



MagicStream™

Laminar



Installation and User's Guide

IMPORTANT SAFETY INSTRUCTIONS
READ AND FOLLOW ALL INSTRUCTIONS
SAVE THESE INSTRUCTIONS

IMPORTANT SAFETY PRECAUTIONS



Important Notice: Attention Installer: This manual contains important information about the installation, operation and safe use of the Light Direct Connect product. This information should be given to the owner and/or operator of this equipment. When installing and using this electrical equipment, basic safety precautions should always be followed, including the following:



WARNING: IMPORTANT SAFETY INSTRUCTIONS PERTAINING TO A RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS. READ AND FOLLOW ALL INSTRUCTIONS.



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) 831-7133 for additional free copies of these instructions.



WARNING - When using electrical products, basic precautions should always be followed, including the following: Before attempting installation of the Light Direct Connect, be sure that all power to the circuit supplying power to the system load center is disconnected and switched off at the circuit breaker. Before attempting any electrical wiring, be sure to read and follow Safety Instructions.

- The Light Direct Connect must be installed by a qualified service professional or be under the direct supervision of a qualified electrician.
- Wiring should only be performed by a qualified professional.
- All work must be performed by a licensed electrician, and must conform to the National Electric Code and all national, state, and local codes, as well as any local electrical codes in effect at the time of installation.
- Use of electrical appliances around swimming pools is hazardous. To reduce the risk as much as possible, carefully read and follow all instructions in this installation guide.

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

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P/N 520969 - Rev A - 11/24/2008

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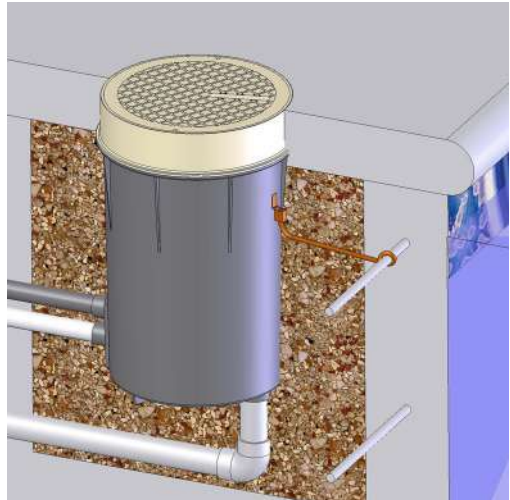
Section 1 Overview

MagicStream™ Laminar

The MagicStream Laminar is designed to provide a clear, turbulence-free stream of water that can be lit with a fiber optic cable, or an LED light engine for a dazzling nighttime effect. The 12 VAC powered LED light engine is capable of generating a series of multicolored light shows, or can be set to display a continuous, single color.

If desired, the built-in solenoid “thumper” can create a random “wrinkle,” in the Laminar’s stream, causing it to display a brilliant spot of light that moves along the stream’s arc. The patented light enhancer can be adjusted to maximize the light in the arc.

The MagicStream Laminar comes equipped with an ABS deck housing for easy installation in a deck surface, or in the landscaping surrounding the pool, fountain, or spa.



MagicStream Laminar

Before Installation Read the Following

Read the following important information before installation the MagicStream laminar:

- The Laminar arc can reach a maximum height of seven feet and a distance of eight feet.
- To achieve the maximum Laminar arc height, a water supply of 10 GPM with 16 ft of head (measured at the Laminar) is required.
- Install the Laminar close to the edge of the pool to minimize water from splashing on the deck on windy days.
- Use a 20 micron cartridge filter to supply clean, filtered water to the Laminar. Do not use a DE or Sand filter.
- Use 1" Sch40 PVC pipe to supply the Laminar. On long pipe runs, calculate the pressure drop and compensate by increasing the supply pressure.
- Install a 1" ball or globe throttling valve on the water supply to EACH Laminar. When installing more than one Laminar, Pentair recommends installing a throttling valve on the main supply manifold.
- Install a 1-1/2" drain line to the bottom of the Laminar deck housing and create a drain system to prevent standing water.

Note: Proper drainage from the deck housing is critical to avoid damage to the Laminar Jet assembly. Do not install the Laminar Jet deck housing in an area prone to runoff or flooding.

- The Laminar arc can reach a maximum height of seven feet and a distance of eight feet.
- The deck housing electrical connection (marked "Electrical" on the housing) is designed for 1" PVC conduit. Create no more than 270° of turns in the conduit without an intermediate pull box.
- If a fiber optic light source is being used, choose one with 150-170 strands. The Laminar will accept a bundle of strands 1/2" in diameter.
- The LED light engine comes with a 100' long two-wire cable. Use a 120/12VAC-100 Watt pool lighting transformer (purchased separately) powered with a GFCI breaker. Six Laminars can be powered with one transformer. Follow the National Electric Code and local codes to determine the placement of the transformer.
- Mount the deck housing so that the water supply and electrical connections are located opposite the intended direction of the Laminar stream.

Section 2

Installation

Mechanical Installation

1. Dig a hole measuring 24" deep and 24" square and place the deck housing in it. This will allow enough room to connect the supply piping and electrical conduit.
2. Solvent weld the conduit and the drain and supply piping to the deck housing.
3. Anchor the deck housing so that the top of the housing cover collar is at the level of the finished deck (Figure 1). The adjustable collar should be angled so that it will align flush with the finished deck surface. Once you have made the final adjustments to the collar's angle, glue the collar to the deck housing.

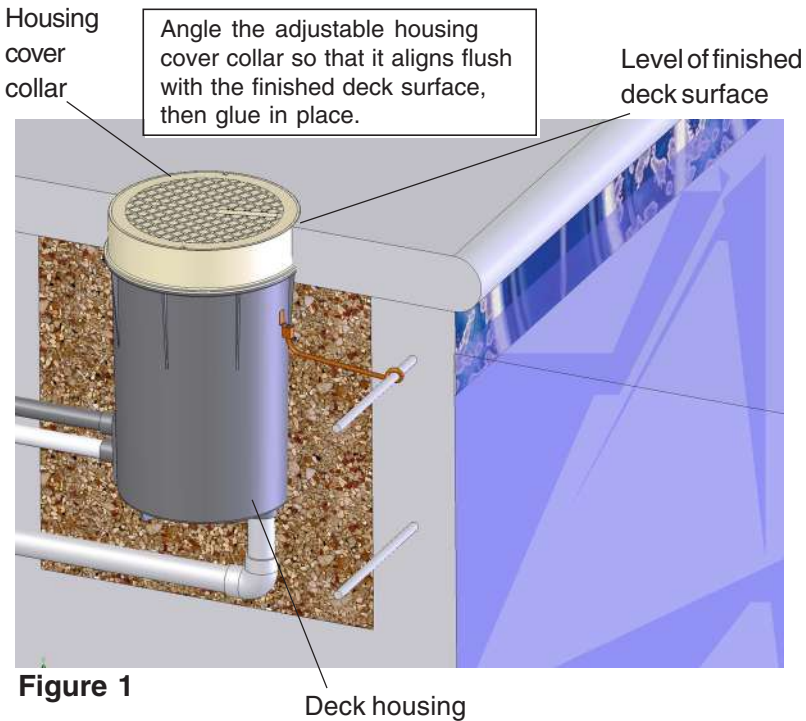


Figure 1

Deck housing

4. Backfill around the deck housing with gravel to further stabilize the housing during deck placement. Leave cover in place during deck installation.

Note: The deck housing is made of ABS. Use Weld-On 793 or 794 ABS-PVC cement to glue Sch40 PVC.

Note: It is recommended that the system pressure test be performed after the deck housing is mounted to the supply piping.

5. Plug the flex line in the housing by disconnecting the union between the deck housing and the Laminar. Using one of the Laminar adjustment nuts, secure the winterization cap to the supply side of the union.

Note: The pressure on the piping/plumbing supplying the Laminar should not exceed 50 PSI.

6. Once the deck is finished, flush any debris from the supply pipe using the pump and filter system that supplies the Laminar.

Note: Any debris in the Laminar unit will hinder its ability to produce a turbulence-free stream.

Electrical Installation

1. Pull the 16 gauge, 2-conductor cable through the opening marked “electrical” in the deck housing and route it, via electrical conduit, to the transformer location (Figure 2). Leave three (3) feet of slack at the deck housing end to allow for servicing.
2. Connect the LED wiring to the 12 VAC taps of the transformer.
3. Connect the 120 VAC side of the transformer to a 120 VAC GFCI power feed that is controlled by a single switch. When installing multiple laminars, make sure all the laminars are connected to a single switch. The switch is used to program the LED light engine (See pages 1112).

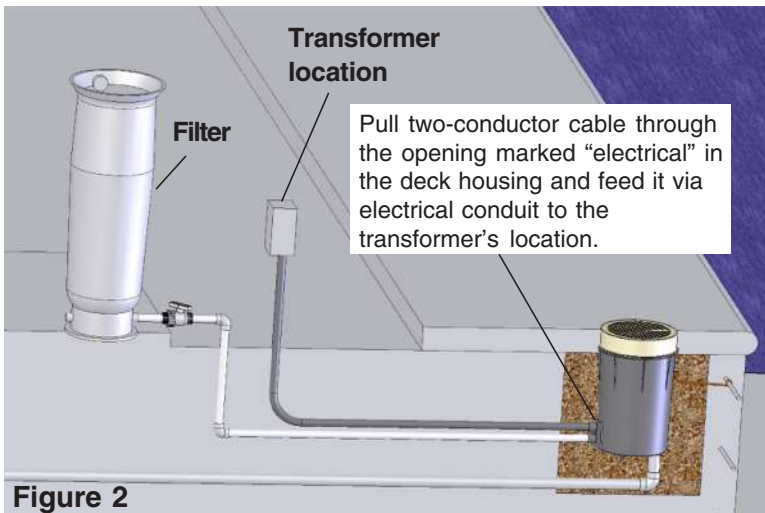


Figure 2



WARNING — To avoid dangerous or fatal electrical shock hazard, all metal items within five (5) feet of the pool or spa must be properly electrically bonded to a reliable grounding point. The Laminar canister must be properly electrically bonded and grounded via the No. 8 AWG ground connector located on the side of the canister.

Fiber Optic Cable Installation

Use 150-170 strand fiber optic cable or a fiber bundle 1/2" maximum diameter.

1. Remove six inches (6") of the cable jacket.
2. Wrap black electrical tape tightly around the exposed fibers, leaving approximately 1/2" of exposed fiber at the end of the cable. The tape prevents the individual fibers from separating.
3. Cut the fiber optic cable with a heat knife so that the cable ends form a flat surface. For best results, heat the knife until it is "cherry" red.

Note: Do not cut the fiber ends too close to the tape. Leave a 1/4" distance between the end of the cable and the tape. This will prevent the adhesive on the tape from melting and adhering to the ends of the fiber optic strands.

4. Slide the completed fiber optic cable through the Heyco waterproof fitting and up the tube (located at the bottom of the laminar) until the cable encounters the lens inside the unit. Secure the fiber by tightening the waterproof fitting.

Note: Provide at least two extra feet (2') of fiber optic cable in the deck housing to allow for easy removal of the Laminar.

5. Install the illuminator and attach the fiber optic cable to it according to the instructions supplied with the illuminator.

Section 3

Setup and Operation

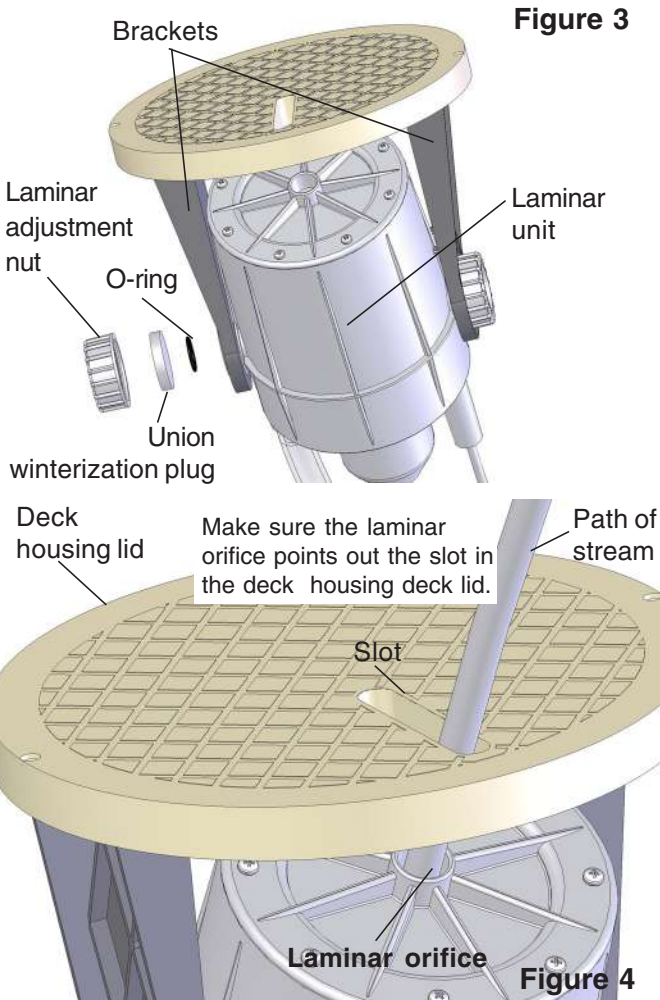
Once the deck is finished, flush any debris from the supply pipe using the pump and filter system that supplies the Laminar.

Note: *Any debris in the laminar will hinder its ability to produce a turbulence-free stream.*

Laminar Setup

Make sure the supply piping has been flushed clear as directed above.

1. Carefully spread the brackets and slide the Laminar unit into the holes in the brackets (Figure 3), making sure the Laminar orifice is pointed out the top slot in the deck housing lid (Figure 4).



2. Make sure the spare o-rings are in place. Place the union winterization plugs in the Laminar adjustment nuts and screw them in place on the Laminar body (Figure 5).
3. Connect the Laminar to the supply pipe with the union connection (Figure 5). Make sure the o-ring stays in its groove).
4. Adjust the laminar so that the laminar orifice is visible through the slot in the deck housing Lid.
5. Place the deck housing lid/Laminar unit in the deck housing (Figure 5). If the hoses in the deck housing prevent the proper seating of the deck housing lid, you may have to loosen the union nut briefly and allow the hoses to twist, so that they spiral out of the way, into the deck housing.

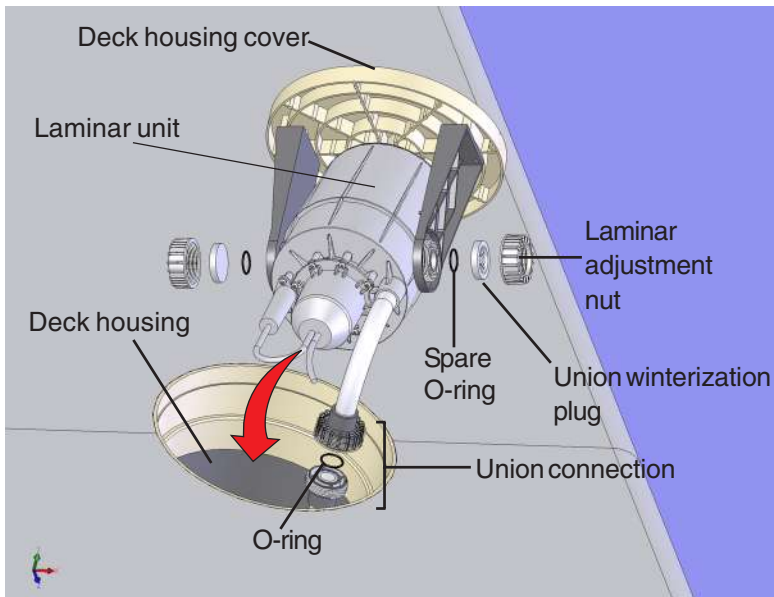


Figure 5

6. Adjust the Laminar throttling valve to $\frac{1}{4}$ open. Turn on the supply pump and let the Laminar fill with water.
7. When a stream of water begins to flow from the laminar orifice, adjust the flow, elevation and direction as desired.

Light Enhancer Setup (darkness required)

You may choose to vary the intensity of the light when using the LED or fiber optic light source to light the laminar stream. You can adjust the light intensity by means of the light enhancer. The light enhancer uses a very small stream of water to add very small bubbles to the stream. The screw that controls the light enhancer is located on the Laminar orifice plate (Figure 6).

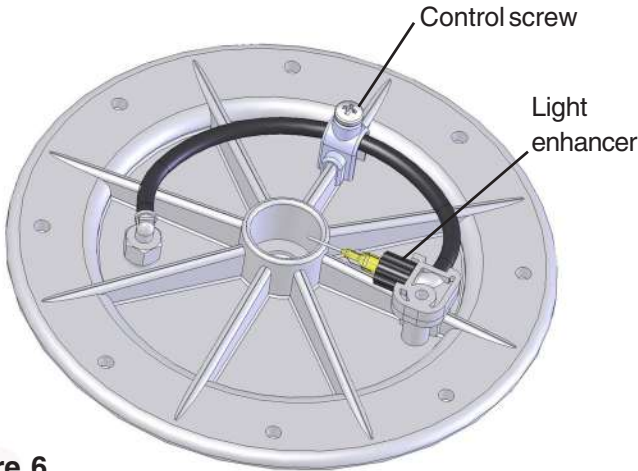


Figure 6

There is no optimal setting for the light enhancer, and the intensity of the light emitting from the laminar stream is purely a matter of taste. We encourage you to experiment with the light enhancer to achieve the effect you desire.

Note: Laminars are sensitive to wind, earth movement and equipment vibration. Secure the Laminar and Deck Housing to minimize vibration. Periodic stream distortion, caused by pump vibrations and motor electrical fluctuations, is normal and not indicative of a nozzle defect.

Note: A Laminar may occasionally "burp" as a result of trapped air accumulating in the nozzle body. This phenomenon is normal and will occur until all air is purged from the piping system. Trapped air can also cause slight distortion in water action. It is imperative that all air is removed to ensure proper water feature operation.

LED Light Engine Features

The LED Light Engine controls the operation of the following features, and its built-in memory capability ensures that each time you turn the light engine on, it resumes operation with the same features in operation as when you last turned it off:

Lighting

Color freeze mode-You choose one color of light. The color does not change.

Color changing mode-the color of the light changes automatically, according to one the following three programs:

Sync - Colors will change at ten second intervals. In this mode, multiple Laminars will change colors together.

Random - Colors will change at about ten second intervals but in a completely random sequence. In this mode, multiple Laminars will NOT change colors together.

Party - Colors will change randomly and slowly at first, then speed up, until the sequence ends with quick flashes and strobes. The sequence then repeats, beginning with the slow changes. In this mode, multiple Laminars will NOT change colors together

Solenoid Thumper

The solenoid thumper feature creates a "wrinkle" in the laminar stream, thus creating a brilliant spot of light in the laminar arc.

Reset

When you select the reset feature, the LED light engine reverts to the Random color changing mode with the solenoid thumper ON.

Operating the LED Light Engine Features

You control the operation of the LED light engine features by cycling the power OFF and ON rapidly (1SEC) in the combinations described below:



IMPORTANT: Start from the ON position.

Lighting - cycle the power OFF/ON 2 times. Each successive OFF/ON combination will cycle through **Sync**, **Random** and **Party**.

Solenoid Thumper - cycle the power OFF/ON 3 times to turn the solenoid thumper ON and OFF.

Reset - cycle the power OFF/ON 4 times to reset the LED light engine.

LED Light Engine Control Summary

Start programming with the LED light engine ON. Change programs and modes by cycling the power ON and OFF rapidly (1 Sec). Wait 10 seconds between MODE changes.			
"PROGRAM /MODE"	POWER CYCLE	DESCRIPTION	INDICATION
RESET	OFF/ON/OFF/ON/OFF/ON/OFF/ON	Resets Light Engine to Random mode and turns on the thumper.	Flashes Light 2 times
SOLENOID THUMPER	OFF/ON/OFF/ON/OFF/ON	Turns solenoid "thumper" ON or OFF	Flashes Light 4 times
LOCK COLOR	OFF/ON	Locks on any selected color. Returns to previous color change mode.	Color is fixed
LED LIGHT COLOR CHANGE	OFF/ON/OFF/ON	Switches from one color change mode to next. After a Reset, Random mode is running.	"Sync Mode—1 flash Random Mode—2 flashes Party Mode—3 flashes"
COLOR CHANGE MODE DESCRIPTION			
<p>Sync Mode - Colors will change at about 10sec intervals. In this mode, multiple Laminars will change colors together. If the solenoid thumper mode is turned on, the thumpers on multiple Laminars will thump together.</p>			
<p>Random Mode - Colors will change at about 10sec intervals but in a completely random sequence. In this mode, multiple Laminars will NOT change colors together. If the solenoid thumper mode is turned on, the thumpers will thump at random intervals and multiple laminars will NOT thump together.</p>			
<p>Party Mode - Colors will change randomly and slowly at first, then speed up, until the sequence ends with quick flashes and strobes. Then the sequence starts again with slow changes. In this mode, multiple Laminars will NOT change colors together. If the solenoid thumper mode is turned on, the thumpers will thump at random intervals and multiple laminars will NOT thump together.</p>			

Maintenance and Troubleshooting

Filter Cleaning

Perform routine maintenance on the filter to ensure trouble-free Laminar operation. Be careful to keep debris out of the discharge plumbing when cleaning the filter. If debris gets into the filter discharge line to the Laminar, follow this procedure:

1. Remove the Laminar by unscrewing the two deck housing lid retaining screws.
2. Remove the deck housing lid and Laminar unit and place on the deck.
3. Disconnect the supply union and turn on the Laminar supply pump until the water runs clear.
4. Reattach the union, place the Laminar back in the deck housing and check the alignment of the stream.
5. Replace the deck housing lid retaining screws.

Clogged Laminar (Poor Stream Quality)

If the laminar orifice becomes clogged with debris, follow this procedure:

1. Remove the Laminar by unscrewing the two deck housing lid retaining screws.
2. Remove the deck housing lid and Laminar unit and place on the deck. Disconnect the supply union.
3. Using a garden hose, place the hose over the jet nozzle and force water backward through the unit and out the 3/4" open union. This will clear most of the debris.

Note: Do not insert anything into the laminar orifice! This may permanently damage the laminar stream.

Winterization

CAUTION! Do not let the laminar freeze. This will void the warranty.

Take the following steps to winterize the Laminar:

1. Remove the Laminar by unscrewing the two deck housing lid retaining screws.
2. Remove the deck housing lid and Laminar unit and place on the deck. Disconnect the supply union.
3. Remove both union nuts from the Laminar brackets and take off the union plugs (don't lose the O-rings).
4. Spread the brackets carefully and separate the Laminar unit from the brackets.
5. Drain the Laminar by rotating the entire unit until most of the water runs out.
6. Drain the filter and blow out the supply line.
7. Use the union nut and plug to cap off the supply line from the filter (Figure 6).
8. Coil the deck housing supply hose and push it to the bottom of the housing.
9. Turn the Laminar unit so the orifice faces down toward the bottom of the deck housing (be careful not to damage the light enhancer needle). Orienting the unit face down assures that water in the LED light engine does not freeze.
10. Replace the deck housing lid.
11. Wait for Spring.

Spare O-rings

There are two spare O-rings included with the MagicStream Laminar. They are intended as replacements for the water supply union O-ring if damaged or lost.

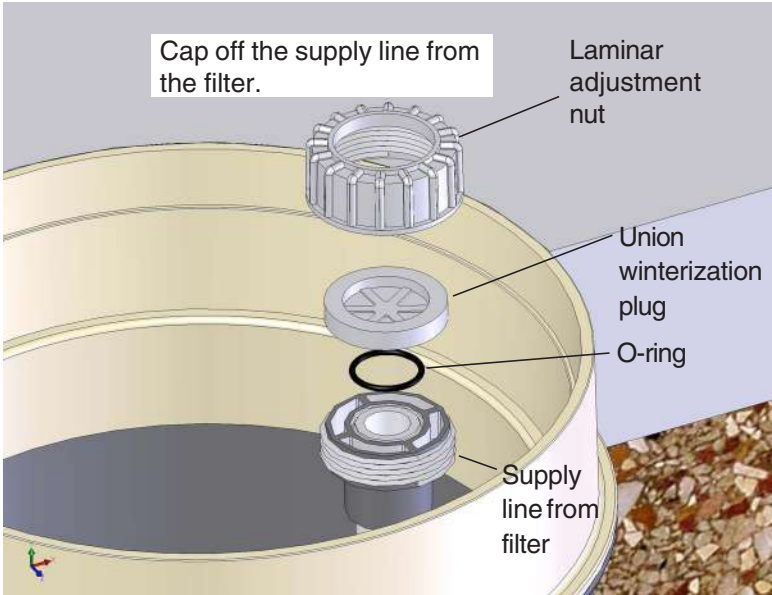


Figure 6

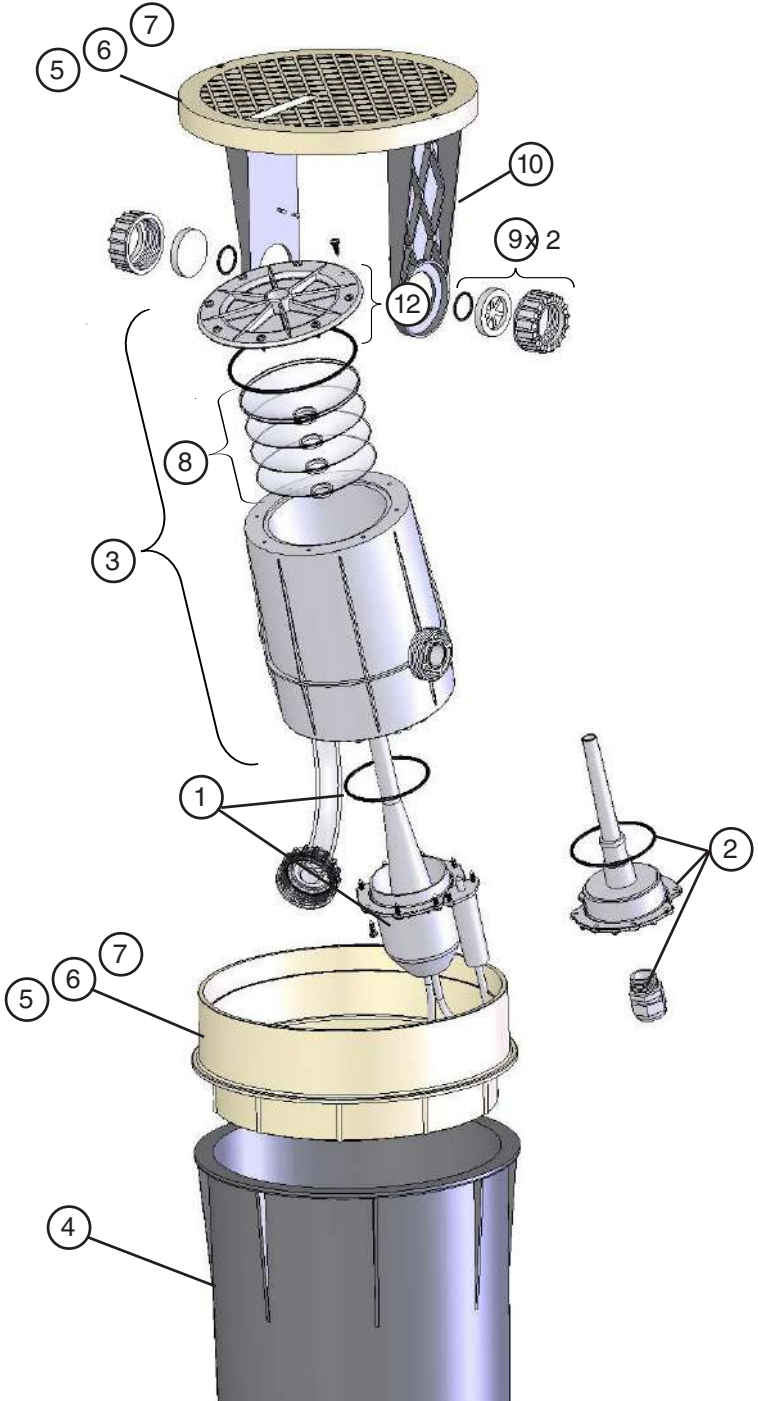
Removal and Replacement

MagicStream Laminar Parts List

Item No.	Part No.	Description
1	590021	Laminar led light engine
2	590022	Laminar fiber optic adapter
3	590023	Laminar body no light
4	590024	Laminar housing-no cover
5	590025	Laminar cover black
6	590026	Laminar cover gray
7	590027	Laminar cover tan
8	590028	Laminar screen kit
9	590029	Laminar union nut kit
10	590030	Laminar bracket kit
11*	590031	Laminar hardware kit (all screws and o-rings)
12	590032	Laminar orifice kit

* Not shown

MagicStream Laminar Illustrated Parts



NOTES

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P/N 590033 - Rev B