SOLUTIONS TO COMMON PROBLEMS

PROBLEM	POSSIBLE CAUSES & SOLUTIONS
One valve does not turn on, all others work correctly.	Wiring to valve broken. Solenoid faulty - test valve with good one. Program set for OFF watering time for that valve. Flow control on valve adjusted to off. Solenoid port clogged in valve, clean with paper clip.
All valves do not turn on	Controller is running on battery only. Check that the outlet and transformer are working. Controller Program switch is not set on RUN. Program set for no watering time. Wiring to valves broken - check common wire. Excess water pressure.
One valve won't shut off	Manually close flow adjustment screw. Valve needs cleaning or repair.
Display shows: **AC**	AC Power to controller is off. Check that AC power is on, then check that the transformer is working (use a multimeter).
Display flashing a zone #	The wire to the flashing station and common wire are shorted. Check wiring connections at the valve, at the controller and in between. Another cause is a shorted solenoid - A good solenoid has 15-35 ohms resistance.
Start times not correct	There could be an overlap of start times between programs A or B Set Start Time to a different time in one program.

For further assistance, call Champion's Customer Service department at (800) 33-CHAMP from 8:00 AM - 5:00 PM PST.

VOLTAGE SPECIFICATION:
Transformer Input: 110VAC 50/60 Hz
Controller Output: 26.5VAC 21.2VA/800 MA Indoor adapter
OPERATING TEMPERATURE: 32^{O}F - 122^{O}F
BACKUP BATTERY: 9V DCReplaceable (battery not included)
WARRANTY: 3 Year limited

CHAMPION®
IRRIGATION PRODUCTS

Automatic Sprinkler System Controller

OPERATING INSTRUCTIONS

For use with:
LC-4, LC-4T, LC-6, LC-6T, LC-9, LC-9T
Indoor Mount Controllers

CHAMPION IRRIGATION PRODUCTS
1460 NAUD STREET LOS ANGELES, CA 90012
(800) 33-CHAMP

Dear Customer;

We at Champion Irrigation Products thank you for purchasing this product. We trust it will give you years of dependable service as it was built to very high standards. It is technologically state-of-the-art, easy to program, and a real value. If you should have any questions please call us at :

(800) 33-CHAMP [800-332-4267].

The "Water Champ" LC series controllers are available in 4, 6 and 9 zone indoor models, and have 2 independent programs, A or B. One program for turf and one program for tree,shrub, flower beds or drip systems.. Other Features Include:

- ODD or EVEN- A lifetime calendar for watering only ODD or EVEN days in the event of a need to conform to local water restrictions.
- OFF/RAIN- To stop watering during rainy days.
- 2 MANUAL RUN OPIONS- Run all zones or select a specific zone to operate.
- 2 START TIMES-For each program for newly seeded lawns, new sod, or hot weather.
- WATER DAYS -Allow watering specific days of the week.
  SKIP DAYS- skip from 1 to 30 days.
  ODD/EVEN- Water only on odd or even calendar days if required by local restrictions.
- ZONE RUN TIME -Valve run times from 1 minute to 1 hour in 1 minute increments and 1 hour to 12 hours in ten minute increments.
- % WATER BUDGETING- Iincreased (up to 200%) or decreased (down to 10%) valve run times without reprogramming - great for water conservation.
- FACTORY DEFAULT PROGRAM- to water every zone daily for 10 minutes starting at 5:00 a.m.
- RAIN SWITCH TERMINAL- Will allow the addition of a rain sensor shut-off. (not included)
- FUSE PROTECTION- 1amp fuse to protect your controller from short curcuit damage.
- BATTERY BACKUP- 9 volt DC battery backup saves your set program in the event of a power failure (battery not included)

Your Champion controller provides the convenience of automatic watering and the flexibility to make the most of our precious water resources. Your controller was designed to be easy to program and operate. Please refer to this guide to learn the best way to install and use your controller.

PROGRAM INFORMATION

STATION RUN TIMES

STATION No.	LOCATION	STATION RUN TIME	
		PGM A	PGM B
1			
2			
3			
4			
5			
6			
7			
8			
9			

START TIMES

	START TIME 1	START TIME 2
PGM A		
PGM B		

WATERING DAYS

	S	M	T	W	T	F	S	SKIP DAYS
PGM A								
PGM B								

NOTES

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INSTALLATION

Where to Install Your Indoor Controller

Locate your controller indoors near a standard 110V AC outlet. The outlet should not be controlled by a switch or share the same circuit with a garage door opener, electric dryer, or other large appliance or inductive motor. The location should be protected from moisture and temperatures exceeding 120^{o} Farenheit.

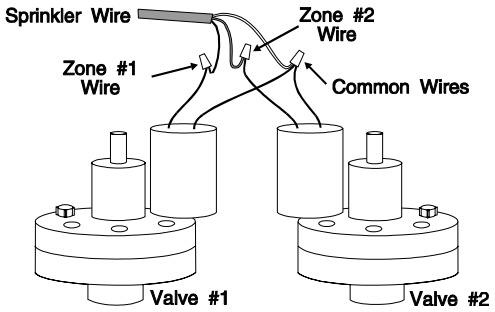
Mounting Your Controller

Screw one of the supplied #8 screws into a wall at eye level. Leave 1/4" of the screw head extending from the surface. Use an anchor bolt for drywall or masonry. Slip the buttonhole opening on the back of the box over the screw head. Open the lower door. Install two more screws from the front, through the holes at the bottom of the box.

Wiring Your Valves

Use color-coded 18 gauge (16 or 14 gauge can also be used) plastic jacketed sprinkler wire to connect the controller to your valves. If you plan to bury the wire, use a route that will not be disturbed later by digging. Each valve has two wires. Use one wire for power and one for common, it doesn't matter which one you use.

Connect the common wires from all the valves to one of the color coded sprinkler wires (usually the white wire). Connect the other wire from each valve to a single color coded wire. Use wire nuts or solder to secure the connections. Protect connections with silicon sealant or electrical tape.



Wiring Your Controller

Open the lower door on your controller. Using a small screw driver, attach the common wire to the terminal marked "COM." Attach the wire to the left side of the screw for better holding, or wrap the wire around the screw.

Rain Sensor

The ÀÙ shaped connector wire must remain connected between the COM and RAIN terminals when a rain sensor is not in use. Disconnect the wire and save it before connecting a rain sensor. Connect one sensor wire to the RAIN terminal and the other to the COM terminal. Champion Irrigation does not manufacture rain sensors so they must be purchased separately. Follow specific instructions supplied with the rain sensor.

ADDITIONAL FEATURES

The 9V DC battery backs up the customer entered programs (memory) and clock time in the event of a temporary AC power failure.

The indoor transformer output is 800 MA (.8 A/19.2 VA) which is sufficient to power two (1) solenoid and a master valve simultaneously with the ten (10) second delay feature.

Your "Water Champ" controller will "stack" program start times and runs logically. Start times are chronological (earliest clock time) and run until a program finishes in the event you programmed longer run times than can finish before the next start time. You could also extend run times into another program with **%** watering/Water Budgeting. Your controller will stack or hold this second program and start it when the first start time program finishes.

Programs could run past midnight (i.e. long drip system programs). The controller will cancel a previous days program when the first start time comes up on the next day. The exception to this is if WATER DAYS are set

match the moisture demand based on the current weather. If it is hot and dry, you can increase the run time - cold and damp, you can decrease the programmed run time.

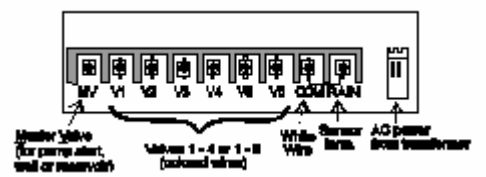
The up and down arrows control the percentage adjustment up to 200% or down to 10% in 10% increments (steps). For any percentage other than 100%, the **%** sign will remain in the LCD readout indicating a percentage run time adjustment. As an example, if you had ten (10) minutes on zone 1 and set **%** watering at 50 %, zone 1 would water for five (5) minutes. All zones in all programs are in an override with **%** watering. It is a beneficial tool to use for water conservation. If you return **%** back to 100%, the original zone run times are still programmed. This is the easiest way to change the length of time you water. With **%** watering, zone run times can go as short as 10% of one (1) minute (equivalent to six seconds) for nursery application or newly seeded lawns.

Zone Test

By pushing both up and down arrows at the same time, a zone test starts with zone 1 to check if there is a bad zone, a short on the wires, or a faulty solenoid. The test has a ten (10) second delay then counts down 30 seconds in the LCD, then moves to zone 2 and so forth. If a short exists, a bad zone # will be indicated on the LCD. If multiple zones are shorted, the bad zones will flash alternately. Your controller will not operate with a bad zone.

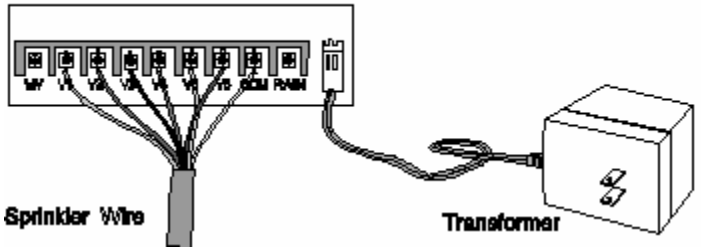
INTERNAL FEATURES

The terminal strip appears as follows:



Attach the wire for Zone #1 to the terminal marked "V1". Attach the remaining wires the same way. (Attach only one valve per terminal.)

[Instructions for Pump Start and Master Valve only: Attach one wire from the pump start relay or master valve to the "MV" terminal, the other wire to the "COM" terminal. To prevent damaging your pump in the event the default program turns on, attach a jumper wire from any unused zone terminal to an operating zone terminal. This way the pump will not operate against a closed system.]



Connecting the Transformer (Indoor Models)

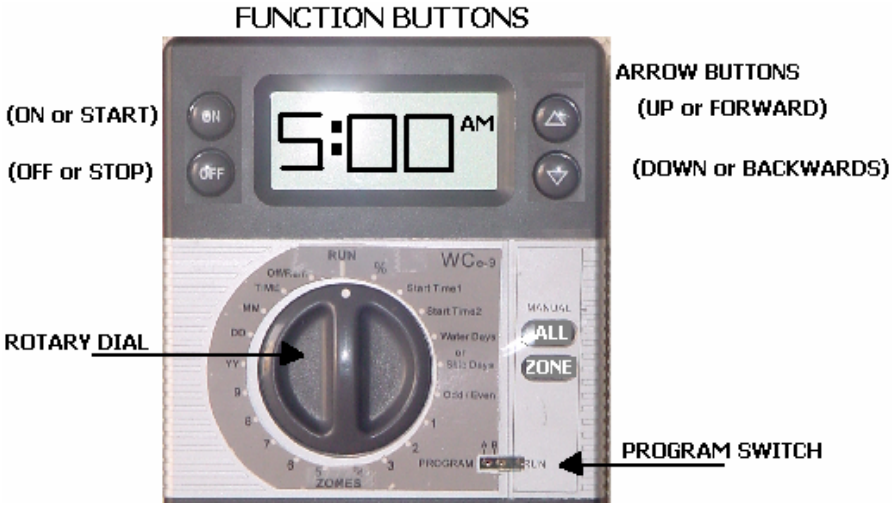
Attach the transformer connector to the two pin circuit board connector. The connector only fits one way. Be sure the ribs on the transformer connector fit over the spine on the circuit board connector. **DO NOT** force the connectors together. Use one transformer per controller.

PROGRAMMING YOUR CONTROLLER

Programs A or B

Your controller allows you to set two independent programs: A or B. Each program can have its own set of start times, run times and watering days. Use these programs to satisfy the different watering needs of your landscape. For example, you may use program A to water the lawn in the morning every other day for ten minutes only in each lawn zone. Use program B for example, to water shrubs on Tuesdays and Saturdays for thirty minutes only in each shrub zone.

(When setting different programs, be careful to avoid setting a start time for one program that will begin while another program is still watering Erratic operation of the controller may result from overlapping programs.)



Setting the Current Calendar Time, Month, Day, & Year

Start programming your controller by setting the CALENDAR TIME (current time A.M. or P.M., MONTH [01 = Jan., 02 = Feb., and so on], DAY [day of the month], and YEAR [98=1998, 00=2000, and so on]).

- Turn the rotary dial counterclockwise (left) to the TIME position. The display will read '12:00 A.M.' (for initial setting only). Set the current time by pushing the s or t button until the correct A.M. or P.M. time is shown in the LCD display.
- Turn the dial to MONTH and set the current month. For example, '01' is January, '02' is February, and '12' is December.
- Turn the dial to DAY and set the current day of the month, one (1) through thirty-one (31).
- Turn the dial to YEAR and set the current year, starting at '02 for 2002 03is the year 2003 and so on.

The calendar extends for 100 years, going far beyond what is needed, and is accurate for the life of the controller (including leap years and the turn of the century).

Manual Operation (Turning on your sprinklers right now)

There are two ways to turn on your sprinklers manually:

1. PRESET ALL PROGRAM WATERING: with the rotary dial at the RUN position, push the RUN button. Zones 1 to 4 (or 1 to 9) will water the time you set in ZONE RUN TIME in Program A, then B,. (Remember each zone can only be assigned to one of the two programs A, or B
2. INDIVIDUAL ZONE WATERING: With the rotary dial in the RUN position, push the ZONE BUTTON zone 1 will appear on the LCD screen with the program run time. Press the ZONE button again to forward to zone 2, again to zone 3 etc until you reach the specific zone you wish to water. The zone run time for manual operation can be adjusted by using the up or down arrow buttons. - remember the 10 second delay before the sprinklers start watering.

NOTE: To stop watering at any time press the OFF button with the dial in the RUN position.

OFF/RAIN

Turn the rotary dial to the OFF/RAIN position if you do not want to water due to rain or for any other reason. The time and all programs will be retained, but electricity will not go to the valves to turn them on. Be sure to turn the rotary dial out of the OFF/RAIN position and back to the RUN position to water again

% WATER BUDGETING

At about the one (1) o'clock position on the rotary dial between RUN and START TIME 1 positions is the **%** sign. In this position the LCD reads 100% which means the zones water the exact time you entered into the program. With this function, you can alter your zone run times to

Repeat instructions for Program A to set Program B beginning with START TIMES, then WATER DAYS, then ZONE RUN TIMES. Remember to not overlap START TIMES by adding up the combined run times for all zones in Program A and add that amount to Program A's START TIME to determine the earliest START TIME for Program B. For example, if START TIME 1 for Program A is set to 4:00 A.M. and Zone 1 runs for 10 minutes, Zone 2 for 25 minutes, Zone 3 for 30 minutes, and Zone 4 for 10 minutes (all in Program A) then the combined total run time is 75 minutes. Accordingly, Program B could not start until 75 minutes or more past 4:00 A.M., so the first available START TIME for Program B would be 5:15 A.M.

Continuing programming your WATER CHAMP controller until you have covered all Programs A, B, START TIMES, WATER DAYS, and ZONE RUN TIMES.

Important Programming Notes

The Program Switch must be in the RUN position for automatic or manual watering, and in the A,or B, position to set program START TIMES, WATER DAYS, and ZONE RUN TIMES.

The start of watering is delayed on either automatic or manual runs on every zone/valve and the Master Valve/Pump Start by ten (10) seconds.

The advantage of this 10 second delay is the demand for electrical current does not come on all at the same time if 1 zone or the pump start to come on simultaneously. It also allows time to do a visual check of your zones to see if they are watering properly.

When the controller is watering, the display will show the active zone number and the corresponding program the zone has been programmed into and count down the remaining run time when running in the AUTO position. To stop watering at any time push the OFF button.

OPERATING YOUR CONTROLLER

Automatic Operation

Whenever your controller is programmed with START TIMES, WATER DAYS, and ZONE RUN TIMES it is ready to automatically water (so long as the rotary dial is not pointing to the OFF/RAIN position).

Factory Set/Default Program

Your "Water Champ" Controller is shipped from the factory with a permanent program for easy programming and as a backup default program. Every zone has ten (10) minutes run time and is assigned to Program A, scheduled to water every day at 5:00 A.M. You can program what you want over this factory set program, but in the event that the AC power is off and the backup battery is no longer functioning, this default program would water your yard as described above.

Setting a Watering Schedule

Your "Water Champ" controller has programs A OR B which allows you to set two independent programs. Each program can have its' own set of start times, run times, and watering days. The dial selects the different program information by setting the PROGRAM switch to the desired program to be set or altered. Use these programs to satisfy the different watering needs of your landscape. Determine what you would like to do with Program A. If it is to water your lawns for example, decide the number of start times needed (generally one or two), and the duration of watering (generally fifteen minutes or less per zone unless rotors or impacts are used). The total length of watering time will be equal to the sum of the watering times for all the operating zones. Watering should be done very early in the morning to assure adequate water pressure, less wind dispersal, diminished chance of leaf burn, and reduced evaporation. Watering at night can promote fungus growth.

Setting Start Times

- Turn the rotary dial to START TIMES position 1. Move the PROGRAM switch left to the 'A' position.

- To set START TIME 1 (factory set/default is set at 5:00 AM, suggested setting: between 4:00 A.M. and 6:00 A.M.) push the up (to advance) or down (to retard) buttons to change the displayed starting time.
- Use the same procedure to set a second start time if desired using START TIME 2. Generally second waterings are set for the afternoon so be sure to check that the correct A.M. or P.M. indicator is shown in the LCD display.

- Should you no longer need a start time (i.e. newly seeded lawn matures), push the OFF button to cancel. They are retained in the memory. If you wish to use them again, push the ON button.

Setting Watering Days

In WATER DAYS you may use either SET DAYS (7 days of the week) or SKIP DAYS (skip from 0 to 30 days) in any combination of Programs A, or B, Programs A can be on SET DAYS and Program B can be on SKIP DAYS. However, ODD/EVEN can only be set when using SKIP DAYS, **not** when using SET DAYS.

To water on specific days of the week, rotate the dial to the SET DAYS position in the WATER DAYS segment of the dial. S M T W T F S (Sunday through Saturday) are the seven days of the week shown in the display. Use the up button to advance through the days of the week (the down button will reverse through the week). The selected day will blink. If you want that particular day to water, push the ON button and a box (bracket) will appear around that day. To turn off a day press the OFF button. For example, to water on Mondays, Wednesdays, and Fridays, the display should show:

S [M] T [W] T [F] S

If you want a consistent number of days between watering, rotate the dial to SKIP DAYS (do not use the SET DAYS position). With this setting you can skip watering from one (1) to thirty (30) days or set at 0 to water everyday. If you set SKIP 1 DAY(S) you will water every other day, if you set SKIP 2 DAY(S) you will water every third day, and so on, up to skipping 30 days (orchards or vineyards).

If you have restrictions from your water company and they require watering on ODD or EVEN calendar days, set your SKIP DAYS first, then turn the dial to ODD/EVEN and push the s or down arrow to toggle between ODD and EVEN settings in the LCD display. If you wish to return that program back to a SET DAYS schedule, be sure to turn ODD or EVEN off.

Setting Zone Run Times

Next move the rotary dial to the ZONE RUN TIME segment of the controller so that it points to the first zone (also known as a station) that operates a valve in the area you want watered in Program A (or whichever program you are setting). This would usually be zone 1. Determine how long you want the sprinklers to water.

Each zone can run from 1 to 60 minutes in 1 minute increments, and from 1 hour to 12 hours in 10 minute increments (generally for drip systems). Use the up (to increase) or down (to decrease) buttons to set the run time for each zone you wish to use in the program you are setting. **(Make sure the run times for the zones you are not using are set to OFF by pressing the OFF button while the rotary dial is pointing to that zone).**

Each zone can ONLY be assigned to ONE program. Zone 1 for example, can not be used in Program A and again in Program B. The 10 minute default zone run times can be changed anywhere from the 10 minute default setting down to 1 minute, or up to 12 hours by using the up or down buttons, and assigned to any program A or B, by moving the PROGRAM switch to the appropriate program.

Efficient Run Times

An efficient run time depends upon several factors: the type of plants being watered, temperature, humidity, soil type, slope of landscape, and type of sprinklers. For most lawns, the amount of water needed per week ranges from about 2" in hot climates down to 1/2" in cooler climates. Trees and shrubs have deeper root structures and require long slow watering, which can best be applied by shrub sprays, a bubbler, or a drip system. High humidity reduces water demands. If your soil is sandy, or you are watering on a slope, water frequently with short run times. Clay soil holds water better, so water less often and use short run times. For more precise guidelines, check with a local nursery or gardening service regarding your specific needs.

To learn the rate at which your sprinklers apply water, do a "Can Test". Place several 1 lb. coffee can size containers evenly across your lawn. Run your sprinklers until the average water depth in the containers reaches 1". Record the run time. Divide the result into 60 minutes to determine the average inches per hour your sprinklers distribute. Use this information to plan your watering schedule.

Plants need more water during hot weather months and less during cold weather months. Use your controller's WATER BUDGETING (**%**) feature to make easy, one-step seasonal adjustments to your run times.

Setting Additional Programs

When you have finished setting the zone run times for Program A, move the program selector switch to Program B if you desire a B program for shrubs or a drip system.