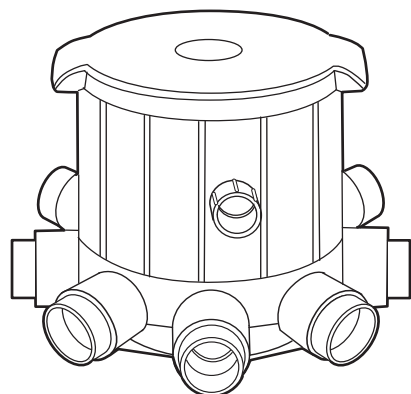


# INSTALLATION AND MAINTENANCE GUIDE



 **PolarisUltraFlex<sup>2</sup>**

IMPORTANT INFORMATION

SERIAL NUMBER

# IMPORTANT SAFETY INFORMATION

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

## READ AND FOLLOW ALL INSTRUCTIONS.

Installation of this equipment should be performed by a licensed electrician and conform to all national electric codes (NEC, Australian, etc.), state and local law, ordinances, codes and regulations.

### **WARNING: To reduce the risk of electrical shock:**

- Install all electrical equipment at least 10 feet (3 m) from inside wall of pool or spa.
- Disconnect power before servicing this equipment.
- CAUTION: Use supply wires suitable for 140-167°F (60/75° C).
- CAUTION: Connect only to a circuit protected by a Class A ground fault circuit interrupter (GFCI).
- Use copper conductors only.

**To guarantee complete cleaning and qualify the warranty**, the pool builder should fax or email a Design Fact Sheet along with a scaled pool plan for FREE In-Floor Design Service.

Email: [design@zpc.zodlac.com](mailto:design@zpc.zodlac.com)

Fax: (760) 597-1246

**If the pool design or dimensions change during excavation, a new design plan must be drawn.**

Install the valve above ground and the finished pool water level. **Do not bury valve after installation.**

Install cleaning heads and nozzles according to the Design Plan.

If pool includes an elevated spa, install a check valve on the line feeding the spa heads to avoid spa draining. Install other check valves (as normal) to avoid spa return jets and suction lines from draining.

**WARNING:** To reduce risk of injury, do not permit children to use this product unless they are closely supervised at all times.

## SAVE THESE INSTRUCTIONS.

### **For customer service or support:**

- For on-line support: [www.polarispool.com](http://www.polarispool.com)  
[www.zodiacpoolcare.com](http://www.zodiacpoolcare.com)
- To contact Polaris: **Zodiac Pool Care, Inc.**  
2620 Commerce Way  
Vista, CA 92081-8438  
1-800-822-7933

# Introduction

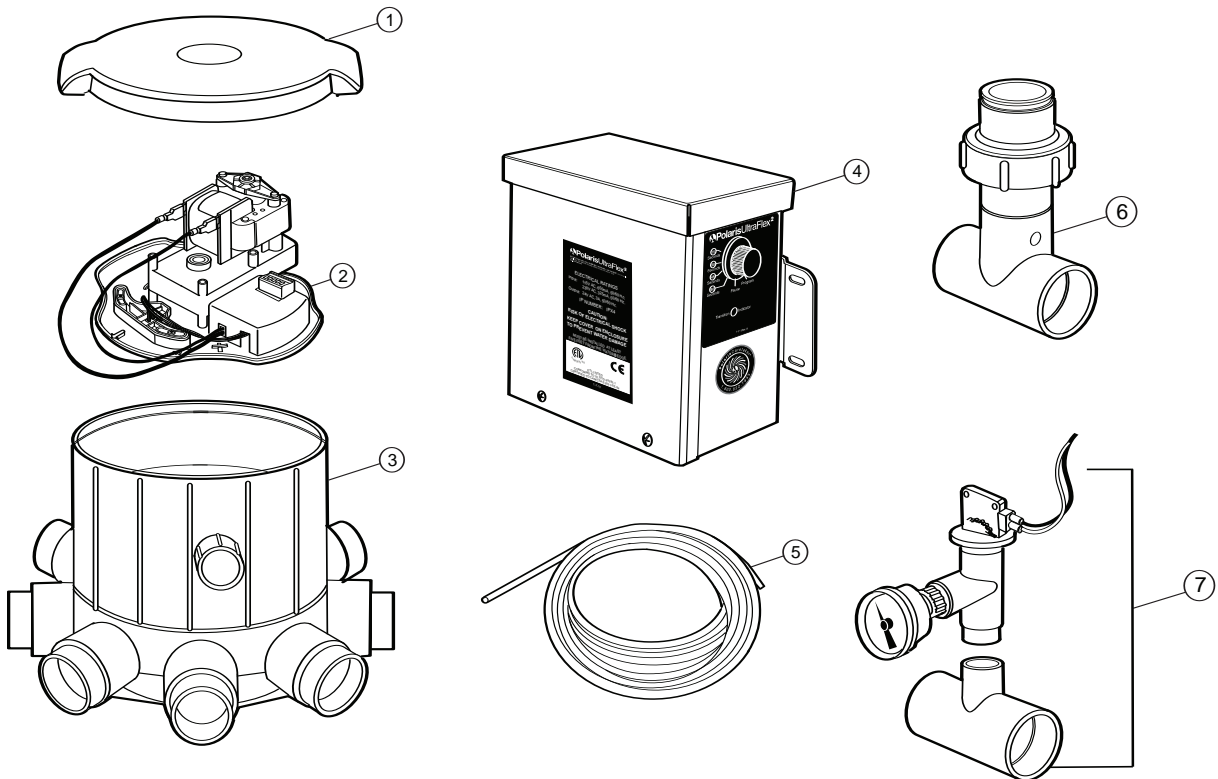
The Polaris UltraFlex2® is an electronically-driven, 8-port water valve for Polaris in-floor pool cleaning systems. The molded UltraFlex2 valve provides high capacity cleaning capabilities for larger pools.

**UltraFlex2 valves are factory sealed, ready for installation without adjustment.**

Installation of this equipment should be performed by a licensed electrician and should comply with all national electric code guidelines (NEC, Australian, etc.) and all applicable local laws, ordinances, codes and regulations. Failure to follow recommended installation methods and maintenance procedures could cause damage to pool equipment and/or personal injury, and may void the warranty.

## UltraFlex2 Components

1. Valve Lid
2. Motor Plate Assembly with Sensor
3. Valve Housing
4. Controller
5. 18-Gauge Burial Cable
6. Capped 2" (5.1 cm) Tee/Union Assembly
7. Pressure Switch/Gauge Assembly with 2" (5.1 cm) x 3/4" (1.8 cm) Tee



# Installation

## 1 Site Planning

Verify that the excavated pool matches the Polaris Certified Pool Plan. Check the break, width, depth and designated step/bench locations. Polaris design dimensions are from **finished pool**, not excavation. **If any dimensions have changed, a new plan must be drawn to ensure cleaning and warranty.**

Position the valve as close as possible to the swimming pool or water feature to reduce piping and improve performance. Valve must be at least 10 feet (3 m) away from the water's edge.

**Install the valve so that the bottom housing and outlet ports are above ground and the finished pool water level.** If a below water level installation is necessary, check valves or manual valves on the inlet and outlet ports are required to prevent flooding of the valve.

Layout system so feed pipes enter the pool in the center of the wall closest to the pool equipment and valve. Use a check valve on the feed line in elevated spas to prevent draining.

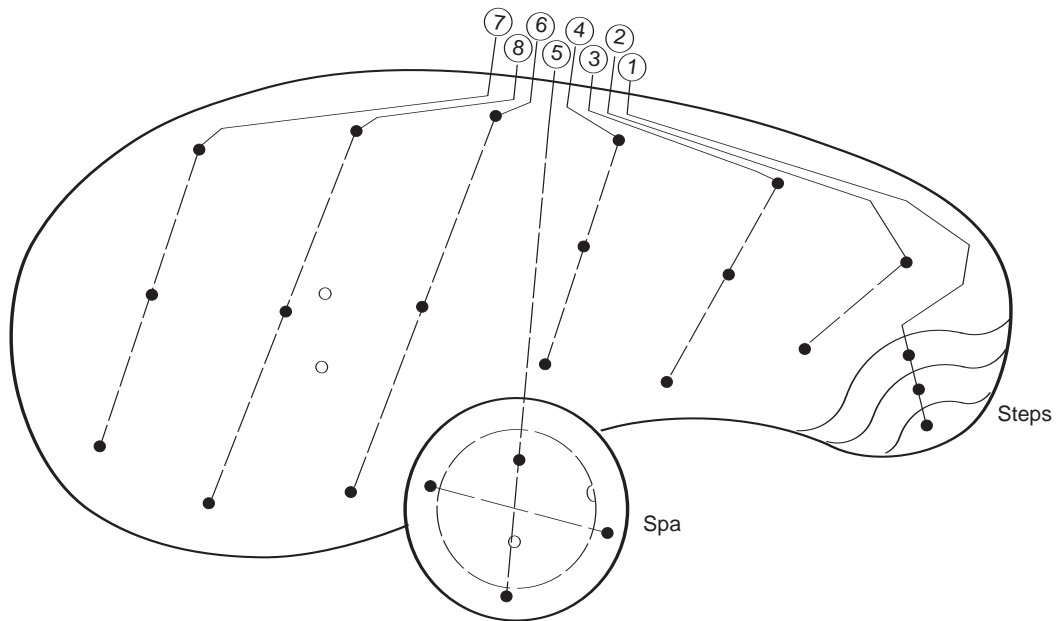
**Follow the design plan to position and stake the cleaning head locations.** Each head has a designated nozzle that has a precise cleaning radius. Perimeter heads have a one foot overlap. Mark the cleaning radius around each stake to verify cleaning coverage.

## 2 Plumbing the System

### Feed Lines

The Polaris certified plan indicates which cleaning heads will be plumbed together to form a bank. Run all feed lines to the top of the bond beam to facilitate easy valve hookup. Number the lines according to the design plan.

- Excavate niche in pool wall, 6" x 24" (15 cm x 61 cm) down to the pool floor.
- Make line trench depth sufficient to cover all pipes with 6" (15 cm) of soil.
- Do not cross lines in floor.
- Use 2" (5.1 cm) Schedule 40 PVC pipe.
- Position feed line stub-ups perpendicular (90-degrees) to slope of finished pool floor.

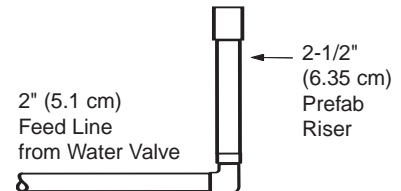


### For Vinyl Liner Pools:

- Stake but do not plumb lines until walls are set, plumbing lines are fed under walls.
- Vinyl collars are not adjustable, stub-ups **must be** perpendicular to finished pool floor.
- Dig trenches 8" (20.3 cm) below excavation grade to accommodate setting of fittings.

## Cleaning Head Risers

The cleaning head collars require 2-1/2" (6.35 cm) Schedule 40 risers. Use the Polaris Prefab Riser (part #5-9-150), a preassembled, capped reducer/riser that glues directly into the 2" (5.1 cm) tee, 90-degree elbow or coupling on the feed lines.



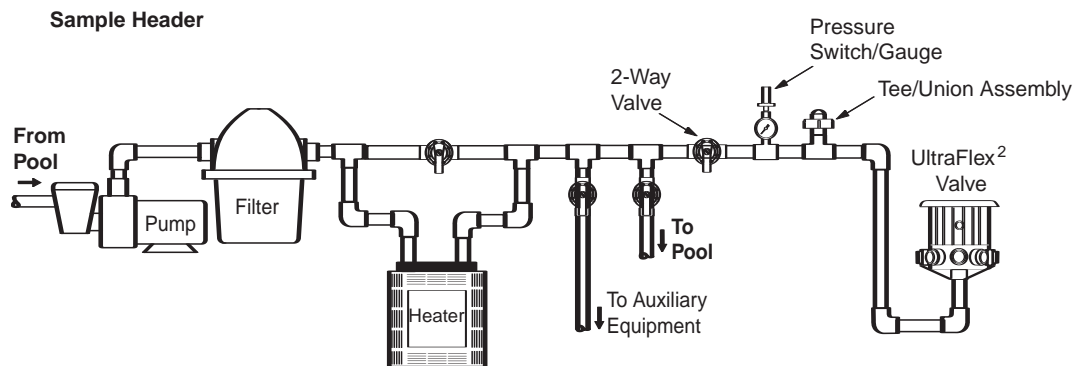
## UltraFlex2 Valve

Plumb the pressure switch/gauge into the valve supply line at the pool equipment to ensure flow to the valve.

Plumb the tee/union assembly into the valve supply line to facilitate clearing lines at startup and when winterizing.

Install a 2-way valve in the valve supply line to simplify flow adjustments, valve maintenance and clearing of the lines.

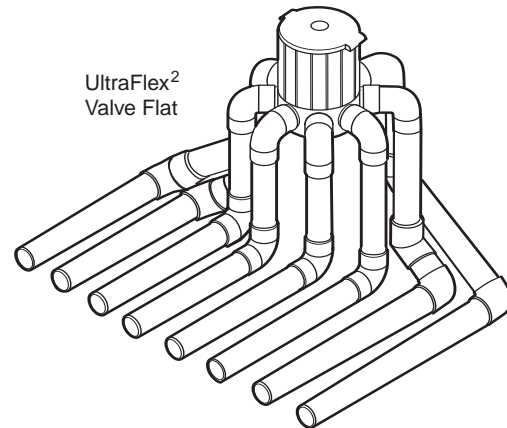
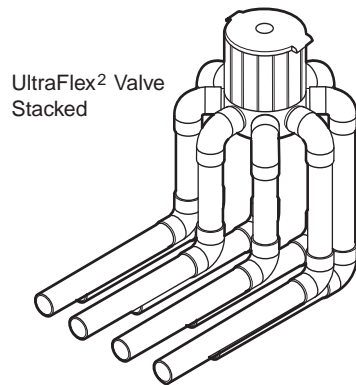
The valve is shipped ready for installation. **Do not loosen or remove the top plate prior to pressure testing.** Do not install the motor plate assembly (Start-Up Kit) until the construction phase is complete.



- Connect the water source from the pool pump to the valve inlet. Do not get glue in the valve housing as this will void the warranty. **Installation Tip:** Do not turn valve upside down to glue inlet pipe, glue may drip into valve.
- Use heavy bodied PVC glue to connect PVC fittings directly to the 2" (5.1 cm) nipples at the outlet ports on the UltraFlex2 valve. Do not get glue inside the housing.

If Backer Rod (polyethylene foam) will be used to winterize the valve, 2" (5.1 cm) Sch. 40 tee fittings must be plumbed off each of the (8) outlet lines instead of 90° ell fittings. Glue a 2" (5.1 cm) female fitting adapter (spigot x female pipe thread) into the top outlet of the tee fitting and thread a 2" (5.1 cm) plug (male pipe thread) into the top of the tee.

Connect the cleaning head feed lines to the valve in a stacked or flat configuration.



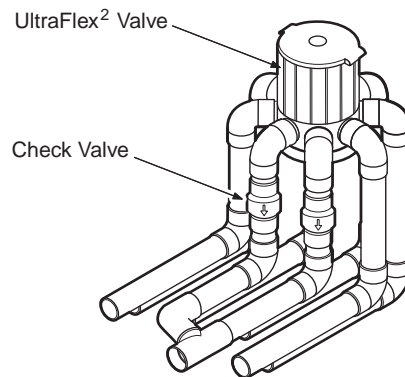
- Install all lines with a minimum of 6" (15. cm) cover or in accordance with local codes.
- The distribution system is designed to rotate from shallow to deep. Port 1 will always be the step or bench port, followed by the shallow bank, etc. Looking down on the valve, note that outlets rotate clockwise. If a spa is included in the application, it will require a dedicated line from the valve. If elevated, install a check valve on the line feeding the cleaning heads to avoid spa draining. Follow the design plan to install the lines in the correct order.
- If all outlet ports on the valve are not needed, tie the unused port into an active port or **double port** the line.

Customarily, double port lines to the hardest-to-clean area of the pool. Consult the design plan for the proper connections.

**Install a service-accessible check valve on both lines** to prevent reverse water flow.

Skipping a line, that is tying port #1 to port #3 instead of #2, is not necessary.

If a port is used as a return line, install an eyeball fitting at the pool wall to create back pressure on the line.



## Other Pool Equipment

### Heaters

To compensate for heater system pressure drops, plumb heaters in a bypass line before the water valve. The heater bypass valve should be adjusted to 3/4 open.

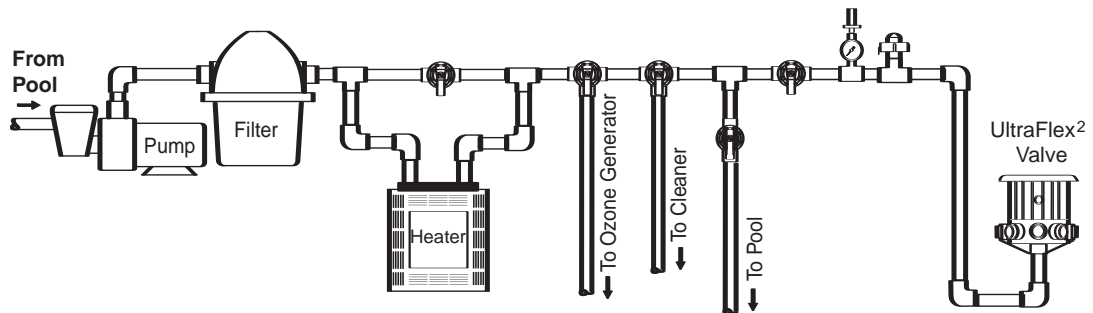
### Chlorinators

In-floor systems can be used with erosion feeders, ozone generators and in-line salt chlorinators. Consult the manufacturer's instructions for proper installation to protect the water valve and other pool equipment.

### Automatic Pool Cleaners

When supplementing the in-floor system with a Polaris automatic pool cleaner, plumb the dedicated cleaner line (booster pump if applicable) before the valve.

Sample Header



## Pressure Testing

Pressure-test the system at a minimum of 35 psi (241 kPa) or to local code requirements. Keep the water valve secure and under pressure throughout the construction process.

## Burial Cable for Electrical Hook-up of Controller

Since there is an open plumbing trench from the equipment to the water valve location, it is most convenient to complete the electrical cable installation during the plumbing phase.

Use only the Polaris 18-gauge burial cable provided for this electrical connection as it has specific ratings and certification for the product.

1. Install flexible conduit between the water valve and the controller.
2. Reference national electric codes (NEC, Australian, etc.) for minimum burial depth requirements.
3. Leave approximately 5 feet (1.5 m) of excess wire at both the controller location and the valve location.

When all connections are complete and it is clear that the system is holding pressure, backfill, tamp and level all trenches.

# 3

## Connecting Electrical Components

**Disconnect the power supply before making any electrical connections.** Refer to the wiring diagram below (also located inside the controller) for connection details.

### Controller

The controller is factory set for 240V (230-240V 50/60 Hz, output 24 V~, 3A, 50/60 Hz) but can be connected to either a 120V or 240V power source. For 120V power, modify the transformer connection as diagrammed below (and noted inside the controller box cover).

- Mount controller on wall or vertical surface near the pool equipment.
- Install flexible conduit to house the wiring.
- Use no less than 12-gauge wire to make connections to power supply.
- Use proper connectors to connect the transformer.

### Pressure Switch Connection

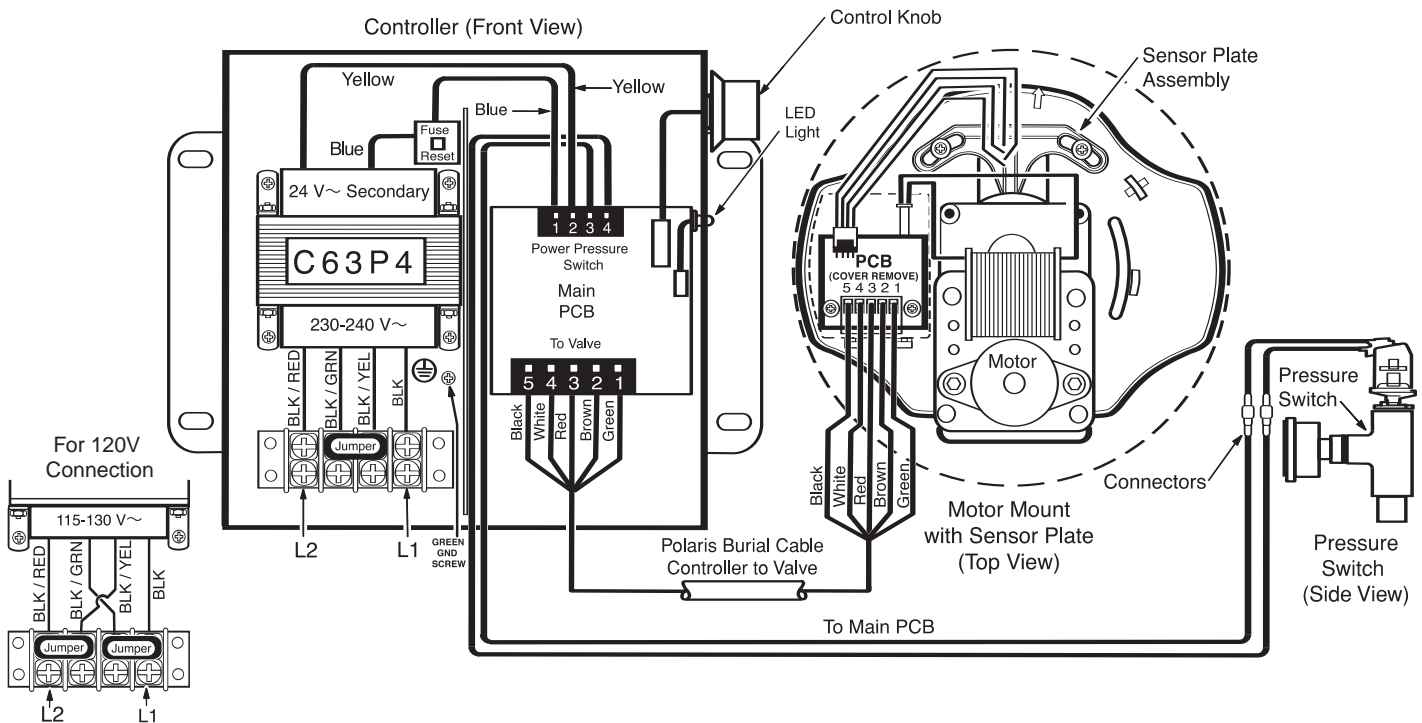
Connect the pressure switch, plumbed into the valve supply line, to the controller.

- Install flexible conduit to house the wiring.
- Use no less than 22-gauge wire to make connection.
- Use 18-22 gauge, fully insulated male push-on connectors at the switch.
- Connect the pressure switch leads to terminal positions 3 and 4 of the 4-pin terminal plug on the top of the controller PCB.

### Valve Connection

If plumber did not do the burial cable installation, install flexible conduit from the valve to the controller and use the Polaris cable provided (this cable is specifically certified for the product) for the connection. Follow national code for minimum burial depth requirements.

- Connect the 18-gauge burial cable to the 5-pin terminal on the valve's motor plate PCB and to the bottom terminal plug on the controller PCB, matching the pin/wire color sequence (i.e. black wire to terminal pin #5) at both locations.





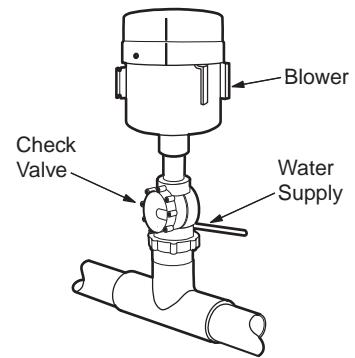
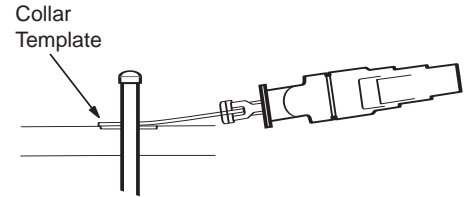
# 4

## Preparing the System

After inspection, prepare the UltraFlex2 system for startup.

### Cut Stub-ups and Clear Debris from System

1. Use the UltraFlex Collar Template (part #1-17-7) to cut each stub-up ensuring collars sit at a height to accommodate approximately 1/2" (1.2 cm) of final finish material.
2. **Use a sander/grinder to sand the stub-ups smooth and level with the shell finish to ensure proper glue adhesion with collar setting.** Insert a test plug in each stub-up.
3. Close the 2-way valve on the pump side of the capped tee/union assembly in the equipment area and remove the plug from the tee.
4. Attach a blower assembly unit (blower, check valve, air/water supply and connectors; call Polaris for assembly instructions) to the tee.
5. Turn on blower and water supply to fill the lines.
6. Starting at the cleaning head farthest from the valve, remove test plug and flush the pipe, blocking and releasing pressure several times to ensure a clear line. Replace test plug and repeat for each stub-up.



#### For Vinyl Liner Pools:

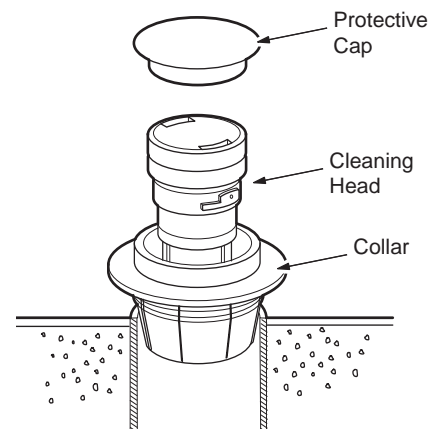
Set collar fittings before clearing lines.

1. Cut pipe stub-up flush with the pool floor. Then use an inside pipe cutter to cut it again 1-7/8" (4.8 cm) lower than the floor level.
2. Use ABS to PVC glue to secure the collar fitting. (Primer can be used on the pipe but not the fitting. Use glue on both.) Insert collar to a full stop to ensure proper height.
3. Excavate an area 12" (30.5 cm) around head and 8" (20.3 cm) below excavated floor. Fill with concrete to form a "thrust block" to eliminate movement of the cleaning head.
4. Clear lines and insert test plugs limiting water use as there is no solid pool bottom.

### Install Cleaning Collars and Heads

When the pool interior is completely clean and ready for the final finish application, remove the test plugs to install the collars and cleaning heads. Reference the design plan to verify nozzle size for each head.

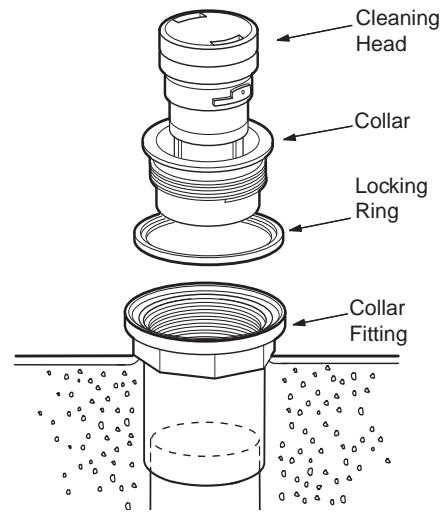
1. Use heavy bodied PVC glue to secure the cleaning collars. (Primer can be used on the stub-ups but not the collars. Use glue on both.)
2. Push collar firmly into pipe.
3. Insert cleaning heads into collars.
4. Put blue protective caps on heads.



### For Vinyl Liner Pools:

Pool liner must be in final position before installing collars and cleaning heads.

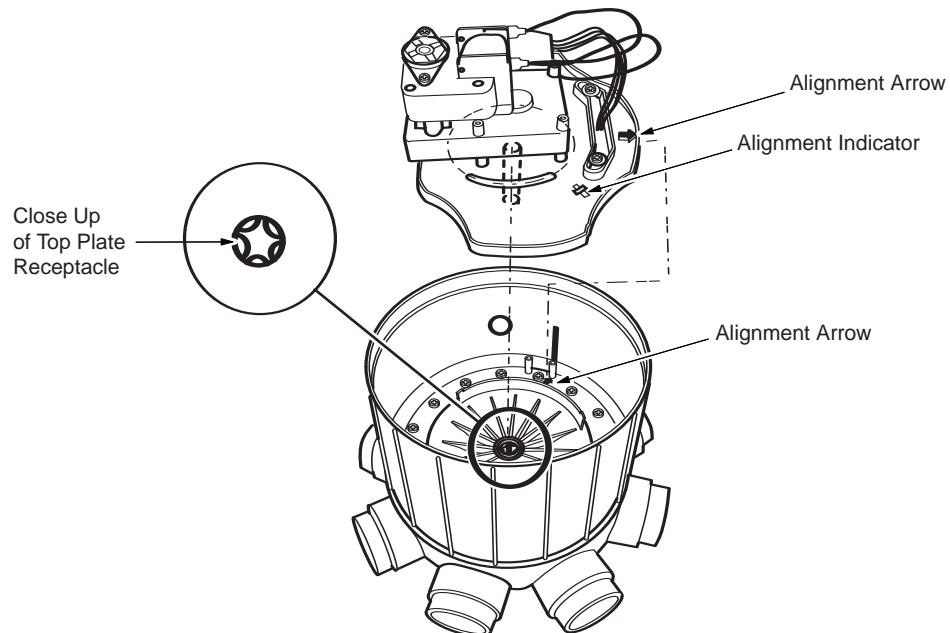
1. Press locking ring firmly into place in groove on collar fitting.  
**Installation Tip:** Turn collar upside down and use as a tool to press ring into place.
2. Use a razor knife to cut liner inside the locking ring, leaving at least a 1/4" (6.4 mm) edge around the ring perimeter.
3. Tighten the collar into the collar fitting, turning clockwise until the collar lip fits snugly against locking ring.
4. Insert Metal Combination Tool (part #3-17-7) into collar and rotate clockwise until collar is firmly seated.
5. Install cleaning head in collar.



### Install Motor Assembly

The drive shaft of the motor assembly has a unique configuration that engages with the tee assembly located below the top plate inside the valve.

1. Insert the motor assembly drive shaft into the top plate receptacle.
2. Rotate until the arrow on the motor assembly lines up with the arrow on the top plate. Push the assembly down into place, making sure the raised tabs on the top plate are flush and in line with the alignment indicators on the motor assembly.



3. When motor installation is complete, secure the valve lid with the screws provided.

# 5

## Starting the System

Before initiating the system, open a discharge line before the valve and flush the pool pump and filtration system. Clear debris from all filters and screens.

**The UltraFlex2 valve operates with a photocell for indexing. The valve lid must be in place for the valve to operate properly.**

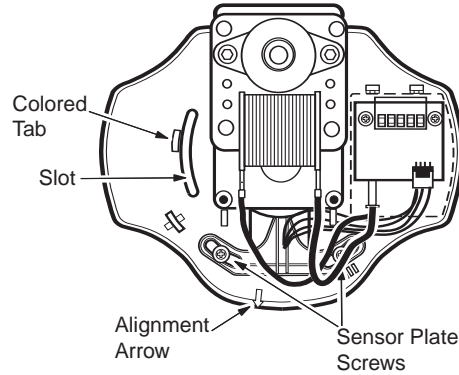
1. Verify proper water pressure at the gauge. Optimum level is 14-22 psi (97 - 152 kPa).
2. Verify that there is discharge from only one valve port at a time and that pressure drops during valve rotation, then increases when rotation is complete.

If not, adjustment may be necessary:

- First, verify that motor assembly is properly aligned and secure.

Alignment arrows should line up and the metal tab on the sensor plate (seen through slot) should line up with the colored tab on the motor plate.

- If needed, loosen the sensor plate screws, rotate the sensor plate counter-clockwise 1/8" (3.2 mm) and retighten. Repeat if necessary.



3. Confirm that all cleaning banks operate and that each head advances during pop-up and retraction.
4. Use the six operational timer options to increase coverage (leave valve in each zone for a longer period), increase rotation times or even pause the system as needed for the specific application.
  - Position 1: 15 seconds
  - Position 2: 30 seconds
  - Position 3: 45 seconds
  - Position 4: 60 seconds
  - Position 5: Pause mode
  - Position 6: Programmable (adjustable from 3 - 60 seconds)

# Operation and Routine Maintenance

The UltraFlex2 cleaning heads are designed to operate at a specific gallonage and pressure. To maintain flow through the heads, run the system whenever the pump is on.

Cleaning times will vary according to application and environment. To determine the optimum cleaning time, run the system 24 hours a day to start. Reduce run times by two hours every two days until minimum cleaning time is determined. Six hours a day is recommended.

## Cleaning the Filtration System

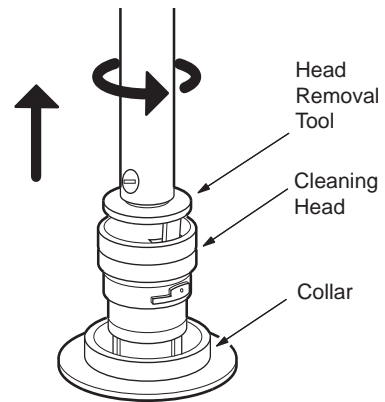
For optimum cleaning efficiency, routinely clean the pool pump basket, skimmer and filter screens. Backwash the pool filter whenever pressure increases 3 psi (20.7 kPa) above normal clean filter operating pressure.

## Changing Cleaning Heads

The **cleaning head must be in the full down position** before removal.

1. Attach the Head Removal Tool (part #3-17-8) to the pool pole.
2. Snap tool into the head.
3. Turn counter-clockwise to release head from collar.
4. Pull and lift head out of collar.

To reinstall, insert head into collar and turn clockwise to lock it into position.



## Winterizing

To prevent freeze damage in cooler climates, remove water from the feed lines that are above the freeze line and seal the valve.

There are three alternative methods to winterize the valve:

**Backer Rod Method:** Uses (polyethylene foam) to winterize the valve and requires the installation of tee fittings at each outlet line of the valve.

**Expansion Plug with Blow-Thru Valve Method:** Uses rubber tapered (winterizing) expansion plugs with blow-thru valves to seal system.

**Standard Expansion Plug Method:** Uses regular rubber tapered (winterizing) plugs to seal the system.

Before winterizing, disconnect the power/sensor cable from the terminal strip at the valve.

1. Remove the motor assembly, top plate, tee assembly and tee assembly o-rings. Store the motor assembly, tee assembly and o-rings in a dry, protected location.
2. Lower the water level of the pool to below the tile level.
3. Seal the valve.

**Backer Rod method:** Remove the 2" (5.1 cm) plugs from the tee plumbed on the eight outlet lines of the valve. Place a 2" (5.1 cm) diameter section of Backer Rod (polyethylene foam) into each outlet line until it reaches the bottom of the plumbing line. (The plumbing line must extend a minimum of 24" (61 cm) below the freeze line.) Cut the foam level with the top of the tee fitting and thread the 2" (5.1 cm) plug halfway onto the fitting.

**Expansion plug methods:** Using an air compressor/blower at the filter system, blow out the supply line to the valve. Place a #11 winterizing plug into the inlet line at the valve.

**Expansion plug with blow-thru valves:** Place expansion plugs with blow-thru valves into each outlet port inside the valve. Use an air compressor with an air chuck at the valve to blow out the outlet lines. Blow each line until air can be seen coming from the line in the pool/spa floor.

**Standard expansion plug:** Use an air compressor or 2-1/2 hp spa blower with an adapter to blow out the outlet lines at the valve until air can be seen coming from the line in the pool/spa floor. Place an expansion plug into each outlet port.

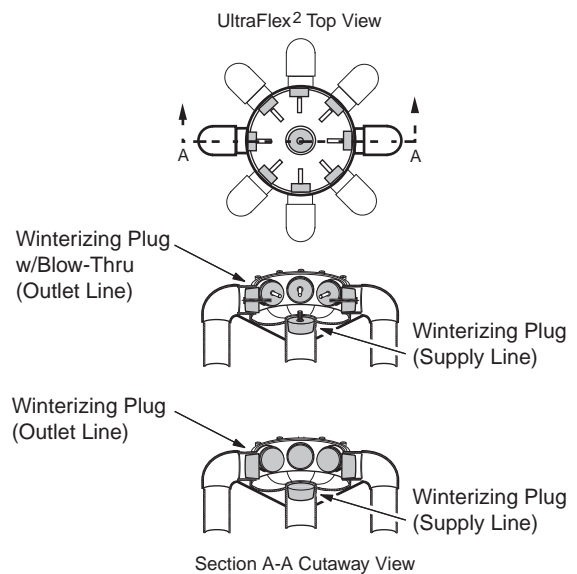
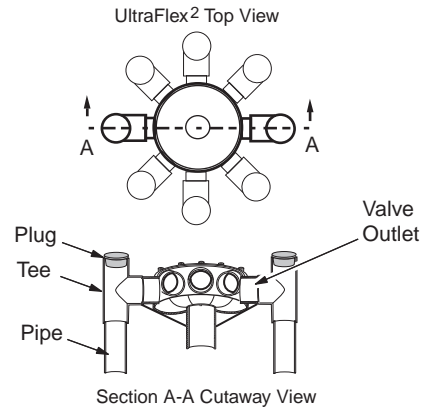
4. If cleaning heads are located above the freeze line (i.e. steps, benches, etc.) remove the heads and seal the lines.

**Backer Rod method:** Push 1-1/2" (3.8 cm) diameter foam into the collar until it reaches the bottom of the plumbing line below the pool/spa. Place a # 10-1/2 rubber tapered expansion (winterizing) plug into the collar.

**Expansion plug methods:** Use the air compressor to blow out the line and place a #10-1/2 expansion plug into the collar.

5. Reinstall the top plate and the valve cover (test housing cover if available) for the winter season.

At spring startup, apply lubricant to the motor assembly drive shaft before inserting it into the top plate receptacle.



# Troubleshooting

If the Polaris UltraFlex2 displays any of these actions, adjustments may be necessary to restore performance.

**Action: Dirty spots appear.**

- Solution:
1. Clean the pool filter, pump basket and skimmer basket(s).
  2. Make sure all auxiliary valves (surface returns, waterfall, spa overflow, etc.) are closed.
  3. Increase the cleaning time to 60 seconds.

**Action: Cleaning head advances but is not cleaning.**

- Solution:
1. Check for debris in the nozzle.
  2. Remove cleaning head and run pump for two full cycles on problem bank. Check nozzle and reinstall head.

**Action: Cleaning head will not pop up or will not go down.**

- Solution:
1. Remove the head. Inspect the cleaning head and collar for plaster remnants or debris.
  2. With head in the upright position, lightly depress the head using a telescoping pool pole.

**Action: Pressure is lower than normal.**

- Solution:
1. Clean the pool filter, pump basket and skimmer basket(s). Backwash pool filter.
  2. Make sure all auxiliary valves (surface returns, waterfall, spa overflow, etc.) are closed.
  3. Confirm that the pool pump is operating properly
  4. Check for leaking or worn o-rings. Replace if necessary.

**Action: The valve does not cycle.**

- Solution:
1. Make sure all auxiliary valves (surface returns, waterfall, spa overflow, etc.) are closed.
  2. Verify valve is not in pause mode.

3. Make sure GFCI is not tripped and check the main power source connections.

4. Check pressure switch wiring.

5. Verify that terminal pin number (ex: pin #1-5) and wire color sequence match on both ends of electrical connections.

6. If the red indicator LED is on but the valve is not rotating, check under the top plate for mechanical restrictions like debris or a damaged o-ring.

**Action: Two ports are discharging water at the same time.**

- Solution:
1. Check for proper port alignment. Adjust sensor plate if necessary.
  2. If feed lines are double-ported, verify that check valves are installed on both lines.

**Action: Valve does not pause at an outlet port.**

- Solution:
1. Verify valve lid is in place.
  2. Check sensor and replace if necessary.

**Action: Valve is leaking.**

- Solution:
1. Check for debris underneath the top plate or around the face seal o-ring, and clean as needed.
  2. Verify that top plate is tight. Replace face seal o-ring if necessary.
  3. Shaft seal is leaking, replace.

**Action: Valve makes squealing noise.**

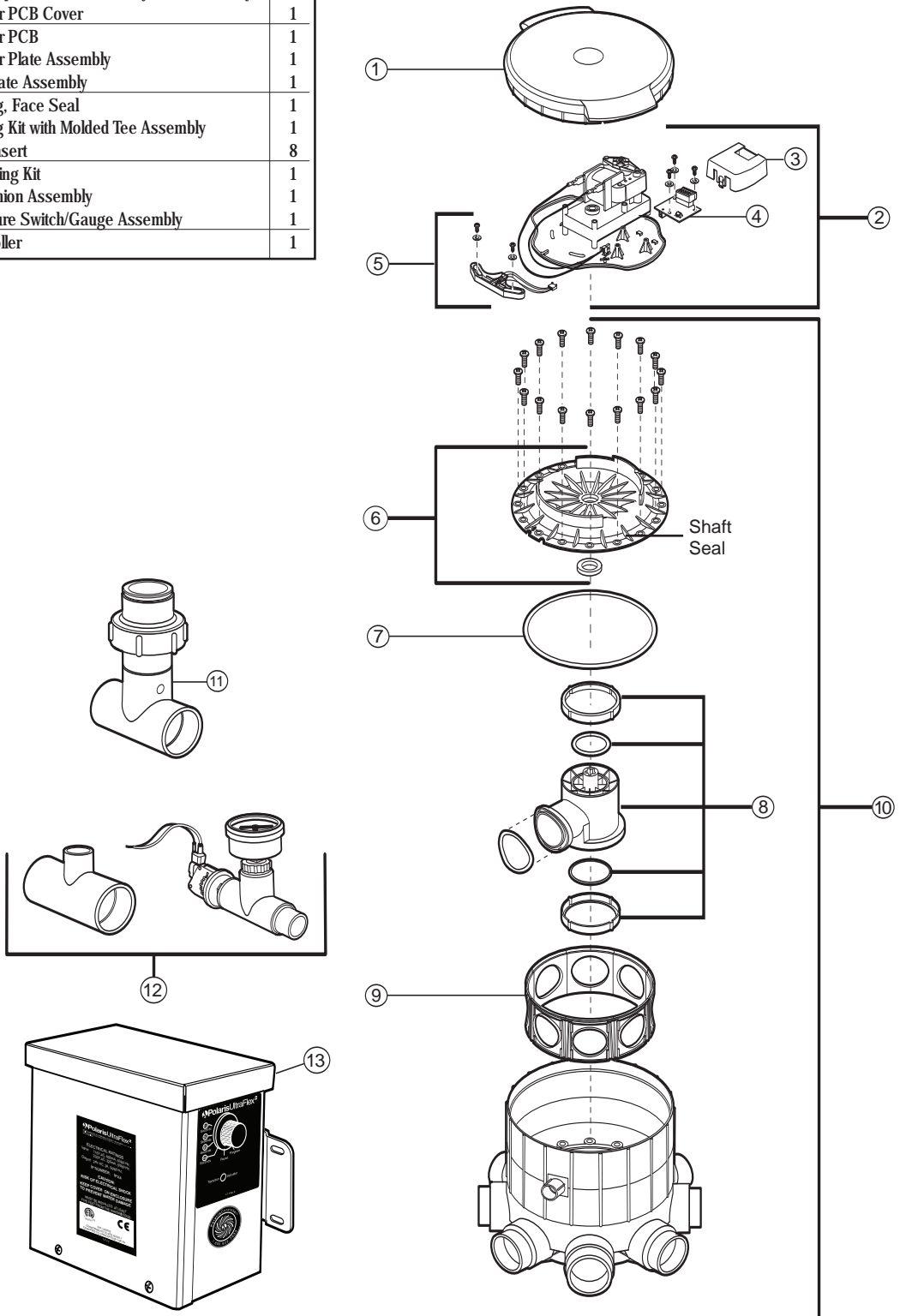
- Solution:
1. Check for proper port alignment. Adjust sensor plate if necessary.
  2. Check for worn tee o-rings. Replace if necessary.

# Polaris UltraFlex<sup>2</sup>

## Exploded Parts Diagram

No.	Part #	Description	Qty
1	3-7-302	Valve Lid	1
2	4-7-310	Start-Up Kit, Motor Assembly w/Sensor Assy	1
3	1-7-106	Sensor PCB Cover	1
4	1-7-660	Sensor PCB	1
5	2-7-304	Sensor Plate Assembly	1
6	2-7-300	Top Plate Assembly	1
7	1-13-21	O-Ring, Face Seal	1
8	3-7-625	O-Ring Kit with Molded Tee Assembly	1
9	3-7-109	Wall Insert	8
10	4-7-300	Plumbing Kit	1
11	**	Tee/Union Assembly	1
12	4-7-2	Pressure Switch/Gauge Assembly	1
13	4-7-320	Controller	1

\*\* Not sold separately.





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[www.polarispool.com](http://www.polarispool.com)