15.88	78.52
	80°	5.25	63.00	4.29	14.70	77.62
	85°	5.11	61.30	4.51	13.59	76.69
	90°	4.96	59.55	4.75	12.55	75.75
	95°	4.81	57.74	4.99	11.56	74.78
50°	75°	5.57	66.78	4.09	16.32	80.74
	80°	5.42	65.09	4.31	15.11	79.79
	85°	5.28	63.34	4.53	13.97	78.81
	90°	5.13	61.53	4.77	12.90	77.81
	95°	4.97	59.67	5.02	11.89	76.79

HEATING PERFORMANCE

Based on 10°F load temp. rise & 11.0 GPM source fluid flow.

Leaving Load Fluid (°F)	Entering Source Fluid (°F)	Total Capacity (MBtuH)	Power Input (kW)	COP	Heat of Abs. (MBtuH)
100°	35°	58.07	4.58	3.72	42.44
	40°	61.72	4.60	3.93	46.02
	50°	69.65	4.64	4.40	53.83
	60°	78.51	4.66	4.93	62.60
	70°	88.36	4.69	5.52	72.36
110°	35°	57.29	5.08	3.30	39.95
	40°	60.80	5.11	3.49	43.37
	50°	68.42	5.15	3.89	50.85
	60°	76.93	5.18	4.35	59.25
	70°	86.40	5.21	4.86	68.61
120°	35°	56.46	5.64	2.93	37.21
	40°	59.82	5.67	3.09	40.47
	50°	67.13	5.72	3.44	47.60
	60°	75.28	5.76	3.83	55.61
	70°	84.36	5.80	4.26	64.57
125°	35°	56.03	5.95	2.76	35.74
	40°	59.32	5.98	2.91	38.91
	50°	66.46	6.04	3.23	45.87
	60°	74.44	6.08	3.59	53.68
	70°	83.31	6.12	3.99	62.43

Units are complete packages featuring 2 stage operation and containing refrigeration compressor, reversing valve, expansion valve metering device and water to refrigerant heat exchangers. Also included are safety controls: Overload protection for compressor, high and low refrigerant pressure switches and a lock-out control circuit.

FHP Manufacturing Company

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BOSCH WATER COOLED CHILLERS AND LOW TEMP BOILERS **SPECIFICATION DATA SHEET**

TW122 TW SERIES

ELECTRICAL SPECIFICATIONS

Electrical Characteristics	Elect. Symbol	Compressor X2		Min. Circuit Ampacity	Max. Fuse Size
		RLA	LRA		
208-230/1/60	-1	28.3	178	63.7	90

FLUID FLOW & PRESSURE DROP

Chilled Fluid Side (@ 44°F)		Cond. Fluid Side (@ 104°F)	
Flow (GPM)	ΔP (FOH)	Flow (GPM)	ΔP (FOH)
18	5.4	18	4.7
22	7.7	22	6.7
26	10.5	26	9.1
30	13.6	30	11.9
34	17.0	34	14.9



CHILLER PERFORMANCE - FULL LOAD

Based on 25 GPM load and 30 GPM source fluid flow.

Leaving Load Fluid (°F)	Entering Source Fluid (°F)	Total Capacity (Tons)	Total Capacity (MBtuH)	Power Input (kW)	EER	Heat Rejection (MBtuH)
40°	75°	9.33	111.93	6.73	16.64	134.88
	80°	9.09	109.10	7.15	15.26	133.49
	85°	8.85	106.20	7.60	13.98	132.12
	90°	8.60	103.21	8.08	12.78	130.76
	95°	8.34	100.11	8.59	11.65	129.42
42°	75°	9.67	116.06	6.74	17.23	139.05
	80°	9.43	113.12	7.16	15.80	137.55
	85°	9.18	110.12	7.61	14.47	136.07
	90°	8.92	107.03	8.09	13.23	134.62
	95°	8.65	103.83	8.60	12.07	133.18
44°	75°	10.03	120.31	6.75	17.82	143.34
	80°	9.77	117.28	7.17	16.35	141.75
	85°	9.51	114.16	7.62	14.98	140.16
	90°	9.25	110.95	8.10	13.70	138.59
	95°	8.97	107.65	8.61	12.50	137.04
45°	75°	10.21	122.47	6.76	18.13	145.53
	80°	9.95	119.37	7.18	16.63	143.87
	85°	9.68	116.21	7.63	15.23	142.24
	90°	9.41	112.95	8.11	13.93	140.61
	95°	9.13	109.59	8.62	12.71	139.00
46°	75°	10.39	124.68	6.76	18.43	147.76
	80°	10.13	121.53	7.19	16.91	146.06
	85°	9.86	118.30	7.64	15.49	144.36
	90°	9.58	114.98	8.11	14.17	142.67
	95°	9.30	111.57	8.63	12.93	141.01
48°	75°	10.76	129.18	6.78	19.06	152.31
	80°	10.49	125.91	7.20	17.48	150.49
	85°	10.21	122.56	7.65	16.02	148.67
	90°	9.93	119.12	8.13	14.65	146.86
	95°	9.63	115.60	8.64	13.37	145.08
50°	75°	11.15	133.81	6.79	19.69	156.99
	80°	10.87	130.42	7.22	18.06	155.05
	85°	10.58	126.94	7.67	16.55	153.11
	90°	10.28	123.40	8.15	15.15	151.20
	95°	9.98	119.73	8.66	13.83	149.28

HEATING PERFORMANCE

Based on 25 GPM load and 30 GPM source fluid flow.

Leaving Load Fluid (°F)	Entering Source Fluid (°F)	Total Capacity (MBtuH)	Power Input (kW)	COP	Heat of Abs. (MBtuH)
100°	35°	110.92	8.21	3.96	82.90
	40°	118.43	8.17	4.25	90.54
	50°	134.86	8.10	4.88	107.23
	60°	153.37	8.03	5.60	125.96
	70°	174.16	7.98	6.40	146.94
110°	35°	109.84	9.33	3.45	77.99
	40°	117.03	9.28	3.69	85.36
	50°	132.74	9.19	4.23	101.39
	60°	150.41	9.10	4.84	119.35
	70°	170.28	9.03	5.52	139.45
120°	35°	108.91	10.65	3.00	72.58
	40°	115.77	10.58	3.21	79.66
	50°	130.72	10.46	3.66	95.04
	60°	147.53	10.34	4.18	112.23
	70°	166.42	10.25	4.76	131.45
125°	35°	108.52	11.39	2.79	69.66
	40°	115.20	11.31	2.98	76.59
	50°	129.76	11.17	3.40	91.65
	60°	146.12	11.04	3.88	108.45
	70°	164.52	10.93	4.41	127.24

Units are complete packages featuring 2 stage operation and containing refrigeration compressor, reversing valve, expansion valve metering device and water to refrigerant heat exchangers. Also included are safety controls: Overload protection for compressor, high and low refrigerant pressure switches and a lock-out control circuit.

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NOTES



BOSCH

601 N.W. 65th Court, Ft. Lauderdale, FL 33309
Phone: 954-776-5471 | Fax: 954-776-5529
www.boschtaxcredit.com | www.bosch-climate.com

Revised 03-12





State of Idaho

DEPARTMENT OF WATER RESOURCES

Southern Region, 1341 Fillmore Street, Suite 200 • Twin Falls, Idaho 83301-3380
Phone: (208) 736-3033 • Fax: (208) 736-3037 • Web Site: www.idwr.idaho.gov

C. L. "BUTCH" OTTER
Governor

GARY SPACKMAN
Director

February 28, 2013

COOPER FAMILY GIFT TRUST
26 DROMARA DR
ST LOUIS, MO 63124

Re: Application For Permit No. 37-22814

Dear Applicant(s):

The Department of Water Resources has received your water right application. Please refer to the number referenced above in all future correspondence regarding this application.

A legal notice of the application has been prepared and is scheduled for publication in the **IDAHO MOUNTAIN EXPRESS** on **3/6/2013 and 3/13/2013**. Protests to this application may be submitted for a period ending ten (10) days after the second publication (**March 25, 2013**).

If the application is protested, you will be sent a copy of each protest. All protests must be resolved before the application can be considered for approval. If the protest(s) cannot be resolved voluntarily, the Department will conduct a conference and/or hearing on the matter.

If the application is not protested, the Department will process your application and notify you of any action taken on the application. If your application is approved, the Department will send you a copy of the permit.

Please contact this office if you have any questions regarding the application.

Sincerely,

Denise Maline
Administrative Assistant

Maline, Denise

From: Maline, Denise
Sent: Thursday, February 28, 2013 11:43 AM
To: Idaho Mountain Express
Subject: LEGAL NOTICES
Attachments: Idaho Mtn Express Cover Letter.docx; Lower Valley IWRB Recharge 01-10609.docx; Idaho Mtn Express Ad.docx

Attached please find **(2) legal notices** being submitted for publication on March 6th & 13th, 2013. Please contact me if you have any questions, or if you are not able to run the ads on the dates requested.

Thank you in advance,

Denise Maline
Administrative Assistant
Idaho Department of Water Resources
1341 Fillmore St, Ste 200
Twin Falls, Idaho 83301
(208) 736-3033
denise.maline@idwr.idaho.gov

February 28, 2013

LEGAL NOTICE DEPARTMENT
IDAHO MOUNTAIN EXPRESS
PO BOX 1013
KETCHUM, ID 83340

RE: Application For Permit No.(s): 1-10609 (Original number 01-7143)
Application For Permit No. (s): 37-22814

RE: Transfer No. 78392
Water Right No(s): 37-2578

Dear Legal Notice Department:

Please publish the enclosed legal notice on the dates indicated (once a week for two consecutive weekly issues). If you cannot publish the notice on the proposed dates, please contact us immediately.

An affidavit of publication must be submitted to the Department along with the publication bill. Please send the affidavit and bill to this office before March 25, 2013. Your cooperation is appreciated.

Sincerely,

Denise Maline
Administrative Assistant

Enclosure(s)

The following application(s) have been filed to appropriate the public waters of the State of Idaho:

37-22814

COOPER FAMILY GIFT TRUST

26 DROMARA DR

ST LOUIS, MO 63124

Point of Diversion SWNW S29 T04N R18E BLAINE County Source GROUND WATER Tributary

Use: COOLING 01/01 to 12/31 0.13 CFS

Use: HEATING 01/01 to 12/31 0.13 CFS

Total Diversion: 0.13 CFS

Date Filed: 2/25/2013

Place Of Use: HEATING AND COOLING

T04N R18E S29 SWNW

T04N R18E S30 SENE

NOTICE OF PROPOSED CHANGE OF WATER RIGHT

TRANSFER NO. 78392

LLOYD and DEANN RICHINS, 2809 E 550 S, PAUL, ID 83347; MARK and SUSAN WILLIAMS, 622 S 45 LANE W, RUPERT, ID 83350; and PAUL and POLLY CARNEY, 291 S 2800 E, PAUL, ID 83347 have filed Application No. 78392 for changes to the following water rights within BLAINE County(s): Right No(s). 37-2578. The purpose of the transfer is to change a portion of the above rights as follows: Application proposes adding a third point of diversion (proposed well) to supplement a 2.74 cfs irrigation ground water right. The new point of diversion and place of use are located approximately 8.7 to 9.8 miles north and 7.0 to 7.9 miles east of the intersection of Hwy 20 and Hwy 93 in Carey.

Permits will be subject to all prior water rights. For additional information concerning the property location, contact Southern Region office at (208) 736-3033; or for a full description of the rights &/or proposed transfer(s), please see www.idwr.idaho.gov/apps/ExtSearch/WRFiling.asp. Protests may be submitted based on the criteria of Sec 42-222 and 42-203A, Idaho Code. Any protest against the approval of this application(s) must be filed with the Director, Dept. of Water Resources, Southern Region, 1341 Fillmore St, Suite 200, Twin Falls, ID 83301 together with a protest fee of \$25.00 for each application on or before March 25, 2013. The protestant must also send a copy of the protest to the applicant.

GARY SPACKMAN, Director

Published on March 6th & 13th, 2013