INTEC'S IONIZED POOL INSTRUCTION MANUAL

MODELS:

- **CA10**
- **CV50**
- **CV60**

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ATTENTION

Table of Contents

1. VALUE OF COPPER IONIZATION SYSTEMS

You have purchased a chemical-free water treatment system that eliminates the need for chlorine. A system that is state of the art. We are committed to make servicing your pool and swimming more pleasurable, less time consuming, and more economical to maintain. As a bonus, you'll find a chlorine-free pool healthier for you, your family, and friends. Before installing the Ionizer, read these instructions from cover to cover. Write down any questions you have. If, after reading the entire booklet, you still have questions; PLEASE CALL US – TOLL FREE. You will be glad you did.

The following is a partial list of the health benefits copper mentioned in the article in the February 1989 issue of *Better Nutrition Magazine* written by contributing Editor Frank Murry.

1. Copper strengthens blood vessel walls.
2. Copper is important to energize metabolism.
3. Copper shares anti-inflammatory powers with zinc, which is important in healing.
4. Taste perception may be influenced by copper.
5. Copper is important to the functionality of the immune system
6. Copper is a potent anti-ulcer agent.
7. Copper also may play an important role in cancer prevention.
8. Copper is one of the more important antioxidants in the blood stream.
9. Copper is the key mineral of collagen and elastin which are essential for tendons and blood vessels.
10. Copper helps prevent anemia, bone and skeletal defects, a degeneration of the nervous system, defects in the color and structure of hair, reproductive problems and abnormal cardiovascular problems.
11. Those who are deficient in copper and iron are more likely to have problems with sleeping.
12. Nerves will fray without copper.
13. Without copper, skin becomes fragile, will break easily, and heal slowly.
14. Without copper, bones can fracture
15. Without copper, blood vessels can leak or burst.
16. Copper deficiency can elevate blood pressure.
17. A copper-deficient diet may cause defective transport of vitamin A from liver to blood.

Copper, while extremely important in one's diet, should not be confused with swimming pools or consuming bathing water. Copper ionized pools do have its own benefits whicg are outlined below:

1. Copper Ionization is the only way to have *healthy water* in your pool.
2. You will save 80-85% on your water care expenditures and 80-85% on your water care time. There is no need for purchasing chlorine, shock treatments, algaecides, or stabilizer!
3. Pool liners, paint, vinyl, and plaster last three to five times longer, saving *thousands* of dollars.
4. Copper ions are non-irritating to skin and will not burn your eyes.
5. Copper ions are many times more effective, faster acting, and longer lasting than chlorine in inactivating algae and bacteria.

2. CA10 AND CV50 INSTALLATION OVERVIEW

The copper electrode is the only part of the system that must be installed. It is installed after the pool filter and before the pool heater (if you have a heater).

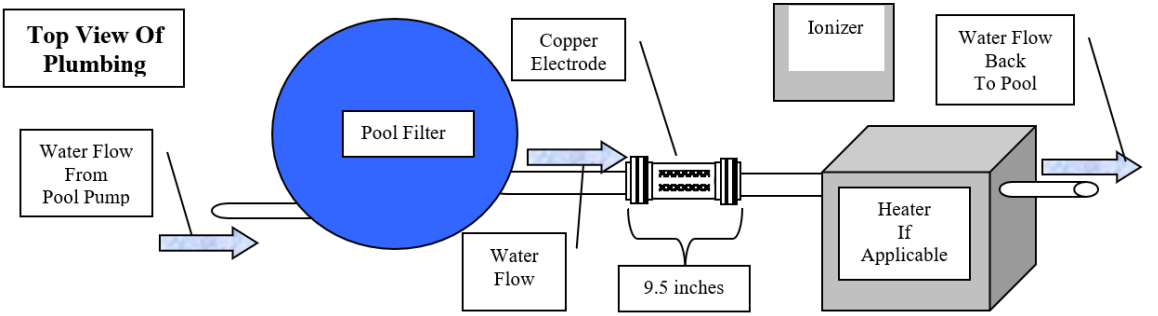


Figure 1

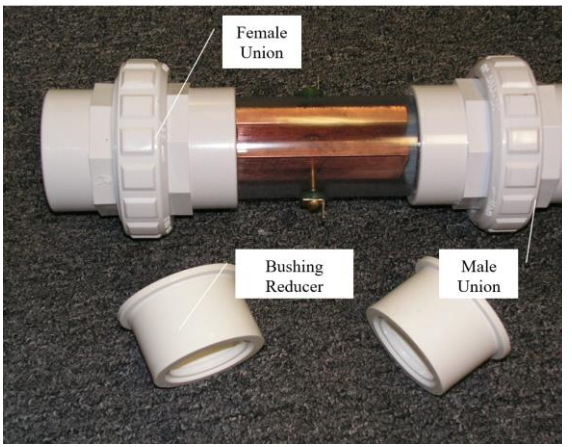


Figure 2. CA10 and CV50 Electrode

Figure 3. CV60 Electrode

Installation of the Electrode

1.5" Plumbing

You will need to use a 2" to 1.5" reducer bushing (not provided). The electrode can be installed horizontally or vertically. Take the male half of each male union, clean them both, and then cement the bushing/reducer into the male union (Figure 4).

Use a hacksaw and cut approximately 10 inches out of the pipe after the filter Please note – this measurement can be different as bushings vary in depth. Take the male half of each union that contains the reducer/bushing, clean the inside and cement assembly component on the remaining pipe ends (Figure 5). Slide in the electrode and hand tighten the female union to the male union.

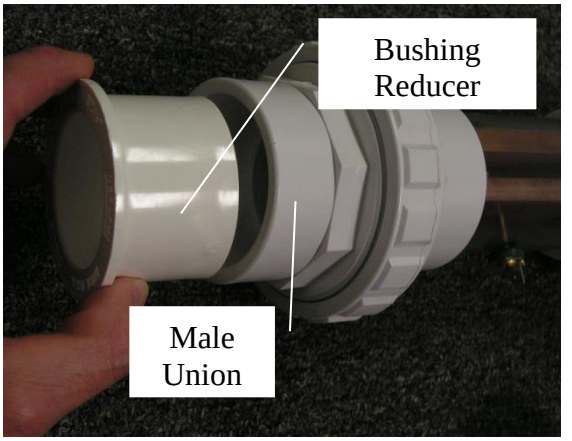


Figure 4

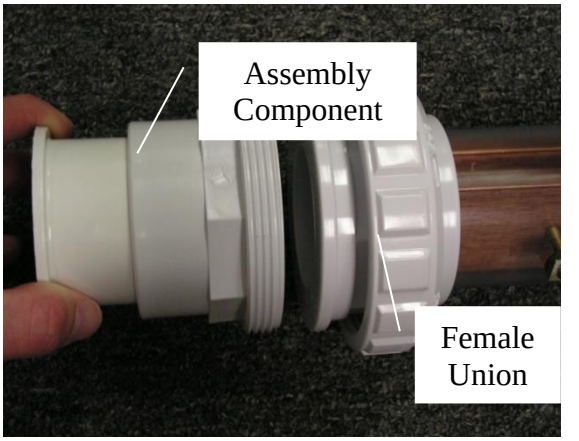


Figure 5

2" Plumbing

Use a hacksaw and cut approximately 9.5 inches out of the pipe after the filter The electrode can be installed horizontally or vertically. Take the male half of each union and clean and cement them on the remaining pipe ends. Slide in the electrode and hand tighten the female union to the male union.

Connecting the Electronics Unit to the Electrode

Locate the male spades found at each side of the electrode (Figure 6). Connect the female plug located at the end of the wire from the electronics unit and connect it to the male spade located on the electrode (Figure 7). Attach the unconnected wire for the electronics unit to the other side of the electrode (Figure 8). ***It does not matter which wire plugs into which side of the electrode***. The polarity will alternate the current between the two copper bars on the electrode. Figure 9 illustrates the proper connection for the electronics unit to the electrode.

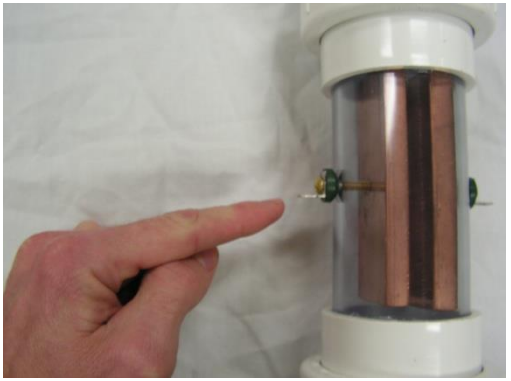


Figure 6

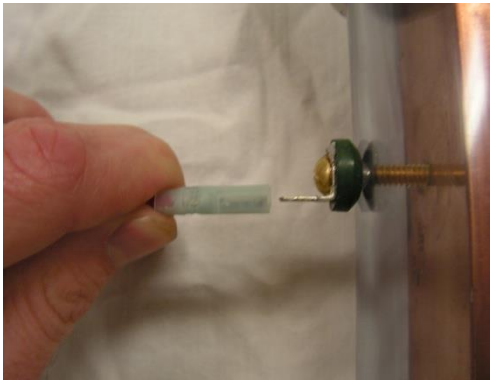


Figure 7

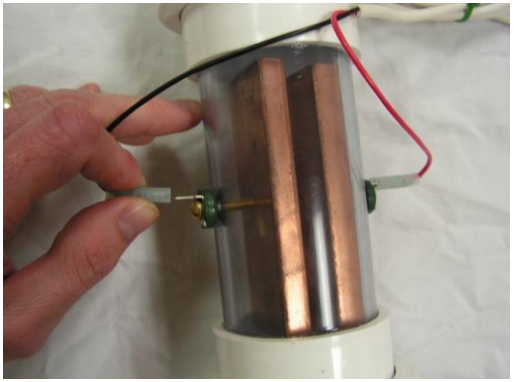


Figure 8

Figure 9

Your new pool ionization system has gone through two separate inspections: (a) by manufacturing, and then, (b) by the shipping department. If you notice any defects on your system, please contact our Quality Assurance Department immediately.

Your unit utilizes an international power supply 110-230 volts, has a Type B plug, and can be plugged into any standard US electrical socket. Many modern pool system controllers have auxiliary plugs/ports that can be programmed to the ionizer turn on and off. Copper ions remain active for a long period of time, and you should not have to run the system continuously. These control units may also be plugged into a timer (available at hardware stores) for maintaining a copper residual. The use of an extension cord will not affect this system.

If the unit will be connected to an automated controller, please refer to the instruction manual of that unit. Your ionizer can be connected to an auxiliary port. Many of the modern control panels connect via blue tooth with a smart phone offering remote access and the ability to manipulate run-time programs.

Electronic Controller Specifications

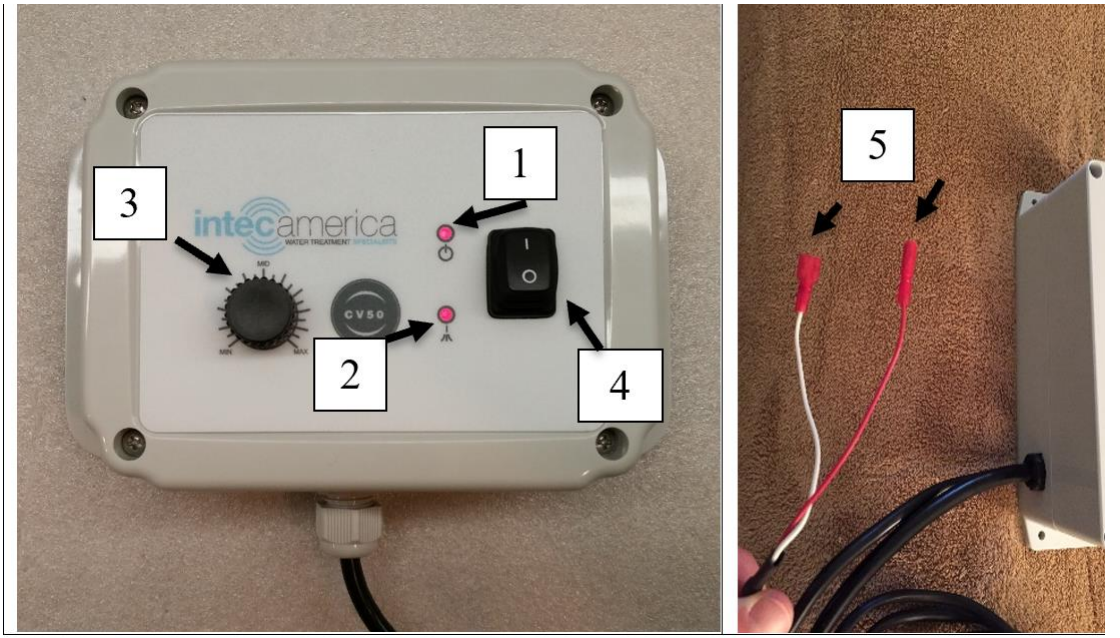
	CA10	**CV50**
Input Voltage US	120/220	120/220
Input Voltage - Europe & Asia	230	230
Hertz (US/Europe & Asia)	60/50	60/50
Volts DC	12	24
Amps	2	1
Maximum Watts	24	24

The electronic controllers must be mounted upright on a wall and preferably at a location underneath the eve of the roof. At no time, should the controller be left laying on a surface facing upwards. By doing so, the controller could be inundated with water and void warranties.

**The total dissolved solids (TDS related to salinity) level in the pool will affect the rate and dosing of the cupric copper production. The same can affect the internal heating at full load and result in an automated shutdown. The output current should be reduced when this occurs.*

NOTE – Only run the CA10 & CV50 controller when the pump is ON

CA10 and CV50 Overview



Item #	Description
1	Power Indicator Light. It will remain a solid red color when power is running to the unit.
2	Polarity Light – Cycles on and off every 10 minutes, indicating a reversal of polarity and cleaning cycle.
3	Potentiometer Switch – Rotate clockwise to increase copper output and counter clockwise to decrease copper output.
4	Power Switch – Will allow the user to turn off the system when it is not in use.
5	Electrode Leads – Attaches to the copper electrode (not shown in picture)

3. CV60 INSTALLATION AND OVERVIEW

The copper electrode is the only part of the system that must be installed. It is installed after the pool filter and before the pool heater (if you have a heater).

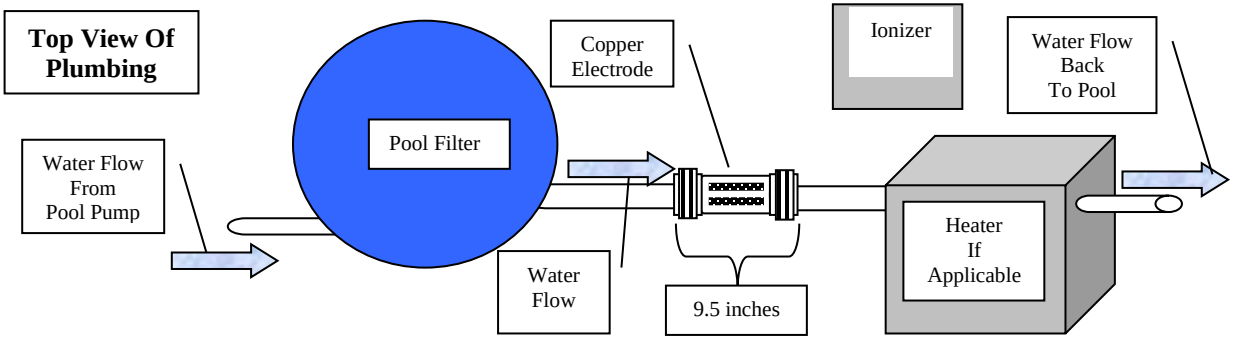


Figure 1

Your new CV60 pool system contains an integrated flow switch (Figure 3) that is not available with the CA10 or CV50 (Figure 2). The electronics controller should have continuous power supplied even if the pool equipment is off. The system will be on standby even when the display is illuminated. The CV60 will only produce copper when the pool pump is running, and water is flowing through the electrode activating the flow switch.

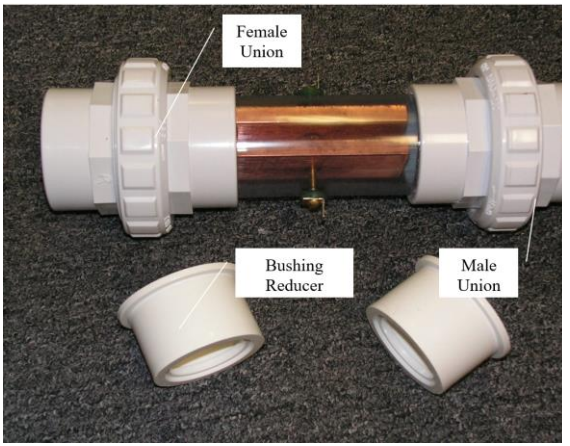


Figure 2

Figure 3

Please note the arrow shown in Figure 4 below. The water flows from the pump, through the filter, into the electrode or flow cell. Ensure the water leaving the cell flows in the direction of the arrow or your system will not produce copper. Figure 5 shows the entire electrode with the lead wires from the flow switch that will connect to your CV60 electronics system.

Figure 4

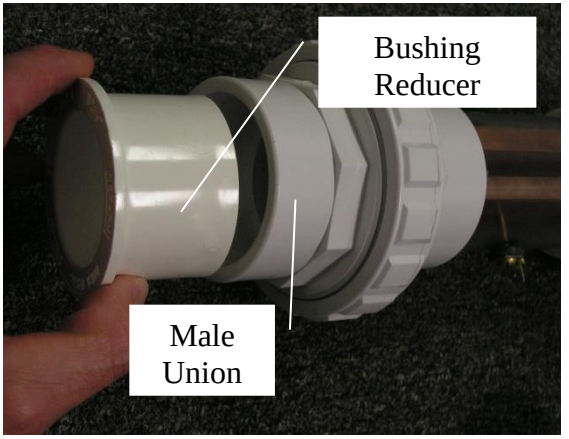
Figure 5

Installation of the Electrode

1.5" Plumbing

You will need to use a 2" to 1.5" reducer bushing (not provided). The electrode can be installed horizontally or vertically. Take the male half of each male union, clean them both, and then cement the bushing/reducer into the male union on the electrode (Figure 6).

Use a hacksaw and cut approximately 12 inches out of the pipe after the filter. Please note – this measurement can be different as bushings vary in depth. Take the male half of each union that contains the reducer/bushing, clean the inside and cement assembly component on the remaining pipe ends (Figure 7). Slide in the electrode and hand tighten the female union to the male union.



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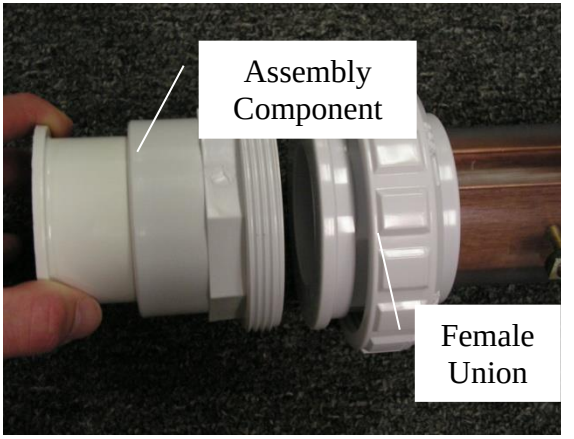


Figure 7

2" Plumbing

Use a hacksaw and cut approximately 11.5 inches out of the pipe after the filter The electrode can be installed horizontally or vertically. Take the male half of each union and clean and cement them on the remaining pipe ends. Slide in the electrode and hand tighten the female union to the male union.

Connecting the Electronic Controller to the Flow Switch

There are 4 wire connections coming from the CV60 terminal. Please note, the red female plugs of the electronics system will plug into the red male plugs of the flow switch as shown below (Figure 6).

Connecting the Electronic Controller to the Copper Electrode

Locate the male spades found at each side of the electrode (Figure 7). Connect the blue female plug from the CV60 electronics unit to the male spade located on the side of the electrode (Figure 7). Attach the unconnected wire for the electronics unit to the other side of the electrode (Figure 5). ***It does not matter which wire plugsinto which side of the electrode.*** The polarity will alternate the current between the two copper bars on the electrode. Figure 8 illustrates the proper connection for the electronics unit to the electrode.

Figure 6

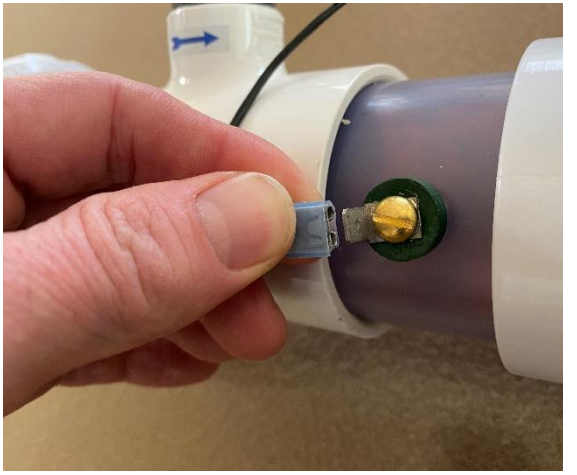


Figure 7

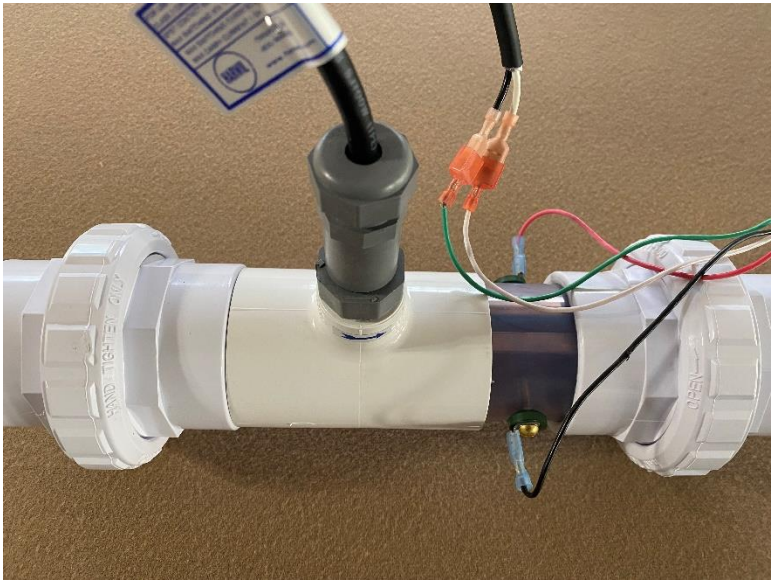


Figure 8

Your new pool ionization system has gone through two separate inspections: (a) by manufacturing, and then, (b) by the shipping department. If you notice any defects on your system, please contact our Quality Assurance Department immediately.

Your unit utilizes an international power supply 110-230 volts, has a Type B plug, and can be plugged into any standard US electrical socket. Many modern pool system controllers have auxiliary plugs/ports that can be programmed to the ionizer turn on and off. Copper ions remain active for a long period of time, and you should not have to run the system continuously. These control units may also be plugged into a timer (available at hardware stores) for maintaining a copper residual. The use of an extension cord will not affect this system.

If the unit will be connected to an automated controller, please refer to the instruction manual of that unit. Your ionizer can be connected to an auxiliary port. Many of the modern control panels connect via blue tooth with a smart phone offering remote access and the ability to manipulate run-time programs.

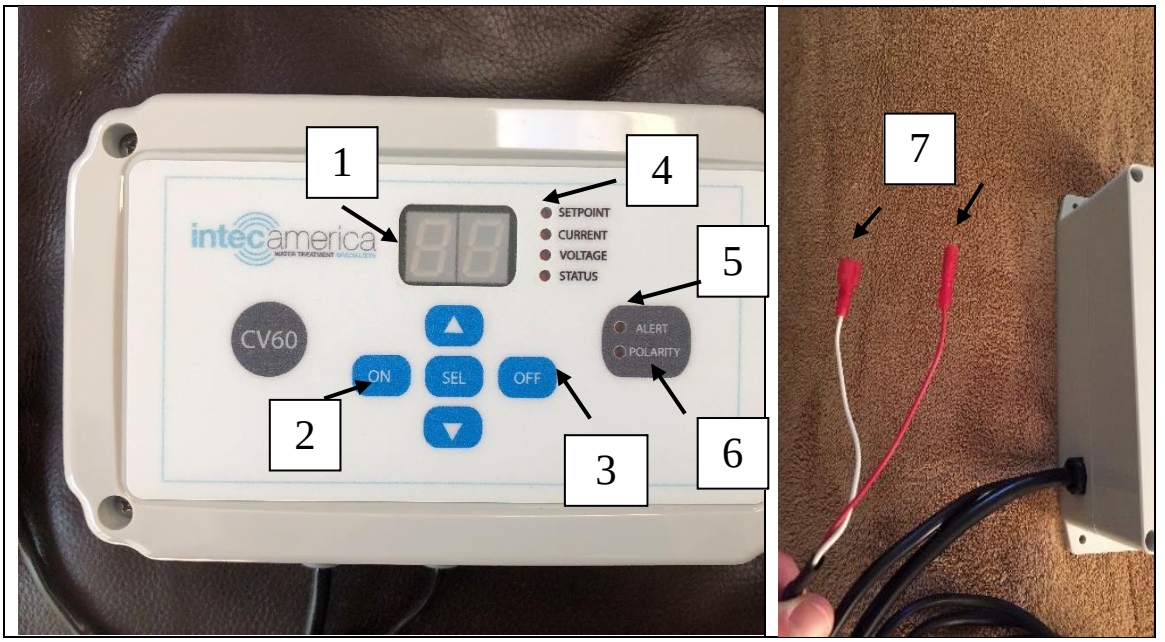
	CV60
Input Voltage US	120/220
Input Voltage - Europe & Asia	230
Hertz (US/Europe & Asia)	60/50
Volts DC	24
Amps	2
Maximum Watts	48

**The total dissolved solids (TDS related to salinity) level in the pool will affect the rate and dosing of the cupric copper production. The same can affect the internal heating at full load and result in an automated shutdown. The output current should be reduced when this occurs.*

The electronic controllers must be mounted upright on a wall and preferably at a location underneath the eve of the roof. At no time, should the controller be left laying on a surface facing upwards. By doing so, the controller could be inundated with water and void warranties.

The CV60 Electronic Unit is Always Powered On. Copper is Produced Only When the Pump Recirculates the Water.

CV60 Overview



Item #	Description
1	LED Display
2	Power ON Switch
3	Power OFF Switch
4	Control Status Indicators
5	Alert Indicator – Alarm codes change depending on application (listed below)
6	Polarity Light – Cycles on and off every 10 minutes, indicating a reversal of polarity and cleaning cycle.
7	Attaches to the copper electrode (not shown in picture)

CV60 Operator Interface

Display

The CV60 has a two digit seven-segment LED display. The segments are driven direct so a limited set of alpha characters can be displayed in addition to numbers.

The following is a list of displayed variables on the CV60:

1. Setpoint Amps – 00 to 20
2. Cell Amps – 0.0 to 2.0 (accuracy of +- 0.1 amps)
3. Cell Volts – 1 to 24
4. Control Status & Alerts
    a. **A0** – Normal operation
    b. **E1** – Flow switch open (no water flow)
    c. **E2** – Cell connection problem or low TDS indication (cell is powered with no feedback). See notes page 19
    d. **E3** – Output reduced because of internal heating. Too high TDS in water, too high of a setpoint, or combination of both.
5. Power-up Mode
    a. **P1** – Powers up off
    b. **P2** – Powers up on (default as shipped)

The display variables can be changed by pressing the "**SEL**" pushbutton and indicated by the LED Light to the left. Options are SETPOINT, CURRENT, VOLTAGE. The SETPOINT is the default and one can increase/decrease the rate of copper production by simply pressing the "UP" or "DOWN arrows to increase or decrease the copper ion output while the LED is next to the SETPOINT indicator.

Current and Voltage

One can also change the power output by pressing the "**SEL**" pushbutton until the LED indicator is located next to the SETPOINT. Use the "UP" or "DOWN arrows to change the copper output. To view the output, press the "**SEL**" pushbutton until the indicator is next to CURRENT (amperage) or VOLTAGE (direct current volts). The CURRENT is a better indicator of the rate copper will ionize. It is best to keep this under 1.7 to prevent overheating or accelerated copper depletion. The combination of these two items is more

useful to a technician for troubleshooting and it is suggested to just use the setpoint screen.

Manual Power On/Off or Automatic One

The CV60 is shipped standard where one must manually turn the system on. This is best utilized when the system is plugged into a standard outlet, wired into a timer, or utilizing the flow switch. To power up, simply press the "**ON**" button. To turn the system off, simply press the "**OFF**" button. If being used with a flow switch or the system is wired into the pump or timer, then you want power applied to it whenever the pump is running which is the default **Program P2.** For those that only want to run the system when needed and manually control the addition of copper (usually one a week), one needs to change the program to **Program P1**.

Changing the Power-up Mode

To change this setting the system must be plugged in and manually press the "OFF" button. With the unit now powered off, unplug the CV60 from the incoming power supply. Press and hold the "DOWN ARROW" while plugging the power cord back into the power outlet. A "P1 or P2 code will be displayed. Please see above for the selection preference. Push the "SEL" push button to lock this program in and return to the home screen.

The Power-up Mode will be displayed when the DOWN ARROW panel pushbutton is pressed and held down when AC power is being applied.

Setpoint Select

The copper ion release rate on the CV60 is adjusted using scroll up and scroll down panel pushbuttons when the LED indicator is next the "Setpoint". The controller will maintain the last used setpoint value during power down or when power is reapplied to the system.

Power On & Off

Power on and off on the CV60 may be selected via ON and OFF panel pushbuttons. rather than a power toggle switch found on the CA10 and CV50.

Alert LED

The ALERT LED will illuminate if any of the E1 to E3 conditions described earlier are present.

E2 – The most probable cause for this error is having extremely low mineral content in the pool water. The average Total Dissolved Solids (TDS) level for a freshwater pool is 500 - 1500 ppm and salt water pools 2800 – 3500 ppm. This error code will show on the display when the TDS is lower than 250 ppm. The system is functioning properly. However, it will take a very long time to increase copper levels in your pool. To increase the TDS, add a 40-pound bag of swimming pool salt for a 20,000 gallon pool to increase the TDS level approximately 250 ppm. See Table 4 in the back of this manual for calculations.

Polarity LED

The polarity changes after 10 minutes or when AC power is applied, but not via the ON and OFF buttons. This is a self-cleaning cycle to keep the cathode and anode clean and reduce the potential of mineral scale plating.

4. START-UP PROCEDURE FOR YOUR POOL

Start-up of Pool

This order of instructions should be followed precisely to properly ionize your pool. If you are converting from chlorine, salt water generated, or other sanitation method, there is no need to drain your pool.

1. Clean out all debris and clean out skimmers (Please see Section 9.0 if applicable)
2. Adjust pH between 7.0 – 7.4
3. Run the Ionizer continuously until the copper level reaches 0.5 ppm. **REMEMBER:** Your pool pump must be running and water must be flowing over the copper bars when the Ionizer is on.
4. Treat water clarity
5. Treat Calcium Hardness

Initial Start-up for the CA10 or CV50

These unit are equipped with a potentiometer to control the copper output. Turn the dial counterclockwise to the lowest setting, and turn the unit on with water flowing through the copper electrode chamber. As the water is flowing through, turn the dial clockwise until it is on full power. **If the power light flashes/blinks sporadically, turn the knob again counterclockwise until the power light is solid and not flashing.** This is the maximum output for your pool water conductivity.

Initial Start-up for the CV60

Similar to the above. However, this unit is equipped with push buttons to control the copper output. Turn the unit on with water flowing through the copper electrode chamber. As the water is flowing through, pay attention to the LED lights to the right of the display. **If the any light flashes/blinks sporadically, push the down arrow one click at a time until the power light is solid and not flashing.** This is the maximum output for your pool water conductivity.

5. SWIMMING POOL / SPA MAINTENANCE

Copper ions do not evaporate or dissipate. If you keep your pool, skimmers, filter, and the weir basket in the front of the pump clean, the copper ions will remain in the pool. It is the pH level in your pool/spa that is the most IMPORTANT.

If you will keep your pH, alkalinity, copper, and calcium hardness in the recommended ranges, plus the regular use of your filtration aid, your pool water will always be beautiful, clear, light blue, and healthy.

Recommended Testing Schedule (Treat as needed)

Monday	Wednesday	Friday
Test for pH Test for copper	Test for pH	Test pH Test alkalinity. Test for copper

6. WATER CHEMISTRY – TESTING YOUR POOL WATER

Your system contains two test kits, the comprehensive test kit (in the hard blue container) and the copper test kit (in the clear container). The instructions for each test are in each test kit. Read these instructions carefully. Then do the test. Below are the only tests that you will need to maintain your pool.

- pH
- Alkalinity
- Acid Demand
- Calcium Hardness
- Copper

**NOTES –*

A. *Anytime you draw a water sample from the pool for testing, make sure you get that sample 12 inches below the pool surface.*

B. *If ever you have a problem, you may call Intec at 800-896-1759 for assistance. Please test your pool water for the aforementioned parameters before calling Intec. These tests results are needed to diagnose and help you solve your problem. Without them, we will not be able to accurately assist you.*

pH Concentrations Scale

	Concentrations of Hydrogen (H^+) compared to distilled water	pH	Solutions that typically have this pH
Acidic pH	*10,000,000*	pH = 0	battery acid
	1,000,000	pH = 1	stomach acid
	100,000	pH = 2	lemon juice, vinegar
	10,000	pH = 3	grapefruit, orange juice, soda
	1,000	pH = 4	tomato juice, acid rain
	100	pH = 5	black coffee, rain water
	10	pH = 6	urine, saliva
Neutral pH	*1*	pH = 7	"pure" water
Basic/Alkaline pH	*1/10*	pH = 8	sea water
	1/100	pH = 9	baking soda
	1/1,000	pH = 10	milk of magnesia
	1/10,000	pH = 11	Ammonia
	1/100,000	pH =12	soapy water, bleach
	1/1,000,000	pH = 13	oven cleaner
	1/10,000,000	pH = 14	liquid drain cleaner

Test the pH of your pool water first.

<u>If it needs treatment, then treat it before proceeding to the other tests.</u>

If you leave your pH higher than 7.4 for an extended period of time, then dissolved minerals and organics inside of the water molecules (which were previously invisible) can precipitate from solution and become suspended (free floating). This may discolor your water and <u>*scale*</u> your pool. If the pH is allowed to go below 7 for an extended period of time, the impurities inside the water molecule will discolor or <u>*stain*</u> your pool. This happens because of the acidic conditions of your water. *Most pool owners will call every discoloration a stain.*

pH is treated with **muriatic acid** to bring it lower and **baking soda** to bring it higher. The muriatic acid will burn up some of the alkaline material, thus reducing your pH. The baking soda will neutralize the acidity, increase the alkalinity, and thus increase your pH. Both chemicals are self-sacrificing and will reach a point of equilibrium, neutralize themselves, and then no longer exist in your pool water in its original form.

Therefore, it can be said that you have a chemical-free pool. Muriatic acid is available in one-gallon bottles at Lowes, The Home Depot, and most local hardware stores. Baking soda is available at Wal-Mart, Target, Dollar General, and your local grocery store.

Recommended Testing and pH Range

The ideal for pH is 7.2 (7.0 to 7.4 is OK). At first, test on Monday, Wednesday, and Friday. At some point in time, you may find you never have to treat the pH on Wednesday for example. If this is the case, then you can just test on Monday and Friday.

You have an ***acid demand test*** in the Comprehensive Test Kit (blue box) that will determine for you the exact amount of muriatic acid needed to bring the pH down from when it is too high. Please see the "Acid Demand Chart" (Table 1) in Chapter 10. You will need to know your pool size in gallons first (See "Table 3" for calculations).

NOTE: It is important to get your pool's pH in its proper range BEFORE starting to test for copper.

Total Alkalinity (TA) and Treatment

pH, as stated earlier, is the most important aspect of pool water care. Alkalinity is just as important because it controls the pH. The Total Alkalinity Test is your "crystal ball" relating to the future rise in your pool water's pH. The higher the alkalinity, the faster your pH will rise. Example: if your pH is 7.0 and your alkalinity is over 140ppm, then your pH will twice as fast as it would if the TA were 70ppm.

The ideal for TA is 50 to 80 ppm (parts per million)

Test as needed - You will learn how long to wait between treatments by testing and finding the TA is still in the proper range. These numbers can vary in some regions.

If your TA gets below 50ppm, then your pH will bounce. This means that you do not have enough alkalinity in your pool to maintain a constant pH. The pH may test differently in different parts of the pool

When your TA reduces to 50ppm add one pound of baking soda for each 5,000 gallons in your pool.

Copper Ions and Treatment

The ideal level for copper ions is 0.5ppm. Levels in the range of 0.4 to 0.6 are acceptable. Once the copper has reached the desired level of 0.5ppm, you only have to run the electronic unit about one time a week during the day. Test as needed.

NOTE: *When you test your pool's water for copper ions, you look down through the top of the test tube as you hold it ½ inch above the white area of the color comparator.*

The first time you test, wait for three (3) minutes before you compare the test tube to the color chart provided with the kit. Then wait for seven (7) additional minutes and compare to the color chart once again. If you get a higher reading, then use a waiting time of ten (10) minutes for future pool water tests.

NOTE: *Make sure your pH is in the 7.0 – 7.4 range. If your pH is higher, your copper ion test will not be accurate. It will not show all the copper ions you have in your water.*

Calcium Hardness(CH) and Treatment

The purer the water molecule is, the more aggressively it tries to contaminate itself. Calcium chloride reduces the aggressiveness of the water molecule, which in turn, will make the water easier to treat and helping prevent damage to the pool's surface. One could consider this being an insurance policy against owner negligence. For example, the damaging effects of low pH water would slightly be negated with calcium being present in the water.

Calcium Hardness (CH) is treated with calcium chloride. This is available at most stores that carry pool supplies. Please see Table 2 for treatment instructions.

NOTE: *The ideal calcium hardness in a vinyl liner, fiberglass, or painted pool is 150 to 200ppm minimum. For a plaster pool the ideal level is 300ppm. Always follow the manufactures' guidelines for your pools surface. Test and treat in the Spring and Fall.*

Getting The Best Test Results

All treatments for pH, TA or CH should be made with water taken from the pool in a large plastic bucket (5-gallon container for example). ***Please Use Caution.*** The treatment (muriatic acid, baking soda, or calcium chloride) should be totally dissolved and then gently poured into an inlet stream of water. **Do not combine any of these chemicals together.** They must be added separately; i.e., one at a time!

7. CLARITY OF YOUR POOL WATER

Your pool water clarity is the responsibility of your filter and pump. The pump is responsible for impelling the pool water from the pool and propelling it through the filter. The filter is responsible for clearing the pool water. But, all filters are a trade off of filtration capacity (the size of material the filter can remove) and flow rates (the volume of water that can be processed over a given period of time).

NO FILTER WILL KEEP YOUR POOL PERFECTLY CLEAR. Microscopic particles (suspended solids, hair, suntan oil, body oil, dead skin cells) too small for your filter to catch will accumulate and form a cloud. You will need to use **a *filtration aid*** to keep your pool water clear. Below are the options that you can use to keep it clear:

1. Sequestering Agents
   or
2. Oxidizing Agents

Sequestering Agents

These also known as water polishers, clarifiers, coagulants, light flocks, or sequestering agents. These products will pull together those small particles until they are large enough for the filter to catch. Intec recommends a product called *Super Blue* that is manufactured by Robarb™. It is a corn starch durative. Follow the instructions on the label for the amount to add to your pool. This should be added once a week or as needed. If you see another cloud form during the middle of the week; i.e., after a storm or a heavy bathing load, you may reapply.

Oxidizing Agents

These products will physically burn up the microscopic particles in your pool. These products are more commonly utilized because of their ease of use and they are a more economical option. The two most common agents are:

1. Hydrogen Peroxide
   or
2. Household Bleach (Sodium Hypochlorite)

To keep these instructions simplified, one can substitute hydrogen peroxide in the place of bleach. Hydrogen peroxide can be substituted for those choosing to live a totally chlorine-free lifestyle. (Hydrogen peroxide is available at Whole-Foods in the laundry section as a bleach alternative). However, please do not be concerned about using bleach. Remember, we are not using a stabilizer such as cyanuric acid which is necessary to keep chlorine in the water molecule. Bleach does not remain in the pool as a weak form of chlorine. Just like the muriatic acid, it is self-sacrificing, and does not remain in your pool after it finishes doing its job of oxidizing.

Once a week, add one quart of bleach or hydrogen peroxide for each 8,000 gallons of water in your pool (even if the pool water is perfectly clear). This treatment will prevent a cloud from forming. Look at the clarity of your pool water often. Any time the water is not clear, add one quart of bleach for each 8,000 gallons of water.

> ***NOTE:*** *Wait for a minimum of 30 minutes after treating pool before allowing anyone to swim. When treating your pool, make sure that you are running the pump and recirculating the water.*

Pool Filters

Diatomaceous Earth (DE) Filter – This system will filter suspended solids from your water down to 10 microns. This is very good; however, the DE filter will cause the TDS (total dissolved solids) to increase. This increase will cause your treatments to work less effectively and those treatments will take a little longer to take effect.

Zeolite Filter - (also known as Zeosand or Zeobrite) will filter your pool water down to 5 microns, which is even better.

The above two filters use a lot of pool water for backwashing. The backwashing takes the water that you have been testing and treating out of the pool. This requires you to refill the pool with untreated water thus changing your water test parameters. Now you have to do your testing and treatment all over again to attain the previous levels achieved before the filter was backwashed.

Cartridge Filter - This will filter the pool water to 20 microns and it requires no backwashing. You simply take the cartridge out and clean it with a sweeper nozzle. The nozzle is available at any hardware store. You have not changed one gallon of the pool water chemistry and you do not have to retest and retreat the water.

8. TIPS TO PERFECTION

A. Always err on the side of under treating your pool water rather than over treating your pool water.

B. On a new pool or one under construction, be sure to tell the pool builder *not to put any chemicals in the water*. Sometimes builders will put a Metal-Out product in the water. This product will take the copper ions out of the water, attack the electrode, and continue to the process until all of the Metal-Out is utilized and filtered out.

C. When you are using the ionization unit, ***the pool pump must always be running*** so the copper ions can be flushed from the electrode into the pool.

D. Test accurately and often. Make small treatments when necessary. Insufficient testing and treatment will ultimately take more time and more money. Your water will always be perfect with consistent testing and treatment.

E. Keep on hand all the supplies you might need for two months.

F. Operate the pump during the day which is when your water is under the most stress. Recommended hours to run pool pump:

Daily High Temp	Hours
90-95	12
85-90	10
80-85	8
75-80	6
70-75	4

G. Do not use any algaecides because copper ions are the single best algae stat on planet earth. Many algaecides are copper based. Adding algaecides will cause you to get a high false reading on the copper test.

H. When you notice your pool water is discolored (*before you do anything else*), check and treat your pH if high. Then wait until the next day because your water may clear. This is caused by the lower pH reabsorbing whatever caused the discoloration.

I. Get the water from the pool for testing about 12 inches below the surface.

J. Algae should never be allowed to infest the pool. This may happen when you go on vacation and the pool water has not been properly tested and treated. Once the pool water is properly tested and treated, the copper will kill the algae but will not make it disappear. Start an oxidation program (See Section 6.2) of one quart of Bleach or Hydrogen Peroxide for every 8,000 gallons a day until the algae is no

onger visible. Even though the algae are dead, they may still retain their color and stickiness for several days.

9. STAINS AND SCALE

This was discussed earlier in Section 5.1 (under pH). In pools, stains and scale are either caused by low pH or high pH.

First test and treat your pH, and then wait one day. If the stain or scale still exists then use a product called *Stain Tamer* to remove the stain or scale. Be careful not to use a product called Metal Out. Metal Out, and others like it, can bind up the copper ions in your swimming pool/spa, making them ineffective.

If a stain appears on the steps or swimout, you may use the muriatic acid (the same as you use to lower the pH) to remove it.

10. ATTER THE STORM AND TREATMENT

A. Remove all leaves and debris from pool. Do not leave a single leaf!
B. Clean skimmer baskets, and pump weir basket.
C. Put filter on re-circulate and add proper amount of Drop-Out or Heavy Flock. (Follow Drop-Out instructions *especially regarding the pH*) With filter on re-circulate, run pump for 2 hours then cut pump off.
D. 24 hours later, hand vacuum slowly to remove waste. Wait one more day as pool water may drop out additional waste during this time.
E. You may have to add water to your pool when water goes below the skimmer. If this happens, then you MUST:
    1. Readjust your pH,
    2. Test and adjust copper,
    3. Test total alkalinity, and
    4. Test calcium hardness
F. Add Stain Tamer if needed. Please note - Use only products called Drop-Out and Stain-Tamer. Do not substitute. Results will vary according to the pool condition.

11.ELECTRODE MAINTENANCE – REPLACING BARS

1. Detach the electrode housing from the pool plumbing. Loosen both unions by turning them counterclockwise (This assumes you are standing directly above the electrode and the union at a 6 o'clock position and the center of the electrode is at the 12 o'clock position). Keep in mind that the unions are on opposite side of the clear housing and will have to be turned in opposite directions depending on the orientation.
2. Detach and remove the electrode. Be careful the O-rings do not fall or get misplaced.
3. There are two screws on each side of the clear housing. Turn them counter-clockwise until the bars fall out. Repeat the procedure on the other side. Clan holes and tubing if necessary. Discoloration may occur overtime and does not affect functionality of the system.
4. Slide new bars in one at a time aligning the hole of the bar with the hole in the clear tube. It is easiest if you allow the bar to rest at the bottom of the housing and look up to align the holes.
5. Slide screw into hole and line up with the hole in the copper bar. You can move the bar around with your fingers and slightly tighten the screw by hand. Repeat the procedure on the other side.
6. When the bars are in place, use a slot headed screwdriver to tighten the screws until the seals are slightly compressed. ***Over tightening may cause the housing to crack.***
7. Reinstall the electrode housing and ensure the O-rings are in place
8. Re-pressurize the system by turning on the pump and check for leaks. If the leak is at the screw, turn ¼ turn until the leak stops.

12.CHARTS

Table 1

To Decrease pH Using Muriatic Acid with Acid Demand Procedure

Drops of Acid Demand Reagent	500 Gallons	1,000 Gallons	5,000 Gallons	10,000 Gallons	20,000 Gallons	50,000 Gallons
1 Drop	0.9 oz.	1.8 oz.	9.1 oz.	1.1 pts.	2.3 pts.	5.7 pts.
2 Drops	1.8 oz.	3.6 oz.	1.1 pts.	2.3 pts.	4.6 pts.	11.4 pts.
3 Drops	2.7 oz.	5.5 oz.	1.7 pts.	3.4 pts.	6.8 pts.	17.1 pts.
4 Drops	3.6 oz.	7.3 oz.	2.3 pts.	4.6 pts.	9.1 pts.	22.8 pts.
5 Drops	4.6 oz.	9.1 oz.	2.8 pts.	5.7 pts.	11.4 pts.	28.5 pts.
6 Drops	5.5 oz.	10.9 oz.	3.4 pts.	6.8 pts.	13.7 pts.	34.2 pts.
7 Drops	6.4 oz.	12.8 oz.	4.0 pts.	8.0 pts.	16.0 pts.	39.9 pts.
8 Drops	7.3 oz.	14.6 oz.	4.6 pts.	9.1 pts.	18.2 pts.	45.6 pts.
9 Drops	8.2 oz.	1.0 pts.	5.1 pts.	10.3 pts.	20.5 pts.	51.3 pts.
10 Drops	9.1 oz.	1.1 pts.	5.7 pts.	11.4 pts.	22.8 pts.	57.0 pts.

Table 2

To Increase Calcium Hardness Using Calcium Chloride (77%)

Desired Increase in ppm.	400 Gallons	1,000 Gallons	5,000 Gallons	10,000 Gallons	20,000 Gallons	50,000 Gallons
10 ppm	0.77 oz.	1.92 oz.	9.61 oz.	1.20 lbs.	2.40 lbs.	6.01 lbs.
20 ppm	1.54 oz.	3.85 oz.	1.20 lbs.	2.40 lbs.	4.81 lbs	12.0 lbs.
30 ppm	2.31 oz.	5.77 oz.	1.80 lbs.	3.61 lbs.	7.21 lbs.	18.0 lbs.
40 ppm	3.08 oz.	7.69 oz.	2.40 lbs.	4.81 lbs	9.61 lbs.	24.0 lbs.
50 ppm	3.85 oz.	9.61 oz.	3.00 lbs.	6.01 lbs	12.0 lbs.	30.0 lbs.
60 ppm	4.62 oz.	11.5 oz.	3.61 lbs.	7.21 lbs.	14.4 lbs.	36.1 lbs.
70 ppm	5.38 oz.	13.5 oz.	4.21 lbs.	8.41 lbs.	16.8 lbs.	42.1 lbs.
80 ppm	6.15 oz.	15.4 oz.	4.81 lbs.	9.61 lbs.	19.2 lbs.	48.1 lbs.
90 ppm	6.92 oz.	1.08 lbs.	5.41 lbs.	10.8 lbs.	21.6 lbs.	54.1 lbs.
100 ppm	7.69 oz.	1.20 lbs.	6.01 lbs.	12.0 lbs.	24.0 lbs.	60.1 lbs.

Table 3

Pool Volume Calculation

1.1.1.1.1.1 Standard Above-Ground Pool Sizes with a Pool Wall of 48 inches			
12 ft Round	~ 2,975 gallons	**12' x 24' Oval**	~ 5,948 gallons
15 ft Round	~ 4,646 gallons	**15' x 30' Oval**	~ 9,293 gallons
17 ft Round	~ 5,968 gallons	**16' x 32' Oval**	~ 10,573 gallons
21 ft Round	~ 9,106 gallons	**18' x 33' Oval**	~ 12,267 gallons
24 ft Round	~ 11,895 gallons		
27 ft Round	~ 15,054 gallons		
30 ft Round	~ 18,585 gallons		
33 ft Round	~ 22,488 gallons		

1.1.1.1.1.2 Standard Above-Ground Pool Sizes with a Pool Wall of 52 inches			
12 ft Round	~ 3,398 gallons	**12' x 24' Oval**	~ 6,797 gallons
15 ft Round	~ 5,310 gallons	**15' x 30' Oval**	~ 10,620 gallons
17 ft Round	~ 6,821 gallons	**16' x 32' Oval**	~ 12,084 gallons
21 ft Round	~ 10,408 gallons	**18' x 33' Oval**	~ 14,019 gallons
24 ft Round	~ 13,594 gallons		
27 ft Round	~ 17,205 gallons		
30 ft Round	~ 21,240 gallons		
33 ft Round	~ 25,700 gallons		

Continued – Pool Volume Calculations

1.1.1.1.1.3 Standard In-Ground Pool Sizes with Varying Depths					
POOL SIZE	**GALLON 3.5' Av. DEPTH**	**GALLON 4' Av. DEPTH**	**GALLON 4.5' Av. DEPTH**	**GALLON 5' Av. DEPTH**	**GALLON 5.5' Av. DEPTH**
12' x 24'	7,600	8,600	9,700	10,800	11,900
14' x 28'	10,300	11,800	13,200	14,700	16,200
15' x 30'	11,800	13,500	15,200	16,900	18,600
16' x 32'	13,400	15,400	17,300	19,200	21,100
18' x 36'	17,000	19,400	21,900	24,300	26,700
19' x 38'	19,000	21,700	24,400	27,100	29,800
20' x 40'	21,000	24,000	27,000	30,000	33,000
22' x 44'	25,400	29,000	32,700	36,300	39,900
25' x 45'	29,531	33,750	37,968	42,187	46,406
25' x 50'	32,800	37,500	42,200	46,900	51,600
30' x 50'	39,375	45,000	50,525	56,250	61,875

Table 4

Pounds of Salt Required for 100 ppm Increase

Increase TDS Level (ppm)	Pool Size -- Gallons						
	250	500	1,000	2,500	5,000	7,500	10,000
100	0.21	0.42	0.83	2	4	6	8
200	0.42	0.83	1.67	4	8	13	17
300	0.63	1.25	2.50	6	13	19	25

Continued - Pounds of Salt Required for 100 ppm Increase

Increase TDS Level (ppm)	Pool Size -- Gallons						
	10,000	15,000	17,500	20,000	25,000	30,000	40,000
100	8	13	15	17	21	25	33
200	17	25	29	33	42	50	67
300	25	38	44	50	63	75	100

13. WARRANTY AGREEMENT

The Intec Warranty Agreement applies to the following current models: CV50 and the CV60. It also applies to the following discontinued models (Water Doctor I, Water Doctor II, Genesis Expanse, Water Magic II, Water Magic III, CV10, CV40). Intec America Corporation offers a 10-year "Pro-Rated Warranty" on its copper ionization systems. Intec warrants that all equipment is free from defect and will replace purchased equipment according to the prorated schedule below. You will need: 1.) A copy of the purchase receipt, 2.) Copy return of original registration, and 3.) Return of the faulty merchandise (excluding test kits and electrode). The customer must call in advance to receive a return authorization number (RAN) from Intec. (Please see note below). Acts of God and negligence are not considered to be manufacturing defects and will not be covered under this warranty.

1st Year - 100%	6th Year - 40%
2nd Year - 65%	7th Year - 30%
3rd Year - 60%	8th Year - 20%
4th Year - 55%	9th Year - 10%
5th Year - 50%	10th Year - 5%

For example, replacement cost during year 3 is 60% off the currently advertised price. If the current retail price is $1,000, then your replacement cost is $400.00 [$1000 – $600]. The client always has the option to have the unit repaired. Repair costs can vary and may often be a more cost-effective alternative. The option for repair will continue for the life of the system.

NOTE:
If you ever need to send a unit back for a warranty return/repair, please call first so we can issue a Return Authorization Number (RA#). This number must appear on the outside packaging. If the RA# is not present, the routing may be delayed or the package could be refused.

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Cut out and mail warranty registration to:

Intec America Corporation
PO Box 505
Franklinton, LA 70438

Please cut along dotted line.

1. Client Name:		
2. Client Physical Address:		
3. City:	4.State	5. Zip Code
6. Client Billing Address (If Different)		
7. City:	8. State	9. Zip Code
10. Home Phone:	11. Alt. Phone	
12. E-mail address	13. Place of Purchase	
14. Product Model:	15. Date Purchased	16. Serial Number

How did you hear about Intec?

☐Internet Source:_____ ☐Advertisement Source:_____ ☐Referral Source:_____

Please cut along dotted line.

For the CA10 and CV50 Models Only!

Run electronic unit
only when the pump is on
and water is flowing
through the electrode

Make sure the power indicator light is a solid color and not flashing. If the power light is blinking rapidly on any unit, turn the CA10/CV50 knob counter-clockwise or press the set-point down arrow (CV60) until the power is light is a solid color.