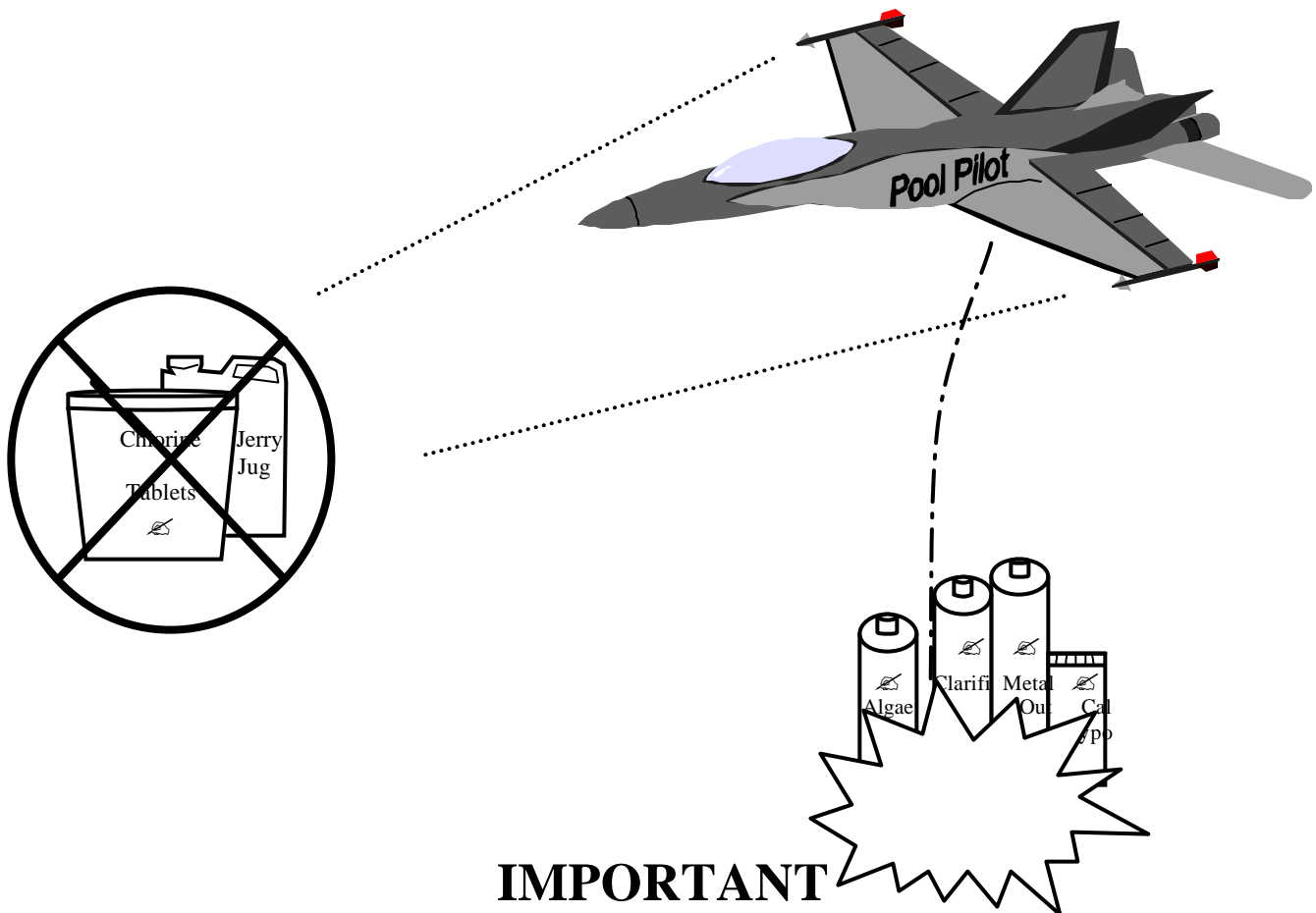

Soft Water Purification System

POOL PILOT CUBBY

by AUTOPILOT SYSTEMS INC.

Residential Operation / Installation Manual



IMPORTANT
Read This Manual Before Installing & Operating

POOL PILOT CUBBY

by AUTOPILOT SYSTEMS
INC.

Record The Following Information

Installer _____
Date installed _____ Model Number _____
Control Panel Serial Number _____
Cell Serial Number _____
Volume of Pool _____

Factory Direct Customer Assistance...

HOTLINE: 1.800.922.6246 or 1.954.772.2255

FAX: 1.954.772.4070

E-MAIL: autopilot@teamhorner.com

Visit Us On The Internet @

<http://www.teamhorner.com>

Manufactured by

AutoPilot Systems, Inc.

5755 Powerline Road • Fort Lauderdale • Florida 33309-2074, U.S.A.

Heat Your Pool

For A Dollar A Day!

Call 1.800.786.7751

Or 1.813.823.5642

For Factory Direct Information

POOL PILOT CUBBY

by AUTOPILOT SYSTEMS
INC.

Section 1b – GENERAL PRODUCT INFORMATION

IMPORTANT SAFETY INSTRUCTIONS

READ AND FOLLOW ALL INSTRUCTIONS

INSTALLATION AND EQUIPMENT RELATED

Installation of all POOL PILOT CUBBY models:

When installing and using your Pool Pilot Control Panel, basic safety precautions must always be followed, including the following:

1. Follow all aspects of the local and National Electrical Code(s) when installing your Control Panel.
2. During installation, mount your Control Panel to ensure the least amount of direct exposure to rain, garden sprinkler water, direct sunlight or any corrosive environment.
3. **WARNING** – Risk of electrical shock. Install Control Panel at least 10' (3 m) for 110V Units, from the inside wall of the pool or spa using non-metallic plumbing. 5' minimum distance (1.5 m) for 220V Units.
4. All field-installed metal components such as rails, ladders, drains or similar hardware within 10' (3 m) of the spa or hot tub shall be bonded to the equipment grounding bus with copper conductors not smaller than No. 8 AWG in the U.S.A. and No.6 AWG in Canada.
5. **CAUTION** – Maintain water chemistry in accordance with manufacturer's instructions.
6. **WARNING** – To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times. Children should not use spas, hot tubs or pools without permanent adult supervision.

Equipment Related

110Volt Models Only (cord and plug)

1. **WARNING** – Risk of Electrical Shock. Connect only to a grounding type receptacle protected by a ground-fault-interrupter (GFCI). Contact a qualified electrician if you cannot verify that the receptacle is protected by a GFCI. The conductors on the load side of the GFCI shall not occupy conduit boxes or enclosures containing other conductors unless additional conductors are also protected by a GFCI.
2. **WARNING** – To reduce the risk of electric shock, replace damaged cords immediately.
3. **WARNING** – To reduce the risk of electrical shock, do not use extension cords to connect unit to electric supply; provide a properly located outlet.
4. Do not bury cord. Locate and protect cord to minimize abuse from lawn mowers, hedge trimmers and other equipment.

220Volt Models Only (fixed wiring)

1. A wire connector is provided on your Pool Pilot to connect a minimum No. 8 AWG (8.4 mm²) solid copper bonding conductor between this unit and any metal equipment, metal enclosures of electrical equipment, metal water pipe or conduit within 5' (1.5 m) of the unit.
2. A bonding terminal is located inside your Pool Pilot. To reduce the risk of electrical shock, this terminal must be connected to the grounding means provided in the electrical supply panel with a continuous copper wire equivalent size to the circuit conductors supplying your Pool Pilot.
3. A disconnection device from the power source, with a contact separation of at least 0.12" (3mm) in all poles, must be incorporated in the fixed wiring for permanently wired units.

SAVE THESE INSTRUCTIONS

Table of Contents

**POOL PILOT
CUBBY**

by **AUTOPILOT SYSTEMS**
INC.

Covers all Model Numbers with Prefix AC, TC, PP, TP, PN and TN

1a	Product Information and Contact Numbers.....	1
1b	Important Safety Instructions	2
1c	Table of Contents.....	3
1d	Technical Specifications.....	4
INSTALLATION		
2a	Material Requirements for Installation.....	5
2b	Locating and Mounting the Control Panel.....	6
2c	Control Panel Connections	
	Electrical/ORP Connections	7 - 8
	Cell Cord and Output Port Connections	8
2d	Locating and Installing the Cell	
	In-Line Unit	9
	Plug-N-Play Floating Unit	9
	In-Deck Unit with Mixing Chamber	10
3a	Key Features and Controls	
	Setting the Output Control Dial.....	11
	Setting the Time Clock	11
3b	Understanding System Sizing	
	Demand Variables for Purifier.....	12
3c	Start-Up Procedures.....	13
3d	Pool Water Preparation	
	Salt Requirement Chart	14
3e	Monitoring and Maintenance	
	Water Chemistry Parameters.....	15
	Manual Cell Cleaning	15
4a	Troubleshooting	16
4b	Servicing and Replacing Parts.....	17 - 18

Section 1d – GENERAL PRODUCT INFORMATION

Technical Specifications

CONTROL PANEL

Power In: 105 – 125 VAC, 50/60 Hz, 75 W
210 – 250 VAC, 50/60 Hz, 75 W

Power Out: RC-5Cell – 3.0 Amps @ 10 – 16 VDC

AC Cord: 3' (92 cm) grounded cord (110V)
(US / Canadian Units)
2 meter (6.7ft.) grounded cord (220V)
(European / Australian Units)

Time Clock: Grasslin 24 Hour 220 VAC or 110 VAC
(TN, TP) Available in 50 Hz or 60 Hz.

Housing: Weatherproof Plastic Cover on
Aluminum Base

Weight: 6 lbs. (2.7 kg)

Dimensions: 12.25"L x 9.5"W x 4.31"D
(31 cm x 24 cm x 11 cm)

CHLORINE CELL MODELS RC-3 & RC-5

Weight RC-3 / RC-5: 2 lbs(.91 kg) / 2.4 lbs (1.1 kg)
w/ 50'(15 m) cord 4.7 lbs. (2.1 kg) / 5.1 lbs. (2.3 kg)

Floater w/Canister: 1.5 lbs. (.68 k) w/o Cell (Swan Floater)
In-Deck Chamber: 7.8 lbs. (3.5 kg) w/o Cell

Dimensions: (In-Line Cell) 18.5"L x 2.5" W x 4.1" H
(46.3 cm x 6.25 cm x 10.25 cm)

(In-Deck Chamber) 8"L x 5"W x 20.5" H
(20 cm x 12.5 cm x 51 cm)

(In-Pool Floater) 18" H (45 cm)

Deck Lid: 6.63" Diameter x 2" H
(16.6 cm x 5 cm)

Life Expectancy: RC-3 Cell: 14,000 hrs @ 3.0 Amps
@100% Output RC-5 Cell: 14,000 hrs @ 3.0 Amps

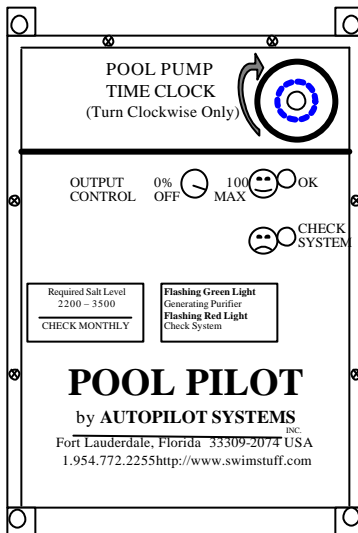
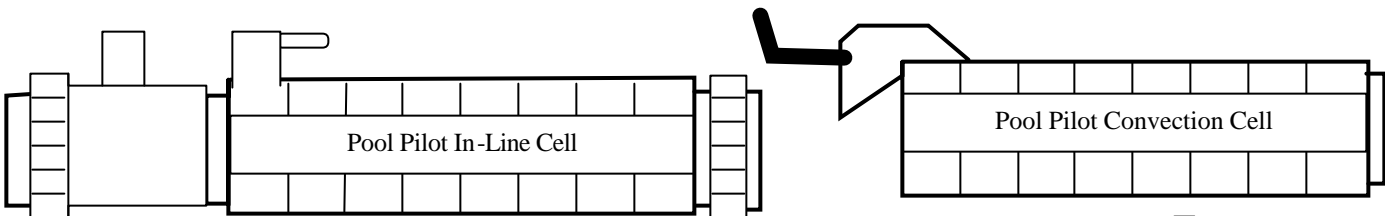
ETL Listed: J99*7396-001

Approvals: ETL, cETL, CE

Equivalent Production Comparisons

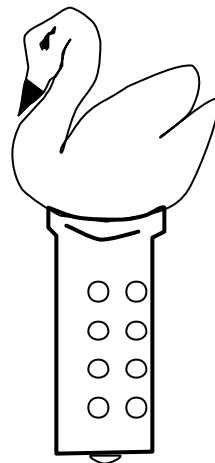
Pool Pilot Cell Model	Equivalent ounces Liquid Chlorine	Equivalent Ounces Granular Tri-Chlor	Equivalent 8 oz. (229g) Tri-Chlor Tablet Produced per Day	Weekly Production
3- Blade	32 oz (1.06 L)	4.5 oz (125 g)	☉	4 Tablets ○ ○ ○ ○
5- Blade	64 oz (2.13 L)	9.0 oz (257 g)	○ ☉	8 Tablets ○○○○○○○○

“POOL PILOT Eliminates the Chlorine Hassle”

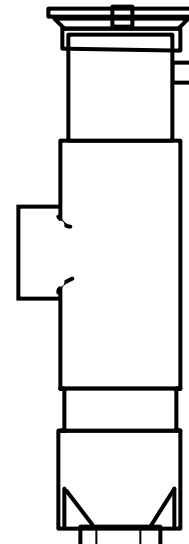


Control Panel
(With Time Clock Shown)

Production Cell



Plug-N-Play Floater
(Swan and Sailboat Available)



Pool Pilot In-Deck Chamber

Section 2a – INSTALLATION

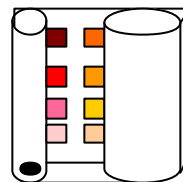
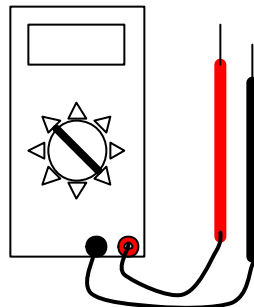
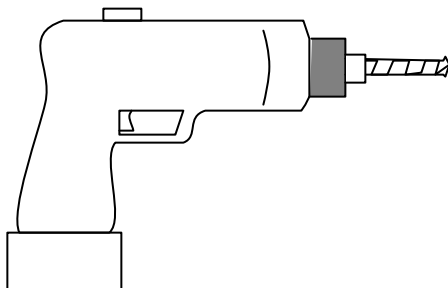
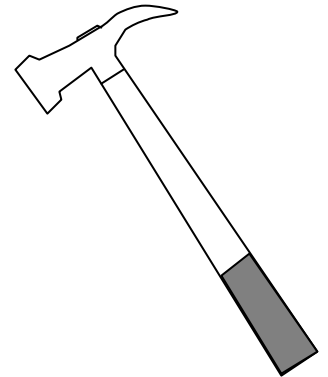
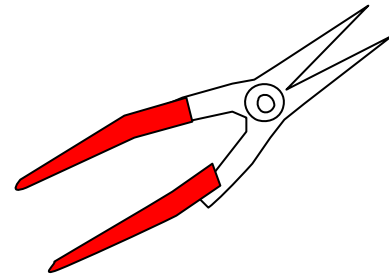
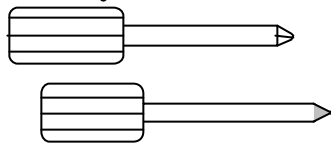
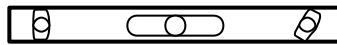
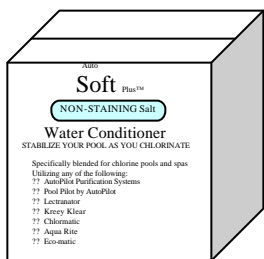
Material Requirements for Installation

NEEDED BY INSTALLER

- 1) Required Amount of AutoSoft Plus™ Salt or equivalent salt
- 2) Torpedo Level, Tape Measure & Permanent Marker
- 3) Screwdrivers: Flat Head & Phillips Head
- 4) Pair of Medium Sized Needle Nose Pliers
- 5) Drill with 1/4" (6.3 mm) Masonry Drill Bit
- 6) Voltmeter – To Determine A/C Voltage to Control Panel
- 7) Test Kit for Chlorine / Bromine, pH, Calcium Hardness, Total Alkalinity and Cyanuric Acid. We Recommend Taylor Technologies K-2005 Test Kit
- 8) Hammer
- 9) Assorted Electrical Hook-up Components

SUPPLIED WITH POOL PILOT

- 1) Residential Installation / Operation Manual
- 2) Limited Warranty with Warranty Card (Must Return)
- 3) Pool Pilot Control Panel
- 4) Chlorine / Bromine Production Cell
- 5) Salt Test Strips & Vial
- 6) Plug-N-Play Floating Canister or In-Deck Convection Chamber
- 7) Installation Kit; Including Mounting hardware



Section 2b – INSTALLATION

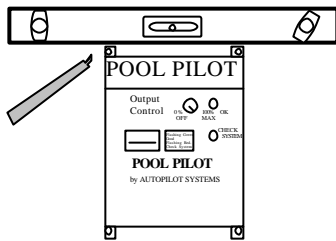
Locating and Mounting the Control Panel

Control Panel

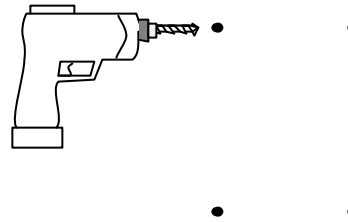
WARNING: USE THE SUPPLIED ANCHORS AND SCREWS TO MOUNT THE CONTROL PANEL. DO NOT SHOOT OR PERMANENTLY ATTACH THE CONTROL PANEL TO THE WALL! This will void warranty.

NOTE: Install at least 10' (3.0 m) for 110V Units or 5' (1.53 m) for 220V Units from the inside wall of the pool or spa.

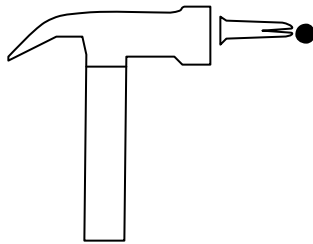
The Control Panel should be set on a vertical surface away from excessive exposure to sunlight and moisture. The standard length Cell Cord is 50' (15 m) and would require locating and mounting the Control Panel within that distance.



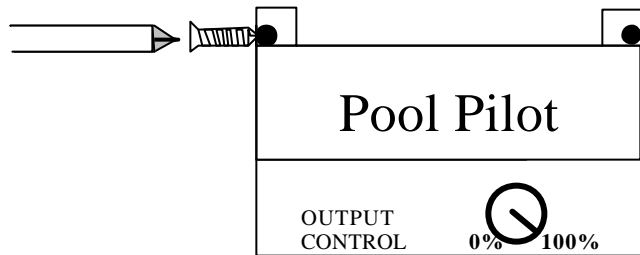
- 1) Using a torpedo level and permanent marker, hold the Control Panel on the surface to be mounted and dot each of the (4) mounting holes with the marker.



- 2) Using a 1/4" (6.3 mm) Masonry Drill Bit, drill to a depth of 1"(26 mm)



- 3) Insert the (4) supplied plastic wall anchors and tap flush with a hammer.



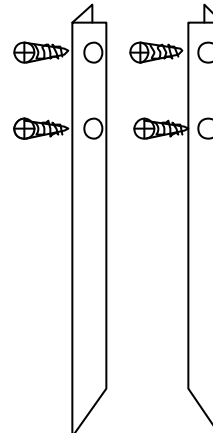
- 4) Your Pool Pilot Control Panel is now ready to receive the (4) mounting screws to complete the Control Panel Mounting.

CAUTION – REMOVAL OF THE CONTROL PANEL COVER IS NOT NECESSARY FOR INSTALLATION. If removal becomes necessary, follow the directions for Removing the Housing Cover in the SERVICING AND REPLACING PARTS section, page 16.

NOTE: For installations that may exceed the supplied 50' (15 m) Cell Cord, you can add a junction box and use the Ground Mounting Kit (PN#15422) or call for Technical Information Bulletin (TIB) #10 regarding additional Control Panel and Cell Location and Installation Schematics. Other lengths of Cell Cord are available in 25' (7.5 m) and 100' (30m) by Special Order Only.

Ground Mounting Kit (PN# 15422) consist of the following:

- (2) 3' (92 cm) – 3/4" x 3/4" x 1/8" (6.5 mm x 6.5 mm x 3.1 mm) aluminum angles with (4) pre-drilled 5/32" (4.0 mm) holes.
- (4) #10-32 3/8" SS screws. Two for each side of the mounting holes of the Control Panel.



Section 2c – INSTALLATION

Control Panel Connections

Electrical Connections: In-Line units must be integrated with the Pool Pump Operation and must be connected to the **load side** of the pump control system. **Convection units** must be connected to the **line side** AC power from a dedicated circuit breaker, external control switch or any other constant Power Source. For flexibility, ease of wiring and making connections, #14 gauge stranded wire is recommended for interconnection between the Power Source and the Control Panel. Wiring diagrams are located on the Control Panel's Back Plate. **NOTE:** Your local Power Company may offer an "Energy Miser Power Interruption Program" that will cause false problems, inaccurate time clocks as well as premature Cell failures that are NOT covered under warranty. Ensure that your pool equipment is NOT connected to this program.

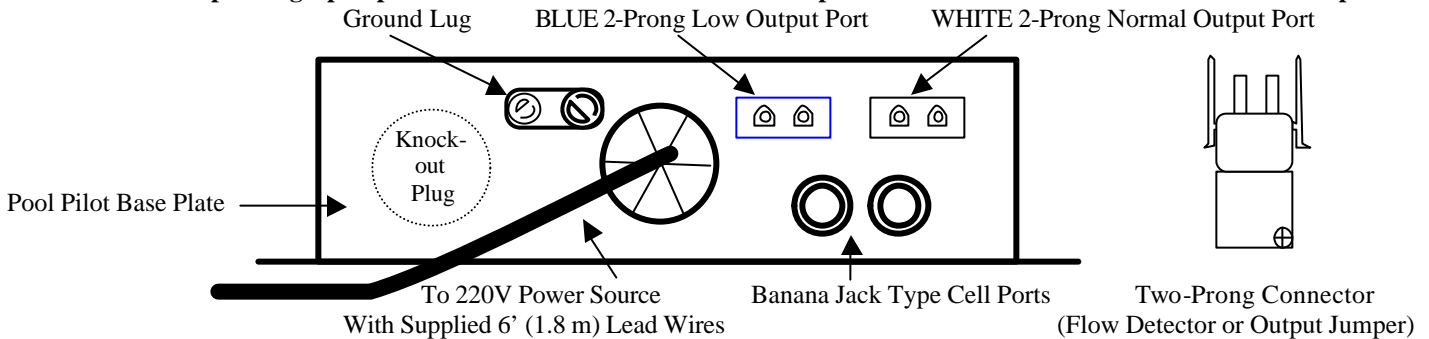
U.S. / Canadian 220 Volt Models Only (You cannot switch to 110 Volt Power)

The 220V Pool Pilot models come supplied with 6' (1.8 m) of lead wiring to connect to your Power Source. Use the green and yellow stranded wire for Control Panel grounding. Attach a #8 or #6 solid bond wire to the Ground Lug on the underside of the unit. Connect the incoming AC power to the blue and brown wires on the Control Panel using the supplied wire nuts.

U.S. / Canadian 220V TIME CLOCK MODEL:

The Knockout Plug on the base plate is replaced with a second set of 6' (1.8 m) Lead Wires to connect to your 220V Filter Pump. These are labeled "AC INPUT" and "TO PUMP" to avoid installation errors. The on/off cycles of the pump will be controlled by the time clock. See the Time Clock Section in the KEY FEATURES and CONTROLS, on page 11 to set the time clock.

Note: 220V Units operating a pump with a rated current in excess of 12 Amps must be connected to a circuit rated at 20 Amps.



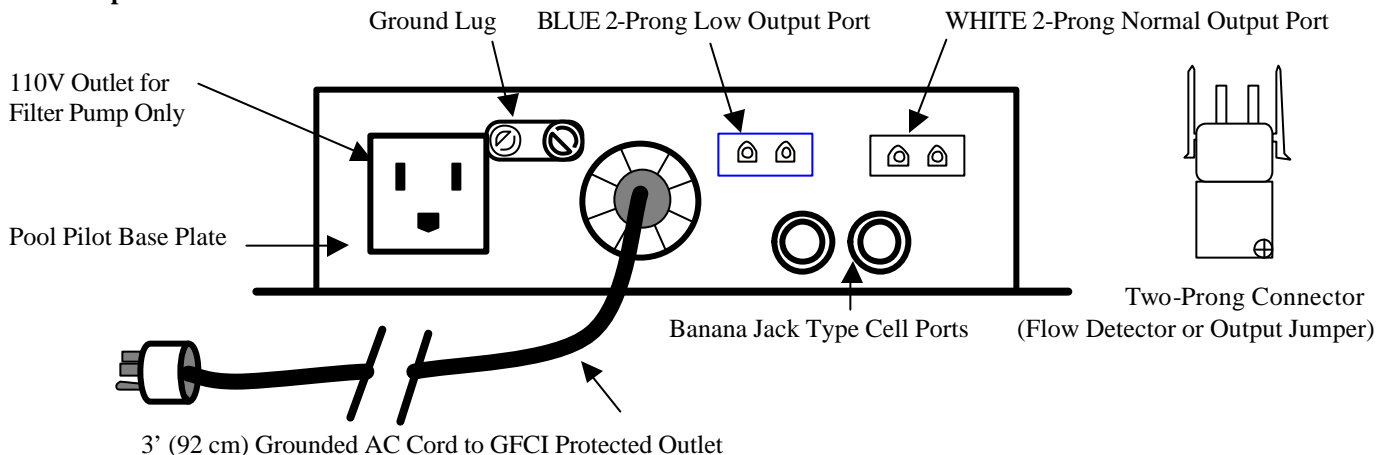
U.S. / Canadian 110 Volt Models Only (You cannot switch to 220Volt Power)

Wiring: The 110V Pool Pilot models come supplied with a 3' (92 cm) grounded AC cord. Plug into a Ground Fault Circuit Interrupter (GFCI) Protected Outlet. There is a 3-prong Outlet mounted on the Base Plate of the Pool Pilot for your 110V filter pump. This AC Outlet receives constant power when the Control Panel is powered and is intended ONLY for the filter pump. DO NOT use for any other purposes.

U.S. / Canadian 110V TIME CLOCK MODEL:

The 110V Outlet is controlled by the time clock. See the Time Clock Section in the KEY FEATURES and CONTROLS, on page 11 to set the time clock.

Note: 110V Units operating a pump with a rated current in excess of 12 Amps must be connected to a GFCI protected circuit rated at 15 Amps.



Section 2c – INSTALLATION

Control Panel Wiring

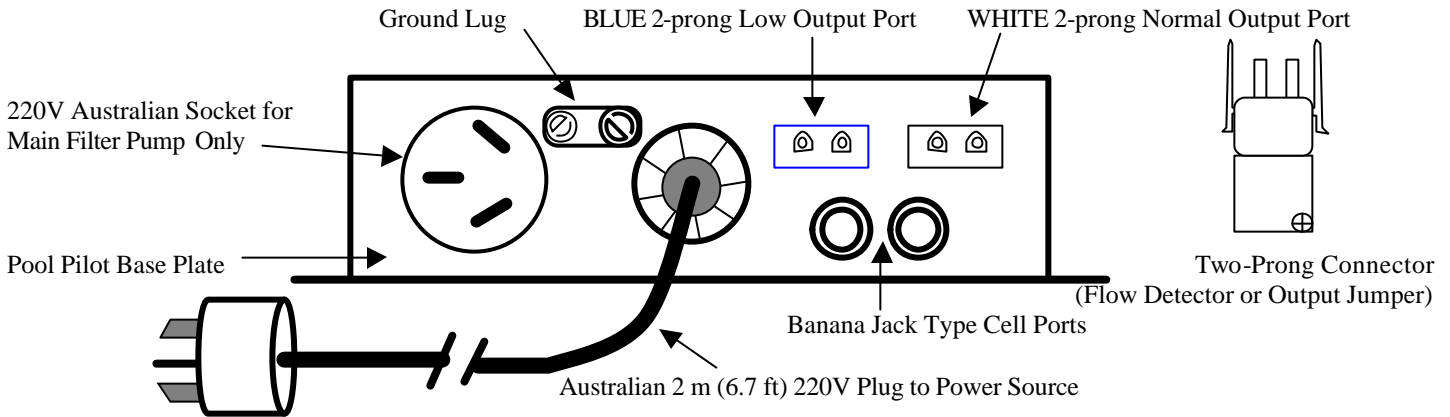
Australian / New Zealand 220 Volt Models Only:

The base plate has a 220V, 10 amp Socket that is interconnected to the Main Filter Pump ONLY and will not operate if disconnected. The 220V Australian / New Zealand Pool Pilot Models come supplied with a 2 meter (6.7 ft) AC cord.

Australian / New Zealand 220V TIME CLOCK MODEL:

The 220V Outlet is controlled by the time clock. See the Time Clock Section in the KEY FEATURES and CONTROLS, on page 11 to set the time clock.

NOTE: The pump rating is limited to 8 Amps for Time Clock or Non-Time Clock Models.



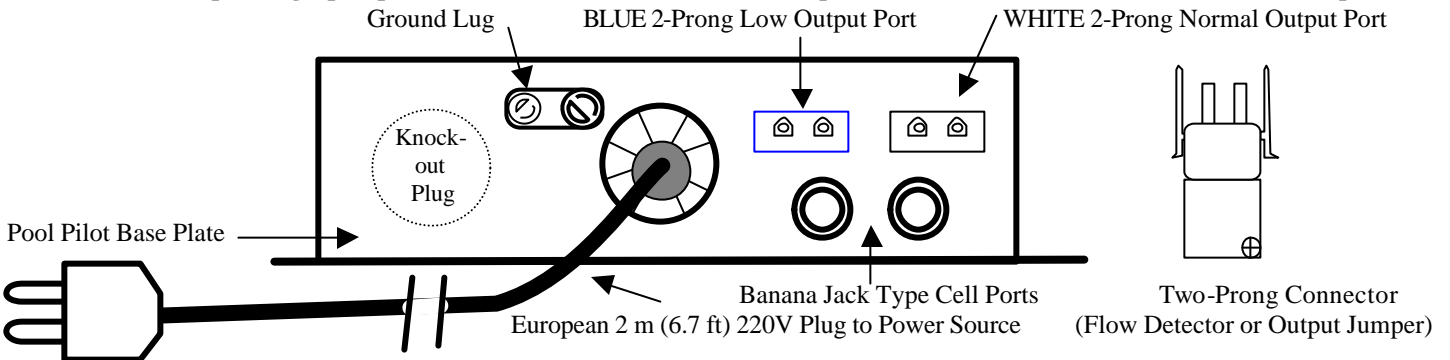
European 220 Volt / 50 Cycle Models Only

The 220V Pool Pilot models come supplied with 2 m (6.7 ft) of lead wiring to connect to your Power Source. Use the green and yellow stranded wire for Control Panel grounding. Attach a #8 or #6 solid bond wire to the Ground Lug on the underside of the unit. Connect the incoming AC power to the blue and brown wires on the Control Panel using the supplied wire nuts.

European 220V/ 50 Cycle TIME CLOCK MODEL:

The Knockout Plug on the base place is replaced with a second set of 2m (6.7 ft) Lead Wires to connect to your 220V Filter Pump. These are labeled “AC INPUT” and “TO PUMP” to avoid installation errors. The on/off cycles of the pump will be controlled by the time clock. See the Time Clock Section in the KEY FEATURES and CONTROLS, on page 11 to set the time clock.

Note: 220V Units operating a pump with a rated current in excess of 12 Amps must be connected to a circuit rated at 20 Amps.



Flow Detector / Cell Production Output Ports:

The In-Line unit is provided with a Flow Detector and the Convection Unit comes with an Output Jumper that has a 2-Prong connector. Plug the Flow Detector or Output Jumper connector to the White Port for Normal Purifier output, or the Blue Port for Low Purifier output (reduced to 12.5% output) for spas, above ground or small volume pools.

ORP Controller: Follow the directions for Removing the Housing Cover in the SERVICING AND REPLACING PARTS section, on page 16. The Circuit Board has a 2-pin connector at terminal J2, that when shorted, the BLUE Output Port becomes the input for the ORP Controller. Use Special Order PN# 993 to install the shorting jumper at J2 and use the supplied cable to the ORP Controller Output. Ensure that your Output Control Dial is set to 100% AND the Output Jumper is in the White Normal Output Port.

WARNING: This is a dry contact input. DO NOT ENERGIZE THIS INPUT. DAMAGE TO THE CONTROL PANEL WILL OCCUR AND THE WARRANTY WILL BE VOIDED.

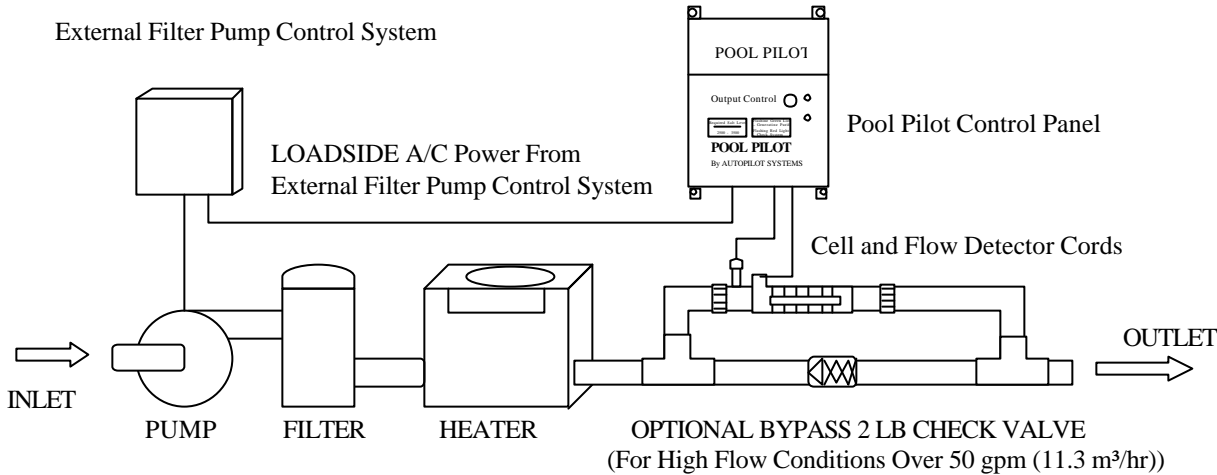
Section 2d – INSTALLATION

Locating and Installing the Cell

The Location of the Control Panel is not drawn to scale and cannot be mounted closer than 10' (3.0 m) from the inside wall of the pool or spa for 110V Units. 5' (1.5 m) minimum distance for 220V Units.

In-Line Cell Installation Diagram

Pool Pilot In-Line Cell: The In-Line Pool Pilot model uses a flow detector to read a minimal water flow of 15 gallons per minute (gpm) (3.4 m³/hr). It is also recommended that for water flow greater than 50 gpm (11.3 m³/hr), a 2lb spring check valve be used to bypass excess flow. A typical In-Line installation locates the cell and flow detector after all other equipment.



For Pool/Spa Combination, whether single pump or dual pump configuration, locate the cell in the **POOL RETURN** line only. This prevents over saturation of the chlorine residual in the spa when isolated.

For a Single Pump system using Motorized Valve Actuators, *if the spa is raised*, a swing check valve must be installed after the three way Return (Motorized) Valve on the Spa Jet Line to ensure spa drain down does not occur.

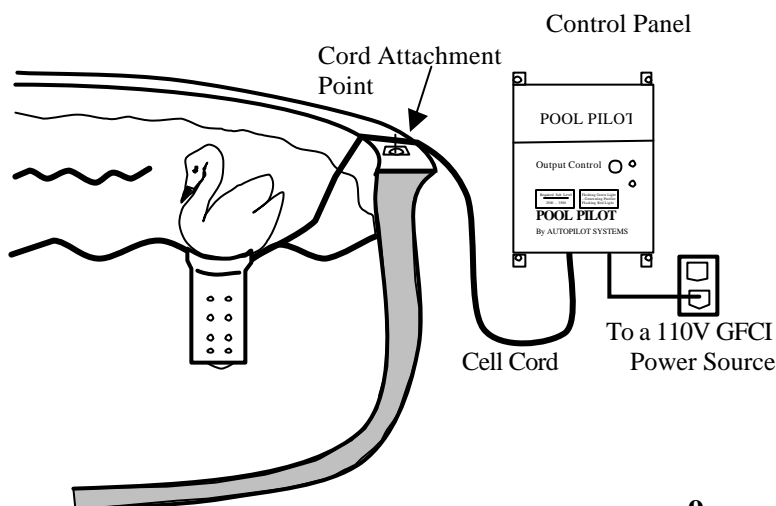
For a Dual Pump system using hydraulic valves, *if the spa is raised*, a 5lb spring check valve must be installed on the Pool Return line before the flow detector to ensure adequate spa spillover.

If you require further assistance, please contact our office for plumbing diagrams or other assistance.

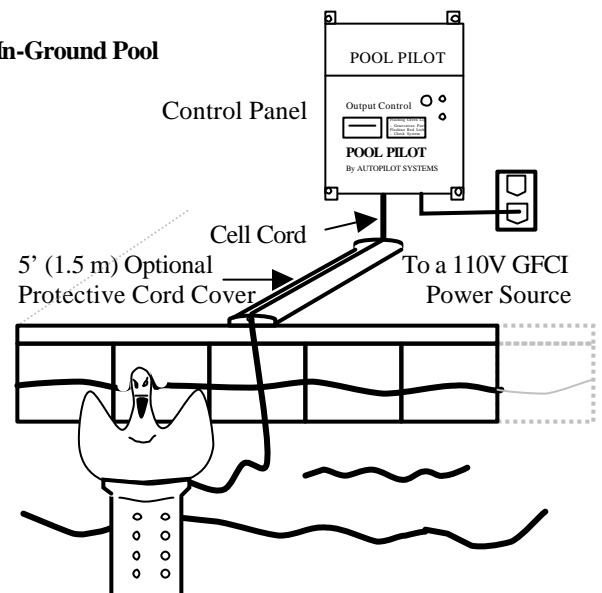
Convection Cell Installation Diagrams

In-Pool Floating Cell: Secure the Cell Cord to the side but allow enough slack so that the Cell is capable of being placed on the deck for cleaning or maintenance. NOTE: Do not place the Floater adjacent to any entrance or exit areas.

Spa or Above Ground Pool



In-Ground Pool



Section 2d – INSTALLATION

Locating and Installing the Cell (Con't)

Convection Cell Installation Diagrams

In-Deck Chamber with Cell: Use 1.5" (3.81 cm) minimum diameter pipe from Chamber. The discharge (effluent) side of the Chamber is to be at a typical location and should be mounted a minimum of 6" (15.4 cm) below the normal water level. The suction (influent) side of the Chamber can be plumbed to several locations. Contact us for additional schematics with dual port bottom drain or side suction sump, or skimmer connections.

Two Styrofoam pieces are provided with the In-Deck Chamber. Place the smaller Styrofoam plug into the bottom of the chamber to protect against debris clogging the bottom port. The larger Styrofoam ring is used to attach the Deck Ring and Lid. Ensure that the deck lid is centered and positioned over the chamber before paving or pouring the deck, so that there is easy access to the cell for service. After positioning the Chamber, it is recommended to pour a concrete shell encasing the Chamber to prevent any potential breakage. Ensure that the suction and discharge openings are 1" (2.54 cm) minimum and are unobstructed (*see note below).

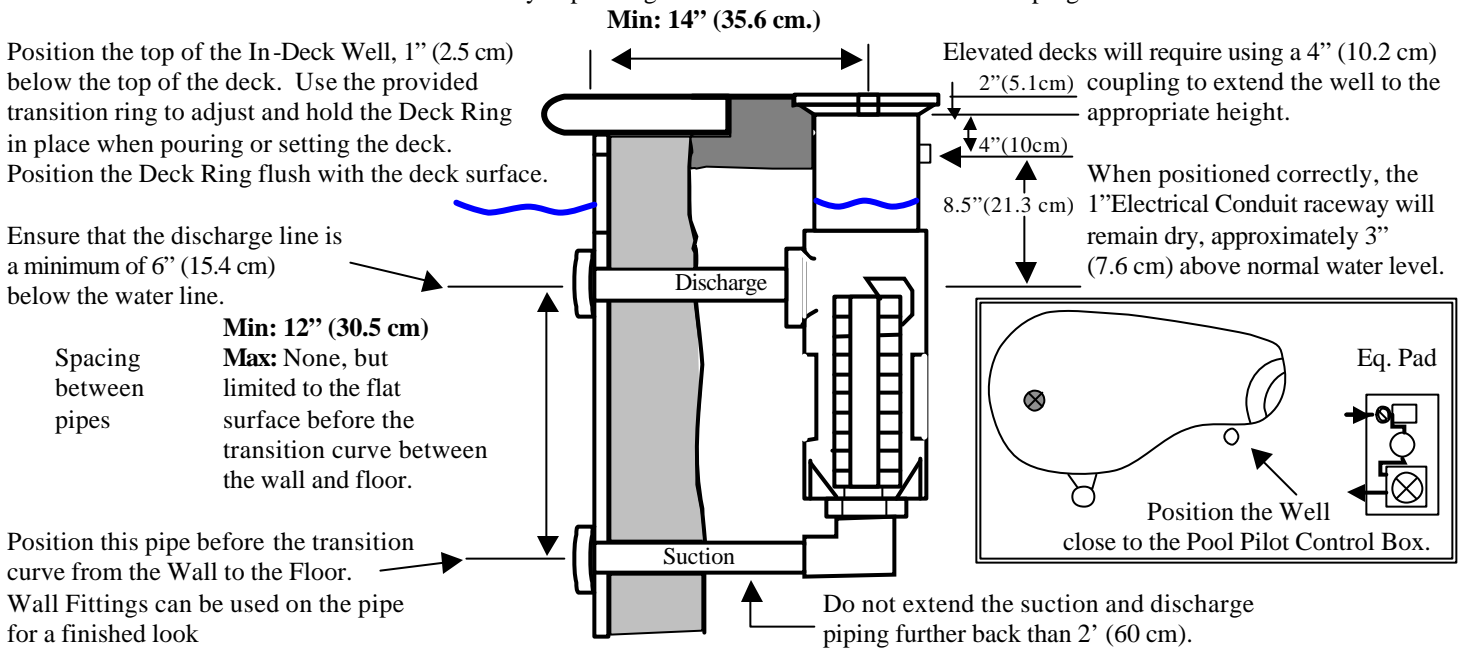
The chamber is supplied with a 1" conduit fitting. We recommend using 1" conduit from the chamber back to the Control Panel to ease installation/replacement of the cell cord. We also recommend that as few angles as possible are used to route the conduit.

To avoid twisting and kinking the cord, un-bundle the cell cord and lay it flat across the deck before pulling through the conduit. Route and pull the Cell cord through the conduit to the Control Panel until the Cord Stop Label is at the Conduit Opening (approximately 18" (45.72 cm) from cell) to allow access of the cell from the deck.

NOTE: Before the pool is ready to be filled with water, remove the smaller Styrofoam plug from the bottom of the chamber and flush any debris out with a jet stream of water.

To ensure a quick and easy start up, mix a bucket of water from the pool, previously treated with salt, into the convection chamber. This assures proper salt levels in the chamber for cell activation.

This distance will vary depending on the thickness of the wall and coping.



*** CAUTION:** Use 1.5" (3.81 cm) minimum diameter pipe from Chamber. Inlet fittings can be used to provide a finish appearance to the wall. However, do not use the eyeball inserts or reduce less than 1" opening!

For highest efficiency, it is recommended to position the In-Deck chamber with as short a run to the Pool Pilot Control Panel as possible and to cut back any excess cell cord. Provided enough slack at the control panel, one or two loops of cord, for servicing the cell if needed. Installation Video is available upon request.

Section 3a – OPERATION

Key Features and Controls

Key Features

Your Pool Pilot is equipped with several key features and very few controls to make it easy for you to maintain and operate. After the initial start-up period, your pool will be ready for Pool Pilot to take over so you can sit back and relax!

Self-Test Cycle: During the first minute of every start-up, your Pool Pilot will perform a series of self-diagnostic test. This is indicated by the alternating GREEN/RED flashing Lights. After the initial Self-test, a GREEN “OK” Light will indicate all functions are normal while a RED “Check System” Light will indicate any problem. Your Pool Pilot will halt Purifier production until the RED Light is corrected. See the TROUBLESHOOTING section, on page 15 for corrective measures.

At the end of operation, the GREEN Light remains on and will slowly dim, allowing the capacitors to discharge. This is normal and not a cause for alarm. Allow one minute for the unit to reset before starting back up.

Self-Cleaning Cycle: Your Pool Pilot is equipped with a self-cleaning feature that automatically cleans the Cell for optimum efficiency by reversing the electrical current flow. The frequency of the reversal depends on the Output Dial setting so that as your Purifier demand increases so does the frequency of the cleaning cycle. Under extreme water chemistry imbalance, specifically scale forming conditions, or high calcium hardness levels, a build-up can occur on the blades much faster than this feature can handle at the factory settings. When the reversal rate cannot clean the scaling sufficiently, the Cell will require manual cleaning, as described in the Manual Cell Cleaning section in the MONITORING AND MAINTENANCE, on page 14.

“OK” Indicator Light: Your Pool Pilot will show a GREEN Light when all systems are normal. The Light will flash GREEN when Purifier is being generated and is controlled by the Output Control Dial. The higher percentage the Output Dial is set, the more you will see the flashing GREEN Light rather than a steady GREEN Light. At 100% Output, your Pool Pilot will be constantly flashing GREEN, indicating a constant production of Purifier.

“Check System” Indicator Light: Your Pool Pilot is equipped with a diagnostic feature that prevents operation during cold water temperatures, low salt residual levels and improper Cell conditions. These conditions can contribute to the premature deterioration of the conversion Cell. Whenever there is a problem with any of these parameters, the RED “Check System” Light will come on. The sequence of flashes will help pinpoint what needs to be cleaned or adjusted. See the TROUBLESHOOTING section, on page 15 for corrective measures.

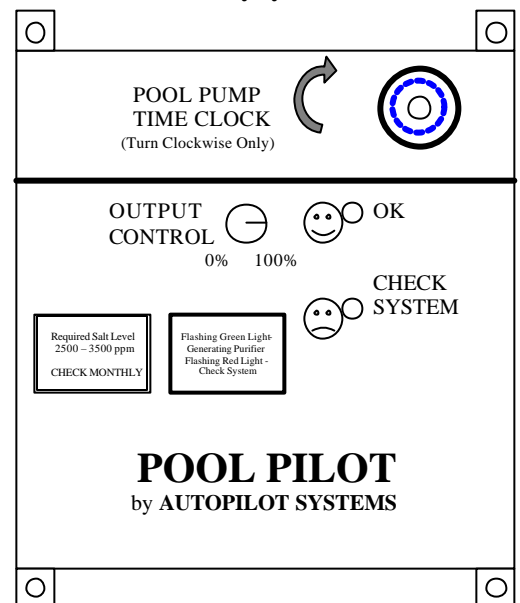
Controls

Output Control Dial: The Output Control Dial varies from 0% to 100% Purifier output and controls the amount of time that the Cell receives power. During normal operation, no control changes are necessary unless the Purifier demand increases or decreases. Turn the Dial clockwise to increase Purifier levels. Turn the Dial counter-clockwise to decrease Purifier levels. Allow 2 – 3 days for the new setting to establish the new Purifier level. **NOTE: Any interruption of power will cause the current memory cycle to reset itself when power is restored.**

Time Clock Models:

Setting the Time Clock: Operates on a 24-hr cycle and controls the main filter pump cycle. The white on/off tabs located on the dial face, each representing 15-minute increments, should be positioned towards the center for “OFF” times, and pushed towards the outside for “ON” times. This allows you control of up to 96, 15-minute timing cycles. Set the clock by turning the dial clockwise only, until the correct time is aligned with the arrow above the 3 O’clock position.

NOTE: Ensure the correct AM or PM position on the dial.



Section 3b – OPERATION

Understanding System Sizing

Pool Pilot Purifier Demands

The rate at which Purifier is **consumed** in any swimming pool depends on the relationship of several **major variables**. Since these variables can vary widely from pool to pool and season to season, precise prediction of the Purifier **demand** for any one pool can be difficult.

The Demand Variables are:

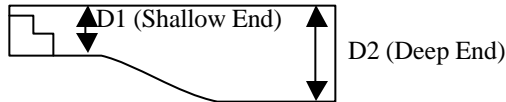
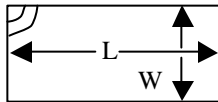
1. **Volume and Surface Area of the pool / spa being purified:**

Determining Volume of Pool

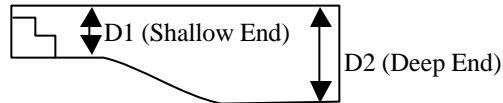
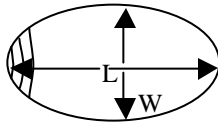
It is important to determine the volume of water that is in your pool for the proper addition of salt and other chemicals.

Use these three formulas to figure your correct gallonage, or cubic meters of water in the pool/spa and record on Page 1 for future reference:

Rectangular Pool: Length (L) X Width (W) X Average Depth $((D1 + D2) / 2)$ X **7.5** = Total Gallons
Length (L) X Width (W) X Average Depth $((D1 + D2) / 2)$ = Total Cubic Meters



Oval / Round Pool: Diameter (L) X Diameter (W) X Average Depth $((D1+D2) / 2)$ X **5.9** = Total Gallons
Diameter (L) X Diameter (W) X Average Depth $((D1 + D2) / 2)$ X **0.79** = Total Cubic Meters



- Average Water Temperature Maintained:** As the temperature of the water increases, the Purifier **demand** will also increase. As the temperature of the water decreases, the Purifier **demand** will also decrease. When this happens, the Output Dial should be adjusted to compensate for this change in **demand** (which will also protect your equipment from excessive levels of Purifier). **Aqua Cal's Heat-N-Cool Heat Pumps** allows you to heat in the winter and cool in the summer to maintain a constant water temperature year around and extending your swimming pool enjoyment.
- Cyanuric Acid Level Maintained:** This chemical, also called stabilizer or conditioner, when added to pool water, significantly inhibits Purifier depletion from exposure to sunlight. Cyanuric acid also inhibits corrosion if your pool is equipped with any metal components. Minimum levels or better must be maintained to ensure that the Purifier being produced is protected from UV breakdown. **AutoSoft Plus™** Water Conditioning Salt contains the proper ratio of salt and cyanuric acid for to maintain optimum salt and cyanuric acid levels.
- Bather Load:** As the bather load increases, the Purifier **demand** will also increase.
- Amount of direct sunlight / UV exposure:** Pools exposed to larger amounts of direct sunlight are more vulnerable to increased Purifier loss and algae growth. Indoor or screened pools have less Purifier **demand**.
- Exposure to vegetation and airborne debris:** Dense landscaping near or around the pool, along with increased nitrate levels (urine, bird droppings, fertilizer, well water, etc.) greatly contribute to increased Purifier **demand**. Nitrates and phosphates provide food for algae to thrive in. Using **Lo-chlor Chemical's Starver** treatment removes phosphates from the water to prevent algae growth.
- Chemical Dilution:** Virtually all pool chemicals experience dilution though rainfall, adding of fresh make-up water due to evaporation, splash-out, filter backwashing, leaks, etc. When freshwater is added for any of the above reasons, Purifier **demands** increase for a brief period.
- (In-Line Only) Main Filter pump run time and your pool's circulation patterns:** Sanitizer can only be produced while the filter pump is operating. During heavy sanitizer demand conditions such as warm water temperature, heavy swimmer usage or heavy waterfall/fountain/water feature usage, the filter pump run time may need to be increased to satisfy this high demand.

Section 3c – OPERATION

Start Up Procedures

The following steps should be taken to ensure a proper start-up with the Pool Pilot Purifier. In the event that you need to drain and refill your pool for any reason, refer to this section for a successful start-up.

NOTE: Do not use your Pool Pilot at start-up after freshly filling pool. First get your water clear, blue and in proper balance *before* tuning on your Pool Pilot!

1. After balancing your water chemistry according to the Water Chemistry Parameters section on page, add the proper amount of salt, as instructed in the Salt Requirement Chart, on page 13 of this manual and circulate 24-hours prior to starting your Pool Pilot. It is recommended to also add a handful of salt, or mix a bucket of pre-treated salted water directly into the In-Deck Convection well to assist at start-up.
2. Your Pool Pilot In-line runs in conjunction with your Filter Pump. Your Pool Pilot Convection runs independent of the filter pump and should display a GREEN Light when power is sent to the Control Panel.
3. Turn your Output Control Dial higher than 0%. Upon start-up, you will see the RED and GREEN Lights flash alternately for one minute while the Pool Pilot performs a self-test. After one minute, the “OK” Light will remain GREEN. If the RED “Check System” Light appears, it is an indication of a problem.
4. Whenever the “OK” Light is GREEN, power is being supplied to the control panel. Whenever the “OK” Light is flashing GREEN, Purifier is being generated. Your Pool Pilot will cycle between steady and flashing GREEN according to the Output Dial Setting, except at the 100% setting, where your Pool Pilot will be constantly flashing GREEN and producing Purifier. If a RED “Check System” Light is displayed, there is a problem with part of the system. Please note the sequence of flashes, either single, double, triple or quadruple, and consult the TROUBLESHOOTING section, on page 15.
5. For the first two weeks, test the water every 2-3 days for proper Purifier levels. Raise or Lower the Output Control Dial as needed, according to your test results. A simple rule to follow...
As the water temperature decreases, Purifier demand also decreases.
Lower the Output Dial setting to satisfy this change in Purifier demand until it is necessary to raise the residual level. Water temperatures below 60°F are detrimental to the life of the Cell. We recommended setting the Output Dial to 0% and manually “shock” with Potassium Monopersulfate as needed, until the water temperature increases above 60°F.
As the water temperature increases (or an increase in any of the demand criteria), Purifier demand also increases.
Raise the Output Dial setting to satisfy this change in Purifier demand until it is necessary to lower the residual level.
6. To protect and extend the life cycle of the Cell, any RED Lights displayed will shut off power to the Cell and will not display any “OK” Lights. At this point, no Purifier is being generated until the RED Light status is corrected. Check the TROUBLESHOOTING section, on page 15 or contact your dealer or AutoPilot Systems Inc for further assistance.

Section 3d – OPERATION

Pool Water Preparation

Salt Requirements

It is important that a salt residual of 2500 to 3500 ppm be maintained at all times for peak efficiency. Allowing less than 2200 ppm salt will activate a double flashing red “Check System” Light and stop Purifier generation. The amount of salt required depends on the size of the pool and the present salt level. We recommend the use of **AutoSoft Plus™** Water Conditioning Salt.

AutoSoft Plus™ salt contains 99.8% pure Sodium Chloride (NaCl) without Iodine or the Anti-Caking additive, Yellow Prussiate of Soda (YPS) that can cause a localized tint to the water or yellow staining on the cementitious finish if allowed to rest undissolved, on the finish for any extended periods of time. **AutoSoft Plus™** also contains the proper amount of stabilizer needed to maintain a proper level within the recommended range when added according to the salt chart on the box.

Granular Salt dissolves as quickly as the **AutoSoft Plus™** and can be utilized, as well as Solar Salt or Water Conditioner Pellets, which take longer to dissolve. In the event that the salt you use contains Iodine or YPS, constant brushing will help the dissolve rate and help prevent any staining due to the additives in the salt. Ensure that the salt you use contain a minimum purity of 99% Sodium Chloride (NaCl).

NOTE: Do not use Rock Salt due to its high levels of impurities.

First, determine the current salt residual with the provided salt test strips, and then use the chart below to determine the amount of salt to add. Before adding salt to pool for the first time, turn your Pool Pilot’s Output Control Dial to “OFF” (0%), open the main drain valve, then with the main filter pump running, pour the salt around the inside perimeter of the pool. For above ground pools, **slowly** add salt through the skimmer (or pre-dissolve in a bucket first). Circulate your water for a minimum of 24 hours to allow the salt to completely dissolve before turning your Pool Pilot Output Control Dial “ON”.

Throughout the swimming season, your salt residual level should remain relatively stable. Usually once or twice a season, salt may be lost due to heavy bather splash out, filter backwashing, rain or makeup water dilution, or leaks. As you perform your periodic maintenance checks, if the salt residual falls below 2500 ppm, add the proper amount of salt to reestablish the optimum range.

POUNDS (kg) OF SALT NEEDED FOR 3000 PPM RESIDUAL

SALT Level Before Addition	Pool / Spa Volume in Gallons (m ³)								
	300 (1.1)	500 (1.9)	750 (2.8)	1000 (3.8)	5000 (18.9)	10000 (37.7)	13000 (49.0)	18000 (67.9)	20000 (75.5)
0 ppm	7.4 (3.4)	12.0 (5.5)	19.0 (8.6)	25.0 (11.4)	124.0 (56.4)	248.0 (112.7)	322.0 (146.4)	446.0 (202.7)	495.0 (225.0)
300 ppm	6.7 (3.0)	11.0 (5.0)	17.0 (7.7)	22.0 (10.0)	111.0 (50.5)	223.0 (101.4)	290.0 (131.9)	401.0 (182.3)	446.0 (202.7)
500 ppm	6.2 (2.8)	10.0 (4.5)	15.0 (6.8)	21.0 (9.5)	103.0 (46.8)	206.0 (93.6)	268.0 (121.8)	371.0 (168.6)	413.0 (187.7)
750 ppm	5.6 (2.5)	9.0 (4.1)	14.0 (6.4)	19.0 (8.6)	93.0 (42.3)	186.0 (84.5)	241.0 (109.6)	334.0 (151.8)	371.0 (168.6)
1000 ppm	5.0 (2.3)	8.0 (3.6)	12.0 (5.5)	17.0 (7.7)	83.0 (37.7)	165.0 (75.0)	215.0 (97.7)	297.0 (135.0)	330.0 (150.0)
1250 ppm	4.3 (1.9)	7.0 (3.2)	11.0 (5.0)	14.0 (6.4)	72.0 (32.7)	144.0 (65.5)	188.0 (85.5)	260.0 (118.2)	289.0 (131.4)
1500 ppm	3.7 (1.7)	6.0 (2.7)	9.0 (4.1)	12.0 (5.5)	62.0 (28.2)	124.0 (56.4)	161.0 (73.2)	223.0 (101.4)	248.0 (112.7)
2000 ppm	2.5 (1.1)	4.0 (1.8)	6.0 (2.7)	8.0 (3.6)	41.0 (18.6)	83.0 (37.7)	107.0 (48.6)	149.0 (67.7)	165.0 (75.0)
2250 ppm	1.9 (0.9)	3.0 (1.7)	5.0 (2.3)	6.0 (2.7)	31.0 (14.1)	62.0 (28.2)	80.0 (36.4)	111.0 (50.5)	124.0 (56.4)
2500 ppm	1.2 (0.5)	2.0 (0.9)	3.0 (1.7)	4.0 (1.8)	21.0 (9.5)	41.0 (18.6)	54.0 (24.5)	74.0 (33.6)	83.0 (37.7)

Note: The above chart is based on 1 lb. (2.2 kg) of salt added to 1 million pounds of water (Approximately 120,000 gallons (1283 m³)), which equals 1 ppm of salt.
One (1) lb. (2.2 kg) of salt added to 1,000 gallons (3.8 m³) will increase your salt residual 120 ppm.

Section 3e – OPERATION

Monitoring and Maintenance

Water Chemistry - VERY IMPORTANT NOTE! Your Pool Pilot is designed to provide Purifier on a daily basis. We recommend the following water chemistry ranges and periodic checks to monitor your systems efficiency.

Biweekly Checks:		Monthly Checks:	
Free Chlorine: 1.0 – 3.0 PPM		Calcium Hardness: 200 – 400 PPM	Salt Residual: 2500 – 3500 PPM
Or Bromine: 2.0 – 4.0 PPM		Total Alkalinity: 80 – 150 PPM	Langelier's Index: ± 0.3 pH of saturation
pH: 7.2 – 7.8		Cyanuric Acid: 60 – 80 PPM	Visual Cell Inspection for wear, scale or debris

CHLORINE/BROMINE REQUIREMENTS: During Peak Purifier Demand (summer months, rainy season or heavy bather usage) it may be necessary to increase your Purifier output by increasing your Output Dial setting. Conversely, during Low Purifier Demand, you can decrease your Output Dial to a lower setting. For extremely Heavy Purifier Demand or to boost your chlorine residual levels quickly, you can supplement with a *Non-Chlorine Shock* containing **POTASSIUM MONOPERSULFATE**.

NOTE: During cold water conditions, below 60°F, Purifier demand is reduced significantly. For colder climate regions with sustained low temperatures, visit your local pool professional for proper pool winterizing instructions. For warm climate regions, it is recommended to reduce your Output Dial setting or introduce a higher chlorine residual (3.0 ppm) then turn “OFF” your Pool Pilot to further protect the Cell from premature wear.

pH: When your pH falls below the accepted range, your Purifier is used up very quickly. For pH levels higher than the accepted range, your Purifier becomes much less effective. Improper pH also contributes to the strong smell, red eyes, dry itchy skin and brittle hair conditions usually associated with “too much Chlorine”.

CALCIUM HARDNESS AND TOTAL ALKALINITY: Your Pool Pilot provides 100% pure Sodium Hypochlorite and does not affect the calcium hardness or total alkalinity levels. When you start up and maintain your pool with proper water chemistry, it stays balanced much easier, until influenced by adding other ancillary chemicals or “out of balance” make-up water.

CYANURIC ACID (STABILIZER/CONDITIONER): This chemical goes by either trade name and allows your chlorine residual to last longer by protecting it from the UV rays of the sun. With low or no Cyanuric acid it is possible for the chlorine being produced, to be used up just as quickly as it enters the pool.

NOTE: For Bromine or indoor pools, it is not necessary to maintain a stabilizer level to protect the Purifier from the UV rays. However, it is recommended to maintain a minimal 15-ppm to protect metallic fixtures from possible corrosion.

SALT RESIDUAL: Your Pool Pilot works most efficiently with salt levels between the above-recommended ranges. Low salt will cause premature deterioration on the Cell blades. For SALTWATER pools, your Pool Pilot is designed to handle up to 35,000 ppm without harmful effects on the unit. However, high salt levels, above 6000 ppm have been known to cause corrosion on metallic fixtures.

LANGELIER'S INDEX: (or Saturation Index) A mathematical formula used by Pool Professionals to ensure that your total water chemistry does not fall into a corrosive or aggressive condition. Either condition can cause premature damage to the Cell, any of your other equipment as well as your cementitious finish.

VISUAL CELL INSPECTION:

REMOVING THE CELL: Follow the directions in the Removing and Replacing the Cell section in the **SERVICING AND REPLACING PARTS**, on page 16.

The titanium Cell blades, seen inside the Cell body, should be straight and clear of any debris between the blades. Your Pool Pilot is designed to automatically self-clean calcium scale build up within the Cell. However, certain conditions can cause a heavier scale build up that exceeds the self-cleaning capability and would need to be cleaned manually by the method described in the next section.

Manual Cell Cleaning:

With the Cell removed as described in the Removing and Replacing the Cell section in the **SERVICING AND REPLACING PARTS**, on page 16, use a high-pressure hose nozzle to spray off as much loose scale and debris as possible. Any remaining calcium scale can be treated with a mixture of one (1) part Muriatic Acid into four (4) parts water. Mix the solution in a pail, high enough to cover the Cell blades.

Remove the Cell cord and immerse the Cell so that the blades are completely covered in the solution for no more than 15 minutes intervals. Drain and flush with fresh water and re-inspect. Repeat the immersion if necessary.

CAUTION: ALWAYS ADD ACID TO WATER, never water to acid.

NEVER USE ANY SHARP OBJECTS TO REMOVE SCALE. Scraping or scratching the titanium blade's edge or surface will allow chemical attack of the blade and cause premature failure of the Cell and will void your warranty.

Section 4a – TROUBLESHOOTING AND SERVICING

TROUBLESHOOTING

<u>PROBLEM</u>	<u>CAUSE</u>	<u>SOLUTION</u>
1) Insufficient Purifier Production.	A) The test kit reagents or test strips are old or expired. B) The unit is set too low in relation to increased demand. C) The bather load has increased. D) Purifier loss due to intense sunlight exposure. E) The body of water being purified leaks. F) Low Salt. G) Flow Detector / Output Jumper connector plugged into the wrong input. H) Suction (bottom port of In-Deck Well) is blocked	A) Retest with new Reagents or Strips. B) Turn the output dial to a higher setting. C) Same solution as (B) or add a Non-Chlorine Shock containing Potassium Monopersulfate, to super-chlorinate. D) Check your stabilizer level and adjust if needed. If on Bromine, replenish bromine residual. E) Repair the leak and rebalance as needed. F) Check the salt level and adjust as needed. In-Deck wells may experience low salt at start-up. Manually add a handful into the In-Deck well to assist start-up. G) Unplug cable from the BLUE two-hole input and plug into the WHITE two-hole input. H) Ensure that this Port is clear from debris.
2) Scale Build-up within the Cell.	A) The water being purified contains high pH, total alkalinity and calcium hardness levels. B) Possible Cell failure. C) Power Supply not Reversing. D) In-Deck Chamber piping restrictive.	A) Calculate Langelier's Index to assure balanced water. Adjust chemicals and clean the Cell as described on page 14. B) Same as above. Replace Cell. C) Contact the factory for repair or replacement. D) See Installation Instructions, Pg. 10.
3) DC Plug and Cell Terminals Burned.	A) The Cell cord plug is not securely pushed onto the Cell terminals allowing moisture to seep into the plug. B) The Cell terminals leak. C) Completely failed Cell.	A) Ensure the Cell cord plug is pressed completely onto the Cell terminal. Check the terminals and clean with a dry cloth to remove all dirt and corrosion. B) Contact the factory for Warranty Status and Procedures. C) Replace the Cell.
4) Premature Cell Failure (Requires replacement Cell. Life expectancy at 100% Output is approximately 11,000 hrs).	A) Abnormally high Cell usage due to an insufficient Stabilizer (Cyanuric acid) level. B) Debris in the Cell.	A) Check the stabilizer level as recommended and adjust. B) Inspect the Cell monthly and clean debris if needed.
5) White Flakes in the Water.	A) This occurs when excessive calcium hardness is present in the water. This should cease after a few days.	A) Visually inspect Cell for scale build-up and clean the Cell as described on page 14. Adjust water chemistry as needed.
6) No "OK" Light with Power to the Control Panel.	A) Power fuse blown.	A) Replace this fuse as described on page 16.
7) Single "CHECK SYSTEM" Flash (Purifier Production Output Port).	A) The Flow Detector, Cord or Output Jumper is loose or not connected properly.	A) Check the Flow Detector, Cord or Jumper for continuity and tightness into the port and at the Flow Detector.
8) Double "CHECK SYSTEM" Flash (Cell Condition, Low Salt or Cold Water Temperatures).	A) The Cell is scaled. B) The Cell cord is disconnected from the Cell. C) Low salt. D) Possible Cell failure. E) Very cold pool water.	A) See #2 of this section. B) Ensure that the Cell cord is firmly pressed onto the Cell. C) Check residual salt level of and adjust if needed. It may be possible for the salt residual in the In-Deck Well to be lower than the level in the pool. Manually add a handful if needed. D) Check with 957A tester and replace cell if needed. Also see #4 of this section. E) Lower the output dial, even to the "0" position and add a Non-Chlorine Shock containing Potassium Monopersulfate to the pool until the water temperature increases to above 60°F.
9) Triple "CHECK SYSTEM" Flash (Cell Problem).	A) Low Cell voltage.	A) Check with 957A tester. Replace Cell if needed.
10) Quadruple "CHECK SYSTEM" Flash (Control Panel Problem).	A) No Cell voltage or current.	A) Send the Control Panel back to the factory for service.

Section 4b – TROUBLESHOOTING AND SERVICING

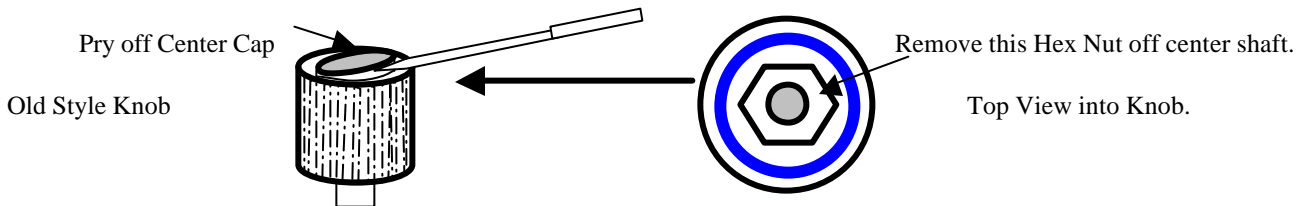
SERVICING AND REPLACING PARTS

Replacing the Control Panel

Turn off all power going to the Control Panel and verify with a voltmeter. Unplug the Output Jumper and Cell Cords from under the Control Panel and install in the same location of the new Control Panel. Remove the 220V electrical wire connections from the junction box, circuit breaker or time clock, or unplug the 110V cord. Page 6 shows the steps to install the control panel. Remove the four Control Panel mounting screws and replace with the new Control Panel. Reconnect the electrical connections; turn on all power going to the Control Panel and check for proper operation.

Removing the Housing Cover:

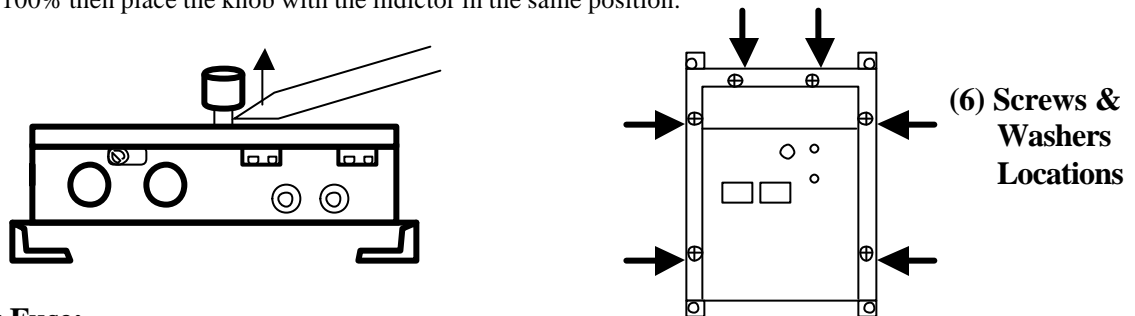
*Older model two piece knobs have a center cap on top of the knob. You are required to first pry off the center cap, which will reveal a hex nut. Loosen the hex nut with needle nose pliers and lift off the knob.



For newer one-piece knobs, remove the one-piece knob by prying it off the shaft from its base. This is a compression fit and should pop right off.

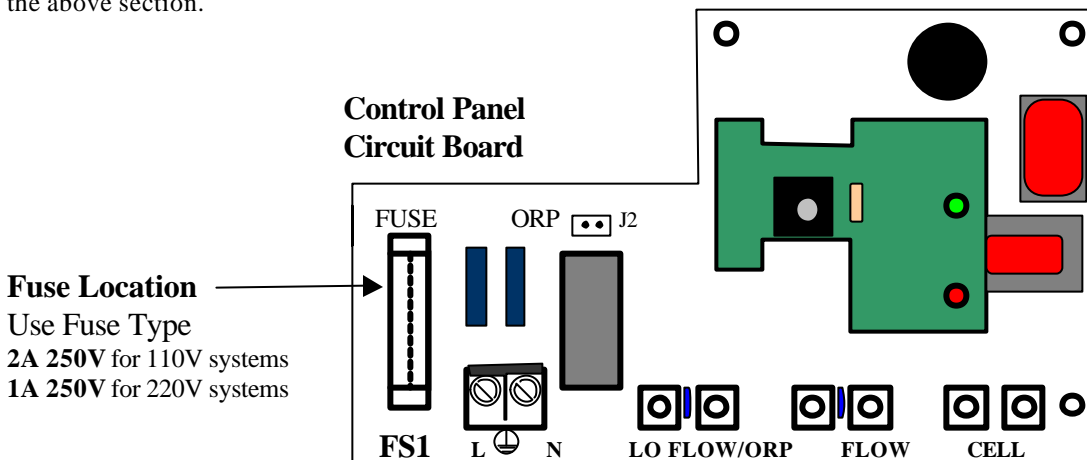
Turn off all power going to the Control Panel and verify with a voltmeter. Remove the knob and (6) stainless steel screws and washers, see below location arrows, and lift off the Housing Cover. Reverse these steps to re-install the cover and knob making sure to align the Output Control shaft position with the Output Control Dial indicator.

*Align the shaft to 0% or 100% then place the knob with the indicator in the same position.



Replacing the Power Fuse:

If no Lights are displayed with power going to the Control Panel, inspection and possible replacement of the power fuse may be necessary. Follow the above directions for Removing the Housing Cover. Once removed, access to the electronics is gained. On the Control Panel circuit board, there is a power fuse located at terminal **FS1**. For the 110V unit this is a 2-amp fuse, and a 1-amp fuse for the 220V unit. This fuse protects the Control Panel and Cell from voltage spikes. Remove the old fuse and replace with the new fuse. Ensure that the fuse rating is the same as the one removed. Re-install the Housing Cover and Output Control Dial knob as described in the above section.



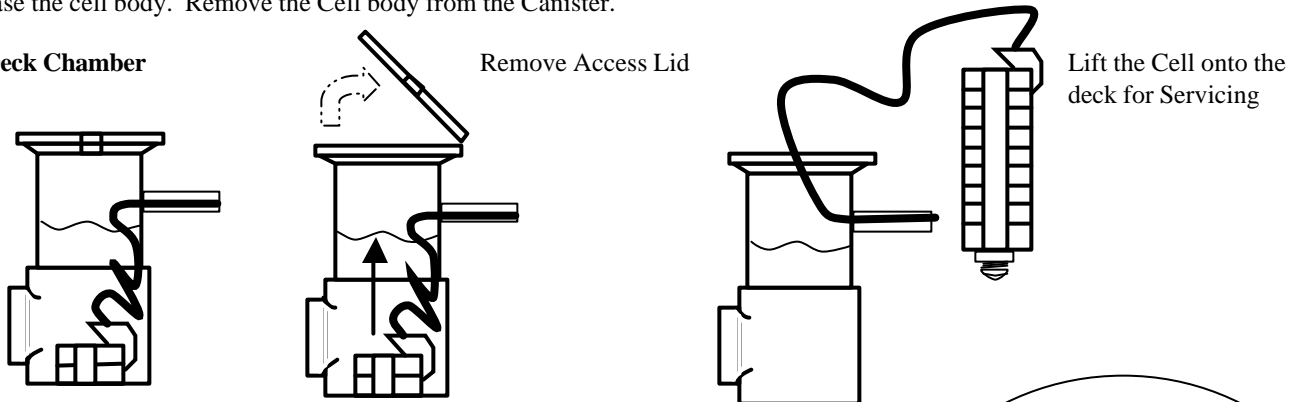
Section 4b – TROUBLESHOOTING AND SERVICING

SERVICING AND REPLACING PARTS (Con't)

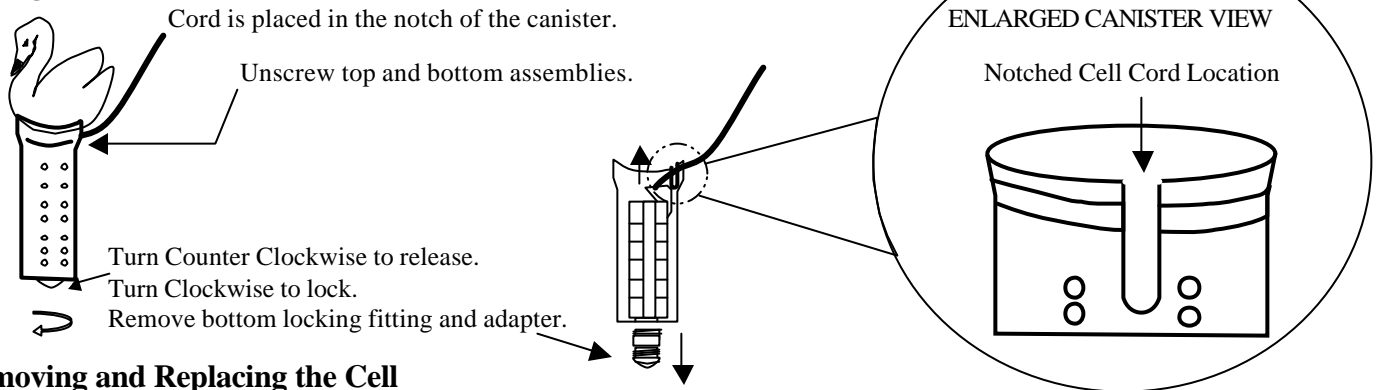
Accessing the Cell Body

The **In-Line Cell Body** and Flow Detector are attached with Unions to allow easy access and removal. The **In-Deck Cell Body** should be initially installed with enough slack in the cord to allow removing and servicing the cell body on the deck simply by lifting the Cell Body out. The **In-Pool Floating Cell Body** should be removed from the Canister housing for manual cleaning. Separate the Top Float from the Bottom Canister by unscrewing them. Also unscrew the bottom locking fitting (and adapter if supplied) under the Canister to release the cell body. Remove the Cell body from the Canister.

In-Deck Chamber

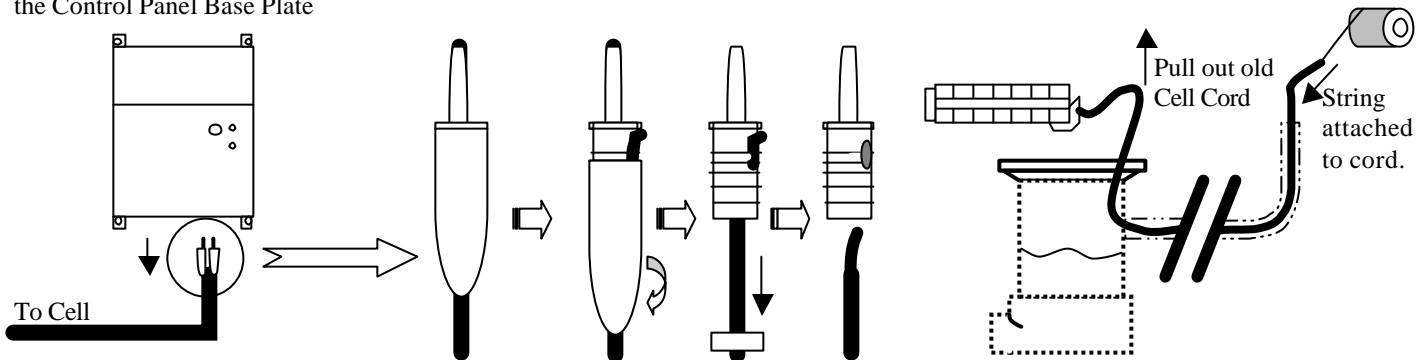


Floating Canister



Removing and Replacing the Cell

In-Deck Unit: Turn the Control Panel off. Ensure that the water level is not above the conduit fitting within the Chamber and drain if necessary. The Cell cord is permanently wired to the Cell body but is removable at the Control Panel. Unplug the two Banana Plugs and remove the Banana Plug Housing. Attach a string to the exposed wire ends with enough lead to run the length of the conduit from the control panel to the Convection Chamber. This will greatly help in pulling the new cord back through the conduit. Pull out the old cord with the string attached from the Convection Chamber end. The new cord can be tied to the string and pulled back through the conduit to the Control Panel. Re-attach the wires into the Banana Plug housing and tighten. Insert the Banana Plugs back into the Banana Jacks on the Control Panel Base Plate



In-Pool Floating Unit: Turn the Control Panel off. Remove Cell body from the Canister as described above “Accessing the Cell Body” section. Unplug the two Banana Plugs from the Control Panel and replace the Cell and cord assembly. Reroute the new Cell and cord in the same location as the original Cell and cord. Re-assemble the Plug-N-Play Cell Body and Canister, and then screw on the Top Float. Take care to protect the cord wherever exposed to lawn mowers, edgers, hedge trimmers and other equipment.