

2016  
Owner's Manual  
and Pre-delivery Guide

In-ground Spas



United States, Canada, and International



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Cal Spas Home Resort™

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### CONTACT INFORMATION

For customer service, please contact your authorized dealer immediately. If you need additional information and/or assistance, please contact:

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# Important Safety Instructions

When installing and using this electrical equipment, always follow basic safety precautions. Following these instructions will help make your first spa session a pleasurable one.

## READ AND FOLLOW ALL INSTRUCTIONS

**NOTE:** A licensed electrician may be required to upgrade your standard receptacle and/or circuit breaker.

**DANGER -- RISK OF ACCIDENTAL DROWNING:** Do not allow children to be in or around a spa unless a responsible adult supervises them. Keep the spa cover on and locked when not in use. See instructions enclosed with your cover for locking procedures.

**DANGER -- RISK OF INJURY:** The suction fittings in this spa are sized to match the specific water flow created by the pump. Should the need arise to replace the suction fittings, or the pump, be sure the flow rates are compatible.

**DANGER -- RISK OF INJURY:** Never operate the spa if the suction fitting or filter baskets are broken or missing.

**DANGER -- RISK OF INJURY:** Never replace a suction fitting with one that is rated less than the flow rate marked on the original suction fitting.

**DANGER -- RISK OF ELECTRIC SHOCK:** Install the spa at least five feet (1.5 meters) from all metal surfaces. As an alternative, a spa may be installed within 5 feet of metal surfaces if each metal surface is permanently bonded by a minimum #8 AWG solid copper conductor to the outside of the spa's control box.

**DANGER -- RISK OF ELECTRIC SHOCK:** Do not permit any external electrical appliances, such as lights, telephones, radios, televisions, and etc., within five feet (1.5 meters) of the spa. Never attempt to operate any electrical device from inside the spa. This does not apply to lights built in to the spa as factory options from Cal Spas™.

## WARNING -- RISK OF INJURY

The spa water should never exceed 104°F (40°C). Water temperatures between 100°F (38°C) and

104°F (40°C) are considered safe for a healthy adult. Lower water temperatures are recommended for young children and when spa use exceeds 10 minutes.

High water temperatures have a high potential for causing fetal damage during pregnancy. Women who are pregnant, or who think they are pregnant, should always check with their physician prior to spa usage.

The use of alcohol, drugs or medication before or during spa use may lead to unconsciousness, with the possibility of drowning.

Persons suffering from obesity, a medical history of heart disease, low or high blood pressure, circulatory system problems or diabetes should consult a physician before using the spa.

Persons using medications should consult a physician before using the spa since some medications may induce drowsiness while others may affect heart rate, blood pressure and circulation.

## Hyperthermia Danger

Prolonged exposure to hot air or water can induce hyperthermia. Hyperthermia occurs when the internal temperature of the body reaches a level 3°F to 6°F above the normal body temperature of 98.6°F (or 2°C to 4°C above 37°C). While hyperthermia has many health benefits, it is important not to allow your body's core temperature to rise above 103°F (39.5°C). Symptoms of excessive hyperthermia include dizziness, lethargy, drowsiness and fainting. The effects of excessive hyperthermia may include:

- Failure to perceive heat
- Failure to recognize the need to exit spa or hot tub
- Unawareness of impending hazard
- Fetal damage in pregnant women
- Physical inability to exit the spa
- Unconsciousness

**WARNING:** The use of alcohol, drugs, or medication can greatly increase the risk of fatal hyperthermia.

# Preparing for Your New Inground Spa

## Inground Spa Installation Checklist

Most cities and counties require permits for exterior construction and electrical circuits. In addition, some communities have codes requiring residential barriers such as fencing and/or self-closing gates on property to prevent unsupervised access to the property by children. Your dealer can provide information on which permits may be required and how to obtain them prior to the delivery of your Cal Spa.

Before Delivery	
	Plan your delivery route
	Choose a suitable location for the shell and equipment pack
	Excavate the hole
	Install dedicated electrical supply
	Install dedicated NG line for gas heater

After Delivery	
	Remove spa from shipping platform
	Install shell in ground
	Install equipment pack
	Connect plumbing
	Connect electrical components
	Pour the deck

## Planning the Best Location For Your Spa

### Safety First

Do not place your spa within 10 feet (3 m) of overhead power lines.

### Consider How You Will Use Your Spa

How you intend to use your spa will help you determine where you should position it. For example, will you use your spa for recreational or therapeutic purposes? If your spa is mainly used for family recreation, be sure to leave plenty of room around it for activity. If you will use it for relaxation and therapy, you'll probably want to create a specific mood around it.

### Plan for Your Environment

If you live in a region where it snows in the winter or rains frequently, place the spa near a house entry. By doing this, you will have a place to change clothes and not be uncomfortable.

### Consider Your Privacy

In a cold-weather climate, bare trees won't provide much privacy. Think of your spa's surroundings during all seasons to determine your best privacy options. Consider the view of your neighbors as well when you plan the location of your spa.

### Provide A View With Your Spa

Think about the direction you will be facing when sitting in your spa. Do you have a special landscaped area in your yard that you find enjoyable? Perhaps there is an area that catches a soothing breeze during the day or a lovely sunset in the evening.

### Keep Your Spa Clean

In planning your spa's location, consider a location where the path to and from the house can be kept clean and free of debris.

Prevent dirt and contaminants from being tracked into your spa by placing a foot mat at the spa's entrance where the bather's can clean their feet before entering your spa.

### Allow For Service Access

Make sure the spa is positioned so that access to the equipment compartment and all side panels will not be blocked. Be certain that your installation will meet all city and local safety codes and requirements.

Many people choose to install a decorative structure around their spa. If you are installing your spa with any type of structure on the outside, such as a gazebo, remember to allow access for service. It is always best to design special installations so that the spa can still be accessed.

## Planning the Best Place for the Outdoor Equipment Pack

The Designer Spa series requires an external equipment pack. When locating the outdoor equipment pack, you will want to consider the following:

- The equipment pack must be located within a maximum of 15 feet from the spa.
- Ensure the equipment running its normal filtration cycles does not make too much noise for spa owners and/or neighbors.
- Ensure the equipment can be easily serviced for filter cleaning and periodic inspections in the location chosen.
- If you are using a gas heater, you will need to consider wind and drafts as well as heater exhaust for proper heater placement. (See heater owner's manual for important location and safety information.)
- The equipment base and heater must be placed on either a 3 1/2" cement slab or 3" paving stones.
- Make sure the equipment area selected will not be in an area where water could run or stand.
- If the area receives direct sunlight, you will want to provide some protection for the equipment portion of the equipment pack.

The equipment pack and heater are delivered separately. Do not cover gas heaters unless properly vented. (See heater owner's manual for important safety information.)

## Inground Spa Site Preparation

- Ensure there is enough room for the spa and equipment.
- Plan for proper electrical and gas service to both the equipment area and spa side.
- Ensure the required flat, level foundation can be constructed in the area chosen.
- The spa must be properly back-filled with wet sand, underneath and on all four sides.
- Never place any spa in a sealed area. Water must be able either to be absorbed into the surrounding area or channeled away. Water build-up under and/or around the spa, will cause the spa to float out of the ground.

### Grading Prior to Excavation

Selection of the Designer Spas site will determine how much grading will have to be accomplished prior to the actual dig for the spa. Naturally, a level area is best because it will require the least amount of preparation for the dig, but in many cases there is no level area, therefore, the site must be prepared to accept the spa prior to dig. The spa site should be elevated slightly higher than the surrounding area.

When dealing with slopes, the severity of the slope will determine if retaining walls must be built in order to have a level area for the spa. If the slope is relatively minor, contact your local building safety.

### Site Excavation – Hard Bottom

For hard bottom placement for inground spas, you will need a smooth and flat concrete surface at least 4"

thick as large as the bottom contact points. Be sure not to seal the bottom off and making a sealed box. You will need adequate water drainage for escape under the spa. A gravel beds around the concrete base will help with this.

### Site Excavation – Sand Bottom

With the spa area and all elevations planned including your decided type of decking, you are now ready to proceed with the dig. An ideal excavation is one that is as close as possible to the dimensions of the spa shell, but with the following rules in mind. The excavation should be 2" to 4" deeper than the actual spa for your sand bed. The sand bed is to level the spa shell and provide a perfect support base with no voids when the spa is lowered into the hole. Your excavation should be approximately one foot longer and one foot wider than the spa shell. This will allow for a six inch over dig all the way around the spa once it is in place. Additional hand excavation will be required to insure the skimmer will fit in the excavation when attached to the spa.

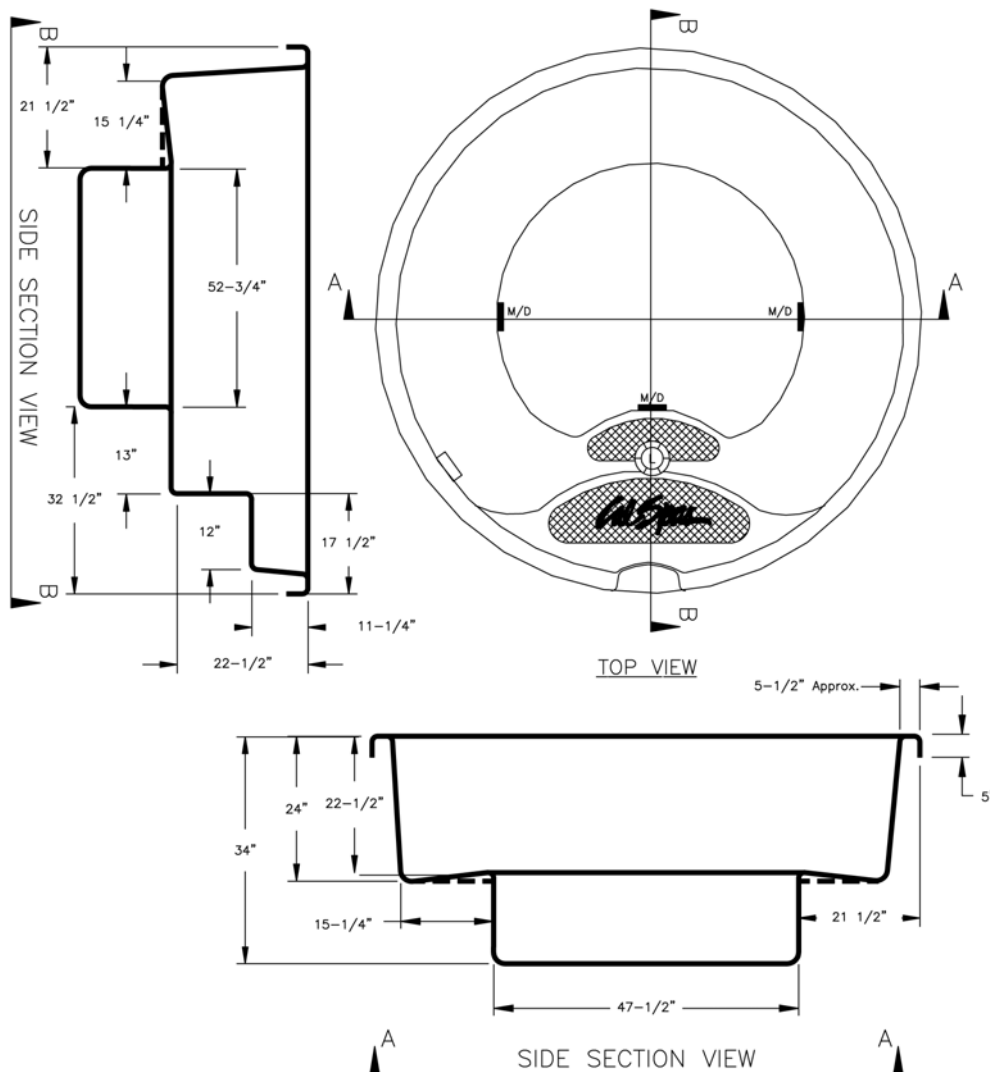
Sand or rock dust must be used to bed the shell into the excavation and for backfill. In no event is dirt to be used. One of the easiest ways to know how much sand is needed to be placed on the bottom of the excavation is to set a grade stake at all four corners, and one on each side of the center line in the bottom of the hole. If there are areas that are deeper than 2" to 4", these can be filled with sand and are of no consequence.

## Spa Shell Dimensions and Side Views

All sizes on this chart represent outside dimensions. Due to our continuous improvements, specifications, size and pricing are subject to change without prior notice.

Model	Width	Length	Depth	Gallons	Dry Weight	Filled Weight
IG-401	93"	Round	34"	500	500 Lbs.	4665 Lbs.
IG-402	93"	93"	32"	500	500 Lbs.	4665 Lbs.
IG-403	93"	93"	34"	500	500 Lbs.	4665 Lbs.
IG-404	96"	130"	34"	900	750 Lbs.	8247 Lbs.
IG-405	93"	130"	33"	900	750 Lbs.	8247 Lbs.
IG-406	80"	120"	35"	800	750 Lbs.	7414 Lbs.
IG-407	93"	202"	48"	2500	1300 Lbs.	22125 Lbs.

### IG-401



Technical drawing of a rectangular container, showing three views: Side Section View, Top View, and another Side Section View.

**Dimensions (inches):**

- Top View:** Overall width 93", overall height 93". Inner octagonal opening width 67", height 67".
- Side Section View (Left):** Overall height 32". Top flange width 23", inner width 21". Main body width 20". Bottom flange width 11", inner width 21".
- Side Section View (Right):** Overall width 38". Top flange width 20", inner width 20". Main body width 32". Bottom flange width 20", inner width 20".

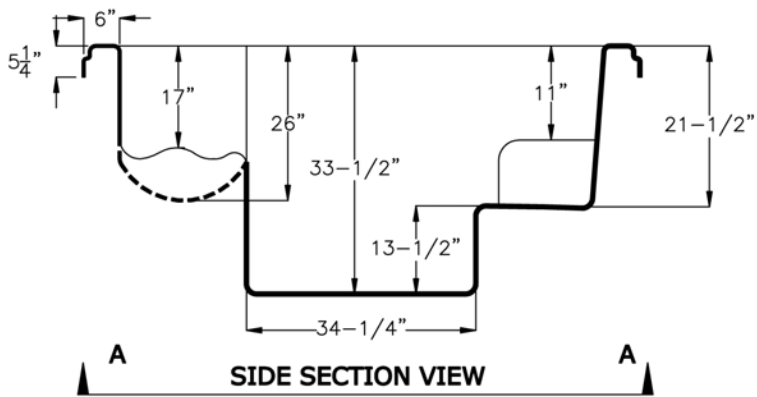
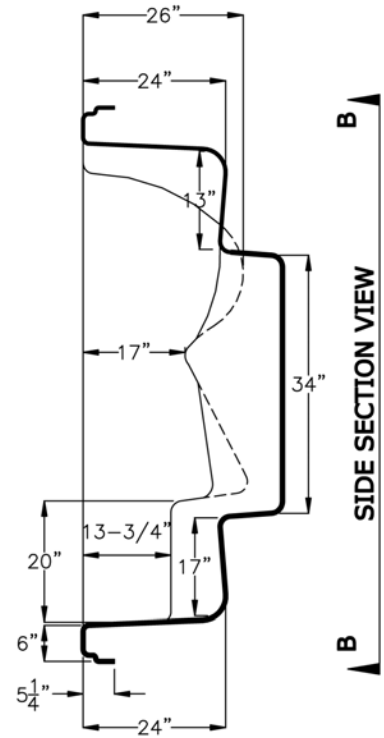
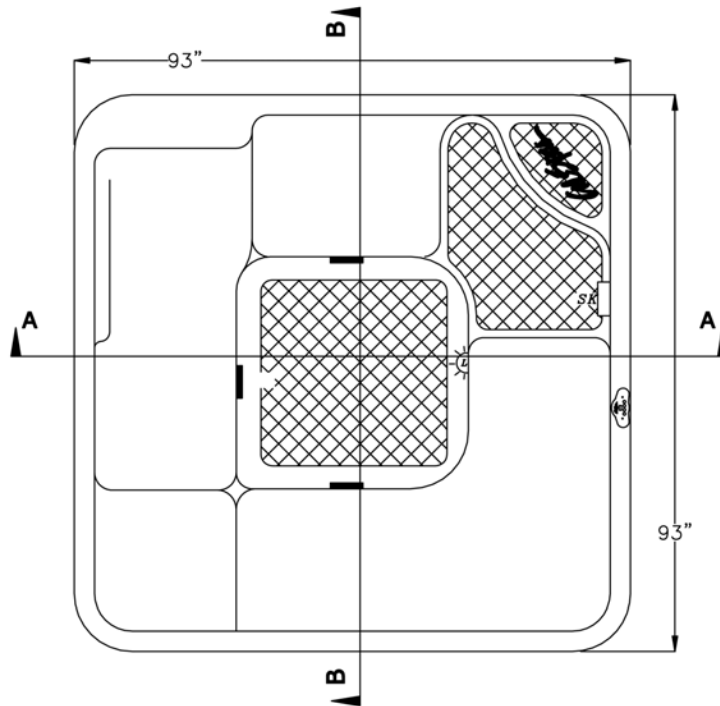
**Section Lines:**

- A-A:** Vertical section line through the center of the container.
- B-B:** Horizontal section line through the center of the container.

**Labels:**

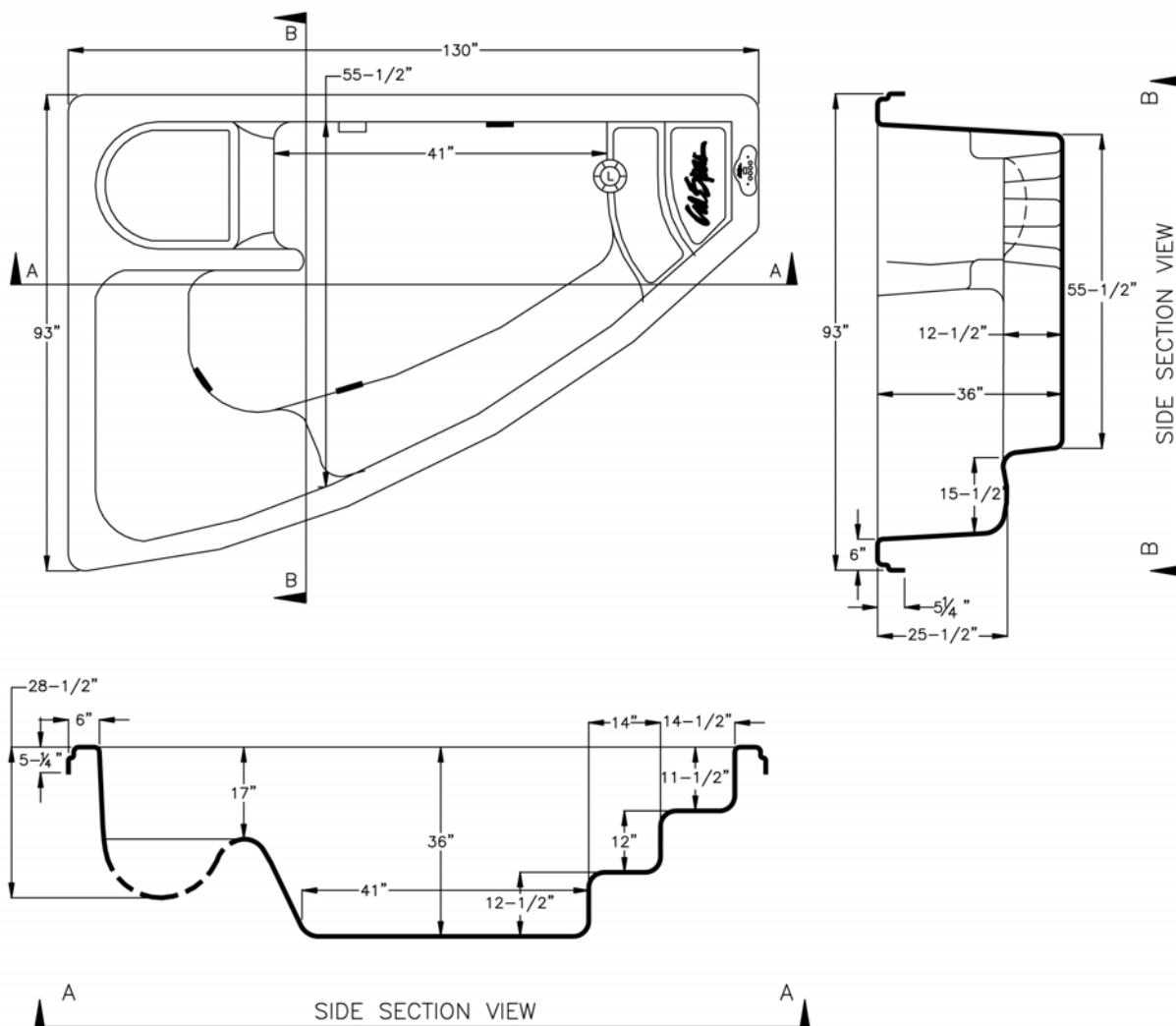
- M/D:** Material designation (likely Metal/Die).
- L:** Light source symbol.
- TOP VIEW:** Label for the top view.
- SIDE SECTION VIEW:** Label for the side section views.

IG-403

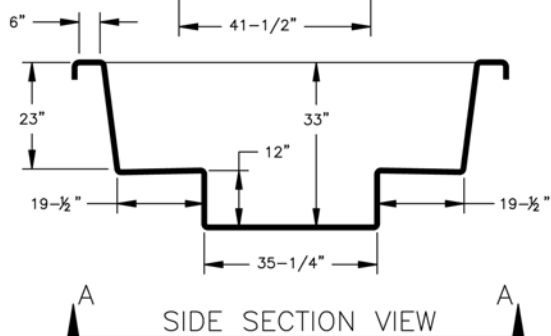
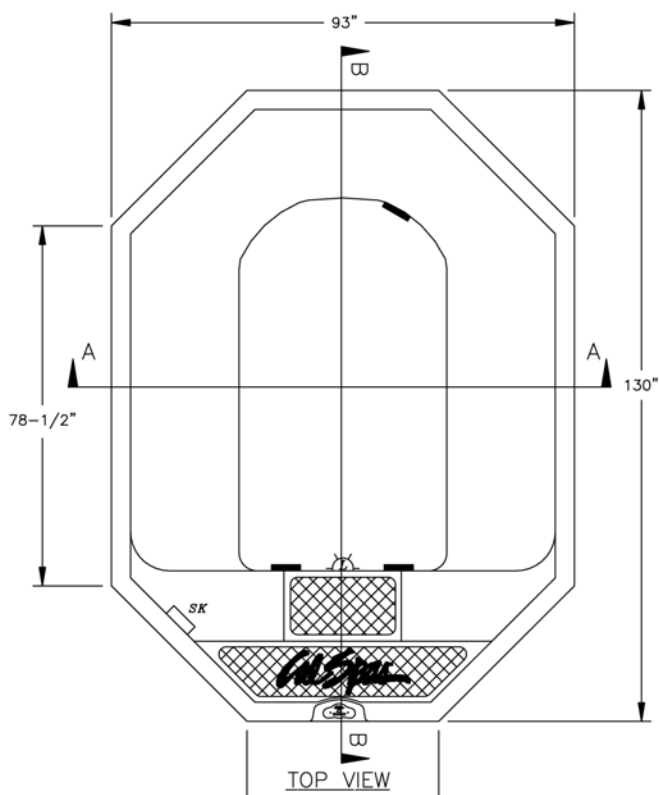
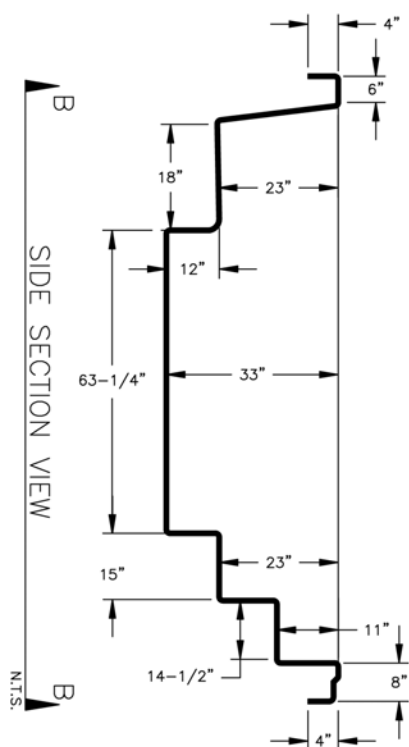




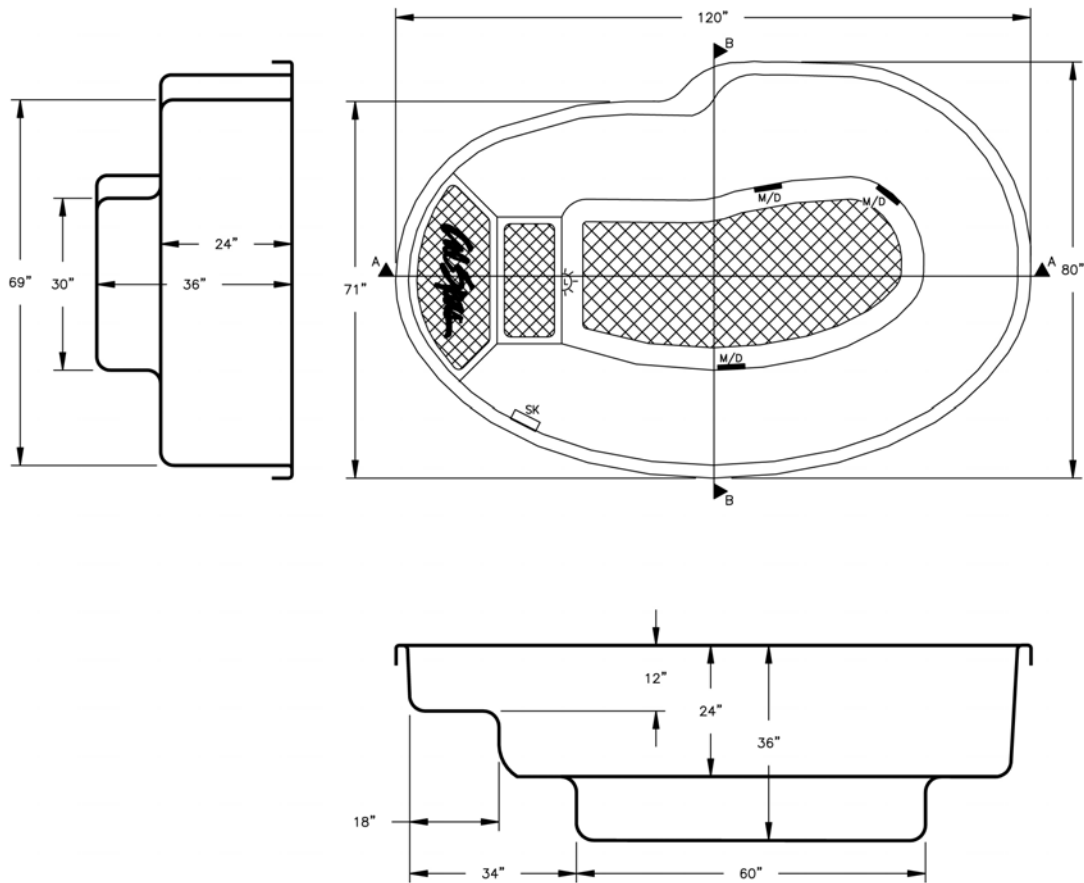
## IG-404



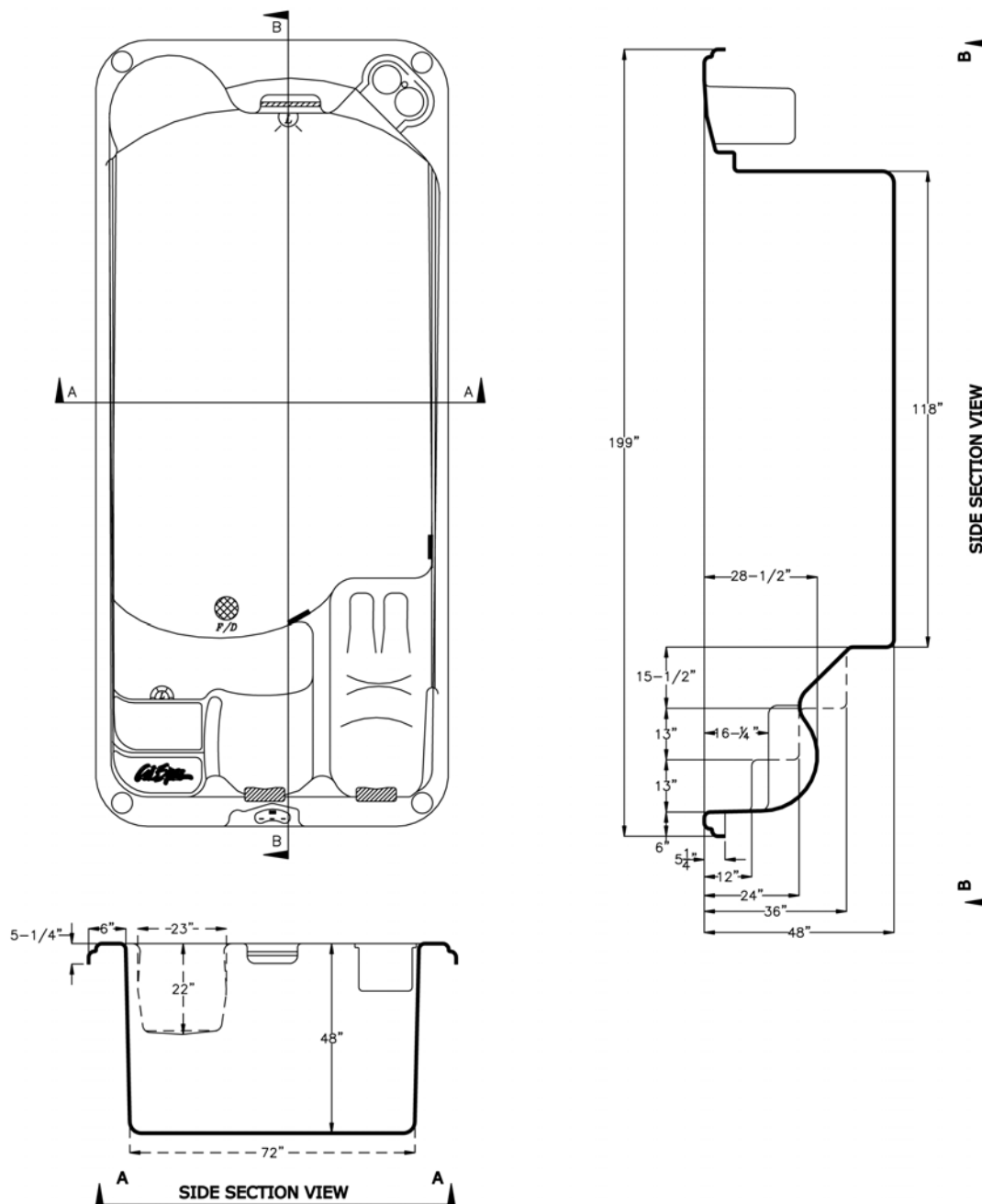
## IG-405



## IG-406



IG-407





# Getting the Spa Into Your Yard

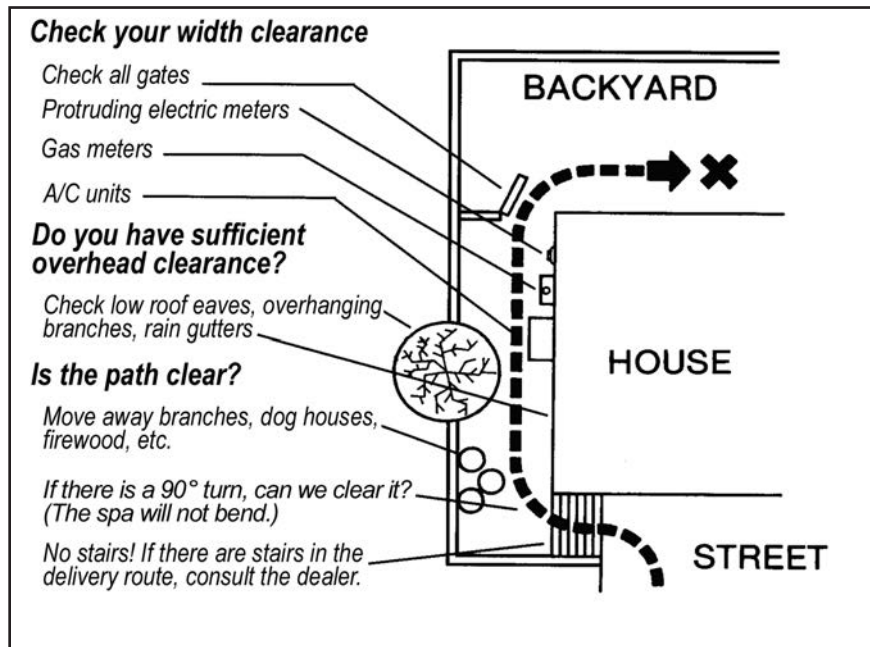
## Check the Dimensions of Your New Spa

The specification chart on page 6 lists your spa's model and its dimension as it sits on the delivery cart. During delivery, the spa must remain on the delivery cart at all times. Compare the dimensions to the width of the gates, sidewalks, and doorways along the delivery route. It may be necessary for you to remove a gate or partially remove a fence in order to provide an unobstructed passageway to the installation location.

## Plan the Delivery Route

Consider the following when planning your delivery route:

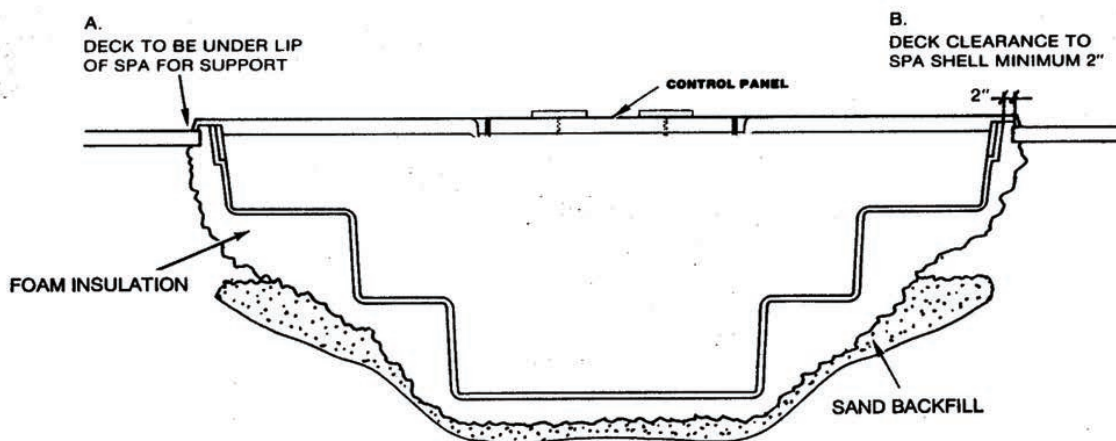
- Check the width of gates, doors and sidewalks to make sure your spa will pass through unobstructed. You may have to remove a gate or part of a fence to allow for adequate width clearance.
- Are there low roof eaves, overhanging branches or rain gutters that could be an obstruction to overhead clearance?
- 8' spas need at least 42" wide gate and 9' height clearance.
- If the delivery route will require a 90° turn, check the measurements at the turn to ensure the spa will fit.
- Are there protruding gas meters, water meters or A/C units on your home which will cause obstructions along the delivery path to your yard?
- Are there stairs in your delivery route? If so, you must consult your Cal Spas dealer prior to delivery to make adequate preparations.



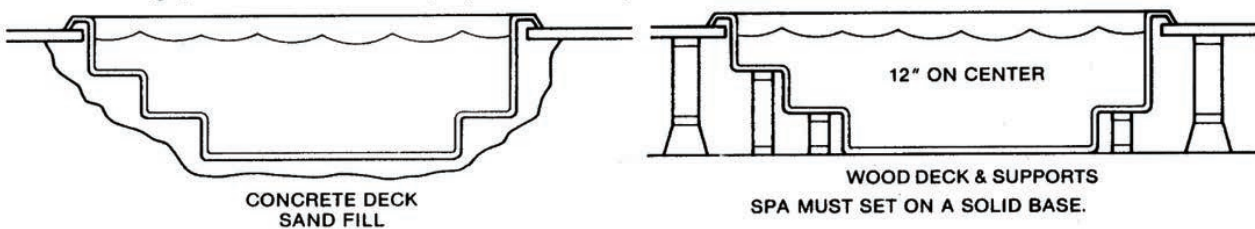
## Special Circumstances

The use of a crane for delivery and installation may become necessary if you are unable to provide an adequate delivery route. It is used primarily to avoid injury to your spa, your property or to delivery personnel. Your Cal Spas dealer may be able to assist you with the arrangements. If your spa delivery requires the use of a crane, the cost of a crane is generally not included in the standard delivery service.

## Installing the Inground Shell



- A.** Deck must go under lip of spa uniformly for proper lip support. Lip is not to bear any weight from spa. Deck is only to stop lip from flexing when stepped or sat on.
- B.** Deck must not be poured up against spa, since cement expands and contracts as temperature changes. Leave a gap of 2" from shell for proper structure protection.



## Equipment Pack Plumbing Connections

**IMPORTANT!** Always check local codes prior to any inground spa installation.

Once the spa and equipment are properly located, you will want to lay out the plumbing run.

Trenches should be deep and wide enough to allow all pipes to be buried below the frost line and should be in as straight a line from the spa to the equipment as possible. Check local code requirements for underground pipes. Always know what is under the ground before you dig anywhere.

You will need 2" flex or PVC lines for your suction, intake, and air line. In ground spas have marked intake and suction lines, making it easy find and connect to and from the spa and equipment pack.

The plumbing run should not be any longer than 15 feet to maximize water pressure. Another way to maximize water pressure is to limit (or even eliminate) the use of 90° elbows in your plumbing run. A more direct plumbing run using 45° elbows is more efficient, and promotes increased water pressure.

### Identifying Plumbing Lines

The spa's plumbing lines are clearly marked during water testing at the factory. This is done to assist installers in properly identifying the installation. We still recommend that the installers verify plumbing lines prior to gluing. This can be done by using one of the following techniques.

#### Air Test

The air test requires a wet/dry vacuum. Locate the plumbing line you wish to identify and secure the vacuum hose to cut open end. Turn on the vacuum, enter the spa and listen for vacuum suction sound from inside the spa side filter canister. If you hear the suction sound in the canister, the line is properly marked and can be connected to the suction side of the pump on the equipment pack.

#### Water Test

The water test requires a garden hose and water source. Locate the plumbing line you wish to identify and secure the outlet side of the garden hose to cut open end. Turn on the water supply to the garden hose, enter the spa and look for water inside the spa side filter canister. If you see water in the canister the line is properly marked and can be connected to the suction side of the pump on the equipment pack.

If any plumbing line is not properly marked or not marked at all, follow either the air or water test procedure until all lines are identified prior to gluing.

**NOTE:** Once complete, water test the plumbing run for at least three days prior to covering any plumbing trenches and back-filling spa cavity completely.

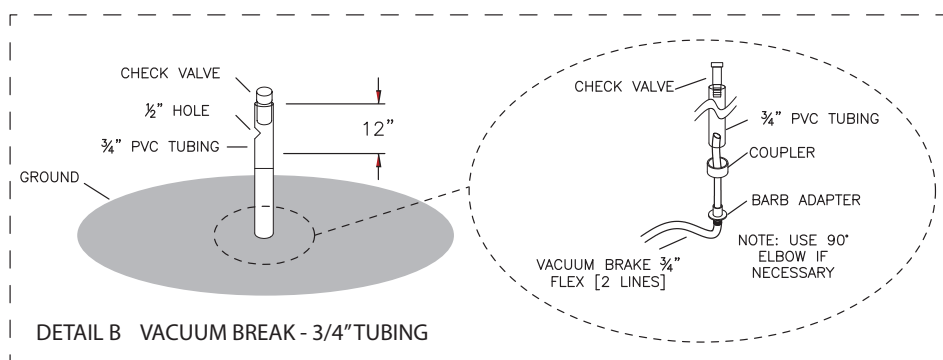
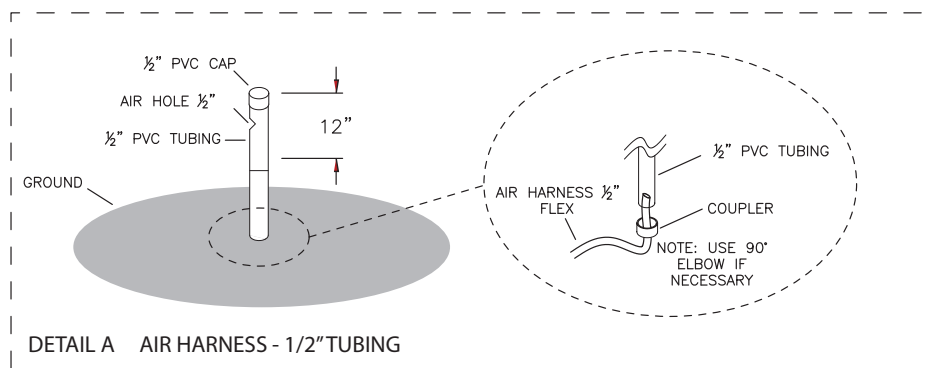
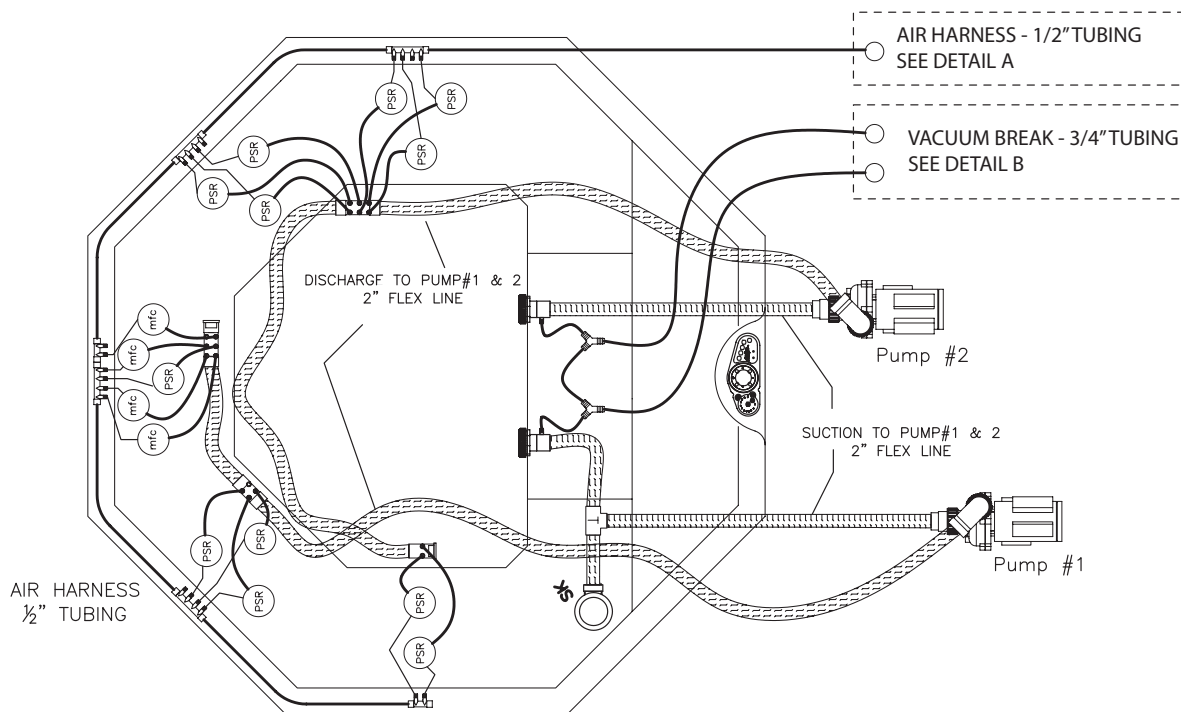
**NOTE:** Some local inspectors require pressure testing the plumbing lines. Although the spa is pressure tested at the factory, local inspectors may insist on pressure testing the plumbing run between the spa and equipment pack.

### Gate Valves

The use of gate valves is recommended on all plumbing lines (both suction and return lines). These valves are used to contain the spa's water in either the equipment or the spa. This will assist in the pump priming process and future servicing without needing to drain the spa.

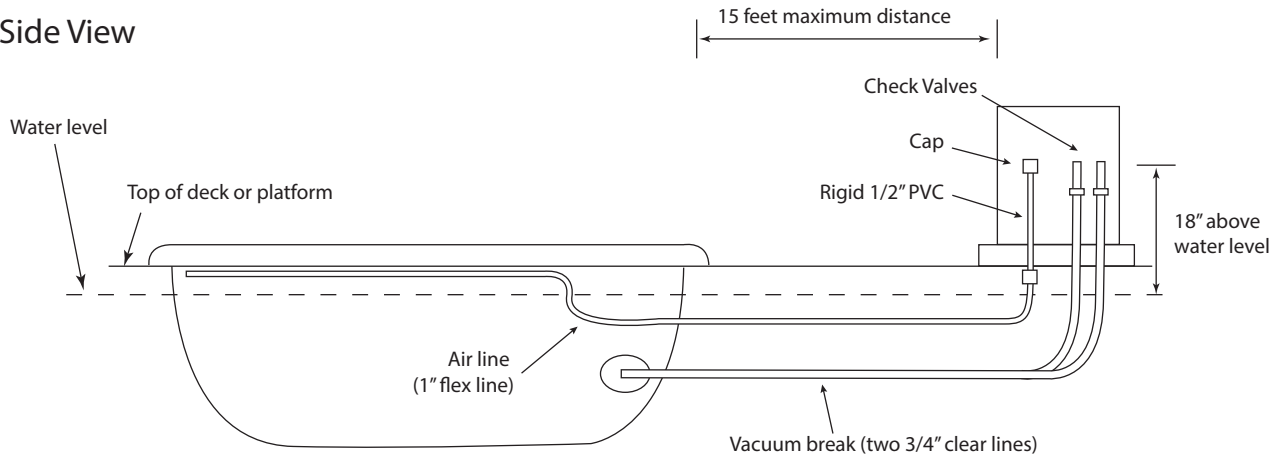
**NOTE:** When draining the spa to perform maintenance, always close the gate valves prior to draining. This will maintain the pump's prime.

## Top View





## Side View



## Connecting Plumbing to Remote Equipment

Connecting the plumbing from the spa to the equipment pack must be performed in accordance to local and city codes.

**NOTE:** Most codes require plumbing to be rigid PVC schedule 40 or heavier in both above and below ground installations. In most cases, the use of flexible PVC plumbing is acceptable when properly buried in trenches.

Most water plumbing lines are 2" or larger and must be schedule 40 or heavier PVC. When plumbing, minimize the use of 90° elbows as much as possible. The use of 45° elbows will increase the amount of jet pressure you will have over the use of 90° elbows.

The plumbing on the spa shell is labeled by the factory in the following manner:

**Pump 1 suction:** 2" line that connects the spa filter and bottom drain assembly to the front of pump 1.

**Pump 1 return:** 2" line that connects the top of pump 1, through the equipment filter and heater back to selected jets in the spa.

**Pump 2 suction:** 2" line that connects the spa filter and bottom drain assembly to the front of pump 2.

**Pump 2 return:** 2" line that connects the top of pump 2 back to selected jets in the spa.

**Air line:** 1/2" line that is plumbed 18" above the spa's water level.

**Vacuum break:** 3/4" clear lines plumbed 18" above the spa's water level.

## Inground Spa Light Installation Instructions

The next steps of installation should be performed by a qualified licensed electrician.

Always read and follow light manufacturer's safety and installation instructions prior to installation and operation. Incorrect installation may damage the light and void its warranty.

The light circuit must be on a GFCI protected service (alone or with a switch).

The water resistant junction box (or for 12 volt models, the low voltage transformer) must be located:

- **at least 8" (20 cm) above water level**
- **at least 4" (10 cm) above ground level, and**
- **at least 48" (121 cm) away from the spa.**

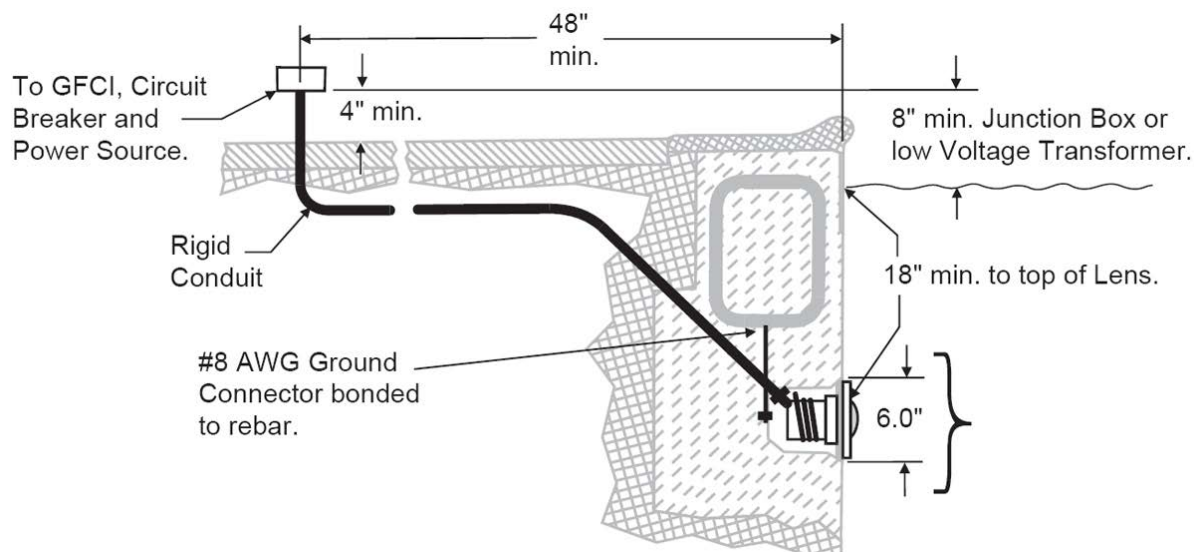
See figure below.

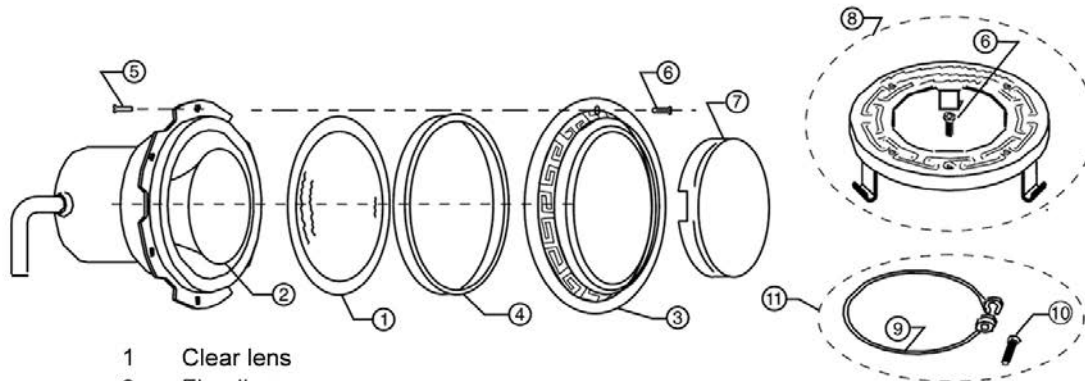
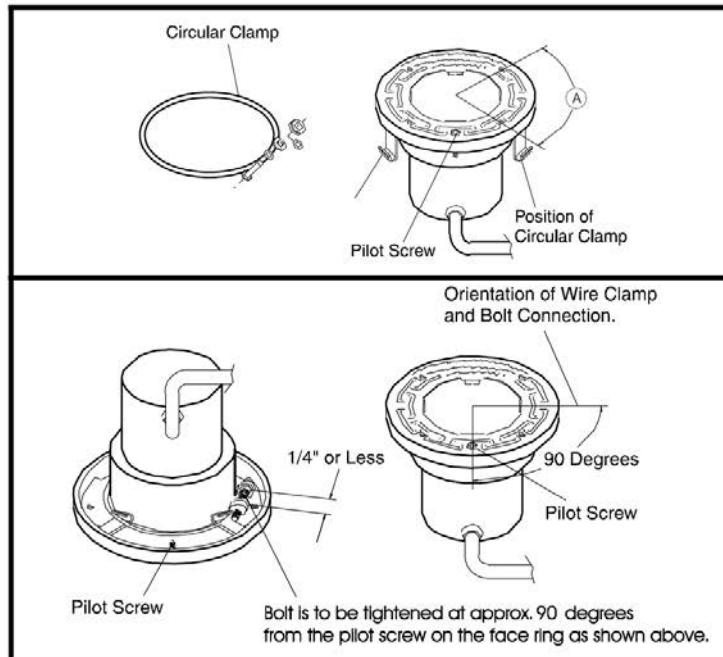
Light niche and any metallic items in a 5' (152 cm) radius must be properly bonded with #8 AWG grounding wire.

1. Connect rigid conduit to the 3/4" hub located at the back of the light niche and run to a water resistant junction box (or for 12 volt models to a low voltage transformer) no further than 25' (7.6m). Remember this is a water cooled light, so the conduit and all connections must be leak-proof.

2. Feed the light cord through the rigid conduit to the junction box, leaving at least 4 feet of cord at the end of the light fixture. This slack in the light cord will allow servicing without draining the spa in the future.
3. Wrap light cord slack around back of light housing and attach light to niche with mounting screw.
4. Cut the cord at the junction box, leaving at least 6" (15 cm) of cord to make connections.
5. Strip 6" (15 cm) of the out cord jacket to expose the three insulated wires. Be careful not to damage the insulation on the three inner wires.
6. Connect the three wires to the corresponding circuit wires in the junction box and secure the junction box cover in place.
7. Replace the light assembly in the niche and tighten the special pilot screw.
8. Fill the spa until the underwater light is completely submerged in water before operating the light for more than 10 seconds. Turn on the main switch or circuit breaker, as well as the spa light control, to check for proper operation

**Important: Make sure spa light is submerged in at least 18" of water prior to testing.**





- 1 Clear lens
- 2 Floodlamp
- 3 Face ring, chrome-brass
- 4 Gasket, 4" diameter
- 5 Screw, stainless steel, 10-24 x 3/8" (6 required)
- 6 Pilot screw with captive gum washer
- 7 Kwik-change color lens
- 8 Face ring assembly
- 9 Wire spring clamp
- 10 1/4-20 x 5/8" bolt
- 11 Uni-tension wire assembly, stainless steel with welded nut

### **⚠ WARNING**

Use only the special pilot screw provided with this underwater light. This screw mounts and electrically grounds the housing securely to the mounting ring and wet niche. Failure to use the screw provided could create an electrical hazard which could result in death or serious injury to pool users, installers or others due to electrical shock.

## Pouring the Deck

It is recommended that all electrical hook ups and all plumbing be completed before pouring the concrete. Make certain all electrical inspections on lights, bonding and all other electrical work have been completed and checked off by the local inspectors prior to proceeding with your concrete or finish work. It is a good idea to run the spa for at least 24 hours before pouring the concrete to insure there are no leaks. We understand you want to enjoy your spa now, but a 24 hour period with your spa running will let you know of any problems before they will be extremely hard to fix.

The type of decking you have selected will have determined the grade of the spa. If you are pouring a regular deck up to the spas coping, then the top of the coping should be 4" above the surrounding area. In either event, it is recommended to dig out an area around the spa exposing the flange of the coping and

just under it. This is important, as concrete should be packed under and over the flange of the spa, as the deck is poured. This will lock the spa into the concrete and provide for a much stronger bond of the spa to the deck. It will also eliminate cracking of the deck where it meets the spa.

When setting your outside forms, remember you want any water from rain or splash out to run off the deck, not into the spa. If your deck is going to tie into an existing deck, then some type of drain system should be planned to handle the run off. Proper drainage planning is very important.

An experienced concrete finisher should always be used when pouring spa decks, especially when you are doing a cantilevered deck, as the forms must be taken off at the proper time to allow finishing of the inside of the form.



## Adjustable Jets

Almost all of the jets in your spa are adjustable. Rotating the face of an adjustable jet to the left (counter-clockwise) will decrease the amount of water flow through the jet. Rotating the face of an adjustable jet to the right (clockwise) will increase the amount of water flow through the jet.

Neck jets adjust in the opposite directions (counter-clockwise to increase, clockwise to decrease).



## Diverter Knobs

Diverter knobs are 1" and 2" knobs located around the top of your spa. They allow you to divert water through jets from one side of the spa to the other, or in most cases from floor jets to wall jets. This is accomplished by rotating the diverter knob to the left (counterclockwise), decreasing the amount of water flow through a section of jets. To increase the amount of water flow through the other section of jets, rotate the handle to the right (clockwise).



# Water Clarity

This section is intended for new spa owners with no experience with water chemistry. Everyone's experience with maintaining water quality is different, but there are some general concepts you need to know.

Water maintenance is not difficult, although it requires regular attention. The most important thing to understand about taking care of your spa water is that preventive action is much easier than correcting water quality issues.

## Contents of this section:

Testing and Adjusting Spa Water  
Sanitation  
Filtration  
Bather Load  
Starting the Spa with Fresh Water  
Maintenance Schedule  
Troubleshooting Water Clarity Problems

## The Key to Clear Water

Excellent water quality is a simple matter of four things:

### Regularity

Clear water requires regular maintenance. Establish a routine based on a regular schedule for your spa water maintenance.

Maintaining your water quality helps the enjoyment of your spa and extends your spa's life by preventing damage from neglect and chemical abuse.

See page 26 for the schedule of recommended maintenance.

### Filtration

Cleaning your filter regularly is the easiest and most effective single thing you can do to keep your water clear.

A clogged or dirty filter will cause the heater and pump to work harder than they need to, possibly causing them to fail.

The spa's heating system will only function with the proper amount of water flow through the system.

See page 25 for filter cleaning instructions.

### Sanitation

Sanitizers kill bacteria and viruses and keep the water clean. A low sanitizer level will allow microbes to grow quickly in the spa water.

We recommend using either chlorine or bromine as your sanitizer.

See page 24 for learn how to use sanitizer.

### Chemical Balance

You will need to test and adjust the chemical balance of your spa water. Although this is not difficult, it needs to be done regularly.

Depending on your choice of sanitizer, you need to test the level of calcium hardness, total alkalinity, and pH.

See page 23 for learn how to balance your spa water.



## Testing and Adjusting Spa Water

You have two types of testing methods to choose from:

- **The reagent test kit** is a method which provides a high level of accuracy. It is available in either liquid or tablet form.
- **Test strips** are a convenient testing method commonly used by spa owners.

### Balancing the Total Alkalinity

Total alkalinity (TA) is the measure of the total levels of carbonates, bicarbonates, hydroxides, and other alkaline substances in the water. TA can be considered a “pH buffer”. It is the measure of the ability of the water to resist changes in pH level.

**The recommended total alkalinity is 80 - 120 ppm.**

If the TA is too low, the pH level will fluctuate widely from high to low. Low TA can be corrected by adding an alkalinity increaser.

If the TA is too high, the pH level will tend to be too high and may be difficult to bring down. High TA can be corrected by adding an alkalinity decreaser.

When the TA is balanced, it normally remains stable, although adding water with high or low alkalinity will raise or lower the TA level.

### Balancing the Calcium Hardness

Calcium hardness (CH) is a measure of the total amount of dissolved calcium in the water. Calcium helps control the corrosive nature of the spa's water and is why soft water is not recommended. The low calcium content of soft water is very corrosive to the equipment and can cause staining of the spa shell.

**The recommended calcium hardness is 150 - 200 ppm.**

If the CH is too low, add a calcium hardness increaser.

If the CH is too high, dilute the spa water with soft water.

When the CH is balanced, it normally remains stable, although adding soft water or very hard water will raise or lower the CH level.

### Balancing the pH

The pH level is the measure of the balance between acidity and alkalinity.

If the pH is too low, it can cause corrosion of metal fixtures and the heating element. Low pH can be corrected by adding a pH increaser.

If the pH is too high, it can cause scaling by allowing metals or minerals to form deposits and stain spa surfaces. High pH can be corrected by adding a pH decreaser.

### Ideal Water Chemistry

Testing For:	Ideal Range (ppm)	
	Minimum	Maximum
Total Alkalinity	80	120
Calcium Hardness	150	200
pH	7.2	7.6

## Sanitation

Sanitizers kill bacteria and other organic waste by breaking them down to non-harmful levels and are filtered out. Before you fill your spa, you need to decide which chemical sanitizer you wish to use. Consult your Cal Spas dealer for the right decision with regards to your lifestyle and spa usage.

We recommend either **bromine** or **chlorine** as your sanitizer. Both work well when maintained regularly.



**DO NOT use trichlor. Trichlor is very acidic and the hot temperature of the spa causes it to dissolve too quickly. It will cause damage to your spa and will void your warranty.**

Whichever plan you decide on, follow it completely and don't take shortcuts. It will provide you with clean, safe, clear spa water with a minimum of effort. Spa owners with an ozonator still need to use a chemical sanitizer.

### Using Chlorine as a Sanitizer

If you choose to use chlorine as a sanitizer, only use granulated chlorine, not liquid chlorine.

Once a week, check the chlorine level using either a test strip or a reagent kit. See the table on the following page for the ideal range.

Add one or two tablespoons granulated chlorine to the spa water weekly. Note that chlorine dissipation rate will be faster at higher water temperatures and slower at lower temperatures.

When you add chlorine, open all of the jets and run the spa at high speed with the cover open for at least 30 minutes.

Follow the maintenance schedule on page 26.

### Using Bromine as a Sanitizer

Bromine is a very effective sanitizer that produces low chemical odors. Unlike chlorine, it can break down bacteria and other impurities to a safe level with a low burn-out rate.

Bromine is available in both granulated and tablet form. Use granulated sodium bromide to establish your bromine base. Use tablets to maintain it.

When you begin with fresh water, add 2 ounces of granulated bromide. Open all of the jets and run the spa at high speed with the cover open for at least 30 minutes. This is your base bromine level as the tablets will take a while to dissolve.

Place three or four bromine tablets in your chemical floater.

Follow the maintenance schedule on page 26.

### Shocking the Water

In addition to using a chemical sanitizer, you will periodically need to shock the water. Shocking the water helps remove burned-out chemicals, bacteria, and other organic material from your spa's water and improves your sanitizer's effectiveness.

Do not use chlorinating shock, which will damage your spa's jets and pump seals. Only use an oxidizer shock. It can be used with either chlorine or bromine sanitizers.

Add one ounce of oxidizer shock once a week, after heavy bather loads, or if water has a strong odor.

Spa must be running with all of the jets on high for 30 minutes with the cover open. If necessary, repeat oxidizer shock in 30 minute intervals.

Testing For:	Ideal Range (ppm)	
	Minimum	Maximum
<b>Chlorine level</b>		
Without ozonator	3.0	5.0
With ozonator	2.0	4.0
<b>Bromine level</b>		
Without ozonator	6.7	11.0
With ozonator	5.7	10.0



## Bather Load

“Bather Load” is the term used to describe the number of people using a spa, combined with the length of usage, and the frequency of usage. All these factors have a great effect on the spa water. The higher the bather load, the more chemicals need to be added and a longer filtration time will be needed.

Recommendations are designed for spas with average bather load (3 to 4 people, 15 minutes of usage, three times a week at 100 degrees) If your bather load exceeds these guidelines, and you experience water quality problems, increase the amount of filtration first, (go to the next higher filtration number) then if water quality is still not adequate, consult the advice of your Cal Spas dealer for additional chemical or system recommendations. Be sure to give them your bather load information.

## Filter Cleaning

The filter is the part of your spa that removes the debris from the water and needs to be cleaned on a regular basis to maximize your spa’s filtering performance and heating efficiency.

In addition to spraying off the filter weekly to remove surface debris, your filter should be deep cleaned periodically to dissolve scale and particles that get lodged deep within the filter fibers and impede the filtration process. Even if the filter looks clean, scale and particles can clog the fibers and prevent water from flowing through the filter resulting in the most common spa problem—no heat, caused by a dirty filter.

We recommend you clean your filter once a month and replace it once a year or as necessary.

**It is extremely important that you never run the spa without a filter. There is a possibility that debris may be sucked into the plumbing through the filter well.**

### Cleaning the filter

1. Remove the filter by unscrewing it and pulling it up and out.
2. Place the dirty filter into a bucket of water deep enough to cover the filter. Add 8 oz of liquid filter cleaner to the bucket of water.

**Note:** It is a good idea to keep a spare filter to use in the spa while the dirty filter is being deep cleaned. This way, you can rotate the filters and both will last longer.

3. Soak the filter for a minimum of 24 hours.
4. Spray the filter with a water hose. Spray each pleat carefully.
5. Reinstall the filter. Do not overtighten.

## Maintenance Schedule

<b>Each time you refill the spa</b>	Follow the section "Starting the Spa with Fresh Water".
<b>Prior to each use</b>	Test the spa water using either test strips a reagent test kit. Adjust chemical levels as necessary.
<b>Once a week</b>	Test the spa water using either test strips a reagent test kit. Adjust chemical levels as necessary.
<b>Once a month</b>	Deep clean your spa's filter. (Follow filter cleaning instruction at beginning of Clear Water Plan)
<b>Every two to four months</b>	<p>Drain and clean your spa with multi-purpose cleaner.</p> <p>Polish the acrylic surface with a surface protectant.</p> <p>Clean and treat spa cover, pillows, and Cal Select cabinet (if equipped).</p> <p>Refill your spa, following the section "Starting the Spa with Fresh Water".</p>
<b>Once a year</b>	Replace filter cartridges if the pleats appear frayed.

## Troubleshooting Water Clarity Problems

Problem	Probable Causes	Possible Solutions
Cloudy Water	<ul style="list-style-type: none"> <li>• Dirty filter</li> <li>• Excessive oils / organic matter</li> <li>• Improper sanitization</li> <li>• Suspended particles / organic matter</li> <li>• Overused or old water</li> </ul>	<ul style="list-style-type: none"> <li>• Clean filter</li> <li>• Shock spa with sanitizer</li> <li>• Add sanitizer</li> <li>• Adjust pH and/or alkalinity to recommended range</li> <li>• Run jet pump and clean filter</li> <li>• Drain and refill the spa</li> </ul>
Water Odor	<ul style="list-style-type: none"> <li>• Excessive organics in water</li> <li>• Improper sanitization</li> <li>• Low pH</li> </ul>	<ul style="list-style-type: none"> <li>• Shock spa with sanitizer</li> <li>• Add sanitizer</li> <li>• Adjust pH to recommended range</li> </ul>
Chlorine Odor	<ul style="list-style-type: none"> <li>• Chloramine level too high</li> <li>• Low pH</li> </ul>	<ul style="list-style-type: none"> <li>• Shock spa with sanitizer</li> <li>• Adjust pH to recommended range</li> </ul>
Musty Odor	<ul style="list-style-type: none"> <li>• Bacteria or algae growth</li> </ul>	<ul style="list-style-type: none"> <li>• Shock spa with sanitizer – if problem is visible or persistent, drain, clean and refill the spa</li> </ul>
Organic buildup / scum ring around spa	<ul style="list-style-type: none"> <li>• Buildup of oils and dirt</li> </ul>	<ul style="list-style-type: none"> <li>• Wipe off scum with clean rag – if severe, drain the spa, use a spa surface and tile cleaner to remove the scum and refill the spa</li> </ul>
Algae Growth	<ul style="list-style-type: none"> <li>• High pH</li> <li>• Low sanitizer level</li> </ul>	<ul style="list-style-type: none"> <li>• Shock spa with sanitizer and adjust pH</li> <li>• Shock spa with sanitizer and maintain sanitizer level</li> </ul>
Eye Irritation	<ul style="list-style-type: none"> <li>• Low pH</li> <li>• Low sanitizer level</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust pH</li> <li>• Shock spa with sanitizer and maintain sanitizer level</li> </ul>
Skin Irritation / Rash	<ul style="list-style-type: none"> <li>• Unsanitary water</li> <li>• Free chlorine level above 5 ppm</li> </ul>	<ul style="list-style-type: none"> <li>• Shock spa with sanitizer and maintain sanitizer level</li> <li>• Allow free chlorine level to drop below 5 ppm before spa use</li> </ul>
Stains	<ul style="list-style-type: none"> <li>• Total alkalinity and/or pH too low</li> <li>• High iron or copper in source water</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust total alkalinity and/or pH</li> <li>• Use a stain and scale inhibitor</li> </ul>
Scale	<ul style="list-style-type: none"> <li>• High calcium content in water – total alkalinity and pH too high</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust total alkalinity and pH – if scale requires removal, drain the spa, scrub off the scale, refill the spa and balance the water</li> <li>• Use a stain and scale inhibitor</li> </ul>

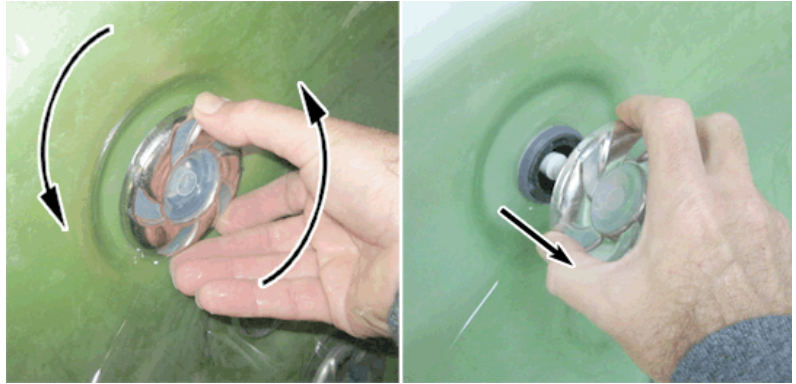
## Cleaning and Maintenance

### Jet Removal and Replacement

Jets can be easily removed for cleaning.

Grasp the outer rim of the jet and turn it counter-clockwise. The jet will unscrew from the fitting until it is free.

To replace the jet, place it in the fitting and turn it clockwise until it is snug in place. Do not overtighten the jet.



### Spa Cover

**Important!** Keep the spa covered when not in use!

- Covered spas will use less electricity in maintaining your set temperature.
- Covering your spa will protect your spa's finish from the sun's ultraviolet rays.
- You are required to keep the spa covered to maintain warranty coverage.
- Covering your spa helps prevent children from drowning in the spa.

See the manual enclosed with your cover for instructions on mounting the locks and how to lock and unlock the cover.

In addition, while the spa cover is rigid, it is not designed to support any weight. Therefore, as a safety precaution and to preserve the life of your cover, you must not sit, stand, or lie on it, nor should you place objects of any kind on top of it.

### Cleaning and Replacing the Filter

Filtration is one of the most important steps you can take to ensure clean, clear water. It is far less expensive to fix water clarity problems by filtering your spa than by using excessive amounts of chemicals, excessive filtration times, or by water replacement.

See the section "Filter Cleaning" on page 25 for more information.

## Winterizing (Cold Climate Draining)

In many areas of the country, the temperature drops below 32°F (0°C). We recommend that you always have your spa full of water and running at normal spa temperatures (80°F to 100°F, 26.7°C to 37.8°C). This will help reduce the risk of freezing in your spa and your spa's equipment.

**WARNING:** If you find the need to drain your spa, please be aware of the potential of freezing in your spas equipment and plumbing. Even if the directions below are followed perfectly, there is no guarantee that your spa will not suffer freeze damage and thereby void the warranty coverage.

1. Open all filter covers.
2. Remove the filter baskets and filters.
3. Drain your spa completely.
4. Remove drain plugs from the front of the pumps (if equipped).
5. Disconnect the unions from both sides of the pump.
6. Use a wet/dry vacuum to blow any remaining water out of the jets and equipment area.

Cover your spa with a good spa cover and an all-weather tarp to ensure that neither rain nor snow enters the spa.

## Cleaning Your Spa

### Spa Cover and Pillows

Due to the constant punishment your spa cover and pillows receive, you should protect them by applying a vinyl and leather cleaner as part of your monthly maintenance plan. Use a product that is specifically designed to protect spa covers and pillows from chemical and ultraviolet light damage without leaving an oily residue behind that is normally associated with common automotive vinyl protectants.

**Warning: *Do not*** use automotive vinyl protectants on spa covers or pillows. These products are generally oil-based and will cause severe water clarity issues that are difficult to correct.

### Spa Shell

Each time you drain your spa, before you refill it you should clean your spa shell with an all-purpose cleaner and apply a coat of surface protectant.

Use a low detergent, non-abrasive cleaner specifically formulated to clean the spa without damaging its acrylic finish.

Use a non-oil based surface protectant that is specifically formulated to protect the spa's finish from the chemicals and minerals associated with normal spa use.

# Appendix

## Replacement Parts

Jets	
<b>ELE 2" Euro No Eyeball</b> PLU282050W	
<b>mfc 3" Directional</b> PLU283050W	
<b>PSR 5" Rim</b> PLU285052W	
<b>SW Swim</b> Standard face PLU21700565	

## Covers

	Deluxe Rust	Deluxe Gray	Deluxe Slate	Deluxe Palomino	Deluxe Teal	Deluxe Navy	Deluxe Hunter
<b>DIJ-401</b> <b>93" Round</b>	ACU02200310	ACU02200311	ACU02200315	ACU02200316	ACU02200312	ACU02200313	ACU02200314
<b>DIJ-405</b> <b>93 x 130</b>	ACU02200540	ACU02200541	ACU02200542	ACU02200543	ACU02200544	ACU02200545	ACU02200546
<b>DIJ-407</b> <b>93 x 200</b>	ACU02200300	ACU02200301	ACU02200305	ACU02200306	ACU02200302	ACU02200303	ACU02200304

## Warranty

Cal Spas Designer Inground Spas do not come with a warranty. If you have any questions, contact Cal Spas customer service at 1-800-CAL-SPAS.







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Fax: 1-909-629-3890

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