



Solar Attic Pool Heating

Solar Attic Pool Heating Benefits:

- No roof-mounted panels required
- Reduces air conditioning costs by cooling attic space
- No wind or storm damage possible
- Extends swimming season up to 10 months
- Adds heat to pool even in Winter
- One unit will heat up to a 35,000 gallon pool
- SAVES BIG \$\$\$ VERSUS HEAT PUMPS OR GAS POOL HEATING

System Description: A heat exchanger (radiator and fan unit) is installed in the attic. Pool water is diverted to the heat exchanger when temperatures in the attic are 20 degrees warmer than the pool temperature. The fan draws hot air from across the attic, passing it over the radiator coil, removing heat from the attic and transferring it to the pool. This, in effect, turns the entire roof surface into a solar collector. Cooling the attic will also reduce air conditioning costs, as the air conditioning ducts will be operating with less heat gain. Automatic drain back system prevents water damage to attic in the event of a leak. Controller and Fan / Coil unit shown below:



Los Angeles Times

SUNDAY, APRIL 23, 1995, REAL ESTATE, PART K, PAGE 5
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Pool Solar System to Install Yourself

CUT YOUR UTILITY BILLS

By JAMES DULLEY
SPECIAL TO THE TIMES

QUESTION: I like warm swimming water and I want several extra months of use. How effective are the new pool solar heating systems that help to cool a house too? Are there any budget-priced do-it-yourself solar units?

ANSWER: Installing a budget-priced solar system can easily extend your swimming season by several months and warm the water. If your pool overheats in mid-summer, run the solar system at night instead of day. This gives off heat to the night sky and keeps the water comfortably cool.

Most budget-priced solar systems are designed for simple do-it-yourself installation. Complete kits include everything except standard plastic pipe and fittings. They use your existing filter pump to circulate the water. Start with one or two collectors and gradually add more as your budget allows.

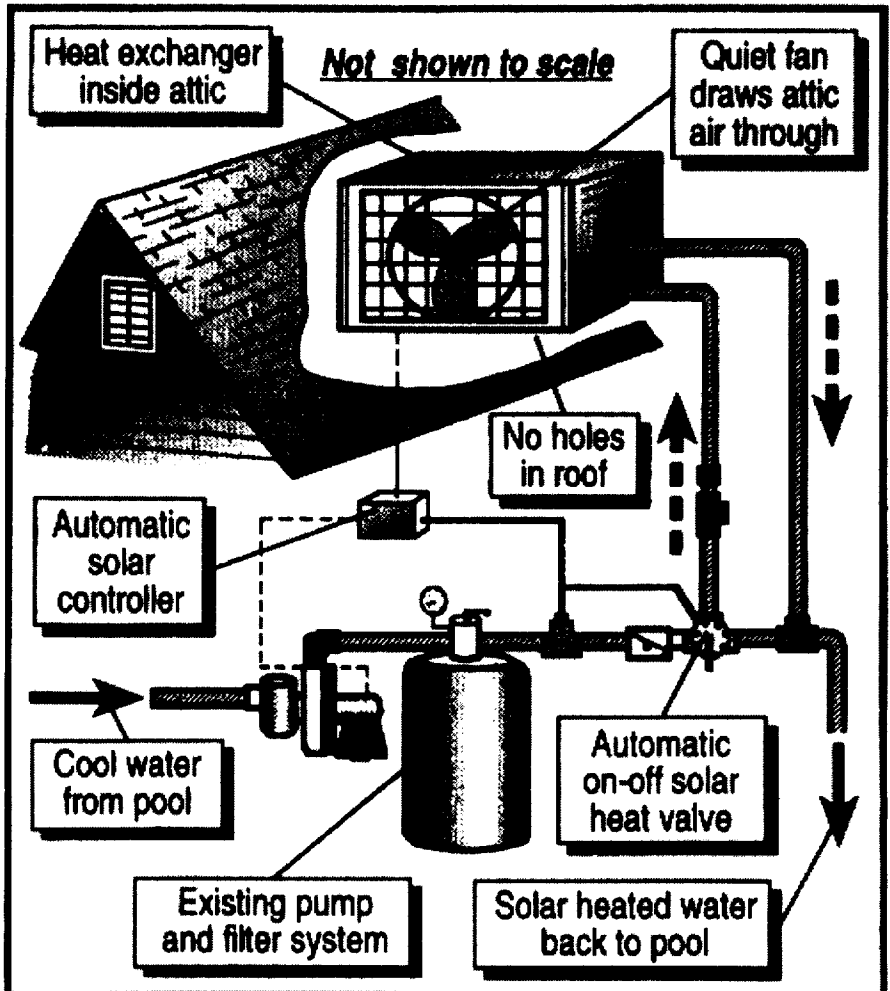
New designs of swimming pool solar systems don't require big collectors on your roof. Optional automatic controllers monitor the water and collector temperatures. The system only runs when it's needed. The controllers also automate chlorination and filtration for a 40% electricity savings.

Attic Technology makes a solar heat exchanger unit that mounts inside an attic. It draws heat from the hot attic and transfers it to the pool water flowing through the heat exchanger. By drawing the heat for the pool water from the attic, your house stays cooler so your air conditioner runs less.

A quiet fan pulls the hot attic air through the heat exchanger. In effect, it uses your entire roof area as an indirect solar collector. Under typical weather conditions, it produces 60,000 Btu of heat per hour.

Another unique solar system is built into the decking around an above-ground pool. The entire pool (12 by 20 by 20 by 60 feet) and decking are sold as a kit. The pool water circulating through the solar deck keeps the deck cooler so it is more comfortable to walk on and lie on.

Recent design changes in rooftop solar collectors have improved appear-



ance and ease of installation. Fewer roof mounting holes are needed. Many of the shallow flexible collectors (in several common roof colors) are barely noticeable from the ground.

These flexible collectors are easy to install and come in four-foot wide rolls up to 25 feet long. Although most pool collectors are uncovered, some have a clear cover option for windy or cool climates. Individual tube collector designs from Heliocol are also good for windy areas.

It is extremely important to properly size a solar pool system. If it is too small for your climate conditions and pool size, it will be ineffective.

Write for Update Bulletin No. 955 showing a buyer's guide of do-it-yourself swimming pool solar system and combo aboveground pool/solar deck kits listing collector materials, installation methods, prices and a solar system sizing chart. Please include \$2 and a self-addressed envelope and mail to James Dulley, Los Angeles Times, 6906 Royalgreen Drive, Cincinnati, Ohio 45244.

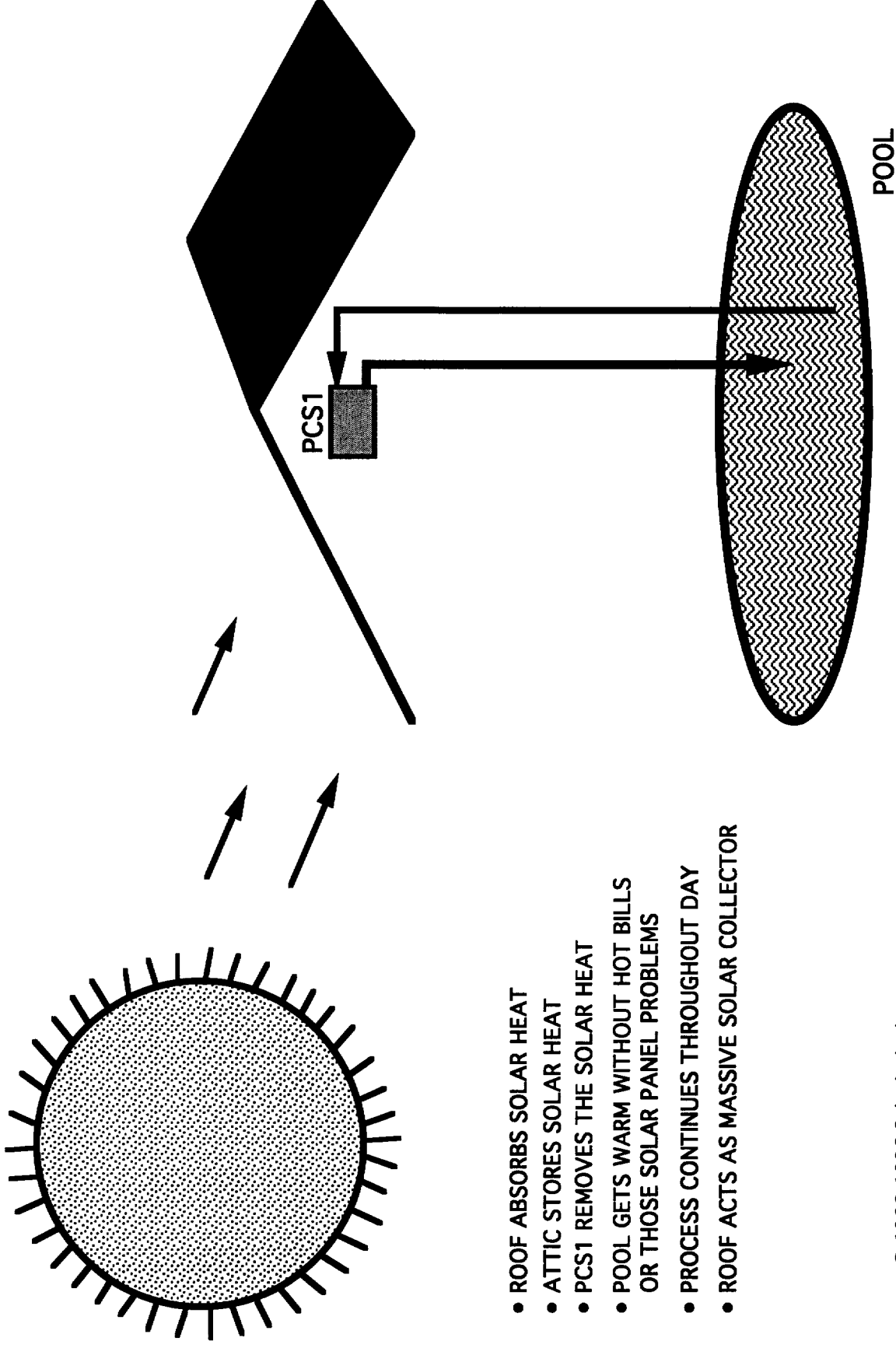
Temperature sensors sense the pool and attic temperatures. Maximum heat is then extracted automatically. The pool owner simply sets the desired thermostat setting on the LX220. Flowreversal™ can substantially reduce the pool's heat demand by allowing the heat to rise from the main drain. Flowreversal™ is a trademark of Mark Urban, Tustin, California. A pool blanket can be used when the pool is not in use thereby minimizing heat losses caused by evaporation (60%). Specifications are subject to change without notice.

Specifications

- Pool Sizes: Up to 1000 square feet or 35,000 gallons
- Up to 70,000 gallons with FlowReversal™ valves
- Nominal BTU Rating: 60,000 BTUs/hour @ D 32°F
I.E. Pool water input 72°F & Attic's Peak @ 104°F
- BTU Transfer Range: 20-150,000 BTUs per hour
- Attic space required: 3 ft min height to peak; and, square ft of attic equal to or greater than pool sq ft
- Attic access: Fits through standard 24" o.c. trusses
- Minimum access opening recommended: 21"x 31"
- Can be disassembled for smaller access openings
- PCS1 Size: 33"W x 30"H x 20"D
- PCS1 Weight: 135 pounds
- Shipping Crate Size: 42"W x 38"H x 24"D
- Shipping/Crated Weight: 246-253 pounds
- Power: 220 vac 1.8 amps @ Full Load
- Operating Cost: \$5-11 per month @ 9¢ per KW/hour
- U.L. Listed: Coil, Motor & other components
- Plumbing: 1 1/2" or 2" PVC typical
- Pressure Drop: 4-6 PSI typical
- Air Flow Rate: 2500 SCFM
- Water Flow Rate: Range 15-80 GPM
- Optimal Water Flow Rate: 45-55 GPM
- Modes: Manual Off & On
- Optional Automatic Operation: LX220 control

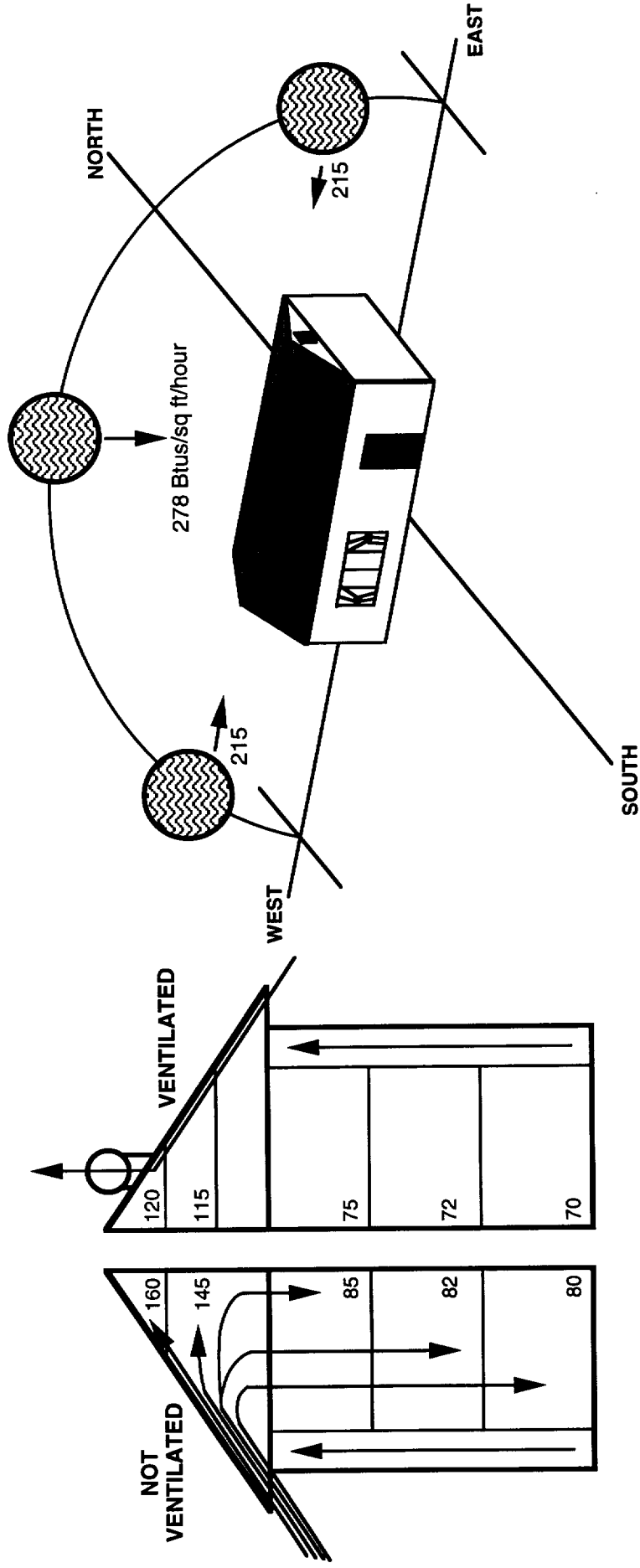
U. S. Patent 5,014,770

How The PCS1 Works



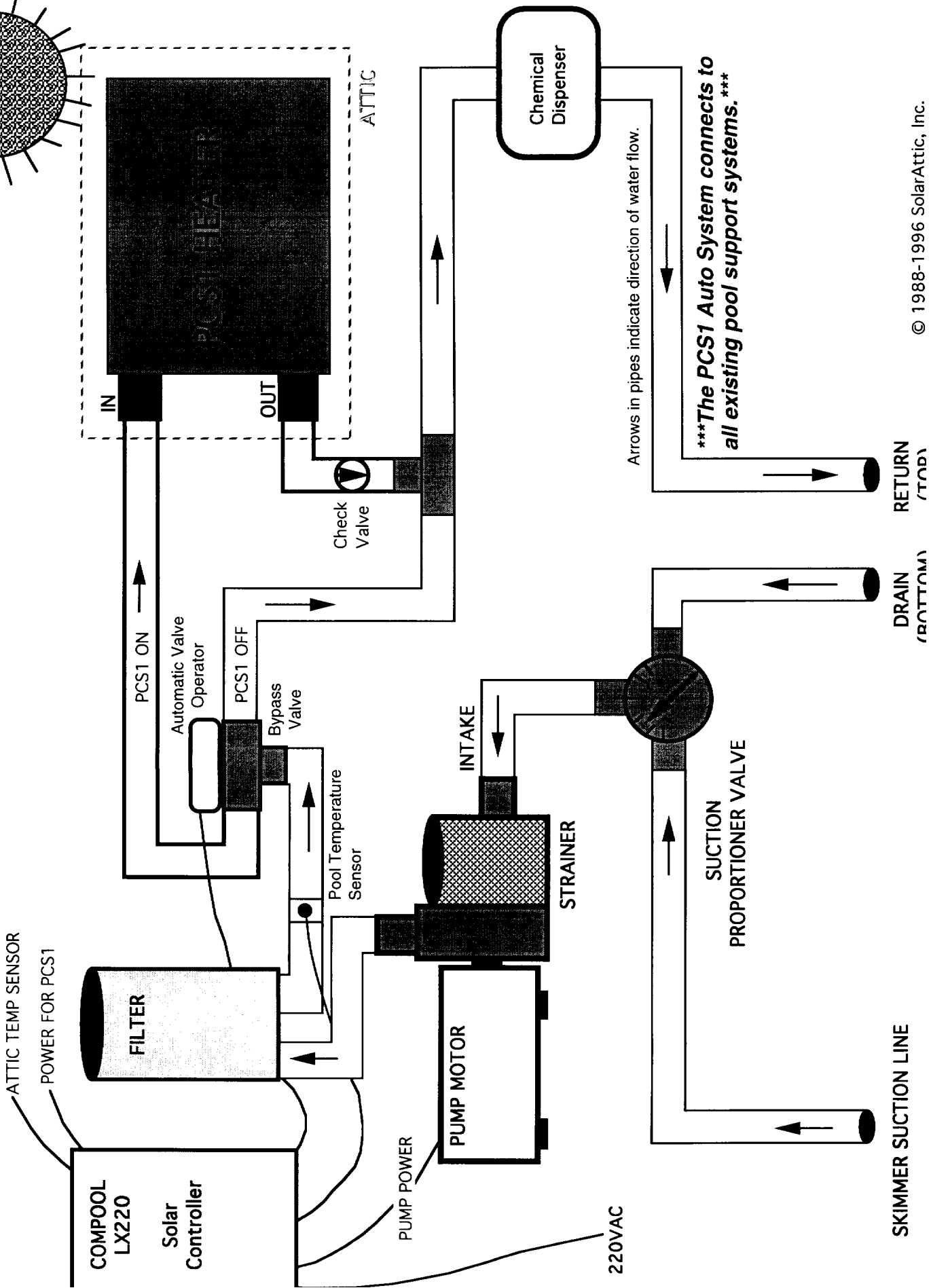
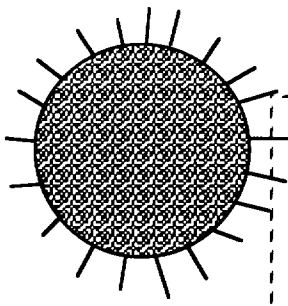
- ROOF ABSORBS SOLAR HEAT
- ATTIC STORES SOLAR HEAT
- PCS1 REMOVES THE SOLAR HEAT
- POOL GETS WARM WITHOUT HOT BILLS OR THOSE SOLAR PANEL PROBLEMS
- PROCESS CONTINUES THROUGHOUT DAY
- ROOF ACTS AS MASSIVE SOLAR COLLECTOR

Solar Impact On Attic

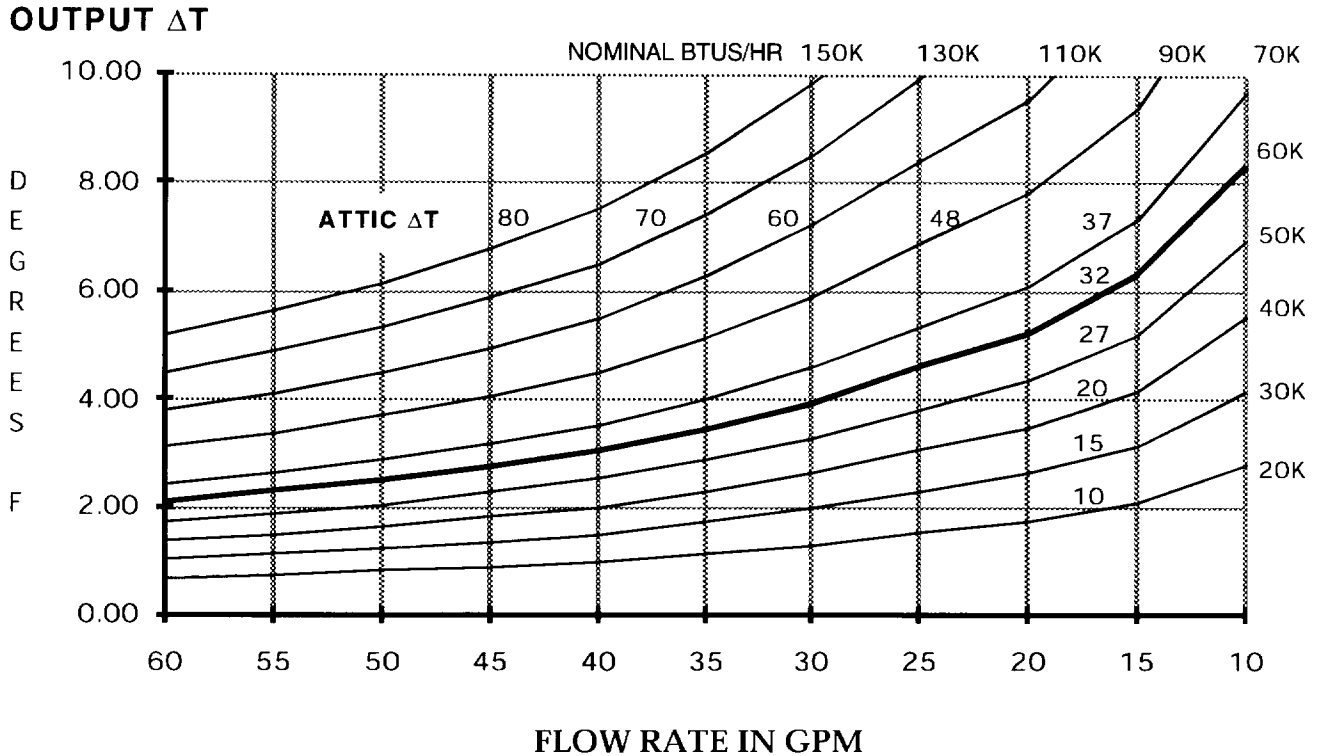


These figures represent the solar radiation intensity hitting a residence located in Kansas City, MO (39 degrees North Lat), June 21, 1973, at 12 noon. For a 2000 square foot house with a solar radiation intensity at noon of 278 BTUS per square foot per hour, there is a heat gain of 2000 x 278 or 556,000 BTUS PER HOUR. One ton of air conditioning equals 12,000 BTUS per hour. If all the radiant heat from the sun were absorbed by the house, it would take 46 tons of air conditioning to keep the house at 70 degrees F. Why does it not take 46 tons? Part of the heat is reflected. Part is removed by convection. Part of the heat is stopped by insulation at the ceiling line. The reason attic ventilators do such a dramatic job is because there is so much heat left between the roof and the ceiling available to be removed. SOURCE: "The NSP Energy Saving Handbook", James W. Morrison, Harper & Row Publishers, 1979.

PCS1 Auto System



PCS1 Operating Curves



These operating curves show the heat transfer range of the PCS1. By knowing the flow rate in gallons per minute, the attic's temperature and the pool's temperature -- both the BTU hourly rate of heat transfer and the output rise in degrees Fahrenheit from the PCS1 can be accurately predicted.

Example: If the flow rate is 30 gpm and the temperature differential between the attic and the swimming pool is 32° F, the output rise will be approximately 4° F [PCS1 output temperature minus input temperature]. This can be found by simply locating the flow rate on the horizontal scale and going up vertically on the graph until you find the curve with the correct temperature differential between the attic

SOLAR Without Those Solar Problems

- NO MASSIVE ROOF INSTALLATIONS.
- NO ROOF ROTTING.
- NO SOLAR DETERIATION.
- NO PLUGGED PANEL HOLES.
- NO VANDAL DAMAGE.
- NO LARGE SURFACE AREAS.
- NO ORIENTATION PROBLEMS.
- NO WIND DAMAGE PROBLEMS.
- NO GLAZING PROBLEMS.
- NO GLASS PROBLEMS.
- NO RUBBER PROBLEMS.
- NO ASSEMBLED JOINTS TO LEAK.
- NO GLUE PROBLEMS.
- NO VACUUM PROBLEMS.
- NO WATER LEVELING PROBLEMS.
- NO PRESSURE PROBLEMS.
- NO FLOW RATE PROBLEMS.
- NO HOLES IN YOUR ROOF.
- NO UNSIGHTLY INSTALLATIONS.
- _____.

CHECK OFF YOUR REASONS FOR SWITCHING TO THE PCS1

WITHOUT THOSE HEAT PUMP PROBLEMS

- NO POLLUTING OUR CHILDREN'S ENVIRONMENT.
- NO USE OF CHLOROFLUOROCARBONS (CFC'S).
- NO DAMAGE TO THE EARTH'S PROTECTIVE OZONE.
- NO OTHER CHEMICALS INCLUDING HCFC's.
- NO COMPRESSORS.
- NO LARGE CURRENT REQUIREMENTS.
- NO RESTRICTIVE NEW ENERGY LAWS.
- NO QUESTION ABOUT OPERATING COST SAVINGS.
- NO HIGH CIRCUIT EXPOSURE TO POOL WATER.
- NO INTERNAL PRESSURE PROBLEMS.
- NO INTERNAL TEMPERATURE PROBLEMS.
- NO FLOW RATE PROBLEMS.
- NO REFRIGERANT LEAK PROBLEMS.
- NO REFRIGERANT RECHARGING PROBLEMS.
- NO EXCESSIVE MOVING PARTS.
- NO SHORT DESIGN LIFE.
- NO LIMITED C.O.P. OF 4 TO 6.
- NO OBSOLETE COMPONENTS.
-
-

Check off your reasons for switching to the SolarAttic Pool Heater

WITHOUT THOSE GAS HEATER PROBLEMS

- NO POLLUTING OUR CHILDREN'S ENVIRONMENT.
- NO CONTRIBUTION TO THE "GREENHOUSE EFFECT".
- NO HIGH MONTHLY "FUEL" COSTS.
- NO BURNING OF FUELS.
- NO FUEL LEAK PROBLEMS.
- NO "RUNAWAY" UNSUPERVISED OPERATING BILLS.
- NO RESTRICTIVE ENERGY LAWS.
- NO HEATER ON/FLOW RATE OFF - PROBLEMS.
- NO COPPER HEAT SINKS ON POOL PIPING.
- NO GAS PRESSURE REGULATORS.
- NO FLUE GAS STACKS.
- NO INTERNAL FLOW RATE PROBLEMS.
- NO FLUE GAS DAMPERS.
- NO EXTERNAL FLOW BYPASS VALVES OR PIPES.
- NO GAS PIPING RUNS.
- NO FUEL STORAGE TANKS.
- NO FLOW METERS OR FLOW SETTING ADJUSTMENTS.
- NO INTERNAL HIGH VOLTAGE WIRING CONNECTIONS.
- NO PILOT LIGHTS.
- NO "FLAME EXPOSED" HEAT EXCHANGER.

CHECK OFF YOUR REASONS FOR SWITCHING TO THE PCS1

Jim Chatterton
2971 Robinwood Lane
Palm Harbor, FL 34684

December 18, 2001

Matt Ross, President
Eco-Smart, Inc.
4411 Bee Ridge Rd. #344
Sarasota, FL 34233

Dear Matt,

Re: Solar Attic Pool Heater

Just a brief note to give you an update re our use and experience with the Solar Attic pool heater. We have now had the heater for approx. 26 months and have to say that in terms of its functioning and mechanical operation, the unit has performed flawlessly. We have had no mechanical problems, no leaks, nothing.

We have tended to use the pool for about 8 – 9 months, shutting the heater off for a portion of Dec. to March. We have found that in those winter months the pool temperature will generally not exceed 82 degrees, even with a pool cover, and that is cooler than we would like. The fact that the pool is north facing and thus receives limited direct sunlight exposure I am sure is a major factor. We also tend to run the pool filter pump for less hours in the winter. I have to add that when the weather is cooler we also have less inclination to want to use the pool. In fact, we tend to keep the cover off the pool in those few months (as we do all summer) because the pool is much nicer to look at. The pool is covered in the spring and fall to help conserve heat overnight.

We average temperatures of 84 – 88 degrees April – May, and low to mid 90's June to Sept. Actually in the summer months we could hit the high 90's if we did not restrict the temp control on the heater. Off course the pool receives full sun exposure in the summer months and we have no shade trees covering our grey asphalt tiled roof. Oct. – Nov. results in temperature readings of 86 – 88.

While not scientific, we do have a sense that the A/C in our home does not have to cycle on quite as often with the possibility of electricity savings though increases in the latter make calculations difficult.

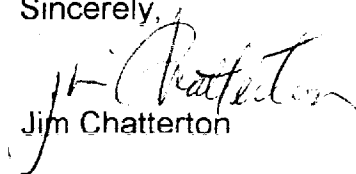
I guess the other advantage with Solar Attic is that no one knows we have a heater (unless we tell them) and there is no unsightly equipment sitting on our roof and potentially damaging the roof.

The final feature that I like about the heater is that when the heater is shut off, either automatically or manually, a valve automatically closes diverting water flow from the attic so that if the pool pump is running, it is not needlessly pumping water in and out of the attic. This is a very thoughtful and important design feature.

So, that sums up our experience and impression with Solar Attic. I do have to add one more thought, and that is the quality of service we have received from you. You were always available and responsive to any questions we had even if it meant calling the company for the information and keep us informed as to the status of the installation process and any follow up questions that we may have had. We did and do appreciate your outstanding customer service.

We will continue to stay in touch.

Sincerely,

A handwritten signature in black ink, appearing to read "Jim Chatterton". The signature is written in a cursive style with a large initial "J".

Jim Chatterton

Jim Chatterton
2971 Robinwood Lane
Palm Harbor, FL 34684

December 18, 2001

Matt, here are the results of our 5 day trial run with the Solar Attic pool heater, after the heater had been shut off for a few weeks and with no pool cover on the pool before or during the 5 day period. We ran the heater for 7 hours on each of the five days – Dec 13 – 17.

DATE	LOW	HIGH
Dec 13	74	77
Dec 14	76	78
Dec 15	77	79
Dec 16	78	80
Dec 17	78	80

Trusting you will find this information useful.

Jim Chatterton

July 6, 1994

Mr. Ed Palmer, President
SolarAttic, Inc.
15548 95th Avenue NE
Elk River, MN 55330

Re: PCS1 Pool Heater

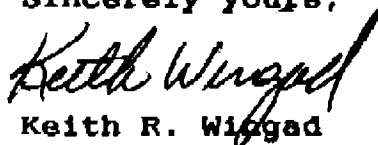
Dear Ed:

Just a quick note to tell you my pool heater/ air conditioner is terrific. When I bought the heater I was hoping my 35,000 gallon shaded pool would benefit from the heat transfer and that has happened. But there is more to just heating one's pool that excites me about the PCS1. For example, it is 95° today and the sun is shining brightly against my two story house. My attic is 92°! It is incredible. My kids, who have rooms in the second story tell me that eventhough the temperature on the thermostat is the same, it actually feels much cooler because the attic is not its normal 120+° temperature. Just as incredible is the economy of the heater. Now I am sure it costs us something to run the heater (it is on all day) but you would never know it to look at our energy bill. Last year our gas and electric bill was \$322.00 for June, this year with the house a degree or two cooler the bill was \$265.00. We saved \$57.00 or 18% on our energy bill, heated our pool, increased the comfort of our upstairs and increased the cleanliness of our pool water. The latter is a benefit gained from the water running through the filter at a slower rate (45-50 gpm vs. 65-70 gpm).

What a terrific investment this has been. Thanks, too, for the prompt attention you have given me when I call for some information.

Good luck to you all at SolarAttic. I look forward to future savings and our continued relationship.

Sincerely yours,



Keith R. Wiggad

Bartlett, Tennessee 38133

20x40 Inground Pool
35,000 Gallons
84-85° F without blanket

March 31, 1991

Mr. Jim Stanley
Attic Technology Inc.
15548 95th Circle NE
Elks River, MN 55330

Jim:

I have had an Attic Technology pool heater for almost three years. As we approach the new swimming season I realize buying the heater has paid-off.

Last week pools in the neighborhood were in the low 70s, ours was 82. Many of the neighbors swim at 82 most of the season, but not us. With your heater we keep the pool between 92-94. It has been up to 98 and climbing before we set back the thermostat.

Because of my work I do most of swimming in the evening. Since the pool is warmer than the air I am always comfortable. Without the heater, I would seldom get to use the pool. And I don't worry about big energy bills, the heater is cheap to run and very easy to maintain.

Overall I'd say the Attic Technology pool heater makes investing in a pool pay-off.

THANKS FOR A PRODUCT THAT WORKS.

Michael C. Knudstrup
Michael C. Knudstrup
3636 Waterside Drive
Orange Park, Fl 32065

PS: The pool is 17x34 in-ground and about 20,000 gallons.

NAME

ADDRESS

CITY, STATE

PCS1 LIMITED WARRANTY

All PCS1 convection units are warranted to be free from defects in material and workmanship for a period of thirty-six (36) months from the date of shipment from the factory. This warranty covers all parts and labor to correct manufacturing defects, but does not cover incidental fin damage nor any corrosive damage to heat transfer coils caused by improperly maintained chemical Ph levels in pools. Ph levels outside of the 7.2 to 7.6 range voids warranty. Use in salt water (sea) pools voids warranty.

Corrugated fins are used on the heat transfer coils for improved efficiency. They are waffled in appearance and not straight. Fin bending that has been combed with a fin tool does not affect performance and is not considered a manufacturing defect. Our obligation under this warranty is limited to the repair or replacement, at our factory, of any part or parts which, upon our examination, have proven to be defective. Correction of such defects by repair or replacement (at our option) and return freight via lowest common carrier, shall constitute fulfillment of SolarAttic, Inc.'s obligation to the purchaser.

This warranty does not apply to those products which, in our judgment, have been altered or repaired outside our factory, or subjected to misuse, negligence, accident, corrosive atmospheres, or operating beyond the limits of our design.

THIS WARRANTY CONSTITUTES THE BUYERS SOLE REMEDY. IT IS GIVEN IN LIEU OF ALL OTHER WARRANTIES. THERE IS NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. WHERE CIRCUMSTANCES CAUSE REMEDY EXPRESSED HEREIN TO FAIL OF ITS ESSENTIAL PURPOSE, SOLARATTIC, INC'S LIABILITY SHALL NOT IN ANY EVENT EXCEED THE PURCHASE PRICE. IN NO EVENT, SHALL SOLARATTIC, INC BE LIABLE FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, WHETHER THE THEORY BE BREACH OF THIS OR ANY OTHER WARRANTY, NEGLIGENCE, OR STRICTLY TORT. DISPUTES ARISING UNDER THIS AGREEMENT SHALL BE GOVERNED BY APPLICABLE MINNESOTA LAW.

DEALER NAME

DATE PURCHASED

PCS1 SERIAL #