

Installation, Operation, and Service Manual

1.1 THP Dual Voltage Series

Variable Speed Pool Pump



Motor Version 2.0
01/2022

SPECK 
pumps

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Date of Installation:	
Installed by:	
Serial Number:	
For Service Call:	

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1 Important Safety Instructions

Notice: *The California Energy Commission requires all pumps purchased for sale or use in a residential pool for filtration in California be listed on their CEC website.*

Important Notice: This manual contains important information about the installation, operation and safe use of this product. This information should be given to the owner and/or operator of this equipment.

WARNING: *This product must be installed and serviced by a qualified pool professional, and must conform to all national, state, and local codes.*

WARNING: *Before Installing this product, read and follow all warning notices and instructions which are included. Failure to follow safety warnings and instructions can result in severe injury, death, or property damage. Call (800) 223-8538 or visit www.usa.speck-pumps.com for additional copies of these instructions.*

When installing and using this electrical equipment, basic safety precautions should always be followed, including the following:

1. READ AND FOLLOW ALL INSTRUCTIONS.

2. **WARNING** - To reduce the risk of injury, **DO NOT** permit children to use this product unless they are closely supervised at all times.

3. **WARNING** - Risk of Electrical Shock. Connect only to a branch circuit protected by a ground-fault circuit interrupter (GFCI). Contact a qualified electrician if you cannot verify that a circuit is protected by a GFCI.

4. **WARNING** - To reduce the risk of electric shock, replace any damaged cord immediately.

5. **DO NOT** install within an outer enclosure or beneath the skirt of a hot tub or spa.

6. **CAUTION** - This pump is for use with permanently-installed pools and may also be used with hot tubs and spas if so marked. **DO NOT** use with storable pools. A permanently-installed pool is constructed in or on the ground or in a building such that it cannot be readily disassembled for storage. A storable pool is constructed so that it is capable of being readily disassembled for storage and reassembled to its original integrity.

7. The unit must be connected only to a supply circuit that is protected by a ground-fault circuit-interrupter (GFCI). Such a GFCI should be provided by the installer and should be tested on a routine basis. To test the GFCI, push the test button. The GFCI should interrupt power. Push the reset button. Power should be restored. If the GFCI fails to operate in this manner, the GFCI is defective. If the GFCI interrupts power to the pump without the test button being pushed, a ground current is flowing, indicating the possibility of an electric shock. Do not use this pump. Disconnect the pump and have the problem corrected by a qualified service representative before using.

8. **TO REDUCE RISK OF ELECTRICAL SHOCK**, A copper bonding connector (8 AWG U.S., 6 AWG Canada) is provided for bonding the motor to all metal parts of the swimming pool, spa, or hot tub structure and to all electrical equipment, metal conduit, and metal piping within 5 feet of the inside walls of a swimming pool, spa, or hot tub, when the motor is installed within 5 feet of the inside walls of the swimming pool, spa, or hot tub.

NOTE: *To installer and/or operator of the Speck Swimming Pool Pump; the manufacturer's warranty will be voided if the pump is improperly installed and/or operated.*

9. SAVE THESE INSTRUCTIONS!

General Safety Instructions

The following guidelines provide information to minimize the risk of injury to users of pools, spas, and hot tubs.

WARNING: TO REDUCE THE RISK OF ENTRAPMENT HAZARD



Pool and spa pumps produce high levels of suction, which can pose extreme danger if a person comes in close proximity to an open pool or spa drain or if a drain cover is loose, cracked, broken or missing. Pool and spa pumps move large volumes of water, which can pose extreme danger if a person's hair comes in close proximity to a drain that is not the proper size for the pump or pumps.

If not an approved single, unblockable outlet, a minimum of two functioning suction outlets per pump must be installed. Suction outlets in the same plane (i.e. floor or wall) must be installed a minimum of three (3) feet (1 meter) apart, as measured from center point to center point. Dual suction fittings shall not be located on seating areas or on the backrest for such seating areas. If any suction outlets are located closer they shall be located on two different planes (i.e. one on the bottom and one on the vertical wall, or one each on two separate vertical walls).

WARNING: *Failure to keep suction outlet components clear of debris, such as leaves, dirt, hair, paper and other material can result in an increased potential for suction entrapment.*

If not a single, unblockable outlet, in the event of one suction outlet being completely blocked, the remaining suction outlets serving the system shall have a flow rating capable of the full flow of the pump(s) or the specific suction system. If in doubt about the rating and/or head loss curve of your system, consult a qualified pool or spa professional and/or your respective equipment manufacturer(s). Also, double check with your local building/health authorities regarding single vs. multiple drain installations, etc.

Regularly inspect all drain covers for cracks, damage and advanced weathering. If a drain cover becomes loose, cracked, damaged, broken or is missing, close the pool or spa immediately, post a notice and keep the pool or spa closed until an appropriate VGB 2008 certified drain cover is properly installed.

WATER VELOCITY AND FLOW RATES

The maximum water velocity through drain covers is limited by some local regulations, for example some state health departments limit the velocity through public pool drain covers to 1.5 feet per second. This velocity limit is lower than the flow rating provided by the ANSI/APSP 16 certification; therefore local limit applies and must be followed. Never exceed the flow rating listed on the cover even if local code does not provide a velocity limit.

For additional information on proper installation refer to The Association of Pool & Spa Professionals ANSI/APSP-7 Standard and the US Consumer Product Safety Commission Guidelines for Entrapment Hazard.

General Safety Instructions - continued

WARNING - Risk of Electrical Shock or Electrocution



Pool pump must be installed by a licensed or certified electrician or a qualified pool serviceman in accordance with the National Electrical Code and all applicable local codes and ordinances. Improper installation will create an electric hazard which could result in death or serious injury to pool users, installers, or others due to electrical shock, and may also cause damage to property.

Always disconnect power to the pool pump at the circuit breaker before servicing the pump. Failure to do so could result in death or serious injury to serviceman, pool users, or others due to electric shock.

2 General Description

The BADU® Pro-II E VSP, ES90-II VSP, E71-II VHV, and A91-II VSP family of variable speed swimming pool pumps are both environmentally friendly and cost efficient. These pumps have three (3) adjustable power levels which provide the pool owner a simple three button control, greatly reducing the operating cost at a reasonable investment. The high performance, medium head pumps use a state of the art axial flux permanent magnet brushless-DC motor controlled by advance logic electronics - providing cooler and quieter operation at a fraction of the cost of a standard PSC motor.

The motor runs on a 24-hour schedule, and operates by keeping the power used by the pump at a constant power level selected by the user. This is especially useful at lower speeds because as the filter gets dirty and pressure increases, the pump will automatically pick up a little speed to keep the programmed power level the same. This allows for longer periods of time before the filter needs to be cleaned, and the user knows exactly how much power the pump is using. In addition, the motor automatically detects either 115V or 230V power without the need for rewiring or a voltage switch.

Ideally suited for pools up to 36,000 gallons (24 hour operation), the pumps operate at maximum system flow of 85- 100 gallons per minute (GPM) at 1000 watts (2850-3500 RPM). The maximum flow rate and RPM are dependant on the pump model and installation. The pumps can operate from 50 watts (400-600 RPM) to 1000 watts (2850-3500 RPM) in increments of 10 watts. This allows you to select the most appropriate power level for your application. These variable speed pumps are designed to meet the needs of today's more environmentally friendly consumer. The pump parts are made of 100% recyclable "environment friendly" plastic.

The user interface provides manual power level controls for the pump. There are three fixed power level buttons that can be selected 1, 2, and 3. (See Figure 1)

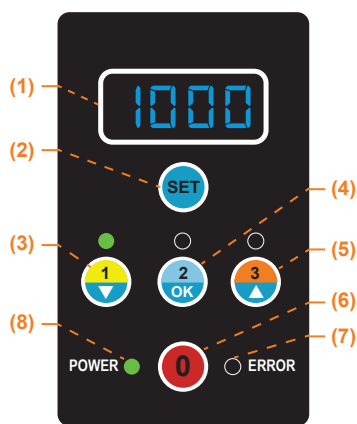


Figure 1

Controls and LEDs	Description
1) Power Level Display	Displays the current motor power level, or error code.
2)  Button	Used to enter programming mode (press and hold for at least 3 seconds).
3)  Button	Used to select fixed power level 1 or to decrease power level when in programming mode.
4)  Button	Used to start the pump from the OFF position or to confirm/save parameters when in programming mode.
5)  Button	Used to select fixed power level 3 or to increase speed when in programming mode
6)  Button	Used to stop the motor.
7) Power LED	The green LED indicates the unit has power.
8) Error LED	The red LED indicates there is a fault.

3 Installation Information

Preparation Guide

1. Upon receipt of the pump, check the carton for damage. Open the carton and check the pump for concealed damage, such as cracks, dents, or a broken base. If damage is found, contact the shipper or distributor where the pump was purchased.
2. Inspect the contents of the carton and verify that all parts are included. See *Section 7, Parts List and Exploded View for details*.

Pump Location

NOTE: In Canada, the pump must be located a minimum of three (3) meters (approximately ten (10) feet) from the water (CSA C22.1).

1. For trouble-free self-priming, install the pump as close to the pool as practical. Consult local codes for minimum distance between pool and pump.

WARNING: Some Safety Vacuum Release System (SVRS) devices are not compatible with the installation of check valves. If the pool has an SVRS device, be sure to confirm that it will continue to safely operate if check valves are installed.

2. The piping should be as direct and free from turns or bends as possible, as elbows and others fittings greatly increase friction losses which reduce the flow of water.
3. Place pump on solid foundation which provides a rigid and vibration-free support so that it is readily accessible for service and maintenance.
4. Install the pump in a well ventilated location protected from direct sunlight and excessive moisture. (rain, sprinklers, etc.)
5. Protect the pump against flooding and excess moisture, and prevent foreign objects from clogging air circulation around motor. All motors generate heat that must be removed by providing proper ventilation.
6. **DO NOT** store or use gasoline or other flammable vapors or liquids in the vicinity of this pump. **DO NOT** store pool chemicals near the pump.
7. **DO NOT** remove any safety alert labels such as **DANGER**, **WARNING**, or **CAUTION**. Keep safety labels in good condition and replace any missing or damaged labels.
8. Provide access for future services by leaving a clear area around the pump. Allow plenty of space above the pump to remove lid and basket for cleaning.

Pipe Sizing

NOTE: All pipe sizes are able to withstand the pressures the pump will deliver, but not necessarily the flow. If the pipe is too small for the pump, or is elevated above water, the maximum gallons per minute (GPM) may not be delivered. If this happens, the pump will develop a pocket of air (cavitation) that makes noise. This may shorten the life of the pump.

SUCTION & DISCHARGE:

When the pump is located up to 50 feet from the pool, the recommended minimum pipe size for both the suction and discharge is 1.5" for all models.

Plumbing Installation

1. When connecting pipework to pump with threaded ports, it is recommended that thread seal tape be used. Hard-plumbed pipes must have proper solvent-weld connections. Flexible hose connections must be tightened properly. If the suction line is not sealed correctly, the pump will not prime properly and will pump small volumes of water or none at all.
2. When installing the pump, care should be taken to see the suction line is below water level to a point immediately beneath the pump to ensure quick priming via a flooded suction line. The height between the pump and water level should not be more than five (5) feet. **NOTE: The E71-II VHV is NOT self-priming and must be installed below water level.**
3. Suction and discharge lines should be independently supported at a point near the pump to avoid strains being placed on the pump. Always use properly sized valves.
4. When installing the pump below water level, it is advisable to install a gate valve in both the suction and discharge line in the event that the pump must be removed for servicing.
5. Before starting the pump for the first time, remove the see-through lid. (Turn lid ring counter-clockwise to remove.) Fill strainer tank with water until it is level with the suction inlet. Replace lid with locking ring. Hand-tighten the lid to make an air-tight seal. **DO NOT** use tools to tighten the lid.
6. Use the fewest number of fittings as possible. Each additional fitting has the effect of moving the equipment farther away from the water. **NOTE: If more than ten (10) suction fittings are needed, the pipe size must be increased.**

Bonding and Grounding

When installing and using the motor, basic safety precautions should always be followed. The wiring of the motor should be done by a licensed electrician in accordance with local codes.

BONDING AND GROUNDING

1. **BONDING:** As required by National Electrical Code Article 680-26, the pump motor must be electrically bonded to the pool structure (reinforced bars, etc.) by a solid copper conductor not smaller than #8 AWG (8.4 mm²) wire via the external copper bonding lug on the pump motor (#6 AWG Canada).
2. Bond the motor using the provided external lug.

WARNING: Always disconnect the power source before working on a motor or its connected load.

WARNING: In order to avoid the risk of property damage, severe personal injury, and/or death, make sure that the control switch, time clock, or control system is installed in an accessible location, so that in the event of an equipment failure or loose plumbing fitting, the equipment can be easily turned off.

CAUTION: The pump must be permanently connected to a dedicated electrical circuit. No other equipment, lights, appliances, or outlets may be connected to the pump circuit, with the exception of devices that may be required to operate simultaneously with the pump, such as a chlorinating device or heater.

WARNING: Motor is fitted with internal auto reset. May restart without warning!

Electrical Installation

1. The pump motor must be securely grounded inside the motor control box. (See Figure 2)
NOTE: DO NOT connect to electric power supply until unit is permanently grounded.
2. Wire size must be adequate to minimize voltage drop during the start-up and operation of the pump. See Table 1.0 for recommended wiring sizes.

Electrical Installation - continued

3. Insulate all connections carefully to prevent grounding or short-circuits. Sharp edges on terminals require extra protection. To prevent the wire nuts from loosening, tape them using suitable, listed (UL, ETL, CSA) electrical insulating tape. For safety, and to prevent entry of contaminants, reinstall all conduit and terminal box covers. Do not force connections into the conduit box.

Table 1.0

Recommended Wire Sizes			
Distance from Sub-panel	0 - 50 Feet	50 - 100 Feet	100 - 150 Feet
Voltage	115 / 230 VAC	115 / 230 VAC	115 / 230 VAC
Minimum Wire Size (AWG)	12 / 14	10 / 12	8 / 10

4. Remove the four screws holding the top control enclosure onto the motor. Carefully lift the top panel and turn it over to expose the inside terminal box. (See Figure 2)

5. The terminal box is supplied with a 1/2" -14 NPT threaded hole. Use only liquid tight fittings in order to protect the electronics and the motor. **CAUTION:** Failure to use liquid tight fittings will void the warranty.

6. Connect L1, L2/N, and Ground to the terminal block as shown in Figure 2.

7. Carefully fold all wires inside the terminal box and place the top control panel back on top of the terminal box.

8. Tighten the four screws into the terminal box while applying light pressure to the top control enclosure. **DO NOT OVER TIGHTEN.**

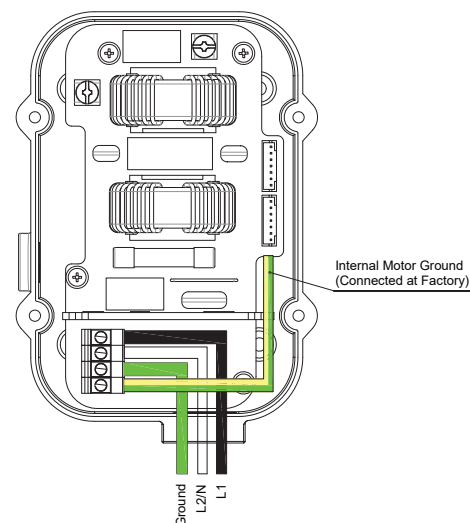


Figure 2

Voltage Checks

The correct voltage, as specified on the pump data plate, is necessary for proper performance and long motor life. Incorrect voltage will cause the error light to turn on and cause damage to the motor if not turned off immediately.

It is the responsibility of the electrical installer to provide data plate operating voltage to the pump by ensuring proper circuit sizes and wire sizes for this specific application.

CAUTION: Failure to provide data plate voltage during operation will cause the motor to overheat and void the warranty.

Pressure Test

WARNING: When pressure testing a system with water, air is often trapped in the system during the filling process. This air will compress when the system is pressurized. Should the system fail, this trapped air can propel debris at a high speed and cause injury. Every effort to remove trapped air must be taken, including opening the bleed valve on the filter and loosening the pump basket lid while filling the pump.

WARNING: Trapped air in the system can cause the filter lid to be blown off, which can result in death, serious injury, or property damage. Be sure all air is properly purged out of the system before operating. **DO NOT USE COMPRESSED AIR TO PRESSURE TEST OR CHECK FOR LEAKS.**

WARNING: When pressure testing the system with water, it is very important to make sure that the pump basket and lid is completely secure.

Pressure Test - continued

STEPS:

1. Fill the system with water, using care to eliminate trapped air.
2. Pressurize the system with water to no more than 35 PSI.

WARNING: DO NOT pressure test above 35 PSI. Pressure testing must be done by a trained pool professional. Circulation equipment that is not tested properly might fail, which would result in severe injury or property damage.

3. Close the valve to trap pressurized water in the system.
4. Observe the system for leaks and/or pressure decay.
5. If there are leaks, repeat Steps 1 -3. For technical support, call 800-223-8538. If calling from outside the U.S. dial +1 904-739-2626.

4 Operation

Start Up Guide

CAUTION: Never run the pump without water. Running the pump “dry” for any length of time can cause severe damage to both the pump and the motor and will void the warranty.

If this is a new pool installation, make sure all piping is clear of construction debris and has been properly pressure tested. The filter should be checked for proper installation, verifying that all connections and clamps are secure according to the manufacturer’s recommendations.

WARNING: To avoid risk of property damage, severe personal injury or death, verify that all power is turned off before starting this procedure.

1. Release all pressure from the system and open the filter pressure release valve.
2. Depending on the location of the pump, do one of the following:
 - If the pump is located below the water level of the pool, open the filter pressure valve to prime the pump with water.
 - If the pump is located above the water level of the pool, remove the lid and fill the basket with water before starting the pump.
3. Prior to replacing the lid, check for debris around the lid o-ring seat. Debris around the lid o-ring seat will make it difficult to prime the pump.
4. **Hand-tighten** the lid to make an air tight seal. **DO NOT** use any tools to tighten the lid: **hand-tighten only**. Make sure all valves are open and the unions are tight.
5. Once all the air has left the filter, close the pressure release valve.
6. Switch on power to the pump-motor. When turning on for the first time, it will be in the stopped position (OFF shown on display). Press the OK button to start the pump and it will begin running on the 24-hour schedule.
7. The pump will run through the priming cycle when you first start the 24-hour schedule. Default priming cycle is 2 minutes at 1000 watts (2850-3500 RPM). Priming power level is adjustable from 50 watts (400-600 RPM) to 1000 watts (2850-3500 RPM) in increments of 10 watts, and priming time is adjustable from 0-10 minutes in 1 minute increments.

Start Up Guide - continued

Prime Sequence: If full prime has not been achieved after prime cycle (max. 10 minutes), press the “0” button to stop the pump. Refill the pump with water and restart. Allow the pump to run for up to 10 minutes to allow air trapped in the suction line to be purged.

8. The pump has three (3) adjustable power level settings (S1, S2, S3) that run on a 24-hour cycle, starting with S1. Each setting can be adjust for power level (0-1000 Watts) and duration (0-24 hours). **NOTE: The total duration for S1 + S2+ S3 must be equal to or less than 24 hours.**

Default Factory Schedule:

S1: 200w; 12 hours

S2: 0w; 0 hours

S3: 0w; 0 hours

9. If the power is turned off or the pump is stopped using the “0” button, it will repeat the programmed priming cycle and start from the beginning of the 24-hour cycle (S1) upon restart.

10. If the pump does not prime and all the instructions to this point have been followed, check for a suction leak. If there is a leak repeat Steps 2 through 6. *NOTE: It is normal for a few drops of water to escape from the mechanical seal from time to time. This is especially true during the break-in period. (Refer to section 5.2 - Mechanical Seal on page 15).*

11. For technical support, call 800-223-8538. If calling from outside the U.S. dial +1 904-739-2626.

Enter Programming Mode

1. To enter programming mode, the pump must be in the stopped position. If the pump is running, press the  button. OFF will be shown on the LED display and the green Power LED will flash. (See Figure 3)



Figure 3 - OFF Shown On Display

2. Press and hold the  button for at least three (3) seconds. SCHE will begin flashing on the LED display. (See Figure 4)



Figure 4 - SCHE Shown on Display

3. Use the  and  buttons to toggle between SCHE (schedule menu), OVRD (override menu), and PR (prime menu). Once you have selected the menu you wish to enter, press the  button.

Schedule (SCHE) Menu

1. Enter programing mode by pressing and holding the **SET** button for at least three (3) seconds when the pump is in the stopped (OFF) position. Once SCHE begins flashing on the LED display, press the **2 OK** button.
2. After entering the schedule menu, S1 (speed/power level setting 1) flashes on the LED display. Use the **1** and **3** buttons to select between S1, S2, and S3. Press the **2 OK** button to edit the selected setting. (See Figure 5)

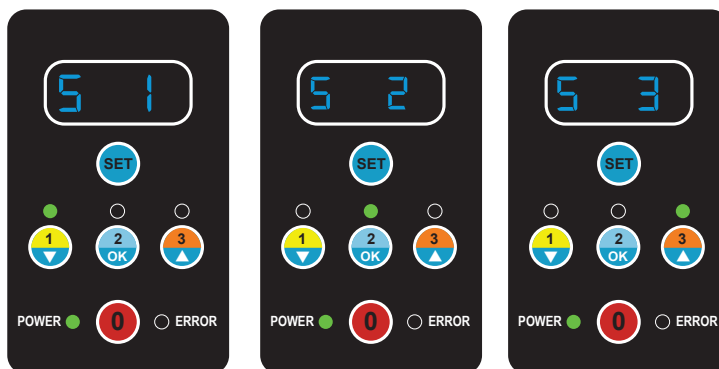


Figure 5 - S1, S2, S3 Shown on Display

3. After selecting S1, S2, or S3 the power level for that setting flashes on the LED display. Use the **1** and **3** buttons to select the desired power level (Watts). Press the **2 OK** button to save the power level and move on to the duration setting. (See Figure 6)

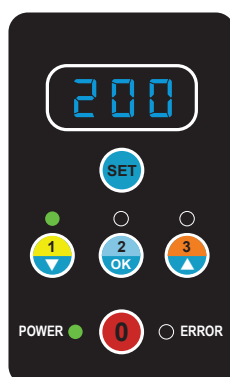


Figure 6 - Power Level (Watts) Setting

4. After saving the power level (watts) setting, the duration (hours) flashes on the LED display. (See Figure 7). Use the **1** and **3** buttons to select the desired duration in hours for the current setting. Press the **2 OK** button to save the duration and return to the speed/power level setting selection.
5. Press the **SET** button to return to the programming menu.



Figure 7 - Duration (Hours) Setting

Please follow all local/state regulations regarding pool motor and timer speeds settings when choosing the appropriate speeds.

Override (OVRD) Menu

1. Enter programming mode by pressing and holding the  button for at least three (3) seconds when the pump is in the stopped (OFF) position.
2. Use the  and  buttons to select OVRD. (See Figure 8). Press the  button to enter the override menu.

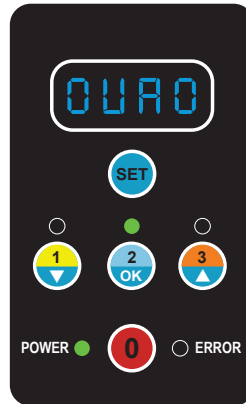


Figure 8 - OVRD Shown on Display

3. The duration (hours) for the override feature flashes on the LED display. The factory default setting is two (2) hours. Use the  and  buttons to select the desired number of hours for the override feature. The duration can be set between 0 and 24 hours. Press the  button to save the override duration and exit the override and programming menus.

To Activate the Override Feature:

First press the  button and then the  button simultaneously when the pump is running. The pump will ramp up to full speed (1000 Watts) for the programmed override duration. At the end of the programmed time for the override feature, the pump will return to the proper place in the 24-hour schedule.

Priming (PR) Menu

1. Enter programming mode by pressing and holding the  button for at least three (3) seconds when the pump is in the stopped (OFF) position.
2. Use the  and  buttons to select PR. (See Figure 9). Press the  button to enter the priming menu.

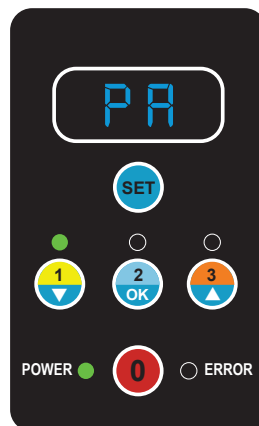


Figure 9 - PR Shown on Display

3. The power level (watts) for the priming cycle flashes on the LED display. The factory default setting is 1000 Watts. Use the  and  buttons to select the desired priming power level. Press the  button to save and move on to the priming time.

Priming (PR) Menu - Continued

4. The priming time now flashes on the LED display. The factory default setting is two (2) minutes. Use the  and  buttons to select the desired priming time between zero (0) and ten (10) minutes, in 1 minute increments. Press the  button to save and exit the priming and programming menus.

Normal Operation

1. To start the pump from the stopped (OFF) position, press the  button. The pump will run through the programmed priming cycle. The priming power level flashes on the LED display and the green LED light above the  button flashes during the priming cycle.
2. Once the priming cycle is complete, the pump will first run on power level setting 1 (S1) for the programmed number of hours. The power level setting for S1 will be shown on the LED display.
3. After running for the programmed number of hours on S1, the pump automatically changes to S2.
4. After running for the programmed number of hours on S2, the pump automatically changes to S3.
5. After running for the programmed number of hours on S3, and at the end of the 24-cycle, the pump automatically starts again on S1.

The Factory Default Schedule is:

S1: 200 Watts; 12 Hours

S2: 0 Watts; 0 Hours

S3: 0 Watts; 0 Hours

Under the default schedule, the pump will run at 200W for 12 hours and then remain off for 12 hours every day.

NOTE: The total run time between the three settings (S1 + S2 + S3) must be equal to or less than 24 hours. The motor will not let the user save the time settings if the total run time exceeds 24 hours.

NOTE: To save power, the LED display will turn off after three minutes during normal operation.

- To stop the pump at any time, press the  button. The pump will come to a stop and the LED display will read OFF.

NOTE: If the power is shut off or the pump is stopped using the  button, upon restart the pump will run through the programmed priming cycle and then resume normal operation.

Reset to Factory Default Settings:

- Verify that the pump is powered ON and the green power LED light is on.
- If the pump is running, press the  button to stop it.
- Press and hold the  button for at least 15 seconds.
- The three preset power level LED lights and the POWER LED light will all illuminate simultaneously to indicate that factory default settings have been restored.

Power Level (Watts)	Approx. RPM
1000	2850-3500
850	2800-3250
750	2400-3150
650	2300-3000
550	2150-2850
450	2000-2600
350	1850-2450
250	1650-2150
150	1350-1750
50	850-1050

Table 2.0

User Interface Lockout

The user interface can be locked to prevent unauthorized programming modifications:

- To lock the user interface, first press the **SET** button then immediately press the **0** button simultaneously.
- When the user interface is locked, there will be a dot "." in the lower right corner of the LED display. (See Figure 10)
- To unlock the user interface, press the **SET** button and **0** button in the same sequence as described above.

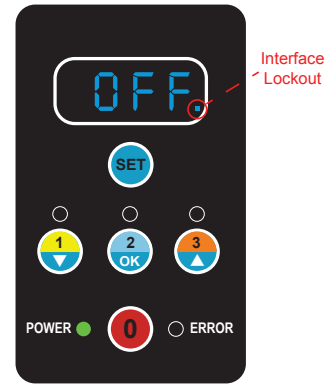


Figure 10

5 Service and Maintenance

Routine Maintenance

This pump requires little or no service other than reasonable care and periodic cleaning of the strainer basket. ***DO NOT*** strike basket to clean. When cleaning the basket inspect the lid o-ring for damage and replace if necessary.

1. Inspect the pump basket for debris by looking through the clear pump lid.
2. Turn OFF the power to the pump. If the pump is located below the water level, close isolation valves on the suction and discharge sides of the pump to prevent back flow of water.
3. Remove any debris, because as the debris accumulates, it will begin to block the flow of water through the pump. Keep the basket clean and clear to improve the performance of the pump.
4. Turn the lid ring counter-clockwise to remove. Carefully remove the lid and lock ring.
5. Remove the basket and properly dispose of the debris into the trash and rinse out the basket. Check basket for cracks, if crack is found replace basket.
6. Replace basket back into the pump, align the basket properly with the suction pipe. Then fill with water up to the suction pipe. Clean the clear lid, o-ring, and sealing surface of the pump of any debris.
7. Replace lid with lid ring. *Hand-tighten* the lid to make an air-tight seal. ***DO NOT use any tools to tighten the lid.***
8. Verify that all valves have been returned to the proper position for normal operation. Turn ON the power to the pump.

NOTE: It is normal for a few drops of water to escape from the mechanical seal from time to time. This is especially true during the break-in period.

The mechanical seal may become worn or loose over the course of time, depending on the running time and water quality. If water continually leaks out, a new mechanical seal should be fitted. After long periods of no operation (seasonal storage, etc.), the pump must be checked for ease of rotation while it is switched off. Detailed instructions for removing and replacing the mechanical seal begin on page 18.

WARNING: Before servicing the pump, switch off the circuit breakers at the power source. Severe personal injury or death may occur if the pump starts while your hand is inside the pump.

Winterizing

CAUTION: The pump must be protected when freezing temperatures are expected. Allowing the pump to freeze will cause severe damage and void the warranty.

There are two options when winterizing the pump

Option 1:

1. Drain all the water from the pump, system equipment, and piping.
2. Remove drain plugs. **DO NOT** replace plugs. Store the plugs in the empty strainer basket for winter.
3. Keep the motor covered and dry.

Option 2:

1. Drain all the water from the pump, system equipment, and piping.
2. Remove the pump and motor from the plumbing and store indoors in a warm and dry location.

NOTE: When the winter season is over the pump will need to be check and primed prior to start. Refer to Section 4 Operation, Start Up Guide.

CAUTION: DO NOT run the pump dry. If the pump is run dry, the mechanical seal will be damaged and the pump will start to leak at the seal. If this occurs, the mechanical seal will need to be replaced. **ALWAYS** maintain the proper water level in your pool. Continued operation in this manner could cause a loss of pressure, resulting in damage to the pump casing, impeller, and mechanical seal.

6 Troubleshooting

Controller Errors

WARNING: The pump must be serviced by a professional service technician qualified in pool/spa installation. The following procedures must be followed exactly. Improper installation and/or operation can create dangerous electrical hazards, which can cause high voltage to run through the electrical system. This can cause property damage, serious personal injury, and/or death. Improper installation and/or operation will void the warranty.

The controller errors are indicated by the red LED and an error code shown in the LED display. (See Figure 11). List of error codes with their descriptions are listed in Table 3.0.

NOTE: In the event that an error code is shown and will not clear, the controller can be 'rebooted' by turning power to the pump OFF and waiting 10 minutes before turning the power back on. If this step does not clear the error code, contact your pool professional for service.



Figure 11

Controller Errors

Table 3.0

Error Code	Error Description	Error Code	Error Description
01	DC-link over-voltage	21	Motor phase short circuit
02	DC-link under-voltage	22	Output phase lack
03	DC-link voltage is too low	31	Communication error with master
04	IPM (Intelligent Power Module) over-current software protection	41	Current sampling sensor error
05	IPM (Intelligent Power Module) over-current hardware protection	42	Inrush current preventing relay error
07	AC input over-voltage	43	Voltage sensor error, AC voltage and DC voltage do not match
08	AC input under-voltage	51	IPM (Intelligent Power Module) temperature sensor error
10	Electronic thermal overload has tripped	60	Motor rotor locked
11	Motor speed too high	61	DSP ROM error
13	IPM (Intelligent Power Module) temperature too high	62	DSP RAM error
16	Motor out of step	63	DSP watchdog error
17	PFC output DC low voltage	66	Internal communication error
20	Short circuit to ground		

General Pump Troubleshooting

Table 4.0

Problem	Possible Cause	Solution
1. Pump will not prime.	A. Suction air leak	Make sure see-through lid and o-rings are clean and properly positioned. Hand tighten see-through lid. Tighten all pipes and fittings on suction side of pump. Be sure water in pool is high enough to flow through skimmer.
	B. No water in pump.	Make sure strainer tank is full of water.
	C. Closed valves or blocked lines.	Open all valves in system. Clean skimmer and strainer tank. Open pump and check for clogging of impeller.
	D. Low voltage to motor.	Check voltage at motor. If too low, pump will not run.
2. Motor does not turn	A. No power to motor.	Check that all power switches are on. Be sure fuse or circuit breaker is properly set. Time set properly? Check motor wiring at terminal.
	B. Pump jammed	With power off, turn shaft. It should spin freely. If not, disassemble and repair.
3. Low flow	A. Dirty filter	Back wash filter when filter pressure is high, or clean cartridges.
	B. Suction Leak	See Problem 2

Blocked Impeller

WARNING: Before servicing the pump, switch off the circuit breakers at the power source. Severe personal injury or death may occur if the pump starts while your hand is inside the pump.

1. Turn OFF the pump. Switch off the circuit breaker to the pump motor.
2. Remove the pump lid and strainer basket.
3. Look inside pump for debris. Remove any debris found inside.
4. Replace the strainer basket and lid.
5. Switch on the circuit breaker to the pump motor.
6. Turn ON the pump, see if the problem is solved.
7. If the impeller is still blocked with debris and it is not possible to remove the debris using Steps 2 - 4, the pump will need to be disassembled in order to access the inlet and outlet of the impeller.

Removal and Replacement of the Impeller and/or Mechanical Seal

WARNING: Before servicing the pump, switch off the circuit breakers at the power source. Severe personal injury or death may occur if the pump starts while your hand is inside the pump.

1. Turn OFF the pump. Switch off the circuit breaker to the pump motor. If you are not replacing the motor, do not disconnect the electrical wiring.
2. Turn OFF any valves to prevent pool water from reaching the pump. Drain water from the pump by loosening the unions or removing the drain plugs.
3. Remove the eight (8) screws (ES90-II VSP, A91-II VSP, E71-II VHV) or four (4) thru-bolts (BADU Pro-II E VSP) connecting the pump casing/strainer tank to the flange.
4. Pull the motor and flange/seal housing out from the pump casing/strainer tank. Remove the pump casing o-ring. The impeller is connected to the motor shaft.
5. Remove the diffuser by gently pulling the diffuser (the diffuser is the cover over the impeller) horizontally until the pins clear the seal housing. *NOTE: Only Models ES90-II VSP, E90-II VSP, and BADU Pro-II E VSP have a diffuser.*
6. Place a flat head screwdriver through the center hole of the fan cover and into the screwdriver slot on the motor shaft.
7. While holding the motor shaft, turn the impeller counter-clockwise.
8. Gently pull the mechanical seal from the impeller shaft noting the way it was originally installed.

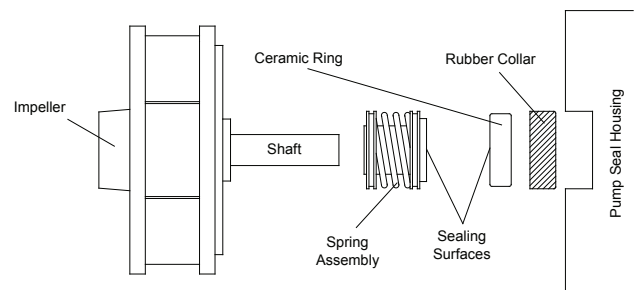


Figure 3

CAUTION: DO NOT damage the ceramic or carbon sealing surfaces of the seal. If the sealing surfaces are damaged, leaks will occur.

9. Using water with a small amount of dish soap, brush the impeller shaft for ease of assembly.
10. With the carbon side up, push the mechanical onto the impeller shaft and wipe carbon surface with a clean cloth. **CAUTION: DO NOT** use grease or lube to install seal. It will damage the seal and cause failure.

Removal and Replacement of the Impeller and/or Mechanical Seal - continued

11. The ceramic side of the seal can be pushed out from the rear of the seal housing. Please note its position before removing.
12. Using water only, wet the ceramic side of the seal and using your thumbs push into the seal housing. Clean surface with a clean cloth.
13. Wipe the motor shaft of all debris and apply a single drop of Loc-tite to the motor shaft threads.
14. Install impeller by spinning it clockwise onto the motor shaft. Continue to turn clockwise until the carbon and ceramic sides make contact and the seal spring slightly compresses.
15. Install the diffuser by aligning the diffuser pin with the holes in the seal housing and pressing together.
16. Make sure the diffuser and casing o-rings are in place and free of debris. Slide the motor flange into the casing.
17. Install the eight (8) casing screws (ES90-II VSP, A91-II VSP, E71-II VHV) or four (4) thru-bolts (BADU Pro-II E VSP) using a cross pattern from side to side and top to bottom. **CAUTION: DO NOT over-tighten.**

Motor Replacement

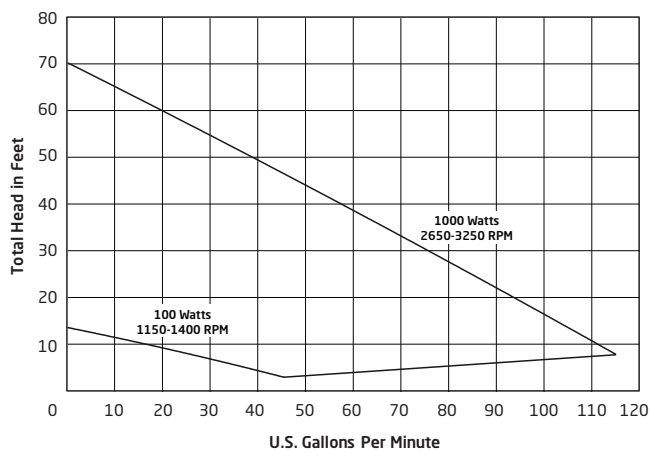
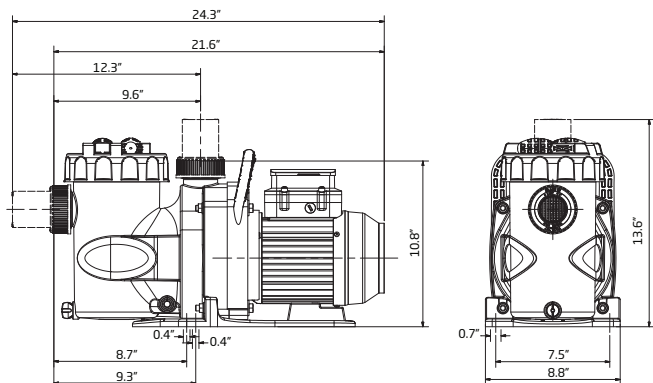
WARNING: The pump must be serviced by a professional service technician qualified in pool/spa installation. The following procedures must be followed exactly. Improper installation and/or operation can create dangerous electrical hazards, which can cause high voltage to run through the electrical system. This can cause property damage, serious personal injury, and/or death. Improper installation and/or operation will void the warranty.

1. Disconnect the wiring from the side of the motor. (Refer to the Electrical Installation)
2. Remove the eight (8) casing screws (ES90-II VSP, A91-II VSP, E71-II VHV) or four (4) thru-bolts (BADU Pro-II E VSP) holding the flange/seal housing to the pump casing/strainer tank.
3. Slide the motor and flange/seal housing away from the casing/strainer tank.
4. Remove the diffuser by gently pulling the diffuser horizontally until the pins are clear from the flange/seal housing.
5. Remove the fan cover (3 Phillips head screws) and place a flat heat screwdriver into the screwdriver slot on the rear of the motor shaft.
6. While holding the motor shaft, turn the impeller counter-clockwise.
7. Using a 1/4" socket, remove the four thru-bolts from the rear of the motor.
8. Remove one-piece flange/seal housing from the front of the motor.
9. Remove the slinger from the old motor and install on to the new motor.
10. Clean the surfaces of the seal (Refer to the Removal and Replacement of the Impeller and/or Mechanical Seal Section page 18 steps 9-17).

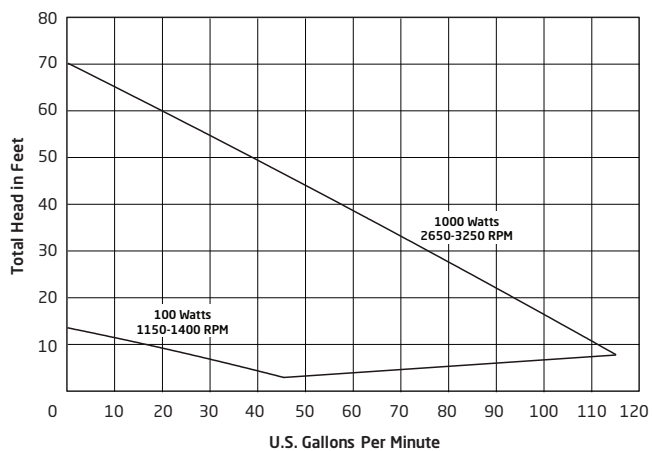
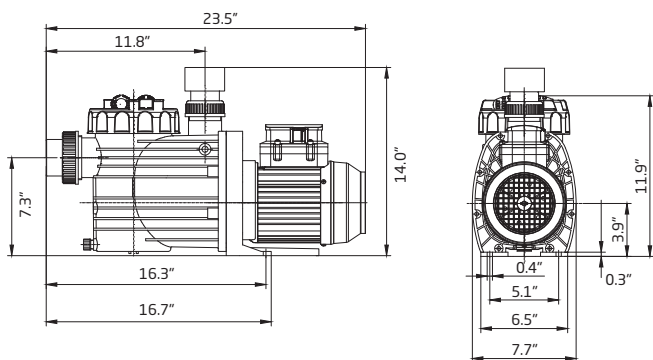
7 Product Specifications

Dimensional Drawings & Performance Curves

Model BADU® Pro-II E VSP

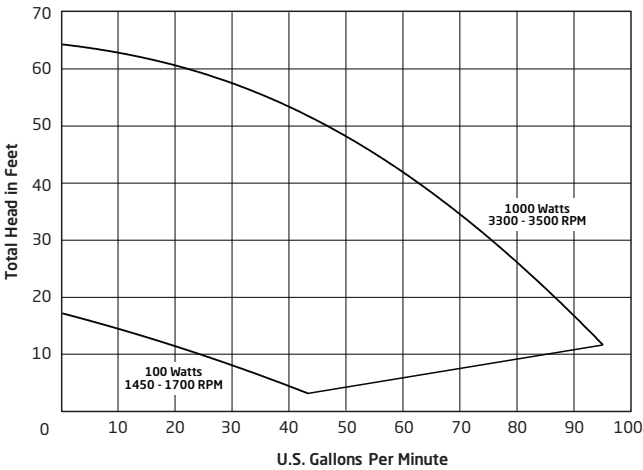
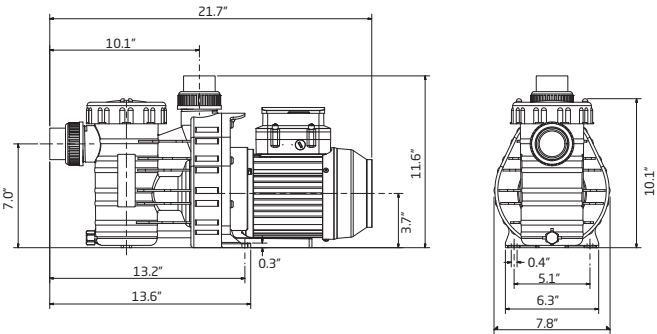


Model ES90-II VSP

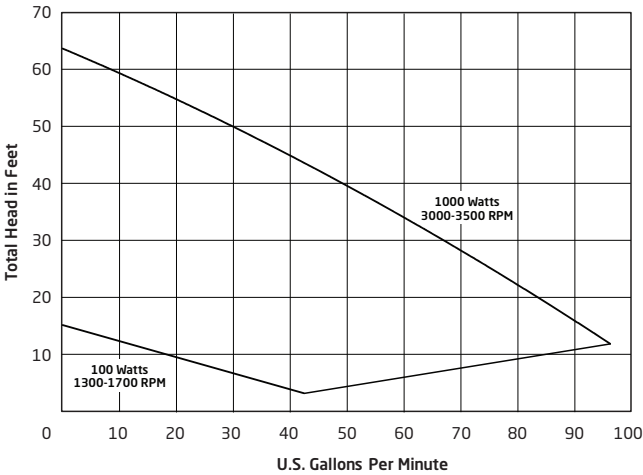
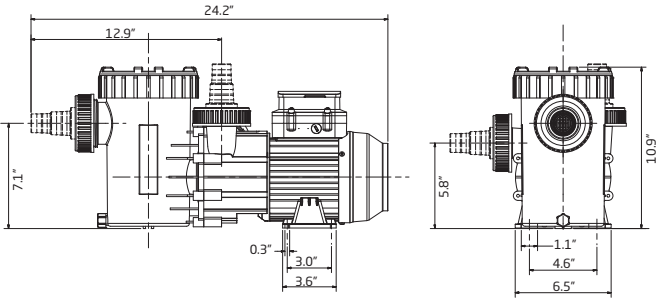


Dimensional Drawings & Performance Curves - continued

Model A91-II VSP

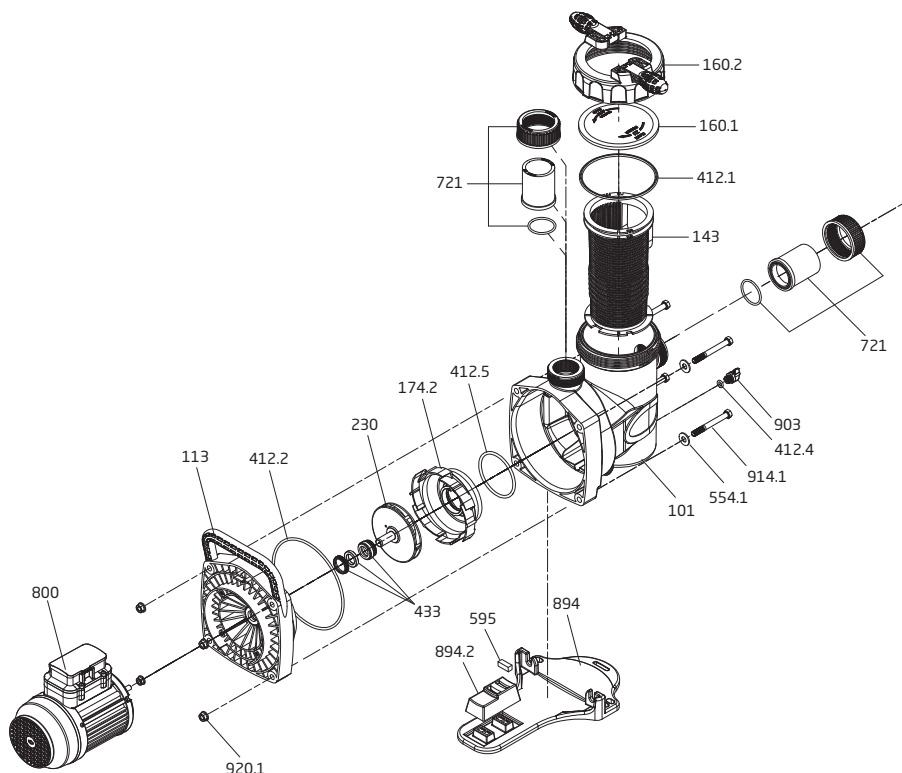


Model E71-II VHV



Replacement Parts and Exploded View - continued

Model BADU Pro-II E VSP

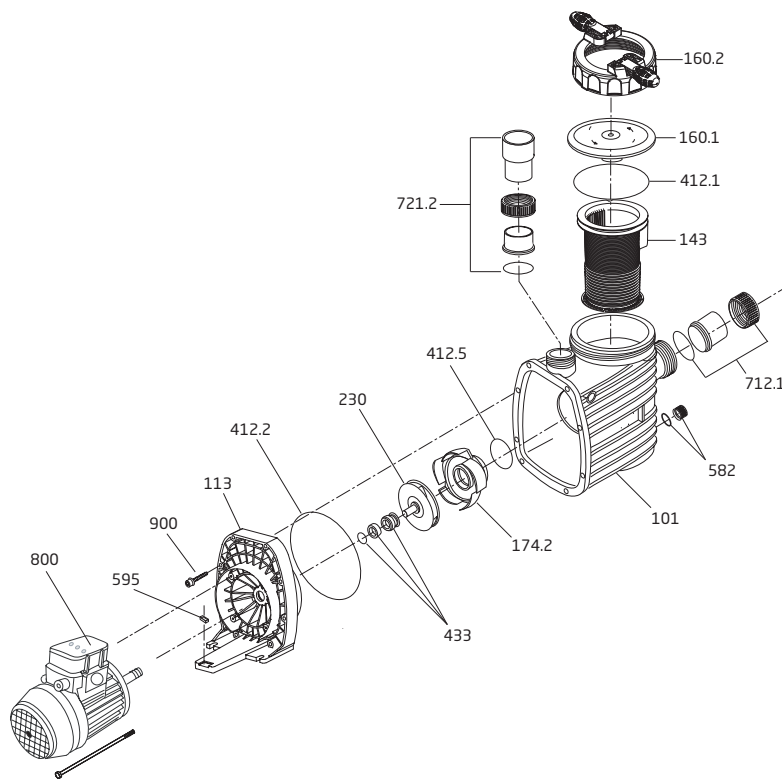


Order#	Drawing #	Description
2901116010	160.1	Lid - Clear
2921116012B	Not Shown	Lid - Clear w/ LED Light
2921116022	160.2	Lid - Lock Ring w/ Handles
2921141210	412.1	O-ring - Lid 137 x 5mm
2901114300	143	Basket
2901510102	101	Casing (1.5")
2901510103	101	Casing (2.0")
2901490300	903	Drain Plug - Winged w/ O-ring
2991000154	914.1	Screw - 3/8-16 x 3-1/2" Hex Cap SS (x4)
2991400035	554.1	Washer - Flat 3/8" SS (x4)
2991000155	920.1	Nut - 3/8-16 Brass (x4)
2920359501	595	Rubber Buffer - 10 x 10 x 27mm

Order#	Drawing #	Description
2901591701	894.2	Motor Support
2901589400	894	Base Plate
2920141210	412.5	O-ring - Diffuser 90 x 5mm
2921117412	174.2	Diffuser
2921223040	230	Impeller - 115 x 9.0mm (3/8")
2921606204	433	Mechanical Seal (5/8") - Carbon/Ceramic
2901541221	412.2	O-ring - Casing 190 x 5mm
2901516102	161.2	Flange/Seal Housing
2500300937	721	1.5" Union Package CPL
2500300936	721	2.0" Union Package CPL
ECPM750011	800	Motor - 1.1 THP; 115-230 V; VS

Replacement Parts and Exploded View - continued

Model ES90-II VSP

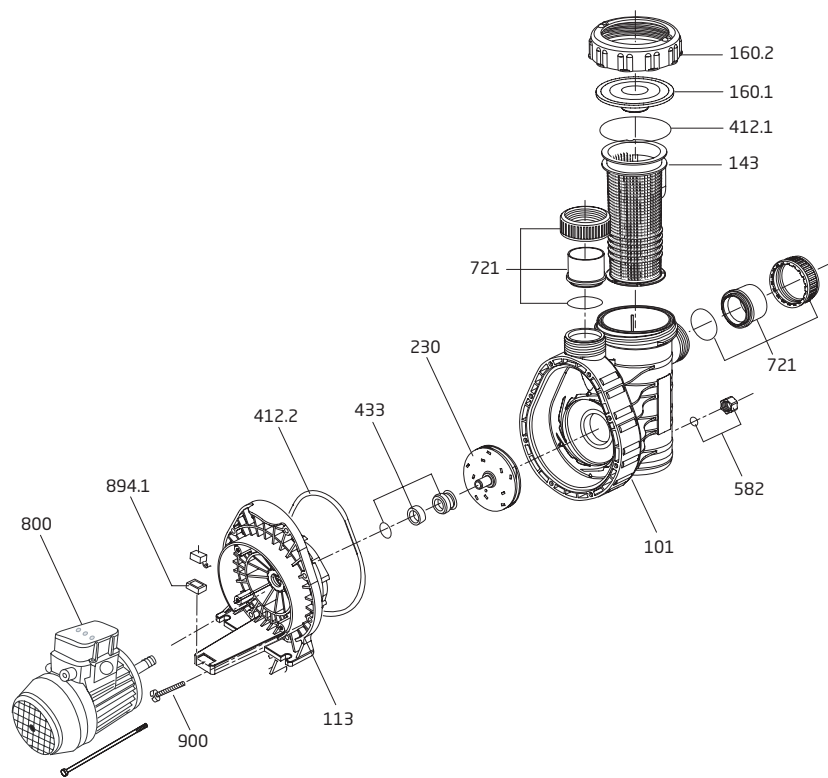


Order#	Drawing #	Description
2901116010	160.1	Lid - Clear
2921116012B	Not Shown	Lid - Clear w/ LED Light
2921116022	160.2	Lid - Lock Ring w/ Handles
2921141210	412.1	O-ring - Lid 137 x 5mm
2901114300	143	Basket
2921110108TB	101	Casing - Thru Bolt
2901158200	582	Drain Cap 3/8" w/ Gasket
2920889410	894.1	Lego Spacer (x3)
2991000120	900	Screw - Casing 1/4-20 x 2.5" (x8)
2991300035	900	Nut - Serrated Flange 1/4"-20 (x8)
2991000012	900	Washer - Flat #12 (x8)

Order#	Drawing #	Description
2920141210	412.5	O-ring - Diffuser 90 x 5mm
2921117412	174.2	Diffuser
2921223040	230	Impeller - 115 x 9mm (3/8") 6V
2921606204	433	Mechanical Seal (5/8") - Carbon/Ceramic
2921141222	412.2	O-ring - Casing 190 x 6mm
2921116112	113	Flange/Seal Housing
2921770005	721.1	Union Package - Suction
2500300902	721.2	Union Package - Discharge
2500300914	721.1 & 721.2	Union Package - Suction/Discharge
ECPM750011	800	Motor - 1.1 THP; 115-230 V; VS

Replacement Parts and Exploded View

Model A91

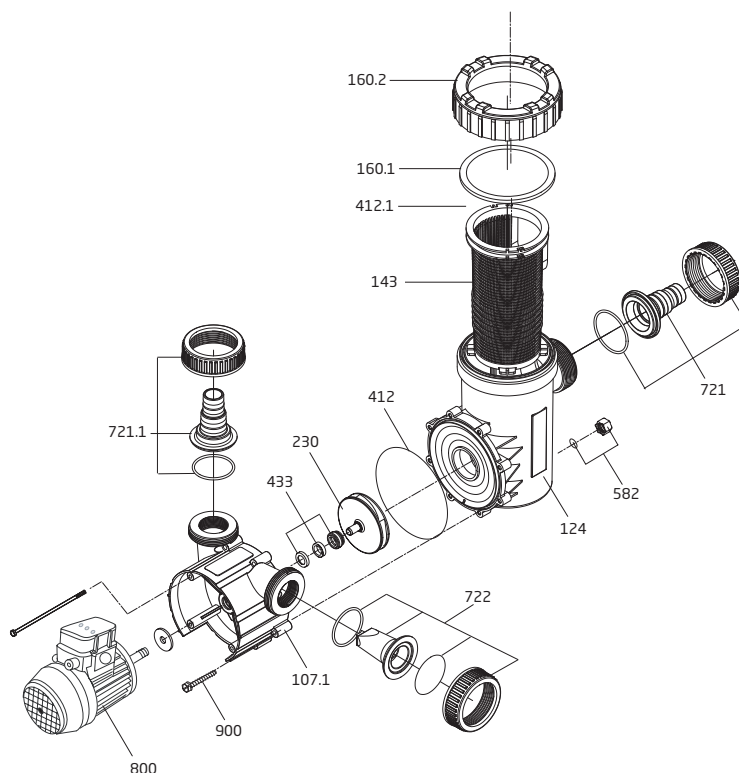


Order#	Drawing #	Description
2901316020	160.2	Lid - Lock Ring
2901316010	160.1	Lid - Clear
2901341220	412.1	O-ring - Lid 105 x 5mm
2901314300	143	Basket
2901310101	101	Casing
2901158200	582	Drain Cap 3/8" w/ Gasket
2921623098	230	Impeller - 98 x 10.5mm
2921606204	433	Mechanical Seal (5/8") - Carbon/Ceramic
2921641223	412.2	O-ring - Casing 165 x 6mm

Order#	Drawing #	Description
2991000091	900	Screw - Casing M7 x 48mm (x8)
2920889410	894.1	Lego Spacer
2901316101	113	Flange/Seal Housing
2500300916	721	Union Package CPL - Slip
2500300913	721	Union Package CPL - NPT
2500300909	721	Half Union Set - NPT (x2)
2500300910	721	Half Union Set - Slip (x2)
ECPM750011	800	Motor - 1.1 THP; 115-230 V; VS

Replacement Parts and Exploded View - continued

Model E71



Order#	Drawing #	Description
2901116010	160.1	Lid - Clear
2921116012B	Not Shown	Lid - Clear w/ LED Light
2901116020	160.2	Lid - Lock Ring
2901141201	412.1	O-ring - Lid 137 x 5mm
2901114300	143	Basket
2901158201	582	Drain Cap 3/8" w/ Gasket
2901141200	412	O-ring - Casing 144 x 4mm
2921923193	230	Impeller (-II VHV) - 106 x 9mm w/ Insert
2921606204	433	Mechanical Seal (5/8") - Carbon/Ceramic
2991000091	900	Screw - Casing (Hex/Washer/Slot) M7 x 48mm (x8)
2901172115	107.1	Casing - Dual Discharge
2901110100B	124	Strainer Tank
2901191600K	722	Plug Kit - Discharge Port ABS
ECPM750011	800	Motor - 1.1 THP; 115-230 V; VS

Order#	Drawing #	Description
Union Packages		
2901172114	721 & 721.1	Union Package - Hose Adaptor Kit (Suction/Discharge)
2500300930	Not Shown	Union Package - Hose Adaptor & Slip Unions (Suction/Discharge)
2500300931	Not Shown	Union Package - Hose Adaptor (Suction/Discharge) & NPT Union (Suction Only)
2500300925	Not Shown	Union Package (1.5") - NPT/Hose (Suction/Discharge)
2921770007	Not Shown	Union Package (1.5") - Slip (Suction)
7300313002	Not Shown	Union Package (1.5") - Slip (Discharge)
7300313000	Not Shown	Union Package (2.0") - Slip (Discharge)
2921770001	Not Shown	Union Package (2.0") - Slip (Suction)

8 Terms & Conditions

PRODUCT REGISTRATION

Thank you for purchasing a SPECK PUMPS® product please take a few moments to register it online. Your registration helps us keep you up to date on product information and offers.

Before you register:

What do I need to get started?

- The Serial Number and the Model Name
- An email address. We will use this to send you confirmation of your registration.
- A copy of your sales receipt and/or qualified installer's invoice.

To register your SPECK equipment please register online at www.usa.speck-pumps.com

or

Scan QR code to register product



LIMITED WARRANTY

LIMITED WARRANTY: Speck Pumps grants solely to Buyer for a limited period of ninety (90) days from the date of shipment the following non-transferable limited warranty ("Limited Warranty"): that the goods shipped under the invoice attached to these Terms and Conditions will be free of material defects in manufacture under normal use. IN THE EVENT OF A BREACH OF THE LIMITED WARRANTY, SPECK PUMPS-POOL PRODUCTS, INC. ENTIRE OBLIGATION AND LIABILITY TO BUYER, AND BUYER'S SOLE AND EXCLUSIVE REMEDY SHALL BE AS FOLLOWS: Speck Pumps-Pool Products, Inc. will, at its option, repair or replace any such defective goods, or refund to Buyer the purchase price paid for such defective goods. The foregoing Limited Warranty is expressly conditioned upon the following: (aa) Buyer giving notice of the claim within the Limited Warranty Period; (bb) the goods were installed by a pool industry professional and/or a licensed electrician; (cc) the goods have not been abused, misused, or modified and were operated in accordance with Speck Pumps-Pool Products, Inc.'s instructions and operator/maintenance manuals delivered with the goods. SPECK PUMPS-POOL PRODUCTS, INC. EXPRESSLY DISCLAIMS AND THE LIMITED WARRANTY DOES NOT INCLUDE OR COVER ANY LABOR PERFORMED IN CONNECTION WITH REMOVAL, REPLACEMENT OR INSTALLATION OF REPAIRED OR REPLACED PARTS OR FOR ANY OTHER COSTS, EXPENSES OR INJURIES OR DAMAGES TO PERSONS (INCLUDING DEATH) OR TO PROPERTY OR THINGS INCLUDING BUT NOT LIMITED TO THOSE ARISING FROM LOSS OF PROFITS, PRODUCTION, INCREASED COST OF OPERATION, OR SPOILAGE OF MATERIAL ARISING IN CONNECTION WITH THE SALE OR USE OF, OR INABILITY TO USE ANY GOODS. OTHER THAN THE LIMITED WARRANTY EXPRESSLY SET FORTH IN THIS SECTION. SPECK PUMPS-POOL PRODUCTS, INC. DOES NOT MAKE ANY EXPRESS OR IMPLIED WARRANTIES, CONDITIONS, OR REPRESENTATIONS TO BUYER OR ANY OTHER PARTY WITH RESPECT TO ANY GOODS OR SERVICES PROVIDED HEREUNDER OR OTHERWISE REGARDING THIS AGREEMENT, WHETHER ORAL OR WRITTEN, EXPRESS, IMPLIED OR STATUTORY. WITHOUT LIMITING THE FOREGOING, ANY IMPLIED WARRANTY OR CONDITION OR MERCHANTABILITY, THE IMPLIED WARRANTY AGAINST INFRINGEMENT, AND THE IMPLIED WARRANTY OR CONDITION OF FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED AND DISCLAIMED.

EXTENDED WARRANTY: Speck Pumps may provide extended warranty coverage. To determine eligibility, duration details, and other specifics please refer to the warranty coverage section within the products' literature. To obtain product literature visit www.usa.speck-pumps.com or call (904) 739-2626.

TO OBTAIN AN EXTENDED WARRANTY: To receive a product extended warranty (longer than 90 days from the original date of installation) the customer must complete the three steps below within 90 days of installation:

1. Register the product. (See *Product Registration*)
2. Provide a copy of the sales receipt.
3. Provide the pool professionals invoice, cord units are exempted. (*see comment below)

*Any Pump purchased on-line is not eligible for an extended warranty. Only products purchased through a pool service company, a pool builder, or a pool store AND installed by a pool professional along with a licensed electrician are eligible for extended warranties.

EXTENDED WARRANTY COVERAGE: Speck Pumps-Pool Products, Inc. grants solely to the original consumer purchaser ("Buyer") of the pump and motor the following personal, non-transferable and limited warranty on the following terms and conditions (the "Limited Warranty"): the pump and motor is warranted to be free of material defects in materials or workmanship under normal use for a period of one (1) year beginning on the date of the Buyer's purchase of the pump and motor. Notwithstanding any provisions herein to the contrary, the warranties and obligations hereunder shall not in any event extend for more than two (2) years beyond the date of shipment of the pump and motor from the factory (the "Limited Warranty Period"). The Limited Warranty is subject to each of the following additional terms and conditions:

Limited Warranty - continued

1. IN THE EVENT OF ANY BREACH OF THE LIMITED WARRANTY, SPECK PUMPS-POOL PRODUCTS, INC.'S ENTIRE OBLIGATION AND LIABILITY TO BUYER, AND BUYER'S SOLE AND EXCLUSIVE REMEDY SHALL BE AS FOLLOWS: Speck Pumps-Pool Products, Inc. will, at its option, either repair or replace the pump and motor or refund to Buyer the purchase price actually paid by Buyer for the pump and motor subject to the Limited Warranty. Speck Pumps-Pool Products, Inc. shall have no obligations under the Limited Warranty unless Buyer delivers timely written notice to Speck Pumps-Pool Products, Inc. of the Limited Warranty claim within the Limited Warranty Period and returns the pump and motor to Speck Pumps-Pool Products, Inc. if requested. To the fullest extent permitted by law, Speck Pumps-Pool Products, Inc. expressly disclaims any liability for, and the Limited Warranty does not include or cover, any labor, costs or other expenses in connection with the removal, transportation, shipment, insurance, replacement, repair, or installation of repaired or replaced parts or for any other costs or expenses or damages to property or things including, but not limited to, those arising in connection with the use of, or inability to use, the pump and motor.

2. To the fullest extent permitted by law, the Limited Warranty will be void and of no force or effect and Speck Pumps-Pool Products, Inc. will have no liability, responsibilities or obligations to Buyer or with respect to the pump and motor in the event of the occurrence of any one or more of the following:

- (a) Any damage to the pump and motor caused by Buyer, any third party, ground movement, other natural forces, acts of God or any other sources or causes not arising from a breach of the Limited Warranty, excluding ordinary wear and tear;
- (b) Any replacement, modification, alteration or repair of any parts or components of the pump and motor by anyone other than Speck Pumps-Pool Products, Inc.;
- (c) Any abuse, misuse, accident, tampering with, improper installation or modification of the pump and motor or any other actions, inactions or failures to act that violate the terms and conditions of this Limited Warranty;
- (d) Buyer's failure or inability to present an invoice, bill, receipt or other documentation clearly evidencing that the pump and motor was installed and maintained in strict compliance with this Limited Warranty and that the claim was timely submitted within the Limited Warranty Period; and/or
- (e) Buyer's failure to comply with the conditions and contingencies set forth in paragraph 3 below.

3. The Limited Warranty is expressly conditioned and contingent upon Buyer's strict compliance with each of the following:

- (a) Installation of the pump and motor by an experienced and qualified pool industry professional and a licensed electrician who is licensed within the jurisdiction in which the pump and motor is installed and will be used; and
- (b) Buyer's operation and maintenance of the pump and motor in strict accordance with Speck Pumps-Pool Products, Inc.'s printed operator/maintenance manuals delivered with the pump and motor.

4. DISCLAIMER: THE LIMITED WARRANTY IS THE ONLY WARRANTY MADE AND IS IN LIEU OF ALL OTHER WARRANTIES, AND ANY AND ALL IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, THE IMPLIED WARRANTY AGAINST INFRINGEMENT, AND THE IMPLIED WARRANTY OR CONDITION OF FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY LIMITED IN THEIR SCOPE AND DURATION TO THE ONE YEAR TERM OF THE LIMITED WARRANTY SET FORTH HEREIN. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO THE BUYER.

5. TO THE FULLEST EXTENT PERMITTED BY LAW, IN NO EVENT SHALL SPECK PUMPS-POOL PRODUCTS, INC. OR ITS OFFICERS, DIRECTORS, EMPLOYEES, SHAREHOLDERS, AGENTS, OR REPRESENTATIVES BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, EXEMPLARY OR CONSEQUENTIAL DAMAGES OR LOSS, INCLUDING TIME, MONEY, GOODWILL, AND LOST PROFITS IN ANY WAY WHICH MAY ARISE HEREUNDER OR FROM THE USE OF OR INABILITY TO USE THE PUMP AND MOTOR OR THE PERFORMANCE OR NONPERFORMANCE OF ANY OBLIGATION UNDER THIS LIMITED WARRANTY. THIS PARAGRAPH, THE WARRANTY DISCLAIMERS IN PARAGRAPH 4 ABOVE, AND THE SOLE AND EXCLUSIVE REMEDY SET FORTH IN PARAGRAPH 1 ABOVE SHALL APPLY EVEN IF SPECK PUMPS-POOL PRODUCTS, INC. HAS BEEN NOTIFIED OF THE POSSIBILITY OR LIKELIHOOD OF SUCH DAMAGES OCCURRING, WHETHER SUCH LIABILITY IS BASED ON CONTRACT, TORT, NEGLIGENCE, STRICT LIABILITY, PRODUCTS LIABILITY OR OTHERWISE, AND EVEN IF ANY REMEDY STATED HEREIN FAILS OF ITS ESSENTIAL PURPOSE. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF SPECIAL, INDIRECT, INCIDENTAL, EXEMPLARY OR CONSEQUENTIAL DAMAGES OR LOSS, SO THE ABOVE EXCLUSIONS AND LIMITATIONS MAY NOT APPLY.

6. This Limited Warranty gives the Buyer specific legal rights, and the Buyer may also have other rights, which vary from state to state.

7. A return merchandise authorization ("RMA") must be obtained from Speck Pumps-Pool Products, Inc. before returning any product. Products returned **without** an RMA will be refused and returned, unopened, to the Buyer. All returned products are to be sent freight prepaid and insured for Buyer's protection to the manufacturer at 8125 Bayberry Road, Jacksonville, Florida 32256. Under no condition will products be accepted after the expiration of the Limited Warranty Period. Speck Pumps-Pool Products, Inc. shall not bear any costs or risks incurred by Buyer in shipping a defective pump and motor to Speck Pumps-Pool Products, Inc. or in shipping a repaired or replaced pump and motor to Buyer.

