

Product Information Specification**Docket #12-AAER-2F (Pool Pumps & Motors)****Provided by Zodiac Pool Systems, Inc.****1) Product definitions**

- a) Zodiac is a manufacturer of various variable-speed, two-speed, and single-speed circulation, auxiliary, and pool cleaner booster, pool pumps. Definitions for each pump can be found in existing code.

2) Sales information related to pool motors/pumps sold in California

- a) Sales information to be provided confidentially, upon request.

3) Costs of lower efficiency pool motors/pumps, higher efficiency pool pump/motors, variable speed motors, and two-speed motors

- a) Average retail pricing
 - i) Lower efficiency single-speed pumps
 - (1) \$330 - \$535
 - ii) Higher efficiency single-speed pumps
 - (1) \$475 - \$870
 - iii) Variable-speed pumps
 - (1) \$806 - \$986
 - iv) Two-speed pumps
 - (1) \$420 - 760

4) Products' duty cycle and per unit estimated energy consumption

- a) APSP has recommended circulation pump run times based on turnover rates.

Sample Pool System:

Pool Size 20,000 gallons

Circulation Pump Model: FHPM2.0 – 5.5 Hours @ 3450 RPM = 9636 Watts

Circulation Pump Model: VS-FHP2.0 - 12 Hours @ 1500 RPM = 2856 Watts

Pool Cleaner Booster Pump Model: PB4-60 – 1 Hour @ 3450 RPM = 1400 Watts

5) Design life cycle and incremental cost of energy efficiency improvement

- a) Life cycle
 - i) Single-speed/two-speed pumps have a projected life of 7-10 years.
 - ii) Variable-speed pumps have a projected life of 8-11.
- b) Cost of energy efficiency improvements
 - i) Variable –speed pumps are approximately \$230 more than two-speed models and approximately \$350 more than single-speed models.

6) Test methods to measure the energy consumption

- a) Lab testing: Complete test method for pump performance, including energy consumption, contained in Hydraulics Institute test specification ANSI/HI 14.6

7) Sources of test data

- a) Results were acquired from a pump test stand qualified to the ANSI/HI 14.6 standard.

8) Energy use metrics

- a) Flow measurement of gallons per minute, kW hours, for Energy Factor at multiple system curves starting with A, B, & C.

9) Product development trends

- a) Energy efficient products, such as variable-speed pumps/motors, continue to be the pinnacle of energy efficiency trends. LED swimming pool lights, higher COP heat pumps, home automation systems that automatically change energy usage base on seasons, higher hydraulic efficiency in pumps, heaters, and filtrations systems, and finally higher efficiency in pool cleaners.

10) Market barriers to energy efficiency

- a) The three market barriers to energy efficiency continue to be lack of consumer & trade education and higher product cost.
 - i) Consumer education- not fully understanding the ROI that energy efficient product offer
 - ii) Cost – Variable-speed pumps are approximately double the cost of their single-speed counterparts.
 - iii) Education – Once installed, proper education is required to ensure the proper setup and programming of variable-speed pumps in order to maximize energy savings, while meeting the circulation requirements of the pool.

11) How do consumers identify efficient products on the market?

- a) Select energy efficient two-speed and variable-speed pumps recently became ENERGY STAR certified products. In addition, consumers identify energy efficient products by energy/utility rebates, and by energy efficient messaging and marketing collateral provided by manufacturers.

12) How many small businesses are involved in the manufacture, sale, or installation of these products?

- a) The national market is comprised of approximately 2,000 pool builders and 20,000 service/installation companies.

13) Any other data relevant to this proceeding

- a) Total system hydraulic efficiency plays a key role in total pump/motor power consumption and subsequent energy usage.

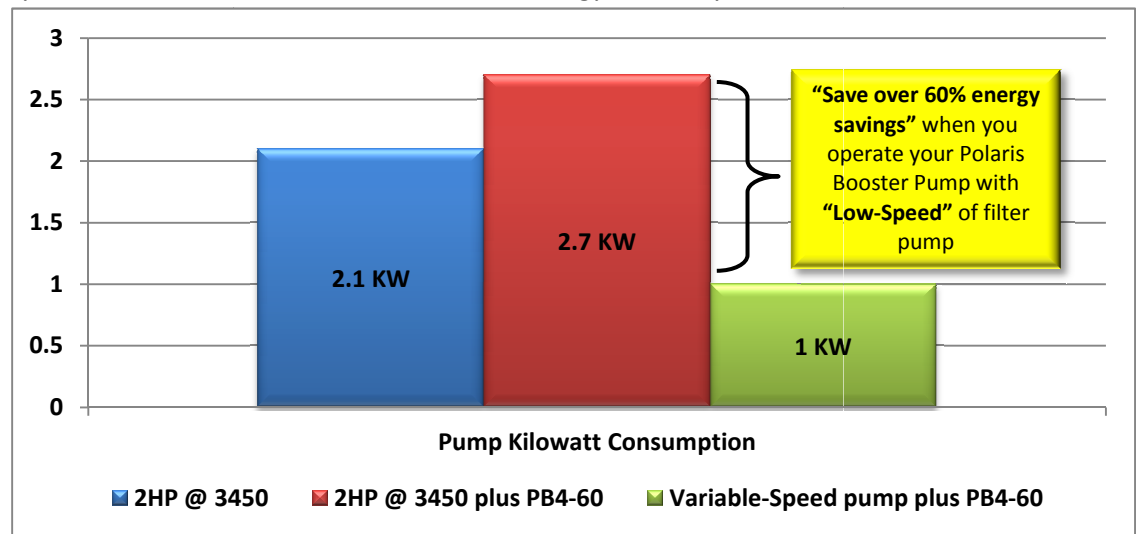
14) Current annual sales 2008-2013 and estimated Compound Annual Growth Rate (in CA and nation).

- a) Sales information to be provided confidentially, upon request.

15) What pool pump models are currently in the market, please provide description/characteristics of the unit i.e. single-speed, variable-speed, and their efficiency.

- a) Zodiac's current pump models include:
 - i) ePump
 - (1) Two models, 1.5 & 2 HP variable-speed models available. Efficiency information can be found on ENERGY STAR's website.
 - ii) VS FloPro

- (1) One 2 HP variable-speed model available. Efficiency information can be found on ENERGY STAR's website.
- iii) Stealth
 - (1) Twenty-two models from .50 – 5 HP available. Single-speed, two-speed, and 3 phase units available. Efficiency information can be found on ENERGY STAR's website.
- iv) PlusHP
 - (1) Sixteen models from .50 – 2 HP available. Single-speed and two-speed models available. Efficiency information can be found on ENERGY STAR's website.
- v) FloPro
 - (1) Eight up rated models from .75 – 2.5 HP available. Single-speed and two-speed models available. Efficiency information can be found on ENERGY STAR's website.
- vi) WaterFeature
 - (1) Auxiliary pump for water features. Three models available.
- vii) WaterFall
 - (1) Auxiliary pump for waterfalls. Two models available.
- viii) Pool Cleaner Booster
 - (1) Specialty pump for powering pressure-side automatic pool cleaners. Booster pump is not self-priming; therefore it does not operate during the majority of the filter pumps cycle. Two models available. See below for energy efficiency:



16) Do higher efficiency pumps require additional equipment to operate properly in new or existing pools, such as timers or controllers etc?

- a) Yes. Variable-speed pumps require a timer or controller to operate them. Some pumps have the necessary controller mounted on-board, while others may either include it in the box or require that it be purchased separately.

17) What are the time and installation costs to replace an existing system and how does that vary with different efficiency and technology pool pump motors?

- a) The additional time it takes to install or replace an existing pump with an energy efficient two-speed or variable-speed pump is almost exclusively due to the additional programming/customization of pump speeds and schedules in the pump controller.

18) What test procedure should be used or modified to measure the efficiency of the pump/motor?

- a) The standard lab test procedure is ANSI/HI 14.6

19) Are there any new features in pool motors/pumps that offer better efficiency from existing units? Please describe.

- a) Variable-speed technology continues to be the pinnacle of energy efficiency as it relates to pool pumps.

20) How many high efficiency units are in use in California, how much energy do they save?

- a) There are approximately 1.1 million in-ground pools in California. Approximately 113, 000 pumps are replaced each year. Since January 1st, 2008, Title-20 has required that energy efficient two-speed, multi-speed, or variable-speed circulation pumps be installed anytime its HP is equal to or greater than one total horsepower.
- b) Depending on pool size, run time, electricity rate, and turnover requirements, variable-speed pumps can save an average of \$1,185 per year.

21) Provide performance data related to pool motors/pumps i.e., total horsepower, name plate horsepower, service factor, flow rate, and head curves.

- a) See CEC pump list or ENERGY STAR for specifications.

22) Is there a difference between units sold to residential and commercial sectors?

- a) Yes, NSF is a required certification for use on most commercial pools. Many times there are differences in product materials, motor types, controllers & pipe connections.

23) Is there any survey done to gauge consumers' acceptance and performance of the new units? If so, what results?

- a) Consumers continue to validate the energy efficiency claims of both two-speed and variable-speed pumps. In regards to performance, consumers acknowledge that longer pump run times to filter and circulate pool water is necessary with energy efficient pumps. The result is significant energy savings and a much quieter pump.

24) How is pool pump motor energy efficiency marketed to residential and commercial sectors?

- a) Select energy efficient two-speed and variable-speed pumps recently became ENERGY STAR certified products. In addition, both residential and commercial sectors identify energy efficient products by energy/utility rebates, and by energy efficient messaging and marketing collateral provided by manufacturers.