OWNER'S MANUAL

Polaris PowerFall®
Polaris FiberFall®

IMPORTANT INFORMATION

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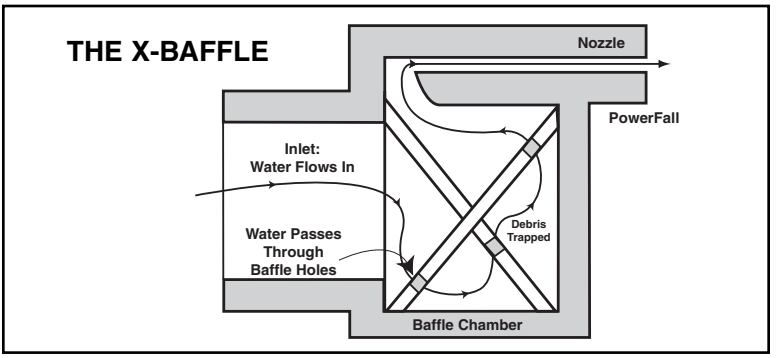
I. Structural Features

Congratulations on the purchase of your new Polaris PowerFall®. The Polaris PowerFall is designed to give you years of dependable and efficient service. This product has no moving parts, but should there be any questions, please call Polaris Customer Service at 1-800-VAC-SWEEP.

The PowerFall is reliable and easy to install. The patented X-Baffle reinforcement gives you the ability to create powerful and beautiful waterfalls.

The following structural features contribute to reliability and ease of installation:

- **Compact Size $2\frac{5}{8}$"W x $3\frac{1}{8}$"H**
  Creates versatile installation in a variety of applications.
- **Low Water Flow Demand**
  Less pumps and plumbing provide for the easy addition of more water features.
- **One inlet for all 12"-96" sizes**
  Each unit requires only one return line, eliminating the need to manifold for balanced water flow. This makes it easier to notch the beam for installation.
- **Patented X-Baffle**
  An X-Baffle extends the length of the chamber, providing maximum internal structural support and even, unrestricted flow. The patented X-Baffle has a performance range from 6 Gallons Per Minute Per Foot (GPM/FT) to 48 GPM/FT. Even large units can maintain a sheet of water up to 45° out of level.



- **Variety of nozzle sizes and colors**
  PowerFalls may be ordered in white, gray or black with the standard 1" nozzle, a 6" or 9" extended nozzle, or a 12" super extended nozzle. Extended nozzles may be cut to a custom size or shape.
- **Self Draining/Winterization**
  Each chamber has drain holes leaving only 1/4" of water in the unit when the pump is off, thereby eliminating any additional steps for winterization.
- **Internal Strainer**
  A rock trap, in-line filter, or strainer are not necessary because of an internal strainer.
- **Water sheet quality testing**
  Factory testing prevents leaks that might develop with a product mounted in or under concrete, stone, brick, and tile.
- **Dove tail grooves extrude into the body of the unit**
  Grooves provide a surface for the bonding agent to attach permanently, locking the unit in place and preventing tile from separating.
- **ABS Plastic Injection Molded**
  The unit is ultrasonically welded to provide a hermetic seal. Support spacers in the nozzle provide for measured removal of 1/8" segments. This ensures the water sheet is not interrupted due to the lack of enough spacer being removed, or the nozzle collapsing from too much being removed. Additionally, the unit can be painted to match your pool or tile color. Paint has lasted more than 5 years in field tests.

II. General Installation Considerations

Before installing the PowerFall or FiberFall, please take a minute to review these general installation considerations and cautions.

A. Optimum Flow Rate

The plumbing standard for the optimum flow rate is 1 Gallon Per Minute Per Inch (GPM/IN). A standard PowerFall or FiberFall will retain an unbroken laminar sheet of water to a maximum drop of 3 ft.-3½ ft.

MINIMUM PUMP AND PLUMBING SIZING FOR POWERFALLS OPERATING AT OPTIMUM FLOW BASED ON CHARTS BELOW

Size in Feet	Size of Unit	GPM Required	Minimum Pump	Minimum Fall Feed	Minimum Pump Suction
STANDARD					
1’	12”	12 GPM	1/2 HP	1 1/2” Pipe	1 1/2” Pipe
1.5’	18”	18 GPM	1/2 HP	1 1/2” Pipe	1 1/2” Pipe
2’	24”	24 GPM	1/2 HP	1 1/2” Pipe	1 1/2” Pipe
3’	36”	36 GPM	3/4 HP	1 1/2” Pipe	1 1/2” Pipe
4’	48”	48 GPM	3/4 HP	1 1/2” Pipe	1 1/2” Pipe
5’	60”	60 GPM	1 HP	1 1/2” Pipe	2” Pipe
6’	72”	72 GPM	1 1/2 HP	2” Pipe	2” Pipe
7’	84”	84 GPM	1 1/2 HP	2” Pipe	2 1/2” Pipe
8’	96”	96 GPM	2 HP	2” Pipe	2 1/2” Pipe
CUSTOM					
9’	108”	108 GPM	3 HP	2 1/2” Pipe	2 1/2” Pipe
10’	120”	120 GPM	3 HP	2 1/2” Pipe	3” Pipe
11’	132”	132 GPM	3 HP	2 1/2” Pipe	3” Pipe
12’	144”	144 GPM	(2)2 1/2 HP	3” Pipe	3” Pipe
13’	156”	156 GPM	(2)2 1/2 HP	3” Pipe	3” Pipe
14’	168”	168 GPM	(2)2 1/2 HP	3” Pipe	3” Pipe
15’	180”	180 GPM	(2)2 1/2 HP	3” Pipe	3” Pipe
16’	192”	192 GPM	(2) 2 HP	3” Pipe	4” Pipe
17’	204”	204 GPM	(2) 2 HP	3” Pipe	4” Pipe
18’	216”	216 GPM	(2) 3 HP	3” Pipe	4” Pipe
19’	228”	228 GPM	(2) 3 HP	4” Pipe	4” Pipe
20’	240”	240 GPM	(2) 3 HP	4” Pipe	4” Pipe

B. Pump Sizing

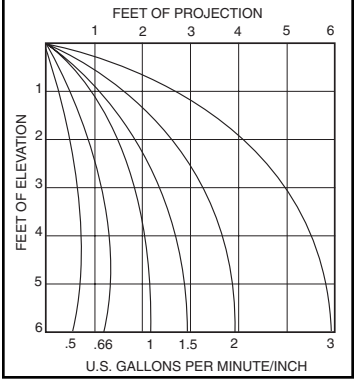
If the waterfall flow requirement exceeds 40% of the output of the circulation pump, you must use a DEDICATED PUMP for the waterfall. This eliminates the need for a filter upgrade or an in-line filter.

To Supply the Waterfall

Install two (2) suctions in a wall, 18" above the pool floor with anti-vortex covers to prevent entrapment.

NOTE: *Many pumps in distribution are uprated, which is indicated by a 1.0 service factor. In this case, verify flow specifications at 50′ head with the pump manufacturer’s recommendations.*

Approximate Sheet Projection For A PowerFall with a 1/8" Thick Sheet of Water



Typical Pump Performance At 50′ of Head

1/2 HP	=	26 GPM
3/4 HP	=	58 GPM
1 HP	=	68 GPM
1 1/2HP	=	93 GPM
2 HP	=	106 GPM
3 HP	=	140 GPM

C. Pipe Sizing

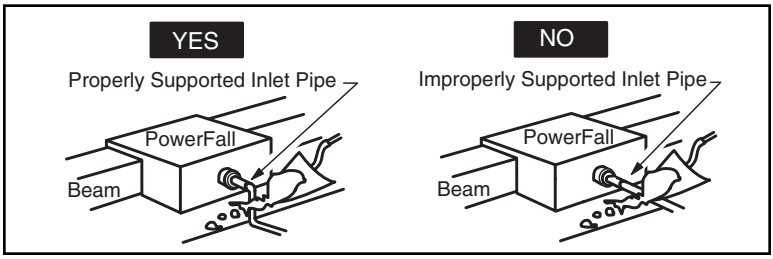
- Suction fittings and pipes are the most critical aspect of supplying adequate water flow.
- Use a minimum of 1 1/2" pipe with units through 60" in size. Use 2" pipe in units exceeding 60".
- Always consult plumbing sizing charts when installing more than one unit.
- Dedicated plumbing lines must be used when installing units in excess of 36" or when waterflow demands 40% of the circulation pump's output.

Suction (SUC) and Discharge (DIS) Water Flow Chart For PVC Pipe		
Pipe Size	Max SUC Flow*	Max DIS Flow**
1 1/2"	48 GPM	60 GPM
2"	80 GPM	100 GPM
2 1/2"	112 GPM	140 GPM
3"	180 GPM	225 GPM
4"	312 GPM	390 GPM
6"	700 GPM	900 GPM
8"	1248 GPM	1560 GPM

* Based on 8′ per second velocity.
** Based on 10′ per second velocity.

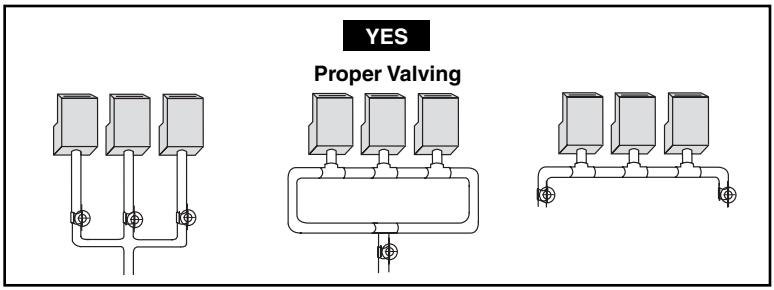
Caution

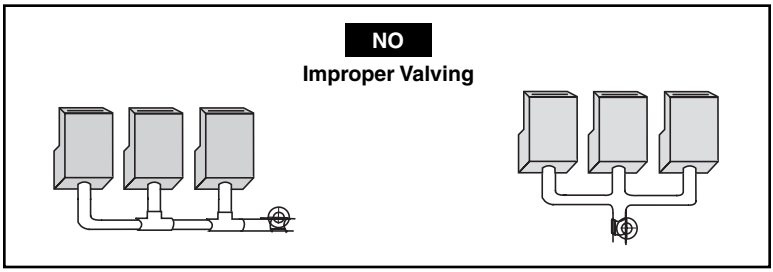
- Do not apply torque to the inlet fittings.
- Do not leave the pipe unsupported.
- Bring the pipe to grade before running line.
- Hot or uneven surfaces may warp your PowerFall. Keep the unit out of direct sunlight until time of installation.



D. Valving

When plumbing multiple units in a water feature, it is best to valve each unit. If the units are the same size and set at the same elevation, you can plumb a loop to equalize water flow to all units.





PowerFall Unit Size

Length of Plumbing Run	12"	18"	24"	36"	48"	60"	72"	84"	96"
50′	12 GPM 1/2 HP 1-1/2" SUC 1-1/2" DIS	18 GPM 1/2 HP 1-1/2" SUC 1-1/2" DIS	24 GPM 3/4 HP 1-1/2" SUC 1-1/2" DIS	36 GPM 3/4 HP 1-1/2" SUC 1-1/2" DIS	48 GPM 3/4 HP 1-1/2" SUC 1-1/2" DIS	60 GPM 1 HP 2" SUC 1-1/2" DIS	72 GPM 1-1/2 HP 2" SUC 2" DIS	84 GPM 1-1/2 HP 2-1/2" SUC 2" DIS	96 GPM 2 HP 2-1/2" SUC 2" DIS
100′									
150′									
200′					48 GPM 3/4 HP 2" SUC 1-1/2" DIS	60 GPM 1-1/2 HP 2-1/2| SUC 2| DIS	72 GPM 1-1/2 HP 2-1/2" SUC 2" DIS	84 GPM 2 HP 2-1/2" SUC 2" DIS	96 GPM 2 HP 3" SUC 2-1/2" DIS
250′		18 GPM 3/4 HP 1-1/2" SUC 1-1/2" DIS		36 GPM 3/4 HP 2" SUC 1-1/2" DIS					
300′									
350′									

E. Plumbing Test

It is important to cap the plumbing lines that will connect to the PowerFall and pressure test them before connecting the PowerFall to the pool plumbing lines.

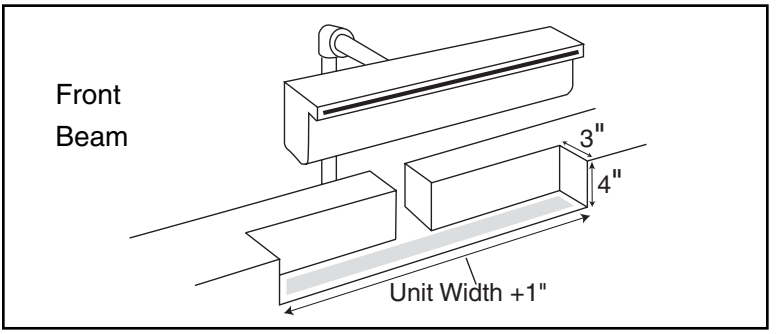
- Make sure the plumbing runs are direct. Also, if plumbing two or more lines to the same water feature, make them as close to the same length as possible.
- Cap or tape open ends of the pipe to keep debris out of the plumbing lines.

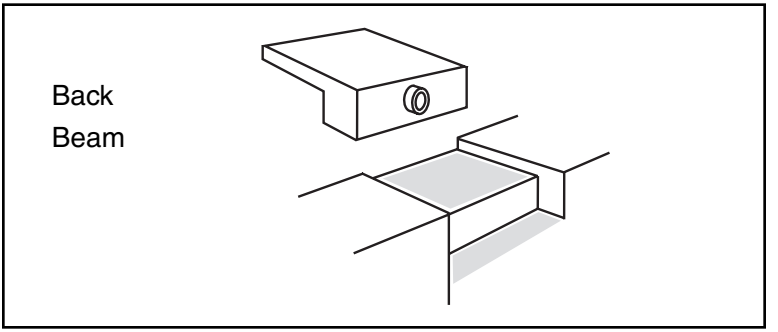
III. Installation Preparation & Instructions

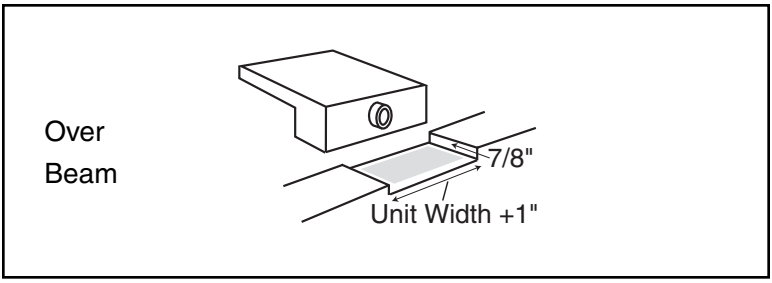
How you prepare for installation of the PowerFall depends on the PowerFall design variation you are creating.

A. Gunite - Bond Beam Preparation

Variations of notching the beam for the gunite pool PowerFall and the return pipe.





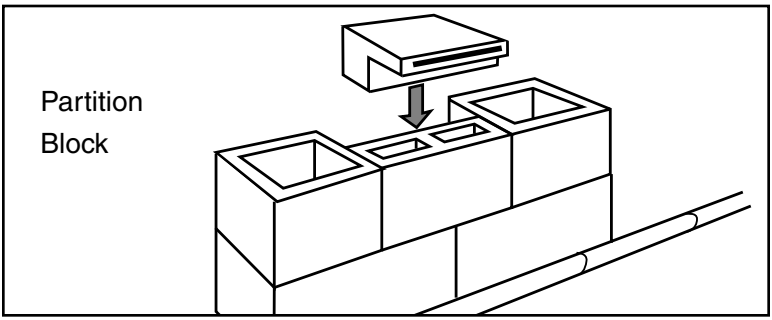


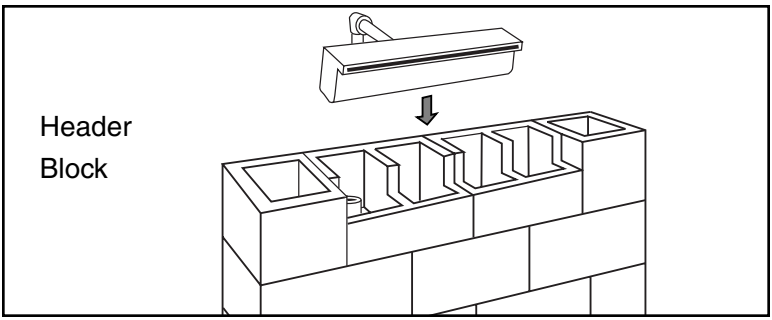
After notching the beam, set the PowerFall unit in the proper location in the beam on a flat, smooth surface to prevent warping. Leave space to apply thin set to the grooves on the face of the PowerFall before applying tile.

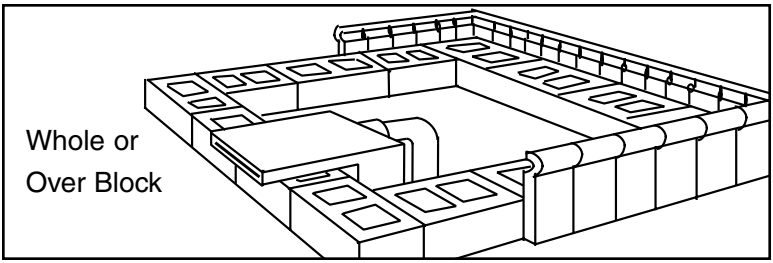
Keep the unit shielded from sun until a finish topping has been applied.

B. Vinyl - Block Preparation

Variations of block preparation for the vinyl pool PowerFall and the return pipe.







Set the PowerFall unit in the proper location on the block on a flat, smooth surface to prevent warping.

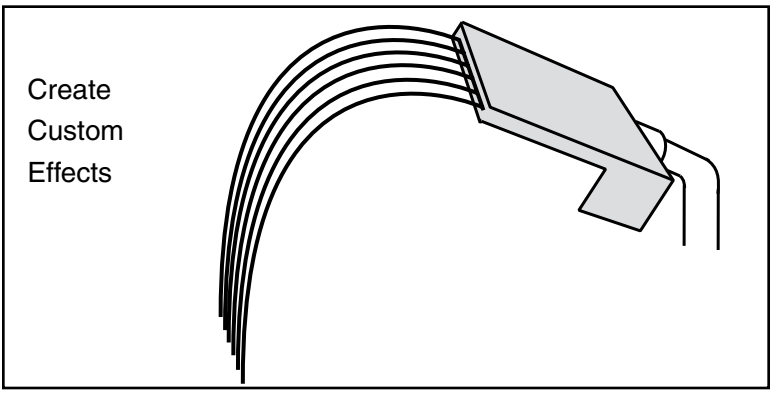
Keep the unit shielded from sun until a finish topping has been applied.

C. Installation Procedures

After notching the beam for gunite pools or the block preparation for vinyl pools is complete, the PowerFall unit is ready to install.

The following steps are usually performed by the tile technician, pool plumber, mason, or the decking contractor and set *BEFORE* decking or coping installation.

1. Be sure the nozzle protector remains in the lip opening until the pool is ready for swimming.
2. Set the PowerFall unit in the proper location in the beam or block wall on a flat, smooth surface to prevent warping of the unit. A properly set unit can maintain a powerful waterfall up to 45° out of level and create custom effects such as a fan or high arcing falls.



3. The lip of the nozzle must be flush with, or beyond, the finished surface of the bond beam.
4. Backfill the gaps around the PowerFall with concrete or grout.
5. Connect the PowerFall inlet to the return pipe with one of the following:
   - For 12"-60" PowerFalls
     $1\frac{1}{2}$" coupling or 90° elbow PVC fitting.
   - For 72"-96" PowerFalls
     2" coupling or 90° elbow PVC fitting.
6. Install decking and coping.

D. Starting Up the PowerFall

Once the pool is cleaned and ready for swimming, the PowerFall is ready to perform.

1. Before running water to the PowerFall, remove the nozzle protector.
2. Divert water to the PowerFall with the valve until you have a sheet projection of 1′ beyond the bond beam. The PowerFall will run a clean sheet of water when air clears the lines.

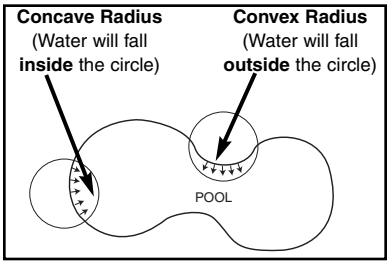
   NOTE: *If using a circulation pump,* ***DO NOT*** *divert water to the PowerFall until the lines run clear.*
3. Clear any small debris lodged in the lip of the nozzle using a credit card, metal nail file, or similar tool.

   NOTE: *Nozzle spacers are welded 1*" *from the back of the nozzle lip, 4*" *apart. Unless you have cut the end of the nozzle,* ***DO NOT*** *break or remove the spacers as they maintain the consistent opening for the water sheet.*

IV. The PowerFall Radius

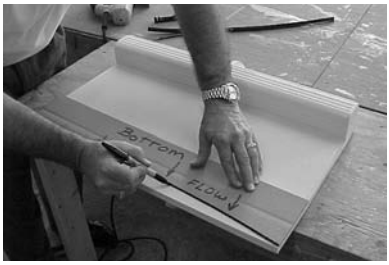
A. Radius Cuts

Two types of radius cuts may be made to achieve various looks for your waterfall: *Concave*, where the water falls inside the curve and *Convex*, where the water falls outside the curve.



B. How to Cut a Radius

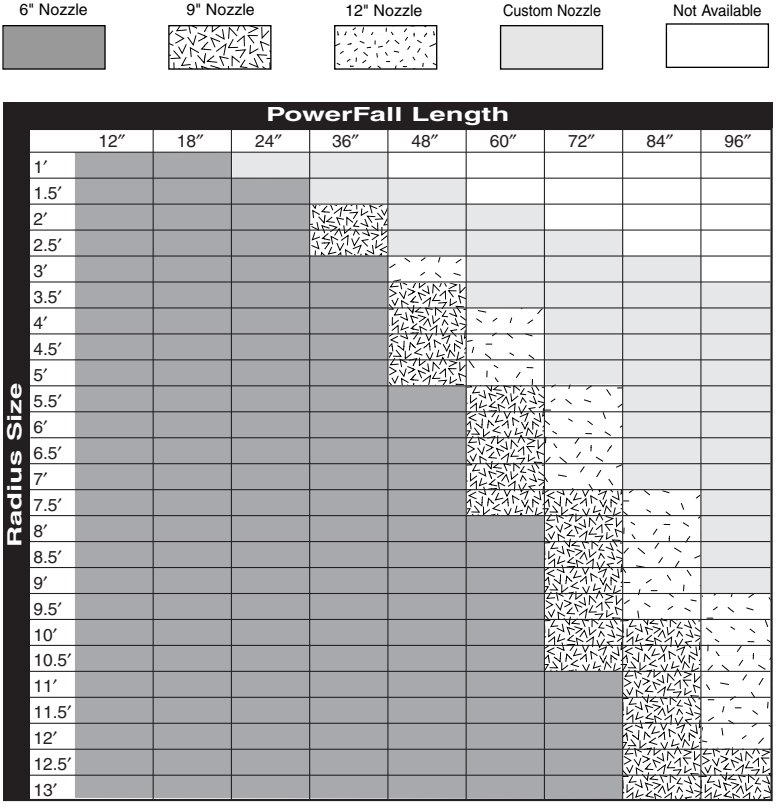
1. Make a template of the radius using masonite, plywood, etc. or trace the curve of the beam directly onto the nozzle from the underside.
2. Flip the PowerFall over so the nozzle side is lying flat.
3. If using a template, trace the radius curve on the PowerFall using the template from step 1 as your guide.
4. Cut the PowerFall along the line using a variable speed jigsaw with a coarse blade (6 to 8 teeth per inch).
5. Sand the lip of the PowerFall with 80 grit sanding paper until it is smooth.



6. Insert the slot in the Spacer Tool around each spacer and move it back and forth to remove spacer to a distance of 1" from the front lip.
7. Thoroughly clean any debris that may have inadvertently gotten in the nozzle.

C. Determine the Correct PowerFall Size

This chart determines the correct PowerFall model for your radius size requirements:



V. Ordering The PowerFall Radius

Custom Order a Radius

You can custom order a radius through Polaris by calling, faxing or mailing the information to:

Custom Radius
Polaris Pool Systems, Inc.
2620 Commerce Way
Vista, CA 92081-8438
Phone: 1-800-VAC-SWEEP
Fax: 877-327-1403

- Copy this page.
- Fill out the form below.
- Circle the kind of radius.
- Attach a paper template.
- Indicate top side of template.
- Use arrows to show water flow.

Radius Order Form

Date: _____

Company Name: _____

Contact Name: _____

Telephone: _____ Fax: _____

Address: _____

_____

Distributor: _____

Branch: _____

Purchase Order Number: _____

Purchaser: _____

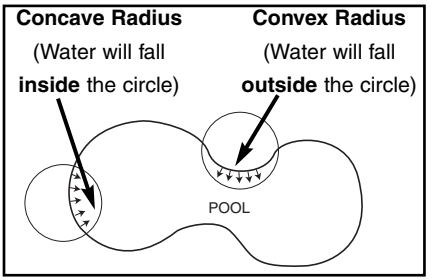
Concave or Convex Radius:

_____

CIRCLE THE CORRECT RADIUS
ON THE ILLUSTRATION →

Length of PowerFall: _____

Size of Radius: _____



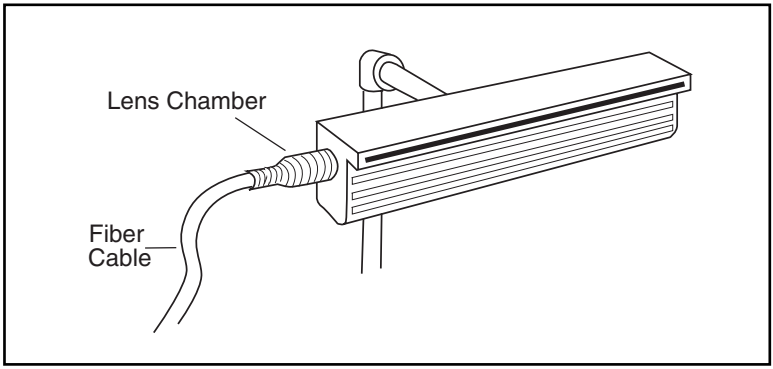
VI. FiberFall Overview & Installation

The Polaris FiberFall® is a PowerFall variation. Through the use of fiber optic technology, the FiberFall sends an array of color through the water. The illuminator creates color through a color wheel with the option of revolving color or the option to stop on any one color. The fiber optics are sealed from moisture and heat exposure. There are no external light fixtures so you see the effect and not the light source.

In addition to all of the PowerFall's features, the FiberFall also provides the following benefits:

- Unit lengths are 12" 18", 24", 36", 48" with standard 1" nozzle size.
- FiberFalls with radius in convex or concave are available at no extra charge.

  ONCE MANUFACTURED, THE FIBERFALL CANNOT BE CUT IN ANY WAY, EITHER IN THE FIELD OR AT THE FACTORY.



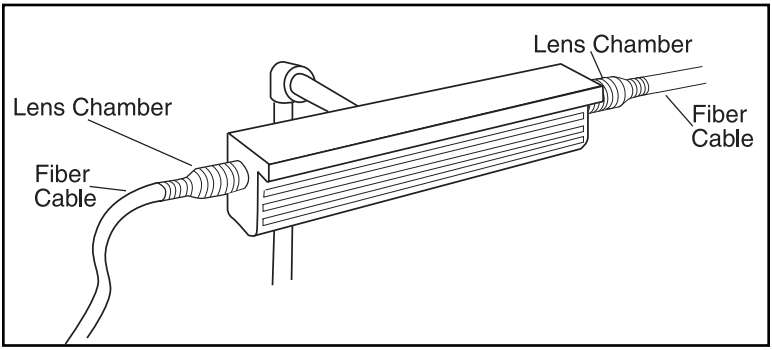
A. General Installation Considerations

Fiber optic recommendations for FiberFall:

If using solid core fiber:

One (1) 9 mm or larger cable needed for 12", 18", and 24" models

Two (2) 9 mm or larger cables needed for 36" and 48" models



If using stranded fiber:

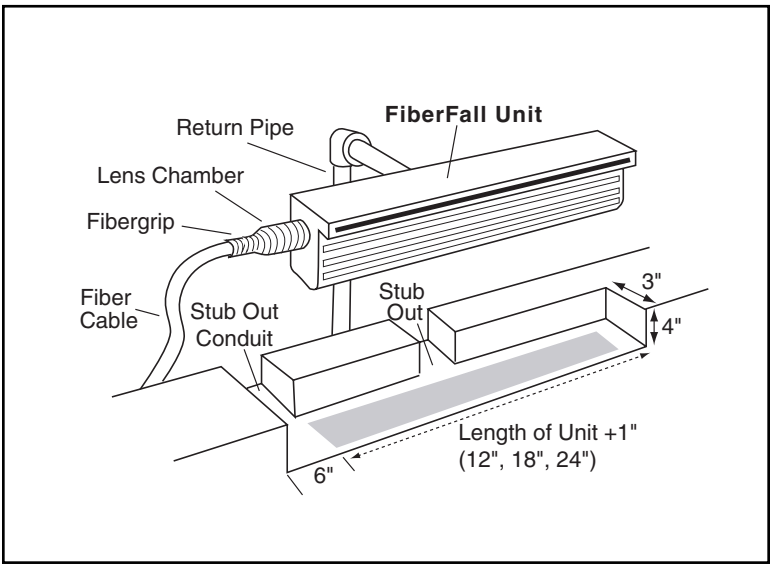
One (1) 150 strands of cable needed for 12", 18" and 24" models

Two (2) 150 strands of cable needed for 36", and 48" models

A metal halide illuminator is recommended. For best results, keep the fiber cable length less than 15' from the illuminator.

CAUTION: Allow for two (2) extra feet of fiber cable in case it needs to be cut and re-set.

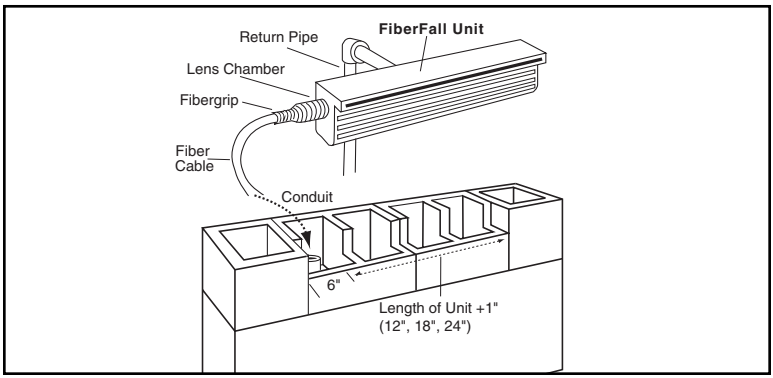
Remember that the fiber cable will most likely be permanently installed under concrete. Take the time to understand the installation instructions and follow them.



B. Gunite - Bond Beam Preparation

1. Notch the front edge of the beam to accommodate the length of the FiberFall, lens chamber, and fiber cable. This requires extending the notch in the beam 6" to the left of the unit as pictured below for 12", 18" and 24" models.
2. Stub out 1" conduit for the fiber cable to the left of the FiberFall Unit.
3. Two lens chambers are standard, one on each side, on the 36", and 48" FiberFall units. Two fiber optic cables are required. Notch for an additional 6" on either side of the unit and stub out a 1" conduit for fiber cable on both sides.
4. Connect the fiber cable(s) to the FiberFall unit (see Installing the Fiber Cable, page 16).
5. Finish the surface of the feature with brick, tile, stone or plaster.

***Note*:** Protect conduit and fiber casing from water intrusion at all times.



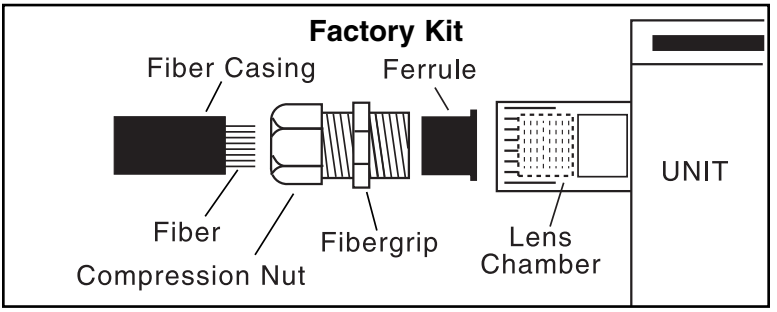
C. Vinyl - Block Preparation

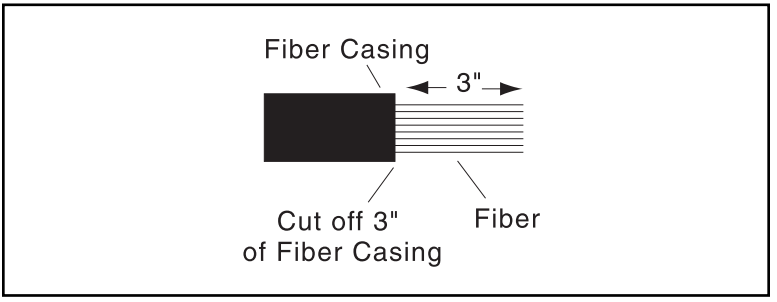
1. Cut the front edge of the header blocks to accommodate the length of the FiberFall, lens chambers, and fiber cables. See section B.
2. Run the conduit(s) through the cells in the block or punch hole(s) in the back of the block.
3. Set the plumbing return pipe for the water supply to the FiberFall unit so that it will run up through the open cells in the block.

4. Connect the fiber cable(s) to the FiberFall unit (see Installing the Fiber Cable, below).
5. Mud in around the FiberFall unit with concrete mix. Finish the block surface with veneer (brick, tile, stone plaster, etc.).

D. Installing The Fiber Cable

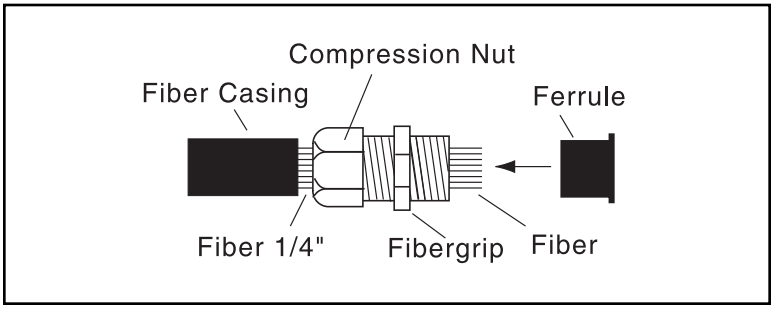
Whether you are a gunite or vinyl pool builder, you will need to connect the fiber cable(s) to your FiberFall using the Factory Kit *PRIOR* to enclosing the beam or block wall. The following steps refer to **STRANDED FIBER OPTIC CABLE ONLY.** See page 19 for installing solid core fiber.



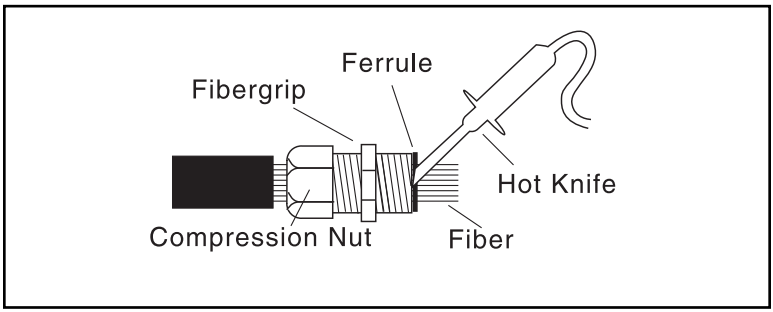


1. Remove 3" of fiber casing, exposing all 150 or 225 strands of fiber.
2. Slip the fibergrip fitting over all the strands of fiber. Leave 1/4" of fiber exposed between the fiber casing and the fibergrip fitting.

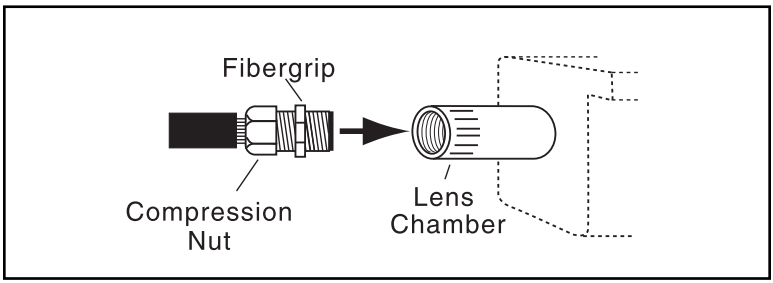
***Note*:** Protect conduit and fiber casing from water intrusion at all times.



3. Slip the aluminum ferrule over all the strands of fiber until it fits into the fibergrip fitting and stops.
4. Trim the fiber along the edge of the ferrule. Be sure that the hot knife is held at an *ANGLE* to the edge of the ferrule as you cut the strands of fiber. ***DO NOT*** run the blade flatly across the ferrule and fibers.

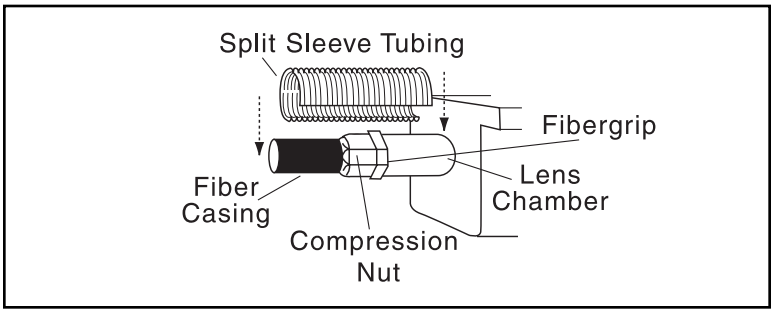


NOTE: Make sure that the stranded fiber is cut properly with a hot knife. This is the most critical operation of the installation.

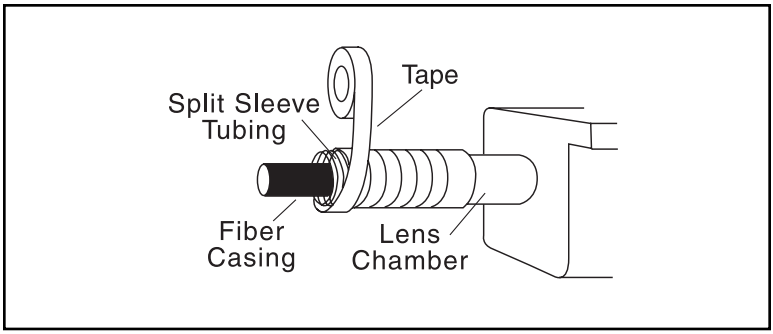


5. Thread and tighten the fibergrip fitting into the FiberFall lens chamber.

6. Push the fiber cable into the lens chamber until it stops. It should be flush with the lens.
7. Tighten the compression nut on the fibergrip fitting.
8. Slip the split sleeve tubing over the fibergrip, extending from the lens chamber to the fiber casing.



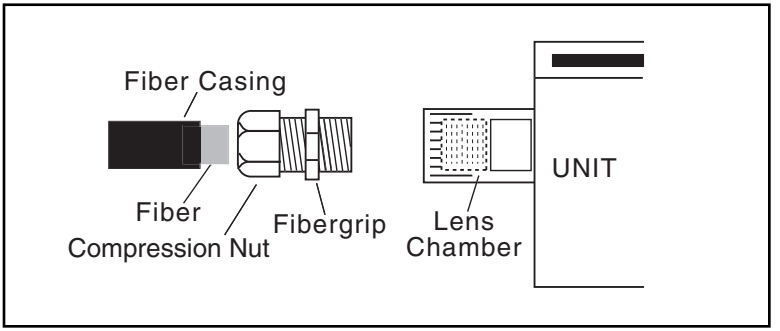
9. Wrap electrical tape over the split sleeve tubing, overlapping 1" on both ends.

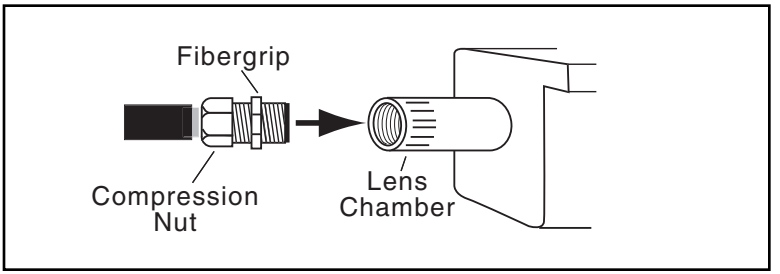


10. Tape the opposite end of the fiber cable(s) and pull it through the conduit(s) to the illuminator with a chase line or fish tape.
11. Make connections to the illuminator following the manufacturer's recommendations.

Installing The Solid Core Fiber Cable

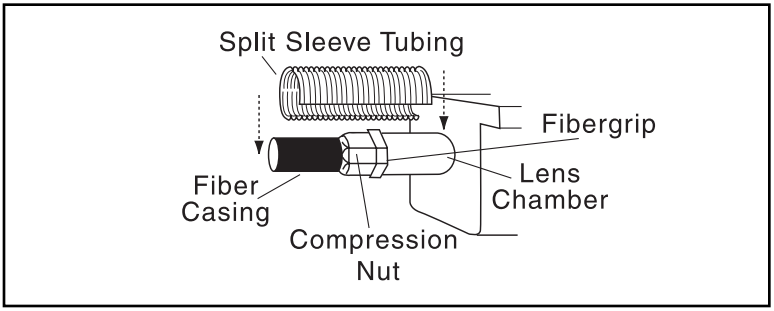
Whether you are a gunite or vinyl pool builder, you will need to connect the fiber cable (s) to your FiberFall using the Factory Kit *PRIOR* to enclosing the beam or block wall. When using Polaris After Dark solid core fiber optic cable, cut the ends of the cables with a sharp clean shear. If necessary, remove the casing on solid core fiber optic cable. You *will not* be using the ferrule for solid core fiber optic cable.

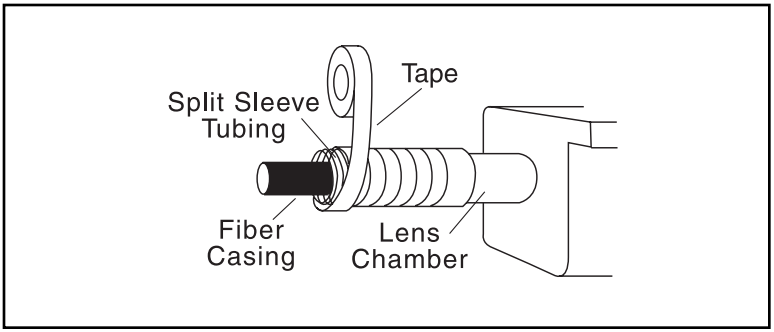




1. Thread and tighten the fibergrip fitting into the FiberFall lens chamber.
2. Push the fiber cable into the lens chamber until it stops. It should be flush with the lens.
3. Tighten the compression nut on the fibergrip fitting.
4. Slip the split sleeve tubing over the fibergrip, extending from the lens chamber to the fiber casing.

5. Wrap electrical tape over the split sleeve tubing, overlapping 1" on both ends.





6. Tape the opposite end of the fiber cable(s) and pull it through the conduit(s) to the illuminator with a chase line or fish tape.
7. Make connections to the illuminator following the manufacturer's recommendations.

VII. Troubleshooting

A break in the water sheet could be caused by:

- Debris in the nozzle.

  Use a small metal tool, nail file, or credit card to remove debris or use a hose with a pressure attachment to force water into the lip opening.

- Collapsed lip caused by a broken spacer.

  Call Polaris Water Designs at 1-800-353-2557 or Polaris Customer Service at 1-800-VAC-SWEEP.

- Spacer is too close to the nozzle lip.

  Use the Spacer Removal Tool to remove excess spacer.

  Spacers should be recessed 1" from the lip of the nozzle.

An unbalanced flow for multiple waterfalls could be caused by:

- Improper valve adjustment or improper plumbing.

  Refer to valving and plumbing considerations on pages 5-6.

No projection of water sheet could indicate:

- Low water flow.

  Check if the valve is open.

  Check if filter is in-line with the waterfall.

  Refer to plumbing, pipe, and pump sizing on pages 3-6.

Limited Polaris PowerFall and Polaris FiberFall Warranty

The Limited Warranty is extended to the original purchaser of the Polaris PowerFall®, manufactured by Polaris Pool Systems, Inc., 2620 Commerce Way, Vista, CA 92081-8438.

Polaris warrants this product it manufactures, including all parts and components thereof, to be free of defects in material and workmanship for a period of twelve months. The Limited Warranty does not apply if the failure is caused or contributed by any of the following: improper handling, improper storage, abuse, improper installation, unsuitable application of the unit, lack of reasonable and necessary maintenance, or repairs made or attempted by other than authorized service centers or technicians. Polaris will repair or replace, at its option, a unit proved to be defective within the warranty period and under the conditions of the warranty.

Polaris is not responsible for the cost of removal of the unit, damages due to removal or installation, any shipping charges to or from the factory, or the installation of a repaired or replacement unit.

Implied warranties, when applicable, shall commence upon the same date as the Express Warranty provided above, and shall, except for warranties of title extended only for the duration of the Express Warranty. Some states do not allow limitations on how long an implied warranty lasts. So the above limitation may not apply to you. The only remedy provided to you under an applicable implied warranty and the Express Warranty shall be the remedy provided under the Express Warranty. Subject to the terms and conditions contained therein, Polaris shall not be liable for incidental and consequential losses and damages under the Express Warranty, and applicable implied warranty, or claims for negligence, except to the extent that this limitation is found to be unenforceable under applicable state law. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusion may not apply to you. The Warranty gives you specific legal rights and you may also have other rights which vary from state to state.

Polaris

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USA: 2620 Commerce Way, Vista, CA 92081-8438 • 760-599-9600 • 1-800-VAC-SWEEP (USA and Canada only)
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Europe:C/Osona s/n. (Pol. Ind. El Ramassar), 08520 Les Franqueses del Vallés, Barcelona, Spain • +34 93 840 25 85
www.polarispool.com