

EC Controller

*Sophisticated Technology and Maximum Convenience
for Residential Systems*



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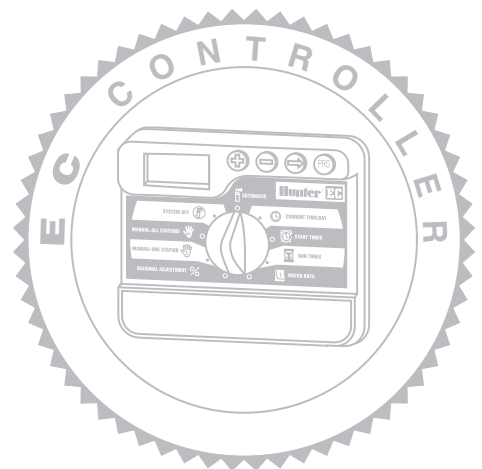
PRODUCT OVERVIEW

Hunter presents a controller created specifically for the international market. A masterpiece of modern technology that brings together the most desirable features, bundles them in a small, attractive package, and makes everything simple and easy to use.

The EC is designed for those who don't want a big controller, but do want one with all the features that meet their irrigation requirements. Available in compact 2-, 4- and 6-station indoor models and 4- and 6-station outdoor models, the EC offers all the features you would expect to find only on more expensive units – on-screen watering budgeting for seasonal adjustment, interval watering options, station delay, one-touch manual start and advance and non-volatile memory (plus, the outdoor models boast a sturdy protective cabinet that includes a lockable case).

Best of all, no controller is simpler to install and program. Both the faceplate and the easy-to-read LCD display feature internationally-recognized icons that make programming a snap, regardless of the language you speak.

The EC controller. Just the latest example of how Hunter makes advanced engineering simple.



PRODUCT FEATURES AND BENEFITS

Outdoor or Indoor Models Available

A versatile controller, covering the needs of all installations

The EC is a very affordable controller offered as an indoor model for installations where protection from the elements is available or as an outdoor model when the need for weather resistance is required.



2-, 4- or 6-Station Models

Best value for residential, only buy the stations you need

Hunter is a leader in fulfilling customer wishes. The EC controller is just one of the latest in a long history of quality irrigation products. For those irrigation systems which may only include a small low-volume zone or two, the EC 2-station is the perfect choice. For small residential systems requiring zones for a number of different plant types, or for areas requiring a number of zones because of reduced design capacity, the EC 4- or 6-station is the best choice.

Large LCD with Interactive Icons

Internationally recognized programming icons

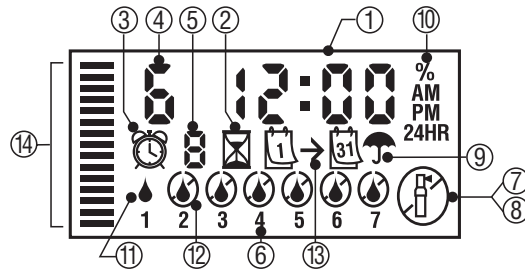


The large LCD display with interactive icons simplifies programming by

using internationally recognized symbols for programming functions. Also, the

display is easy to read and verify, making the entries easy to understand in any language.

1. **Main Display** – Indicates all programmed information.
2. **Run Times** – Icon indicates when Run Times are being set.



3. **Start Times** – Icon indicates when Start Times are being set.
4. **Station Number** – Indicates currently selected station number.
5. **Program Designator** – Identifies program in use A, B, or C.
6. **Day of the Week** – Day of the week is indicated by number 1 to 7.
7. **Flashing Sprinkler** – Indicates that watering is occurring.
8. **Crossed Sprinkler** – Indicates that watering is suspended.
9. **Umbrella** – Indicates Rain Sensor is suspending irrigation.
10. **Percent** – Indicates that Seasonal Adjustment is being made.
11. **Rain Drop** – Indicates watering will occur on that selected day.
12. **Crossed Rain Drop** – Indicates watering will NOT occur on selected day.
13. **Calendar** – Indicates interval watering schedule is being programmed.
14. **Bars** – Indicate seasonal adjust/water budgeting percentage.

Electronic Short Circuit Protection

No fuses to worry about

The EC is equipped with a circuit overload protection system. The electronic short circuit protection system detects a high current path (short) through an operating station. (The most common causes of “shorts” are faulty solenoids



or when a bare valve common wire touches a bare station control wire) When a short circuit is detected on a station, instead of blowing a fuse which would shut down the entire irrigation system, the controller will skip over that station and continue to water the rest of the zones in the program. The controller will indicate what zone is shorting by showing the

station number followed by ERR in the LCD display. To remove the ERR message from the display, just turn the dial or push any button. The controller will continue to “jump over” that zone during every watering until the zone is repaired.

Primary Surge Protection

Microcircuits protected from electrical spikes

The EC is equipped with an electronic component called a MOV (Metal-Oxide Varistor). The MOV is designed to shunt electrical surges away from microcircuits through a grounding circuit. The EC uses a MOV to protect the controller from minor primary power surges when the controller is properly grounded.



Non-Volatile Memory

Holds programs indefinitely; excellent insurance against unreliable power

The EC has what every user of electronic controllers has wished for. The ability to keep programs in memory without the use of a backup battery. In the event of a power failure or if AC power is suspended from the controller by the user, the EC's non-volatile memory will maintain the calendar date and program forever, without the use of a 9-volt battery installed in the controller. Normal watering will resume when AC power is restored.

No Battery Required

Maintain time of day up to four weeks

The circuitry of the EC has such low power consumption that the controller will accurately track the time of day for up to four weeks after AC power has been removed from the controller by the user or in the event of a power outage. This timekeeping occurs without the use of a 9-volt battery installed in the controller. When power is restored the controller will continue to water, right on schedule. Also, when power is restored the controller will recharge its circuits to allow another four weeks of time keeping.



PRODUCT FEATURES AND BENEFITS (cont.)

Intuitive Dial Programming

For easy program entry

For contractors and homeowners alike, the EC provides step by step programming. No complicated entry functions or repetitive keystrokes. Just turn the dial to the section of the program that needs to be changed and use the plus, minus and next buttons to make the adjustments. No other programming method is easier – in any language.

Three Programs (A, B, C) with Multiple Start Times

Different watering requirements are met with independent programming

The EC allows different irrigation applications using the three completely independent programs. This important feature can be used for various types of plants that have separate day watering requirements. Each program has the ability to water up to four start times per day. The user has complete flexibility with watering schedules for new seed or sod lawns, multiple cycles for low infiltration-rate soils, slopes, morning or evening irrigation and other watering window restrictions.

Seasonal Adjustment/Water Budgeting

Changing run times could not be easier, from 10% to 150%

The seasonal adjustment setting on the dial allows the user to make global changes to the run times of each zone from 10% to 150% percent of the original programmed run time. This feature is perfect for making small changes that are necessary as the weather changes, without reprogramming



the entire controller. A bar graph in the large LCD display lets the programmer know at a glance at what percent from the original settings the controller is operating the station run times. An excellent feature built into the seasonal adjustment is the ability to immediately view the newly adjusted run times when the rotary dial is turned to the **Set Station Run Times** position.

Note: The controller should always be initially programmed in the seasonal adjustment in the 100% position.

Controller Programming Without AC Power

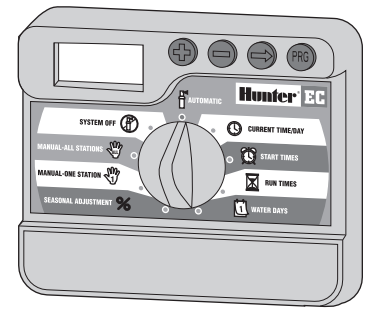
Maximum convenience for programming using a 9-volt battery

With a 9-volt battery hooked up, the EC has the ability to be programmed (including time and day) before installation or in the absence of AC power. This ability comes from circuitry within the controller using the power supplied by the 9-volt battery. After programming, the battery may be removed from the controller if desired because the controller is designed to store all programming indefinitely within its memory.

Assign Zones to Any or All Programs

Complete versatility for any watering requirement

Any station can be assigned to any or all programs in the EC, making the EC a truly versatile controller. This allows zones to have more than one watering schedule if required by the landscape.



One Touch Manual Start and Rapid Advance

Simple operation for a quick check of zones

A new feature that Hunter has incorporated into the EC is called the One Touch Start and Rapid Manual Advance.



It increases user-friendliness of the controller by using fewer steps to activate stations. This feature is great for a

quick cycle when extra watering is needed or if you would like to scroll through the stations to inspect the system.

Single Station Manual Start

If all that is needed is a little extra on a single zone!

Many times throughout the year and for many reasons, the user will want to add extra water to a particular zone. Watering-

in fertilization and pesticides into the soil or spot seeding are just a few. With single station manual start, the EC is able to accomplish that task. Just turn the dial to Manual-One Station, use the arrow button to move to the desired station, then turn the dial to the Run position.

The user may also increase or decrease the run time setting if preferred. After the zone

is finished, the controller will return to automatic mode with its original schedule, even if modified for the manual operation.



AM/PM or 24 Hour Clock Settings

Choose your favorite method of timekeeping



The EC allows the user to select the option of operating the controller in AM/PM mode or 24-hour mode. Many electronic controllers are

dependent on the cycles of electricity to determine whether the controller will operate in the AM/PM or 24-hour clock setting. When the electricity is at 60 Hz, the controller will operate in AM/PM mode and when the electricity is at 50 Hz, the controller will operate in 24-hour mode. The EC is designed to best fit the need of the user without regard to the Hz cycles.

Choice of Independent Day Scheduling Options

Days of the week or 31 day interval for maximum flexibility

The day schedule in program A, B or C may be set up independently from each other. In each program, the choice of Day of the Week or a watering interval up to 31 days apart may be selected. This allows the user to water on certain days of



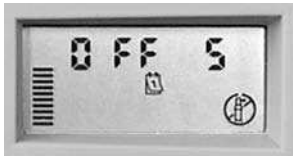
the week such as Monday, Wednesday and Friday or water on a repeating

day cycle (interval) such as every third day, in any of the programs.

PRODUCT FEATURES AND BENEFITS (cont.)

Programmable Rain Delay (0 to 7 Days)

No need to return to the controller to turn it back on



The EC allows you to turn off the controller for a predetermined period of time

(1 to 7 days) during rainy weather. All programs are affected, as this delay is global. After the specified period has elapsed, the controller will return to automatic mode and water as scheduled. This delay feature is very convenient in residential systems, when the operator uses this delay feature, there's no need to worry about remembering the controller has been turned off. This delay is accessed by turning the dial to SYSTEM OFF, wait four seconds and then push the **+** button to the number of days of delay.

Master Valve/Pump Start Relay Circuit *Compatible with Hunter PSR (Pump Start Relay) and other industry relays*

A master valve or Hunter PSR pump start relay can be activated with 24 VAC power by connecting the wires to the C (common) and P (pump/master valve) terminals.

Note: maximum allowable amperage of the relay is set at .28 amps.

Programmable Delay Between Stations

Slow closing valves and water well recovery will never be an issue

A programmable delay between stations solves the problem of a slow closing valve causing a hydraulic overload condition.



The delay is programmable up to 100 seconds. To access the delay: while the dial is at the AUTOMATIC position, push the **⊖** button then rotate the dial the RUN TIMES position. Push the **+** or **⊖** button to increase or decrease to amount of time, up to 100 seconds. Note: The MV circuit will stay hot only for the first minute of the programmed delay.

Up to Four Hour Run Times

Allows accurate watering for all types of plant material

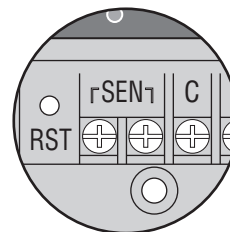
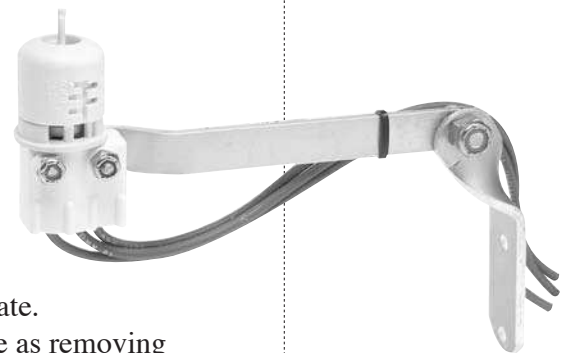
Each station will operate up to four hours of run time programmed in one-minute increments. The factory default for all stations is set at 0 minutes to minimize any valve operation before programming. The controller will keep all run times within its memory after programming, even during and after a power outage of any length.

Weather Sensor Compatible

Hooking up a sensor is a simple process

A Hunter Mini-Click® rain sensor or other type of micro-switch weather sensor can be connected to the EC. The purpose of a sensor is to stop watering when weather conditions dictate.

The hookup is as simple as removing the jumper that is attached across the SEN terminals of the controller and connecting the sensor wires to the terminals.



Start Time Stacking

Prevent hydraulic overload

Preventing hydraulic overload is very important when designing irrigation systems, especially residential systems. All electronic controllers such as the EC allow the user to input start times into the programs that could cause the controller to overlap station run times. This occurs when the station run times add up to more minutes than the amount of time programmed between the start times. In the EC, the start times will stack and not begin to actually water until the previous start time has completed its run through of all zones programmed. This great feature will eliminate the possibility of more than one zone operating at a time causing the system to perform poorly when water pressure and flow are minimal.

Automated Chronological Ordering of Start Times

No more “phantom” starts!

When more than one start time is entered into a program, in any order of sequence, the EC automatically shifts the start times in ascending order from the earliest start time to the latest start time. The EC will also shift or “rubber band” the start times if times were inadvertently added after empty start time slots. The controller will fill the start #1 slot first, and then the #2 slot second and so on, making it easier for the user to check all times. No “phantom” starts from a start time buried deep in the program.

PRODUCT COMPARISONS

	HUNTER EC	RAIN BIRD E-6C	RAIN BIRD ITC	RAIN BIRD IMAGE	RAIN BIRD ESPSi
2, 4 or 6 Station Models	✓		✓	✓	
Indoor / Outdoor Models	✓				
Large LCD with Interactive Icons	✓	✓	✓	✓	
User Friendly International Symbols	✓	✓	✓		
Intuitive Dial Programming	✓	✓			✓
Up To 150% Seasonal Adjustment	✓	✓	✓	✓	✓
Seasonal Adjustment With Visible In-Display Thermometer	✓				
3 Independent Programs (A,B,C)	✓	✓	✓		
Station Run Times Can Be Programmed For Up to 4 Hours	✓	✓	✓	✓	
Individual AM/PM or 24 Hour Clock Settings	✓	✓	✓		
Minimum of 4 Daily Starts per Program	✓	✓	✓	✓	
Start Times "Shifted" into Chronological Order	✓	✓	✓	✓	
Up To 12 Starts per Day	✓	✓	✓	✓	
1-31 Day Interval Programming	✓				
Choice of Independent Day Scheduling Options By Programs	✓	✓	✓	✓	
Weather Sensor Compatible with Dedicated Terminals	✓	✓			
Non-Volatile Memory Saves Programs Indefinitely	✓				
Battery Not Required To Keep Current Time and Day (Up To 4 Weeks)	✓				
Electronic Short Circuit Protection	✓	✓	✓		
Primary Surge Protection	✓	✓	✓		
Master Valve & Pump Start Relay Circuit	✓	✓	✓	✓	✓
120v-60 Hz / 230v-50 Hz / 240v-60 Hz Transformers Available	✓	✓			
Reset Button Returns to Defaults	✓	✓			
One Touch Manual Start	✓		✓	✓	✓
Manual - Single Station Activation	✓	✓	✓	✓	
Rain Sensor Override by Manual Start Operation	✓				
Multi-Language Capability	✓				
Default Settings Set to Zero	✓				

	HUNTER EC	ORBIT SUPER STAR	ORBIT POCKET STAR	NELSON 8100	NELSON 8500	HARDIE SLIM DIAL	TORO GREEN KEEPER
2, 4 or 6 Station Models	✓	✓					✓
Indoor / Outdoor Models	✓	✓			✓		
Large LCD with Interactive Icons	✓						
User Friendly International Symbols	✓						
Intuitive Dial Programming	✓	✓	✓	✓	✓	✓	✓
Up To 150% Seasonal Adjustment	✓				✓		✓
Seasonal Adjustment With Visible In-Display Thermometer	✓						
3 Independent Programs (A,B,C)	✓				✓		✓
Station Run Times Can Be Programmed For Up to 4 Hours	✓	✓	✓		✓	✓	✓
Individual AM/PM or 24 Hour Clock Settings	✓						
Minimum of 4 Daily Starts per Program	✓	✓	✓			✓	
Start Times “Shifted” into Chronological Order	✓						
Up To 12 Starts per Day	✓						✓
1-31 Day Interval Programming	✓						
Choice of Independent Day Scheduling Options By Programs	✓	✓				✓	✓
Weather Sensor Compatible with Dedicated Terminals	✓			✓	✓		✓
Non-Volatile Memory Saves Programs Indefinitely	✓						
Battery Not Required To Keep Current Time and Day (Up To 4 Weeks)	✓						
Electronic Short Circuit Protection	✓			✓		✓	✓
Primary Surge Protection	✓						✓
Master Valve and Pump Start Relay Circuit	✓	✓	✓	✓	✓	✓	✓
120v-60 Hz / 230v-50 Hz / 240v-60 Hz Transformers Available	✓	✓					
Reset Button Returns to Defaults	✓	✓	✓				✓
One Touch Manual Start	✓						
Manual - Single Station Activation	✓	?	?			?	?
Rain Sensor Override by Manual Start Operation	✓						
Multi-Language Capability	✓						
Default Settings Set to Zero	✓						

TECHNICAL INFORMATION

MODELS

230VAC Transformer Version

Outdoor Cabinet Types

- EC-401-E: 4 station
- EC-601-E: 6 station
- EC-401-A: 4 station Australian plug
- EC-601-A: 6 station Australian plug

Indoor and Line In/Line Out External Transformer

- EC-201i-E: 2 station European plug
- EC-401i-E: 4 station European plug
- EC-601i-E: 6 station European plug
- EC-201i-A: 2 station Australian plug
- EC-401i-A: 4 station Australian plug
- EC-601i-A: 6 station Australian plug

110VAC Transformer Version

Outdoor Cabinet Types

- EC-400: 4 station
- EC-600: 6 station

Indoor and US Plug-in Transformer

- EC-200i: 2 station
- EC-400i: 4 station
- EC-600i: 6 station

DIMENSIONS

- Indoor model: 13.3 cm H x 14.6 cm W x 5 cm D
- Outdoor model: 22 cm H x 17.8 cm W x 9.5 cm D

OPERATING SPECIFICATIONS

- Station Run Time: 0 to 4 hours in 1-minute increments

- Start Times: 4 per day, per program, for up to 12 daily starts
- Watering Schedule: 7-day calendar or interval (1 to 31 day) programming
- AM/PM or 24 hour clock option
- Start time stacking
- Simple manual operation, including 1 button manual operation
- Seasonal Adjustment: 10 to 150% in 10% increments

ELECTRICAL SPECIFICATIONS

- Transformer Input: 230VAC, 50Hz International Use
- Transformer Output: 240VAC, 0.600 amps
- Station Output: 24VAC, .28 amps per station
- Maximum Output: 24VAC, .56 amps
- Master Valve Output: 24VAC, .28 amps
- Battery: Not required for program backup. 9-volt alkaline battery (not included) may be used to program controller in absence of AC power.
- Electronic short circuit protection
- Surge protection: primary MOV-type
- Non-volatile memory for program data
- Controller will track time for 4 weeks in event of a power outage (even without a 9-volt battery)
- Rain sensor override by manual operation
- Three Programs: A, B and C

DEFAULT SETTINGS

All stations are set to zero run time. The controller has a non-volatile memory that retains all entered program data even during power outages.

PRODUCT EXPLANATION

EXAMPLE: **EC-601i-E**

SERIES	MODEL	TRANSFORMER VERSION	CABINET TYPE	OPTIONS
EC	2 = 2-station 4 = 4-station 6 = 6-station	01= 230 volt 00= 110 volt	i = Indoor cabinet x = Outdoor cabinet	E = European plug A = Australian plug + cord

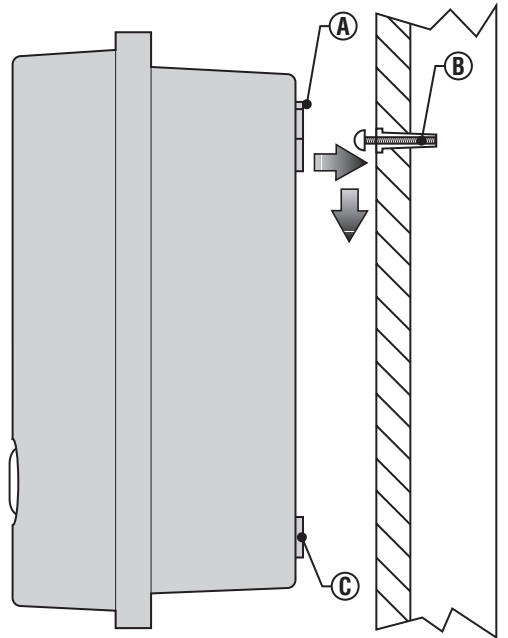
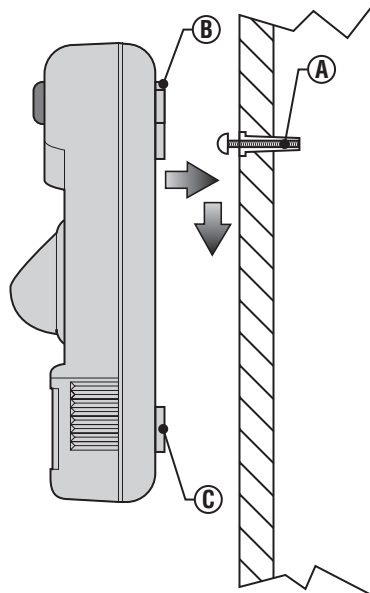
INSTALLATION

Mounting the Indoor Controller to a Wall

NOTE: The indoor EC is not water or weather resistant, and must be installed indoors or in a protected area.

1. Select a location as close as possible to a standard electrical outlet, one that is not controlled by a light switch. The location should be protected from moisture and direct sunlight.
2. Place the controller at eye level. Use the hole at the top of the controller as a reference and secure one 25 mm screw (A) into the wall. *Note: Install screw anchors if attaching to drywall or masonry wall.*
3. Align controller with the screw and slide the keyhole (B) on top of the controller over the screw.
4. Secure controller in place by installing screws in the holes (C) below the terminal strip area.

Do not plug transformer into power source until the controller is mounted and all valves have been connected.



Mounting the Outdoor Controller to a Wall

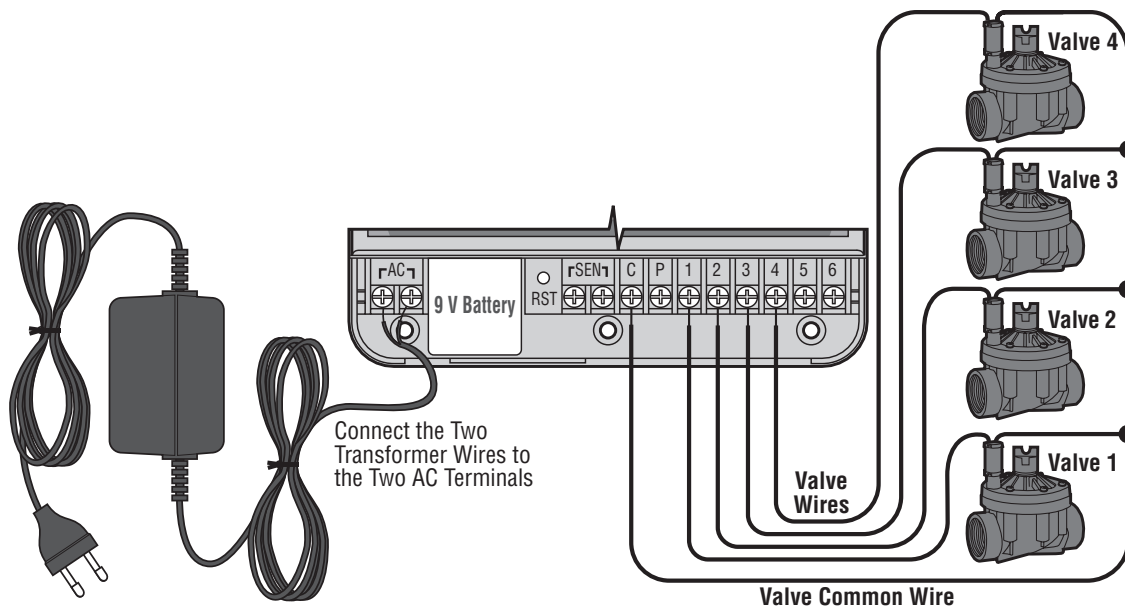
NOTE: Outdoor model is water and weather resistant. Connecting the outdoor EC to the primary power should only be done by a licensed electrician following all local codes. Improper installation could result in shock or fire hazard.

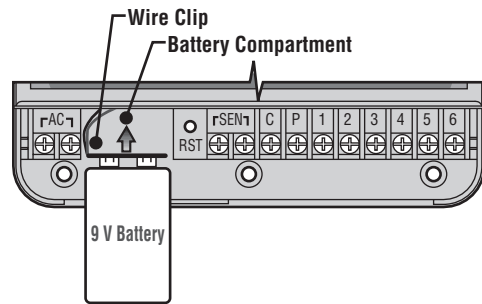
1. Select a location that is conveniently close to a power supply.
2. Make sure to abide by all electrical and installation codes when attaching to an external wall.
3. Place the controller at eye level and align keyhole (A) on top of the controller and mark the spot as well as the three holes (B) on the bottom of the unit.
4. Drill a 6 mm hole at each mark.
5. Install screw anchors (C) into holes if attaching controller to drywall, masonry, or plaster walls.
6. Holding the controller cabinet, line up the holes in the cabinet with the wall anchors or pilot holes.
7. Drive a screw through each hole and secure snugly but do not over tighten.

INSTALLATION (*cont.*)

Connecting Valves and Transformer

1. Route control wires between valve location and controller. Typically it is recommended that at least 1 mm diameter conductor cable be used. This type of cable is insulated for burial and is color-coded to help keep track of your connections.
 2. At the valves, attach the common wire to either solenoid wire of the valve. This is most commonly a white colored wire. Attach a separate control wire to the remaining solenoid wire and make a note of the color corresponding to each valve and the watering station it controls.
 3. Secure the wires with a waterproof wire connector to protect the connection.
 4. Slide down wiring compartment door to access the terminal strip area shown in the diagram.
 5. Route the valve wires into the cabinet. Strip 5 mm of insulation from ends of all wires.
 6. Secure the white valve common wire to the screw on the terminal marked C. Connect the color-coded wires from the valves to their appropriate station numbers and tighten the screws.
 7. For the indoor model, route transformer cable through the left side of the controller and connect the wires to the two screws marked AC.
 8. Before closing the compartment door make sure wires hang in the slotted areas so that the door can snap shut without damaging wires.
 9. For the outdoor model, transformer wires are already connected to the AC slots so all that is required is to connect primary power to the junction box from a power source.
 10. Remove junction box cover and attach power wires to either screw slot. Be sure to use a code approved conduit and adapter for the primary wires.
- Do not plug transformer into power source until the controller is mounted and all valves have been connected.**





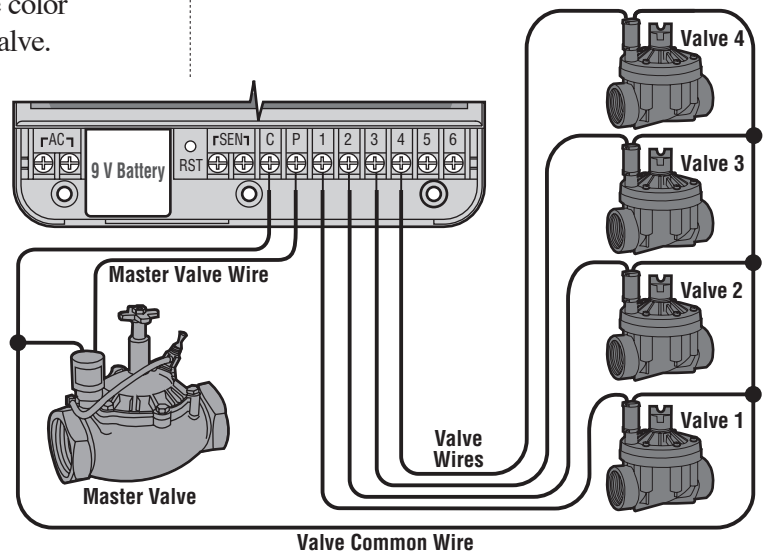
Connecting the Battery

Connect a 9-volt alkaline battery (not included) to the battery wire clip located in the lower left-hand side of the controller. The battery will allow you to program the controller without AC power. However, the battery will not be able to activate any of the station valves. AC power must resume before watering will continue.

Connecting a Master Valve

NOTE: Complete this section only if you have a master valve installed. A master valve is a “normally closed” valve installed at the supply point of the main line that opens only when the controller initiates a watering program.

1. At the master valve, attach the common wire to either solenoid wire of the valve. Attach a separate control wire to the remaining solenoid wire and make a note of the color corresponding to the master valve.
2. Route these wires to the controller the same way as the station valves. The white common wire will still go to the screw slot marked C. The additional wire coming from the master valve will go in the screw slot marked P.



INSTALLATION (cont.)

Connecting a Pump Start Relay

NOTE: Complete this section only if you have a pump start relay installed.

A pump start relay is a device that uses a signal from the controller to actuate a separate electrical circuit to energize a pump to provide water to your system.

The controller should be mounted at least 4.5 m away from both the pump start relay and the pump. When a pump start relay comes on it sends out surges that may potentially cause damage to a controller that is mounted too close. When a pump is to be operated by the controller, a pump start relay must be used. Hunter offers a full range of pump start relays for most applications.

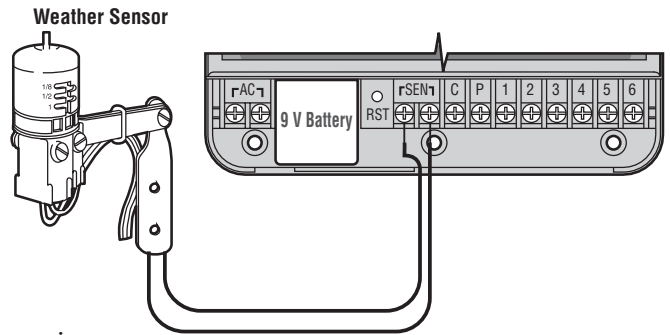
1. Route a wire pair from the pump relay into the controller housing.
2. Connect common wire to the screw slot C (Common) and the remaining wire from the pump relay to the P screw slot.

Relay holding current draw must not exceed .28 Amps. Do not connect controller directly to pump – damage to controller can result.

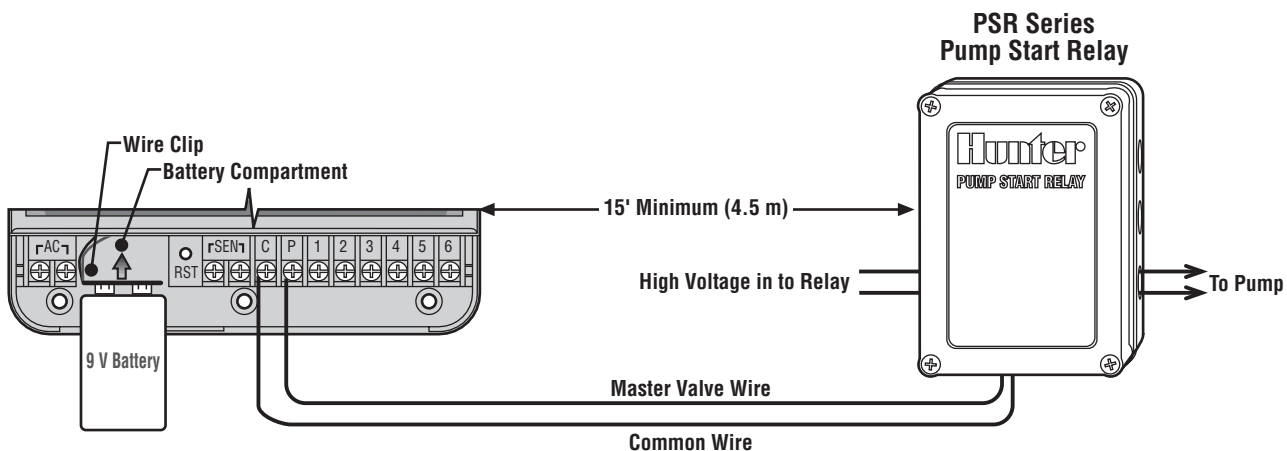
Connecting a Weather Sensor

A Hunter Mini-Clik® rain sensor or other type of micro-switch weather sensor can be connected to the EC. The purpose of this sensor is to stop watering when weather conditions dictate.

1. Remove the jumper that is attached across the SEN terminals of the controller.
2. Route the two wires from the rain sensor up through the same opening used for valve wiring.
3. Connect one wire to the SEN terminal and one to the other SEN terminal.



NOTE: If the rain sensor is interrupting irrigation you can bypass it by using any of the following: **MANUAL-ONE STATION, MANUAL-ALL STATIONS, or ONE TOUCH START AND ADVANCE.** See section “Rain Sensor Bypass” for more information.



PROGRAMMING

Sprinkler System Fundamentals

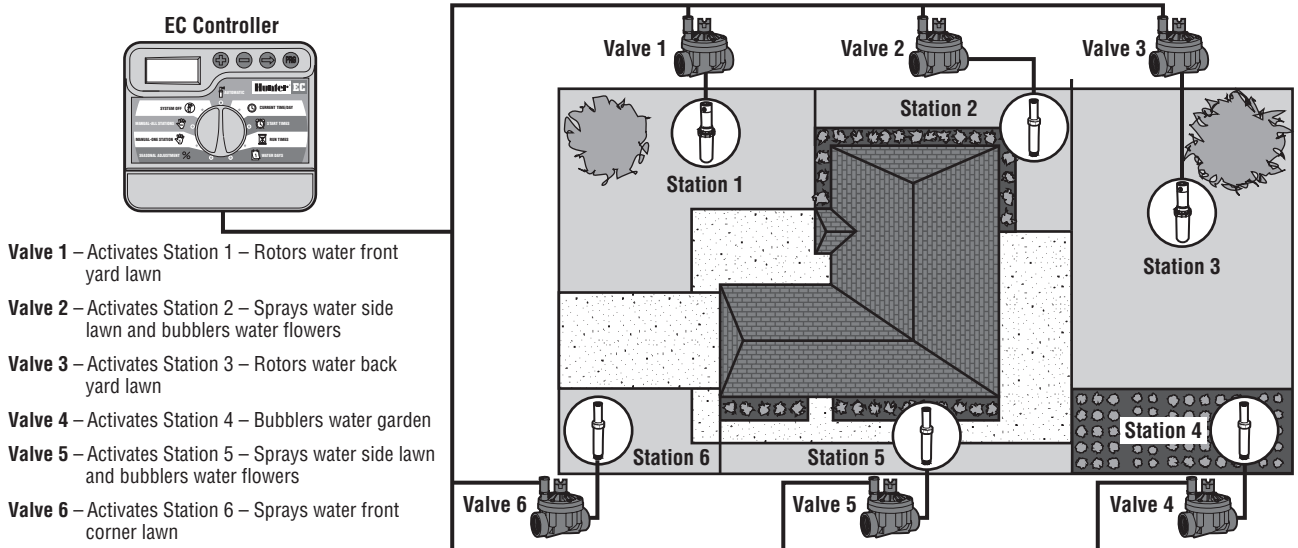
There are three main components that are involved with all automatic sprinkler systems that are made today. They are the **controller**, **control valves**, and the **sprinklers**.

The **controller** is what makes the whole system operate efficiently. It is technically the brain of the entire system, instructing the valves when to supply water to the sprinklers and for how long to do so. The sprinklers, in turn, will direct the water towards the surrounding plants and lawn.

The valve controls a group of sprinklers called a watering **station**. These stations are laid out in a fashion according to the type of plant life that exists there, the

locations of the plants, and the maximum amount of water that can be pumped to the location. Each valve is connected via wire to the terminal strip area inside of the controller. Here the wire is connected to a number that corresponds to the valve's station number.

The controller will operate the valves in order, only one at a time. When a valve has completed its watering; it will switch to the next station that has been programmed. This process is called the watering cycle. The information pertaining to the watering times of the individual stations and how often watering occurs is called a program.



PROGRAMMING (cont.)

Programming Fundamentals

For the controller and its selected program to operate automatically, there are three components that must exist: 1. When to water – or **Watering Start Times**. 2. How long to water – or **Station Run Times**. 3. What day of the week to water – or **Days to Water**.

We have included an example that will better illustrate the operation of a program. Let's say you have a program start time set for 6:00 AM. Stations 1 and 2 are going to have a run time of 15 minutes and station 3 is set for 20 minutes. Please note that stations 4 and 5 have not been included in this program, we will water them on separate programs.

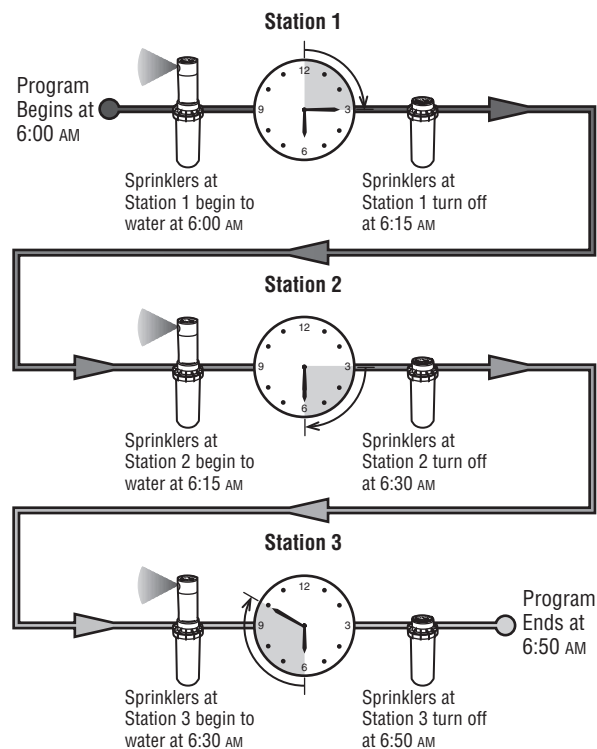
Going back to our previous example, at 6:00 AM the controller will activate the watering cycle. The sprinklers on station 1 will run for 15 minutes and then automatically shut off. The controller will automatically activate station 2 sprinklers. These sprinklers will also run for 15 minutes and then shut off. Then, watering on station 3 will begin automatically. The sprinklers will turn on for 20 minutes and shut off automatically. Since no times were programmed for stations 4 and 5, the controller skips them. This will conclude the program and end the water cycle at 6:50 AM.

As shown in the above example, **only one program start time** was required to run the three different stations. The controller automatically moves to the next station without the need for additional start times.

We realize that many consumers will have variations in their plant watering needs, so at Hunter we equipped the EC with three different programs A, B, and C. These programs are completely

independent of each other and give you the ability to have three coexisting timers in one controller.

For example, using more than one program would enable you to water on odd days for lawn stations 1, 2, and 3 on program A, station 4 to soak the flowers every day on program B, and station 5 and station 6 to water on even days on program C. However, it is not absolutely necessary to use this feature. Many homes and businesses can have all zones adequately watered on one program with the other programs turned off for future use.



Creating a Watering Schedule

For most consumers, it is much easier to plan your specific watering schedule onto paper before actually programming the information into the controller.

It's also handy to have a written record of your programming information for easy reference.

There are some guidelines that should be followed when determining when and how long to water. These factors are the soil type, the part of the landscape being watered, weather conditions, and the types of sprinklers being used. Since there are so many different variables that can determine your individual watering schedule, it is impossible to give an exact schedule to follow. However, we have included some guidelines to help you get started.

It is usually good to water one or two hours before sunrise. Water pressure will be at optimum levels during the early morning and the water can soak into the roots of the plants while evaporation is minimal. For most plants, watering during midday or in the evening may cause plant damage or possibly mildew.

Keep an eye out for evidence of under- or over-watering. Over-watering is most commonly indicated by pools of water that take a long time to soak in or evaporate, while under-watered landscapes will show signs of discoloring and dryness. Make programming changes immediately when evidence is present.

HUNTER EC		PROGRAM A							PROGRAM B							PROGRAM C							
DAY OF THE WEEK		①	②	③	④	⑤	⑥	⑦	1	②	3	④	5	⑥	7	1	2	3	4	5	6	7	
INTERVAL (Choose 1 to 31 days)																2							
PROGRAM START TIMES		1	6:00 AM							5:00 AM							7:00 AM						
		2	Off							Off							Off						
		3	Off							Off							Off						
		4	Off							Off							Off						
STATION	LOCATION	STATION RUN TIME							STATION RUN TIME							STATION RUN TIME							
1	Front Lawn	15							Off							Off							
2	Flowers	15							Off							Off							
3	Back Lawn	20							Off							Off							
4	Garden	Off							15							Off							
5	Side Lawn	Off							Off							20							
6	Front Corner	Off							Off							60							
NOTES:																							

PROGRAMMING (cont.)

How to Fill Out the Watering Schedule Form

Be sure to use a pencil when filling out this form. By using the included example and the information below, you should have all the information you need to construct your personal water schedule.

Station Number and Location – Identify the station number, location and the type of plant that is being watered.

Watering Day – Identify whether you want to use a calendar day or an interval day schedule. For a calendar day schedule circle the day of the week in which watering is desired. For an interval day schedule, simply set the corresponding number of days.

Program Start Times – Indicate the time of day that the program will begin. Each program can have 1 to 4 start times. However, one start time can run an entire program.

Station Run Time – Indicate the run time (1 minute to 4 hours) for each station. Write “OFF” for any station that you do not want to operate in the program.

Keep this schedule in a safe place for quick reference later, rather than scrolling through program information on the controller.

HUNTER EC		PROGRAM A							PROGRAM B							PROGRAM C							
DAY OF THE WEEK		1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	
INTERVAL (Choose 1 to 31 days)																							
PROGRAM START TIMES		1																					
		2																					
		3																					
		4																					
STATION	LOCATION	STATION RUN TIME							STATION RUN TIME							STATION RUN TIME							
1																							
2																							
3																							
4																							
5																							
6																							
NOTES:																							

Programming the Controller

The EC Controller is easy to program. The easy to understand dial design allows you to step through the process of programming and activate manual watering with a twist of the wrist.

The EC display shows time and day when the controller is idle. The display changes when the dial is rotated to indicate the specific programming information to enter. When programming, the flashing portion of the display can be changed by pressing the **+** or **-** buttons. To change something that is not flashing, press the **↻** button until the desired field is flashing.

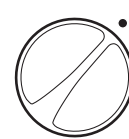
Three programs A, B and C each with the ability to have four daily start times, permit plants with different watering requirements to be separated on different day schedules. Multiple start times permit morning, afternoon, and evening watering, perfect for the establishment of new lawns and thirsty annual flowers. Simply designate the days of the week you want to water. The EC makes it easy.

NOTE: *A basic programming rule is that whatever symbol or character is flashing will be the item programmed. For instance, if the hour is flashing when setting the time, the hour can be changed or programmed. For illustration purposes, flashing characters are in **GRAY** type.*

Setting the Date and Time

1. Turn the dial to the **CURRENT TIME/DAY** position.

2. Hours will be flashing. Press the **+** or **-** button to change the hour shown on the display. Press the **↻** to proceed to setting the minutes.



3. Minutes will be flashing. Use the **+** or **-** button to change the minutes shown on the display. Press the **↻** to proceed to select AM, PM, or 24 hour time.

4. The time will be displayed, and an arrow will be flashing on AM. Press the **+** and **-** buttons to select AM, PM, or 24 hour. Press the **↻** to proceed to setting the day of the week.

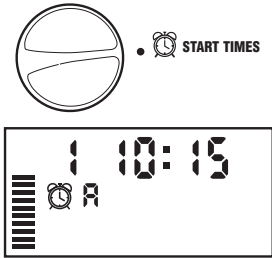
5. The number one will be flashing indicating the first day of the week. Press the **+** and **-** buttons to select the day of the week (1 through 7) corresponding to the day.

The time and day have now been set. You can turn the dial to **AUTOMATIC** to display the current time.

PROGRAMMING (cont.)

Setting Watering Start Times

1. Turn the dial to the **START TIMES** position.
2. The factory preset is set on program A. If necessary, you can select program B or C by pressing the **PRG** button.
3. Use the **+** or **-** button to change the start time. (The start times advance in 15 minute increments). Hold either button down for 1 second to change times rapidly.
4. Press the **➡** button to select the next start time, or press **PRG** for the next program.

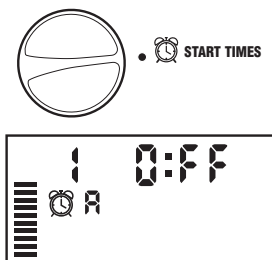


NOTE: One start time will activate all stations sequentially in that program. This eliminates the need to enter each station's start time. Multiple start times in a program can be used for separate morning, afternoon, or evening watering cycles.

Eliminating a Program Start Time

With the dial set to the **SET WATERING START TIMES**

position, push the **+** or **-** button until you reach 12:00 AM (Midnight). From here push the **-** button once to reach the OFF position.

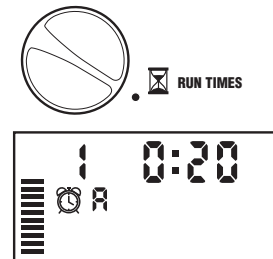


NOTE: If a program has all four-start times turned off, then that program is off. (All other program details are retained.) Because there are no start times, there will be no watering with that program. This is

a convenient way to stop watering on one program only without turning the dial to the **OFF** position.





Setting Station Run Times (Length of Watering for Each Area)

1. Turn the dial to the **RUN TIMES** position.
2. The display will show the last program selected (A, B or C) the station number selected, run time icon, and the run time for that station will be flashing. You can switch to another program by pressing the **PRG** button.
3. Use the **+** or **-** button to change the station run time on the display.
4. Press the **➡** button to advance to the next station.
5. Repeat steps 3 and 4 for each station.
6. You can set station run times anywhere from 0 to 4 hours.
7. You can move between programs while staying on the same station. However, it is recommended that one program is completed before going on to the next program.






NOTE: Jumping between programs can be confusing and may result in program entry errors.

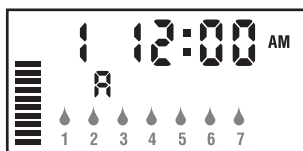
Setting Days To Water

1. Turn the dial to the **WATER DAYS** position.
2. The display will show the last program selected (A, B or C). You can switch to another program by pressing the **PRG** button.
3. The controller will display the seven days of the week with a  icon or a  icon above the numbered day. The  icon would represent an “On” water day, while a  icon would represent an “Off” watering day.




Selecting Specific Days of the Week to Water

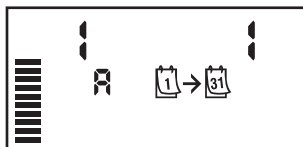
1. With the  cursor on a specific day (the cursor always starts with 1), press the **+** button to activate a particular day of the week to water. Press the **-** button to cancel watering for that day. After pressing a button the cursor automatically advances to the next day.
2. Repeat step 1 until all desired days have been selected. The selected days will show with a  to indicate their status as ON. The last  is the last day of watering for that program.



Selecting Interval Watering

With this option you can select interval watering from 1 to 31 days.

1. With the  cursor on day 7, press the **+** button until the two calendars and a flashing 1 appear in the display. Interval watering schedule appears on the display.
2. Press the **+** or **-** button to select the number of days between watering days (1 to 31). This is called the interval. The controller will water the selected



program at the next Start Time and will then water at the interval programmed.

Example: You program the controller at 8:00 AM for the following:

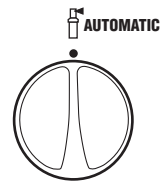
Program A
Start Time 10:00 AM
Interval = 5 days

The controller will run today at 10:00 AM and water program A. Then, the controller will wait 5 days and water again at 10:00 AM and so on.

Had you programmed the controller at 11:00 AM rather than at 8:00 AM, the controller would have watered tomorrow at 10:00 AM and then watered every 5 days after that at 10:00 AM.

Automatic

After programming is complete, turn the dial to **AUTOMATIC** to enable automatic execution of all selected programs and start times. Watering will not occur unless dial is in the **AUTOMATIC** position.



System Off

Valves currently watering will be shut off after the dial is turned to the **SYSTEM OFF** position for two seconds. All active

programs are discontinued and watering is stopped. To return controller to normal automatic operation, simply return dial to **AUTOMATIC** position.

NOTE: Due to variances in pressure and flow, valve may take up to one minute to fully close.



PROGRAMMING (cont.)

Bypass Weather Sensor

If there is a weather sensor installed that is interrupting irrigation, you can bypass it by using the manual watering options described below. The dial positions **MANUAL-ONE STATION** and position **MANUAL-ALL STATIONS** as well as the One Touch Start and Advance process will successfully bypass the rain sensor.

Seasonal Adjustment/Water Budgeting

Seasonal Adjust is used to make global run time changes without re-programming the entire controller. This feature is perfect for making small changes that are necessary as the weather changes without reprogramming the entire controller. For instance, hotter times of the year may require a bit more water. Seasonal adjust can be increased so that the stations will run longer than the programmed time. Conversely, as Fall approaches, the seasonal adjust can be reduced to allow for short watering durations.

To use the seasonal adjustment feature:

1. Turn the dial to the **SEASONAL ADJUSTMENT** position.
2. The display will now show a flashing number followed by **SEASONAL ADJUSTMENT %** a %, as well as the bar graph which always remains on the display. Press the **+** or **-** buttons to adjust the percentage of the seasonal adjustment. Each bar on the graph represents 10%. This feature can adjust the controller from 10% to 150% of the original program.

To view the new adjusted run times, simply turn the rotary dial to the **SET STATION RUN TIMES** position, the displayed run time will be updated accordingly as the seasonal adjustment is made.

NOTE: The controller should always be initially programmed in the 100% position.

Manually Run a Single Station

1. Turn dial to the **MANUAL-ONE STATION** position.
2. Station run time will flash in the display. Use the **+** button to move to the desired station. You may use the **+** or **-** button to select the amount of time for a station to water.
3. Turn the dial clockwise to the **RUN** position to run the station (only the designated station will water, then the controller will return to automatic mode with no change in the previously set program). Also see **One Touch Manual Start and Advance** on page 22.

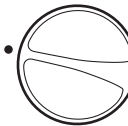
MANUAL-ONE STATION 



Manually Run All Stations

1. Turn dial to **MANUAL-ALL STATIONS**.
2. Select program A, B, or C by pressing the **PROG** button.
3. Press the **+** button until desired starting station is displayed.
4. Station run time will flash in the display. Use the **+** or **-** button to select the amount of run time for the station to water if different from the run time displayed.
5. Use the **+** button to move to the next station.
6. Repeat steps 3 and 4 to customize each station if desired.

MANUAL-ALL STATIONS 



7. Press the **➡** button until you reach the station that you would like watering to begin.
8. Return dial to **AUTOMATIC** (program will water the entire program beginning with the station number last left in the display, then controller will return to automatic mode with no change in the previously set program).

NOTE: *The station that is on the display when you turn the dial to **AUTOMATIC** will be the first station to run. The controller will then proceed to water in sequential order only. It will not water previous stations. Example: If you turn the dial to **AUTOMATIC** with the display reading station 3, the controller will water stations 3 through 6 in the program, but not return to stations 1 and 2.*





One Touch Manual Start and Advance

You can also activate all stations to water without using the dial.

1. Hold down the **➡** button for 2 seconds.
2. This feature automatically defaults to program A. You can select program B or C by pressing the **PRG** program.
3. The station number will be flashing. Press the **➡** button to scroll through the stations and use the **+** or **-** button to adjust the station run times. (If no buttons are pressed for a few seconds during step 2 or 3, the controller will automatically begin watering.)
4. Press the **➡** button to scroll to the station you wish to begin with. After a 2 second pause, the program will begin.

This feature is great for a quick cycle when extra watering is needed or if you would like to scroll through the stations to inspect your system.

TROUBLESHOOTING GUIDE

PROBLEM	CAUSES	SOLUTIONS
Display indicates watering but none is occurring.	Faulty or miswired valve. Faulty pump or pump relay. No water pressure to system.	Check valve and valve wiring. Check pump and pump relay. Replace if defective. Turn on main system water supply.
Display is blank.	No AC power reaching controller.	Verify AC power and wiring. Correct any errors. Check transformer output.
Display is blank with AC power to terminal and with a new battery.	Controller may be damaged by power surge.	Call your dealer or Hunter installer.
Time of day display is blinking.	Unit has just been powered up for the first time. Extended power outage has occurred that has drained backup battery.	Set time/date. Replace battery and reprogram controller.
Rain sensor does not suspend irrigation.	Rain sensor is defective or miswired. Jumper not removed.	Verify operation of sensor and proper wiring. Remove jumper.
Automatic irrigation does not start at start time and controller is not in the system off mode.	AM/PM of time of day not set correctly. AM/PM of start time not set correctly. Start time is disabled (Set for Off). Rain Sensor is preventing operation. Controller is not receiving AC power.	Correct AM/PM of time of day. Correct AM/PM of start time. Turn dial to Automatic. Check AC connections.
Valve will not turn on.	Short in wire connections. Bad solenoid.	Check wiring for short or faulty wire connections. Replace solenoid.
Controller waters the same area more than one time.	Too many start times entered in program.	One start time activates a complete cycle. See "Setting Start Times."
Display shows "ERR" with a number (1-6).	Short in valve wiring circuit; or a faulty solenoid on the station number indicated.	Check wire circuit or solenoid for the valve number indicated. Repair short or replace solenoid. Press any button to clear "ERR" display.
Blank or frozen LCD display or display shows incorrect number of minutes	Spike in incoming power supply may have disrupted normal micro-processor functions.	Press "RST" reset button on terminal strip. Re-set controller to factory default settings by (1) simultaneously pressing and holding the "PRG",  and  buttons. (2) While these 3 buttons are being held down, momentarily press and release the "RST" RESET button. (3) Release the "PRG",  and  buttons. The LCD display will show 12:00 AM and new program can be entered.

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