MATERIALS AND DESIGN

Pump Body
- All thermoplastic pump for maximum hydraulic efficiency.
- Stainless steel.
- Bolts, Nuts, and Washers
- Buna N rubber compression resistant.
- Gaskets
- Glass filled polypropylene thermoplastic with slotted holes for easy mounting.
- Type 6A mechanical seal.
- Glass filled thermoplastic material with threaded brass bronze impeller wear ring.
- Diffuser and seal.
- Glass filled polypropylene thermoplastic with threaded brass inserts for maximum strength.
- Shaft fan-cooled.
- Frame and Type 8018 stainless steel construction.
- Motor
- Glass filled thermoplastic material with integral motor control.
- Thermal overload protection provided by the integral motor control.
- The impeller shall be secured to the motor shaft by means of a molded in brass insert and a stainless steel locking ring.
- The recirculation pump shall be Pentair Commercial Aquatics™ IntelliFlo VS+SVRS Pump.
- Motor shaft shall have a single suction port with a 2" NPT on the base and a winterizing drain port of 1/4" NPT shall be a part of the design.
- The pump motor shall be a NEMA Rated 56 Frame square flange motor (PMSM) totally enclosed fan cooled series with continuous duty rated at 130˚ F (or better) ambient air temperature.
- The electric motor coupled to the pump shall be of the integral motor control.
- The impeller shall be constructed of ceramic and carbon real seals, with stainless steel, brass and PPO resin in the spring loaded portion.

Performance Curves - IntelliFlo vs SVRS Pump

<table>
<thead>
<tr>
<th>Flow / GPM</th>
<th>1100 RPM</th>
<th>1500 RPM</th>
<th>3450 RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>10</td>
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<td>30</td>
<td>30</td>
<td>45</td>
<td>70</td>
</tr>
<tr>
<td>40</td>
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<td>60</td>
<td>80</td>
</tr>
</tbody>
</table>

IntelliFlo vs SVRS PUMP

- Meets ASME A112.19.17.2002 onboard intelligence detects blockage and automatically shuts pump off within seconds.
- Breakthrough motor technology provides energy savings while being safety compliant.
- Safe, interchangeable, variable speed replacement that can replace any pump rated up to 2 HP.
- NSF certified and UL and ETL Listed.

STANDARD FEATURES
- Replaces 3HP or smaller pumps.
- Meets ASME A112.19.17.2002 standards for anti-backflow entrapment requirement
- Onboard intelligence detects blockage and automatically shuts pump off within seconds.

GENERAL NOTES
- Allow 12" minimum clearance above lid for servicing.
- Be sure that wire size and voltage input are adequate to prevent vibration and undue operational noise.
- Do not use the pump in a location where water heater, pool heater, or chemical storage can be damaged.
- Install pump in a cool, dry, well vented location away from moisture, dust, and excessive voltage. Be sure that wire size and voltage input are adequate.
- The pump shall be tested and certified by a nationally recognized testing laboratory to perform in a manner that can be expected in the proposed application.
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The Virginia Graeme Baker Pool & Spa Safety Act of 2007—Summary

The Virginia Graeme Baker Pool and Spa Safety Act of 2007 was enacted to help prevent suction entrapment injuries and became effective December 19, 2008. This federal law was enacted to help prevent suction entrapment injuries and became effective December 19, 2008. The requirements for public swimming pools, spas and wading pools are summarized below and must be met before these facilities can be operated after that date.

Don’t Miss The Cut-Off Date—New drain covers certified to ASME/A112.19.8–2007 must be installed.

Backup System Requirements—New drain covers certified to ANSI/A112.19.8–2007 must be installed.

Why slower is better

The surprising secret to minimizing pump energy costs is reducing speed. Why? Because there’s lower resistance in the filter, accessories and plumbing system. Even with only modest pump speed reductions, the effect on electricity usage can be dramatic. A good analogy is your car: you get much better gas mileage at 30 mph than at 90 mph. The same is true with pool pumps—run slower to reduce energy costs dramatically.

This graph shows the huge increase in energy consumption as pump speed increases. Slow down the pump and you cut energy costs.

Pump Motor Speed in RPM

Energy Consumption

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The IntelliFlo VS+SVRS pump includes breakthrough motor and control technology innovations that combine to drive down energy use and cost. Plus, the savings potential is huge—up to thousands of dollars over its lifespan.

The IntelliFlo VS pump uses a permanent magnet motor—highly efficient, high-speed type—instead of a traditional induction motor. Permanent magnet motors are fundamentally more energy efficient.

Second, the IntelliFlo pump includes a variable speed capability, along with 4 real-time controls and diagnostics. This means that the pump can provide optimum pump speeds for specific tasks—cleaning, heating, cleaning, spa jets, etc. Traditional pump pre-set speeds are almost always greater than what’s needed to meet the department turnover requirements.

With a variable speed pump, the optimum speed would almost always be lower than the pre-set, standard speeds of older pumps. The IntelliFlo pump’s eight selectable, changeable speeds (ranging from 1100 to 3450 RPMs) mean you can adjust the flow requirements for each pool, allowing the pump to use the lowest speed energy possible…adding to your savings. Plus with the IntelliFlo in a retrofit, you may be able to further reduce energy use by reducing flow rates during non-pool use hours, while maintaining 24-hour by 24-hour filtration, at a much lower cost. Check with your local health department for requirements in your area.

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IntellIgent VarIable Speed pump

INTELLIFLO® VS+SVRS

Pump Motor Speed vs. Power Consumption

important layer of entrapment protection.

Safety Vacuum Release System (SVRS) which provides an

• Unlike other devices, the IntelliFlo

down function is pre-programmed into the software.

Requirements.

with the Virginia Graeme Baker Pool Safety Act SVRS

• Meets ASME A112.19.17.2002 standards, thus complying

protection cannot be turned off.

Reliable anti-body entrapment protection

The IntelliFlo VS+SVRS pump is the first pump with an integrated

for your peace of mind

unauthorized personnel.

• Safety lock-out feature (password protected) prevents

will not run.

will not run.

Another valuable feature

Single- and two-drain systems less than 3 feet apart (to

cut cost one of the above requirements must be updated by

adding, (1) Safety Vacuum Release System (SVRS), (2) Screw

fitting Sommerfelt System, (3) Brine Drainage System, (4) Automatic Pump Shale-Off System, (5) Drain Disassembly,

of all Other Systems, demands adding the Consumer Product

Safety Commission to be equally effective. Another option is to

to the single-drain systems in dual-drain pump system with

of separate.

For more information about the Virginia Graeme Baker

Pool and Spa Safety Act and how to comply, review the U.S. Consumer Product

Safety Commission’s latest information at:

comply, review the U.S. Consumer Product

Suction piping for each pump

backup System Requirements -

ANSI A112.19.8–2007 must be installed.

New drain covers certified to ASME/

Drain Cover Requirements -

The requirements for public swimming pools, spas and wading

pool operating challenges:

loss of prime, overheating, freezing and

pool failure—loss of prime, overheating, freezing and

clear LCD readouts make operation a cinch.

Easy to program and monitor: simple push-button controls

and clear LCD readouts make operation a cinch.

Easy to program and monitor: simple push-button controls

Pump

Annual KWh Use @ 24 hr/day Run Time

Annual Electric Cost @ 16 cents

Savings Difference%*•

2 HP

11,272

$3,094

$1,565

$1,539 or 50%

IntelliFlo vs. Pump

9,684

$1,565

$1,539 or 50%

*Actual savings may vary based on local utility rates, pool size, pump and motor horsepower, pump size, size and length of filter run, and other factors.

IntelliFlo pump speeds are almost always greater than those required to meet the health department turnover requirements. With a variable speed pump, the optimum speed will almost always be lower for any given set of conditions than the speeds of older pumps. The IntelliFlo in-pump's eight variable, changeable speeds (ranging from 1100 to 3450 RPMs) mean you can fine-tune the exact requirements to meet the health department's requirements.

Two key technology innovations drive significant energy savings.

The IntelliFlo variable-speed pump includes breakthrough motor technology and controls, which enable energy-efficient operation. Together, these drive down energy use and cost. Plus, the savings potential is step-ineasurable, in thousands of dollars over its lifetime.

First, the IntelliFlo variable-speed pump uses a permanent magnet motor—those typical high cores—of a traditional induction configuration. Permanent magnet motors are fundamentally more energy efficient. Second, the IntelliFlo variable-speed pump includes a variable speed capability, along with a grid control and metering system. This allows the IntelliFlo pump to deliver the optimum pump speeds for specific tasks—cleaning, heating, clearing, spas, etc. Traditionally, pump pre-set

Why slower is better

The surprising aspect to maximizing pump energy costs is to operate at the lowest speed needed to accomplish a job.

trapped in too low of a water demand—too quickly. Why? Because there’s lower resistance in the filter, accessories and plumbing system. Even with only modest pump speed reductions, the effect on energy usage and real cost can be dramatic. In fact, reducing pump motor speed by 25% actually reduces the power needed by 50% of what it consumed at the higher speed. A pump running in your pool can get much hotter as water temperature gets above 100°F. The same is true for your pump motors—run cooler to reduce energy used.

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The IntelliFlo VS+SVRS pump operates at a much slower speed than the pre-set, unchangeable speeds of older pumps. The IntelliFlo in-pump’s eight variable, changeable speeds (ranging from 1100 to 3450 RPMs) mean you can fine-tune the exact requirements to meet the health department’s requirements.

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The only SVRS compliance solution that

Don’t just comply with the Virginia Graeme Baker Safety

Act, upgrade your pool with the IntelliFlo variable-speed pump. This pump not only meets safety requirements, it provides longer, trouble-free service, and may save thousands of dollars in utility costs over its long life.

For more information on the IntelliFlo vs. competitive pumps, contact your service provider, Pentair or visit www.svrspump.com today.

Certified IntelliFlo pumps from Pentair meet strict energy efficiency criteria set by the U.S. Environmental Protection Agency and the U.S. Department of Energy. Three year parts warranty, three year labor warranty, energy use and performance environment.

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Engineered for exceptionally long life

The IntelliFlo VS+SVRS pump includes permanent magnet motors for less heat and therefore lower maintenance requirements. This efficient design means less wear and tear on pump components, but on other equipment, too. A permanent magnet motor generally results in increased pricing unless savings are made and reduced wear and tear on the pump. Plus, built-in diagnostics protect the IntelliFlo variable-speed pump from the most common causes of premature pump failure—loss of prime, overheating, freezing and voltage irregularities. The result is a product you can expect dramatically longer life and at a much greater return on your investment.

Other valuable features

• Ability to set minimum and maximum speeds. The IntelliFlo variable-speed pump will only operate within the ranges you set to help assure safer operation and increased efficiency.

• Built-in clock and timer: eliminates the need for an add-on clock or expensive controller.

• The only SVRS compliance solution that

reduces operating costs. Just do not comply with the Virginia Graeme Baker Safety

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## Intelligent Variable Speed Pump

The IntelliFlo VS+SVRS pump reduces energy consumption significantly, saving you money and protecting the environment.

### Benefits
- **Energy Efficiency:** The IntelliFlo VS+SVRS pump is ENERGY STAR certified, consuming up to 50% less energy than older models.
- **Longevity:** The Pump features a permanent magnet motor, which ensures reliable performance and a longer lifespan.
- **Flexibility:** The pump offers a wide range of speeds, allowing for customization and precise control.
- **Ease of Use:** Simple push-button controls make programming and monitoring straightforward.

### Comparison Table

<table>
<thead>
<tr>
<th>Pump Type</th>
<th>Annual Kilowatts Use</th>
<th>Annual Electric Cost</th>
<th>Savings Difference*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 HP</td>
<td>$1,539</td>
<td>$1,545</td>
<td>$5/yr</td>
</tr>
<tr>
<td>IntelliFlo vs. Pump</td>
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<td>$1,545</td>
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</table>

### Features
- **Safety Features:**
  - In-built controller with proprietary software that detects blockage and automatically shuts itself off.
  - No SVRS calibration required; the blockage detection/shut down function is pre-programmed into the software.
  - Includes a built-in controller with proprietary software that allows for your peace of mind.

### Other Features
- **Built-in Clock and Timer:** Eliminates the need for an added time clock/counter.
- **Suction-Limiting Vent System:** Reduces energy consumption by automatically regulating the flow rate.
- **Easy to Program and Monitor:** Simple push-button controls make programming and monitoring straightforward.
- **Engineered for Exceptionally Long Life:** Features a permanent magnet motor that produces far less heat and is more energy efficient.
- **Energy Compliance:** Meets ENERGY STAR criteria.

### Conclusion
- The IntelliFlo VS+SVRS pump is an excellent investment for anyone looking to reduce energy costs and protect the environment.
**MATERIALS AND DESIGN**

**Pump Body**
- Volume type body pull out design for ease of working on impeller, diffuser and seal.
  - Pent Size: 2 inch - 11 NPT
  - Design: Blower Type, 1 hp - 11 NPT

**Material**
- Glass filled polypropylene thermoplastic with reinforced brass insert for maximum strength.
  - Buna N materials in the spring bellows portion.
  - The mechanical shaft seal shall be constructed of ceramic non-overloading at any point on the performance curve. The impeller shall be of the closed type and PPO resin, and it shall contain a bronze wear ring for the impeller.
  - 40% glass filled polypropylene diffuser to aid in priming

**Mechanical Seal**
- Banana: Glass filled polypropylene thermoplastic with reinforced brass insert for easy mounting.
  - Lid: Clear “see thru” polycarbonate thermoplastic lid for easy debris removal.
  - Lid Locking Ring: Glass filled polypropylene thermoplastic.
  - Lid: Polycarbonate cover with O-ring seal, Cam and Ramp™
  - Lid and Locking Ring: allow for quick and easy access to the basket.

**Frame and Type**
- NEMA 56 Frame square flange, totally enclosed fan-cooled, PMSM for service on a 230 volt electric supply. The pump shall be rated 9.0 AMP, 2 pole, 230 volts, 1 phase, 50 or 60 hertz.

**Bearing**
- Deep groove ball bearings. Motors shall be continuous duty rated at 130˚ F (or better) ambient air temperature, 130˚ F water temperature. Capable of operating at up to 42 psi, 104˚ F continuous water temperature, 130˚ F ambient air temperature.

**Safety Vacuum Release System (SVRS)**
- The ONLY WAY TO COMPLY with new Federal anti-body standards for anti-body entrapment protection.
- Onboard intelligence detects blockage and automatically shuts pump off within seconds.
- Breakthrough motor technology provides energy savings while being safety compliant.

**STANDARD FEATURES**
- Replaces 3HP or smaller pumps.
- Onboard intelligence detects blockage and automatically shuts pump off within seconds.
- Breakthrough motor technology provides energy savings while being safety compliant.
- Vent, variable, interchangeable speed ranging from 1150 to 3620 RPMs.
- NSF certified and UL and ETL Listed.

**Pentair**
- Pentair trademarks and logos are owned by Pentair, Inc. Pentair Commercial Aquatics™, IntelliFlo®, and Cam and Ramp™ are registered trademarks and/or trademarks of Pentair Water Pool and Spa, Inc. and/or its affiliated companies in the United States and/or other countries.
- Because we are continuously improving our products and add-on cost, the IntelliFlo vs-50 pump is an investment that may potentially save thousands of dollars in energy costs over its long life.

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<tr>
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<tbody>
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<tr>
<td>Ambient air temperature: 130˚ F.</td>
</tr>
<tr>
<td>Pump Maximum Thermal Limits</td>
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<tr>
<td>Ambient air temperature: 130˚ F.</td>
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<tr>
<td>Liquid Temperature: 160˚ F.</td>
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**IntelliFlo® VS+SVRS INTELLIGENT VARIABLE SPEED PUMP**

**ENGINEERING SPECIFICATIONS**

**IntelliFlo® VS+SVRS**

The IntelliFlo VS+SVRS pump shall be Pentair Commercial Aquatics™ Series Model No. ________self-priming centrifugal pump, with the requirements of NSF for maximum debris removal and efficiency.

**Gear Notes**
- The impeller shall be secured to the motor shaft by means of a molded in brass insert and a stainless steel locking ring. This shall be mounted with gear support to prevent vibration and undue operational noise.
- The impeller shall be capable of operating up to 42 psi, 160˚ F continuous water temperature, 130˚ F ambient air temperature.

**Pump Motor**
- The electric motor coupled to the pump shall consist of a NEMA Rated 56 Frame square flange synchronous motor. The impeller shall contain a bronze wear ring for the impeller. The impeller shall have a single suction port with a 2” NPT on the base and an impeller. A discharge port of 2” NPT and a water entry port of 14” NPT shall be a part of the design.

**Onboard intelligence detects blockage and automatically shuts pump off within seconds.**

**The impeller shall be secured to the motor shaft by means of a molded in brass insert and a stainless steel locking ring. This shall be mounted with gear support to prevent vibration and undue operational noise.**

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**INTELLIFLO® VS+SVRS INTELLIGENT VARIABLE SPEED PUMP**

**THE ONLY WAY TO COMPLY WITH NEW FEDERAL ANTI-BODY ENTRAPMENT STANDARDS AND SAVE MONEY**

**IntelliFlo® VS+SVRS INTELLIGENT VARIABLE SPEED PUMP**

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**INTELLIFLO® VS+SVRS INTELLIGENT VARIABLE SPEED PUMP**

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MATERIALS AND DESIGN

**Pump Body**
- Vacuum-molded of polypropylene thermoplastic for maximum hydraulic performance, suitability for applications requiring high flow and efficiency.
- Corrosion prevention and maximum flow efficiency.
- Glass filled thermoplastic material with threaded brass inserts for maximum strength.
- Glass filled polypropylene thermoplastic with threaded brass inserts for maximum strength.
- Cast iron ball bearings. Prevents vibration and undue operational noise.
- Pump should be firmly mounted with pipe supported to prevent vibration and undue operational noise.
- Allow 12” minimum clearance above lid for servicing.
- Install pump in a cool, dry, well-ventilated location away from excessive voltage. Be sure that wire size and voltage input conform to National Electrical Code.

**Impeller**
- The impeller shall be in the motor shaft by means of a seal plate of the same material. The pump body shall have a single suction port with a 2” NPT on the base and an impeller. A discharge port of 2” NPT and a strainer basket of mineral reinforced polypropylene material.
- The strainer body shall be 2” NPT suction. The strainer body shall have a removable locking ring for easy servicing.
- The recirculation pump shall be Pentair Commercial Aquatics™ IntelliFlo VS+SVRS pump. It helps prevent your public pool or spa than with the IntelliFlo+svrs pump. It helps prevent sump evacuation and also provides value that no other solution can.

**General Notes**
- Liquid temperature: 104˚ F.
- Ambient air temperature: 130˚ F.
- Circuit breaker required: 20 amp, 2 pole, 230 volts.
- 230 Volts, 1 phase, 16 amps maximum 50 or 60 hertz.
- Water temperature, 130˚ F ambient air temperature.
- Continuous operation at a flow rate of 1.0 gpm will not exceed 104˚ F for 24-hour periods of operation under normal industry conditions.
- The pump motor shall be a NEMA Rated 56 frame square D motor (PMSM) totally enclosed fan cooled series with a permanent magnet synchronous motor (PMSM).
- The electric motor coupled to the pump shall be of the requirements of NSF for maximum debris removal.
- The pump body and attached hair and lint strainer shall be constructed of non-corrosive 40% glass filled polypropylene material, and close-coupled to an electric motor by means of a seal plate of the same material. The pump body shall have a single suction port with a 2” NPT on the base and an impeller. A discharge port of 2” NPT and a strainer basket of mineral reinforced polypropylene material.
- The strainer body shall be 2” NPT suction. The strainer body shall have a removable locking ring for easy servicing.
- The recirculation pump shall be Pentair Commercial Aquatics™ IntelliFlo VS+SVRS pump. It helps prevent your public pool or spa than with the IntelliFlo+svrs pump. It helps prevent sump evacuation and also provides value that no other solution can.

**Standards**
- NSF certified and UL and ETL Listed.

**Performance Curves - IntelliFlo VS+SVRS Pump**

![Performance Curves - IntelliFlo VS+SVRS Pump](image-url)

**IntelliFlo VS+SVRS INTELLIGENT VARIABLE SPEED PUMP**

**ENGINEERING SPECIFICATIONS**

**IntelliFlo VS+SVRS Pump**

The recirculation pump shall be Pentair Commercial Aquatics™ Series Model No. 20350, self priming centrifugal pump, "IntelliFlo VS+SVRS Pump"...

- **Operation:**
  - **GT and CT:**
    - **GT:**
      - **Purpose:**
      - **Function:**
    - **CT:**
      - **Purpose:**
      - **Function:**

**IntelliFlo VS+SVRS INTELLIGENT VARIABLE SPEED PUMP**

The impeller shall be secured to the motor shaft by means of a male to a brass insert and a stainless steel locking screw in the shaft end of the motor shaft. The pump shall be capable of operating up to 62 psi, 15° F higher than minimum water temperature, 104˚ F at ambient temperature.

The electric motor coupled to the pump shall be of the requirements of the NEMA Standard frame permanent magnet synchronous motor (PMSM). Totally enclosed construction with stainless steel strainer and double shaft, single row ball bearings and SS80 . Motors shall be continuous duty rated at 125˚ F for better ambient air temperature and will provide for outdoor installation.

**The pump motor shall be a NEMA Standard frame square D motor (PMSM) totally enclosed fan cooled series with a 230 volt electric supply. The pump shall be rated for 230 volt, 1 phase, 60 Hz. The pump shall be CE certified and certified by a nationally recognized testing laboratory to conform to National Sanitation Foundation Standards 50 and 58. The design and ASME codes for use with Pentair Commercial Aquatics™ IntelliFlo VS+SVRS Pump. It helps prevent your public pool or spa than with the IntelliFlo+svrs pump. It helps prevent sump evacuation and also provides value that no other solution can.

**THE ONLY WAY TO COMPLY WITH NEW FEDERAL ANTI-BODY ENTRAPMENT STANDARDS AND SAVE MONEY**

- **Replaces 3HP or smaller pumps.**
- **Meets ASME A112.19.17 2002 standards for anti-body entrapment.**
- **Onboard technology detects blockage and automatically shuts pump off within seconds.**
- **Breakthrough motor technology provides energy savings while being safety compliant.**
- **Meets IGPCR and IP23 requirements.**
- **NSF certified and UL and ETL Listed.**

While other safety solutions represent an added cost, the IntelliFlo+svrs pump is an investment that trig potentially save thousands of dollars in energy costs over its long life.