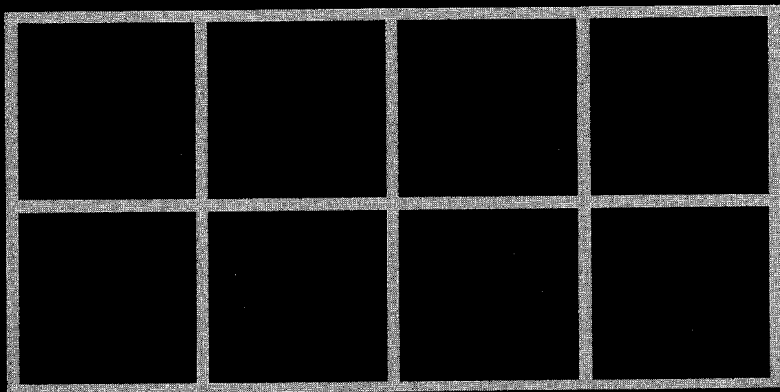


INSTALLATION, PROGRAMMING & OPERATING INSTRUCTIONS

HP 6

HP 8

HP 12



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CONGRATULATIONS! Your new, Rain Bird, HP Series controller uses highly precise, state-of-the-art, solid state technology combined with the user friendliness of mechanical knobs and switches to create a versatile, yet understandable, hybrid timer for irrigation control.

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INTRODUCTION

The Rain Bird, HP Series, hybrid controllers have some very important features and extended flexibility you should be aware of as you begin programming your unit. Details on how to implement these features will be described in the step-by-step instructions on the following pages.

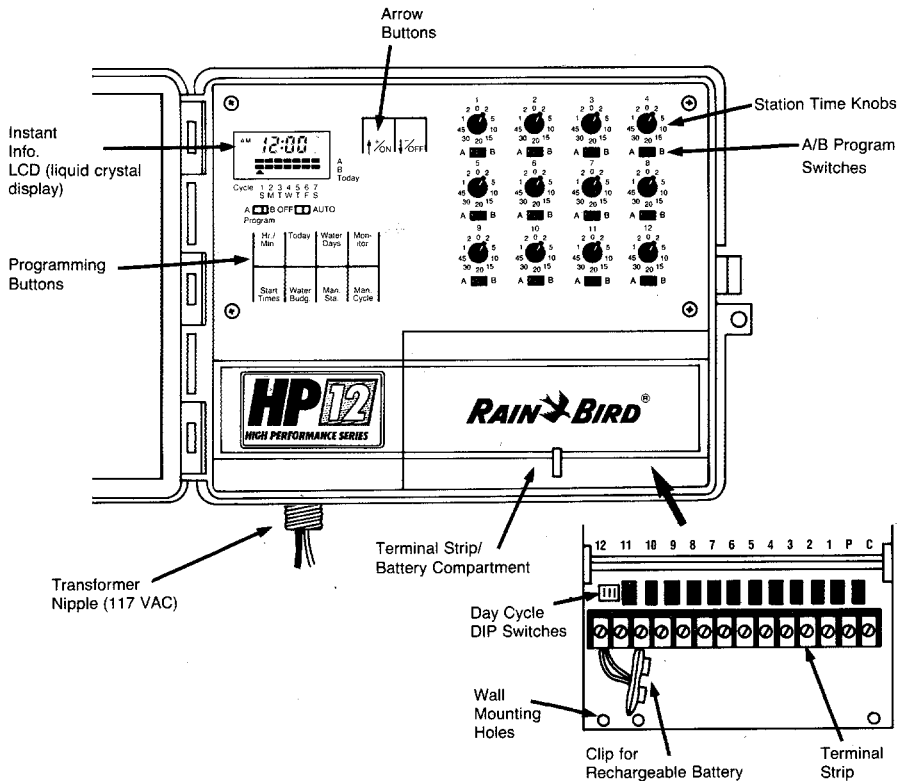
HP Series Features

- **“Instant Info. LCD”**: This full function, large character, liquid crystal display provides you with the following information:
 - Time of day with A.M./P.M. notation
 - Current day of the week
 - The day-cycle on which the controller is set
 - The “on” and “off” days for both programs
 - A “W” indicator when a program is in water budget mode
- During Programming it also displays:
 - start times
 - water budget levels
- While watering it displays:
 - the operating station and minutes “to go”
- If there is a valve short circuit, it displays:
 - the station number with the problem

- **Mechanical Face Panel Switches:** As well as making the controller easy to understand and giving the operator a “feel” for setting the programs, the mechanical switches also make the rest of the programming visible, at-a-glance, by indicating:
 - the watering time set on each station
 - each station’s program assignment
 - which program is being set
 - whether the unit is in “OFF” or “AUTO”
- **Dual Programming:** Essentially, with “A” and “B” programs, this feature makes an HP unit operate like two, separate controllers for maximum flexibility.
- **Variable Day-Cycle:** 2, 3, 5, and 7-day cycles provide the operator with the options of skip-a-day, every third day, every fifth day, or any day of the week watering.
- **6, 8, or 12-station models:** The HP family provides units for a wide range of project and system sizes.
- **Water Budgeting:** Each program can be separately regulated for more or less watering in 10% increments from program “off” to 200% of actual time set. With this feature a 10% cut back in watering can be programmed with the push of a button.

- **Multiple Start Times:** Eight (8) start times per program allow for several short cycles per day for propagating new lawns and plantings or for avoiding puddling and run-off on tight, clay-like soils.
- **Trickle charging circuit:** The HP Series is designed to keep the rechargeable, 9-volt, NiCad battery you supply, in a fully-charged condition. In the case of a prolonged power outage, the battery will maintain your program and keep the correct time and day for up to 3 weeks. The battery, however, cannot operate the system.
- **Default Programs:** Program "A" and "B" each have a default start time if the power outage outlasts the battery back-up. When power resumes, the default start times will take over and because the HP does not forget your station run times and station programs, watering will take place once a day until you reprogram.
- **Master Valve/Pump Start Circuit:** A master valve or 24-volt, AC pump start relay can be operated by HP Series units.
- **Diagnostic, Automatic Circuit Breaker:** As described above, the LCD will continually display a station that has an electrical short circuit. The automatic circuit breaker will bypass the problem station and continue to water all other operable stations. When you have located and fixed the problem with the field wires or valve, the HP controller will restart the station on its next scheduled cycle.

The Rain Bird HP, High Performance hybrid controller has many other features that will be described in detail throughout this manual.



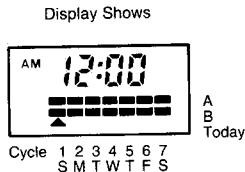
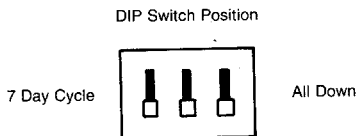
Before Programming: Make sure the controller is hooked up to 117 Volt AC power and a **rechargeable, NiCad battery** has been installed.

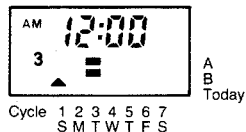
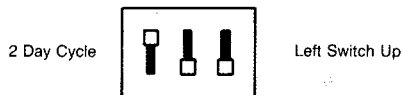
HP SERIES CONTROLLER OPERATING INSTRUCTIONS

Step 1. SET CURRENT TIME by pressing the "Hr./Min." button and then the arrow button to set the hour. Then press the "Hr./Min." button again and then the arrow button to set the minute in the display.

Step 2. SET DAY CYCLE with dip switches behind the front panel access door.

- A. 7-Day Cycle = all switches down (any day can water)
- *B. 5-Day Cycle = righthand switch only up (skip 4 days)
- *C. 3-Day Cycle = middle switch only up (skip 2 days)
- *D. 2-Day Cycle = lefthand switch only up (skip 1 day)





***NOTE:** If you are using one of these fixed, 2, 3, or 5-day cycles, both programs “A” and “B” will run on the last day of the cycle. A “2”, “3”, or “5” will be continually displayed to indicate the fixed day cycle that has been selected. Because your cycle is now fixed, skip step #3 below (Set Water Days) and do step #4 next (Set Start Times).

Step 3. SETTING WATER DAYS (For 7-Day Mode):

Use the “A/B Program” switch to indicate the program for which water days are being set. As indicated by the letters to the right of the display, the top row of dashes represents the seven days for Program “A” and the lower row represents Program “B”. In the 7-day mode, “A” and “B” programs can operate on the same day or differing days.

3.A SET WATER DAYS, in the 7-day mode only, by tapping the “Today” button to move the triangle in the display to each day’s position (Sunday through Saturday), and then press “Water Days” to turn that day “on” (dash displayed) or “off” (blank).

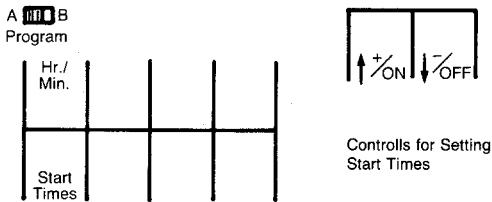
If you are setting both programs, move the “A/B Program” switch to the other program and repeat Step #3.A above.

Programming Example, 7-Day Mode



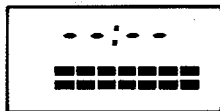
“A” Programmed to Water Every Day, “B”
Programmed to Water Monday, Wednesday, Friday.

Step 4. SET START TIMES for each program by moving the “A/B Program” switch to the program you want and touching the “Start Times” button.



“A” Program has a default start time of 8:00 a.m. and “B” has a 6:00 p.m. default. These start times are backup start times that operate if your programming is ever lost following a prolonged power outage that outlives your battery. You will be changing these defaults to the start times you wish.

Use the “Hr./Min.” button and the arrow buttons to set the hour and minute for the start time as desired. Each program has eight (8) start times available. Touch “Start Times” to access these extra start times and use the “Hr./Min.” and arrow buttons to set them. By pressing “Start Times” repeatedly, you can display each of the eight possible start times for the program you are setting. Four dashes in the upper portion of the display means no start time has been set.



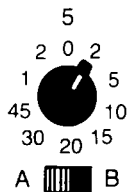
No Start Time, or Start Time Eliminated

Multiple start times are good for scheduling short watering cycles repeated several times per day for such applications as propagating new lawns or establishing new plant material.

TO ELIMINATE A START TIME press the “Start Times” button repeatedly as you approach the unwanted start time and then press and hold “Start Times” for about 3 seconds at the time you are cancelling until it goes blank in the display.

NOTE: With a total of 16 start times possible per day, be careful not to schedule programs that will overlap. If you have inadvertently scheduled a program to start before another in operation is finished, the HP controller will cancel what is in progress and obey the latest start command.

Step 5. SET EACH STATION to the “A” or “B” program with the “A/B” slide switch under each station knob.



Station 5, Set for 2 Minutes
on “A” Program

Step 6. SET STATION RUN TIMES with the knob for each station. Normal timing range is from 2 minutes to 2 hours per station. Zero is the “station off” position.

Using the Water Budget key to change the timing range will be discussed later.

Step 7. SET THE CURRENT DAY with the "Today" button by moving the triangle in the display to today's position. For the 7-day, weekly cycle, Sunday through Saturday are abbreviated below the display.

The numbers below the display are for the fixed day cycles. The controller will water both programs on the last day of a fixed day cycle (where the two dashes appear).

You can make today any day number you wish. For example, if you have established a 3-day cycle, but you want tomorrow to be the first watering day, set the triangle in the display at day #2. Watering will begin tomorrow, the last day of a 3-day cycle.

Step 8. Set "OFF/AUTO" switch to "AUTO" and touch "MONITOR" once or twice to display current time. Programming is complete.

OTHER FUNCTIONS

SYSTEM OFF

Set the "OFF/AUTO" switch to "OFF".

In the "OFF" position, the controller will continue through its normal, automatic programs, however, there will be no electrical output to the control valves in the system. The "OFF" setting is good for system shutdown during rainy weather, for seasonal shutdown when watering is not necessary and for shutdown during system maintenance.

WATER BUDGETING

The HP series controller has separate Water Budgeting for each program.

Set the "Program" switch to the desired program and press "Water Budg." "100" in display means "100% of actual time set." Use the arrow buttons to change the percent of time for all stations on that program, in 10% steps, anywhere from "000" (program off) to "200" (200% of actual time set).



Program "A" Water Budgeted to 150%

A "W" will be displayed continually to indicate that a program is in the water budget mode. The operator of the controller can check the water budget level for a program at any time by simply moving the "A/B Program" switch to the "budgeted" program and pressing the "Water Budg." button.

Water Budgeting operates in the automatic and "Manual Cycle" modes only. In the manual single station mode of operation, described below, the operator will get the actual time set on the station knob.

MANUAL STATION

To manually start a station, first touch "Monitor" to display "00.000", which means no other operation is in progress, then press "Man.Sta."

Then, using the arrow/up button, tap repeatedly to advance toward the desired station and then hold the button down for three seconds at that station. When that station's run time appears in the display, you have manually started the station and may release the arrow/up button.



Station 2, 10 Minutes Watering "To Go"

The manually-started station will run for the actual time set on its knob and then shut off. The controller will then reset itself in the auto mode and await its next scheduled automatic start.

To CANCEL A MANUALLY-STARTED STATION, simply press "Man.Sta.". The controller will return to displaying the current time. By pressing "Monitor" you can see the zeros that indicate nothing is now operating. Pressing "Monitor" again returns the display to the time of day.

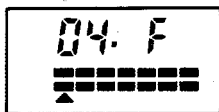
MANUAL CYCLE

To manually start a program, set the "Program" switch to "A" or "B", press "Monitor" to display "00.000" and then press "Man.Cycle" to activate watering. The number and running time for the first station on that program will appear in the display indicating the cycle has started.

The controller will operate, in sequence, each station assigned to the manually-started program and then return to the auto mode and await its next scheduled automatic start.

“F” DISPLAY

The HP series controllers are provided with a new, automatic, “diagnostic circuit breaker” system. With conventional, mechanical circuit breakers or fuses, a short circuit in a field wire or a valve solenoid will shut down the entire irrigation system. The electrical overload protection system in the HP unit only shuts down the station with the electrical problem.



Station 4, Electrical Fault Display

A station number and an “F” in the display means that station has a short circuit or overload trying to feed back into the controller through the field wires.

The controller will continue to water with all other operable stations and bypass the problem one. Locate and fix the problem and the controller will return to normal operation of that station at the next cycle.

INSTALLATION INSTRUCTIONS

Location

The plastic, weather resistant, cabinet of your HP Series controller is suitable for wall mounting outdoors as well as indoors. Preferably select a sheltered location when installing outdoors and always give consideration to the accessibility to electrical power (117 VAC, 60Hz).

Choose a wall location which allows 9¼" of clearance on the lefthand side of the controller so the controller's door is free to swing to the fully open position for complete access by the operator.

Mounting

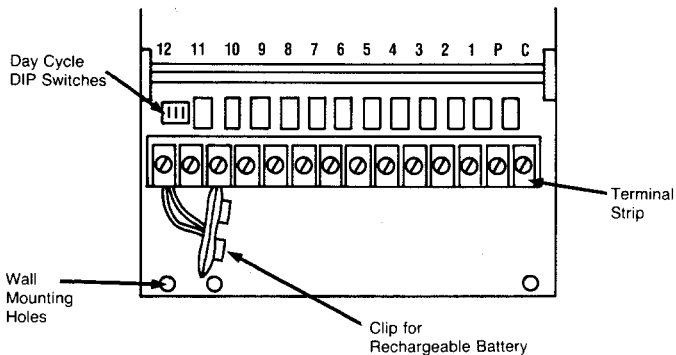
Your HP controller is designed to be wall mounted without requiring the removal of the controller's internals. A "keyhole" slot has been provided in the top center of the back of the controller's case. Drive a screw or appropriate fastener into the wall (preferably at about eye level) where you plan to mount the controller. Leave approximately 1/4" of the fastener's shaft showing between its head and the wall surface.

Prior to hanging the controller on the fastener, snap out the "knock out" disk or disks in the bottom of the controller case to the opening size you think you will need for the incoming valve wires.

Hang the controller by its “keyhole” on the fastener. Open the controller’s access door in the lower righthand corner of the face panel to reveal the other mounting holes. Drive an appropriate fastener into each of the righthand and lefthand holes if you are mounting the controller to a flat surface. If you are mounting the controller to an exposed wall stud or narrow post, use the two lefthand holes to secure the cabinet.

Rechargeable Battery Connections

Connect a 9-volt NiCad rechargeable battery to the battery clip in the lefthand section of the terminal compartment and lay the battery in the lower lefthand corner.



Wiring

Low Voltage Connection (26.5 volts, AC) — The HP controller's terminal compartment has a terminal strip with an attaching screw for each station/valve wire, the valve common wire and the pump start/master valve wire.

The righthand terminal, marked "C" on the access door, is for the "valve common" wire which runs from its screw connection out to the valve locations and connects to one lead each on all the valves served by the controller.

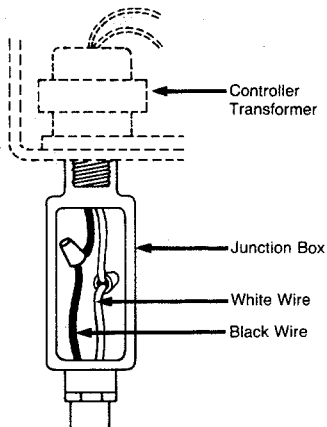
The next terminal screw to the left, marked "P" is for connection of a wire to a 24-volt pump start relay or to one lead on a master valve (a valve upstream of all the other valves, that shuts off the mainline between controller operations). The other low voltage wire from either type of device is to be connected to valve common ("C" terminal). The "P" terminal will provide power when the first station in a cycle turns on and continue until the last station in the cycle shuts off.

The rest of the numbered terminals are for the individual station power wires. One power wire is to be connected to the remaining lead on each valve (or valves) that is assigned to that station number.

The HP Series controller is designed to handle up to 2 valves per station in addition to powering a master valve. Most normal applications, however, call for one valve per station for finer, individual control of the irrigation project's zones.

NOTE: Rain Bird electric, remote control valves are very energy efficient and create a low electrical draw while in operation. The HP Series controllers are designed to operate all standard, 24-volt AC electric valves. Some individual valves or brands of valves on the market have much higher electrical power requirements. In the case of less electrically efficient valves, you cannot operate as many per station as with the Rain Bird units. An overload of valves on a particular station will activate the diagnostic circuit breaker.

NOTE! Make sure all wire from the controller to the valves is code-approved for underground, low-voltage use. Also, use only code-approved, water-tight wire connectors for connection to the valve leads and any wire splices in the field.



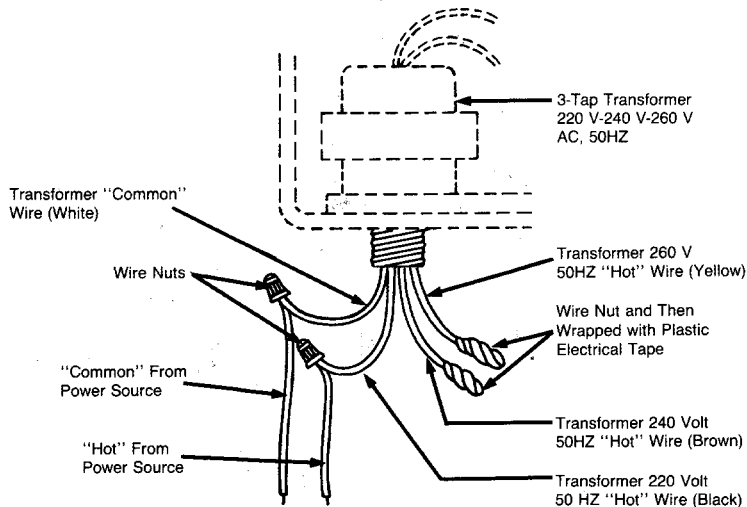
High Voltage Connections (117 volts, AC) — The HP Series controller has a nipple-mounted transformer that provides a 1/2" nipple below the cabinet for connection to an electrical junction box or other code-approved enclosure for wire connections.

MAKE SURE THE 117 VOLT AC POWER IS OFF, attach the junction box, and then connect the white wire from the controller nipple to the white wire coming out of the electrical conduit into the junction box from your power source.

In the same manner, make the black to black wire connections. Make sure all connections are made within a code-approved junction box and with code-approved, insulated connectors. Close up the weatherproof junction box after all connections are complete.

NOTE! For 220/240/260 VAC, 50Hz electrical hookup for international HP Series models see the illustration labelled "50HZ Wiring Instructions".

50 HZ Wiring Instructions



TYPICAL 220 VOLT, 50 HZ POWER CONNECTION (INTERNATIONAL MODELS)
240 V or 260 V Power Connection is Similar — Except Use Appropriate "Hot" Wire of
the Transformer in Conjunction with the "Common" Wire.

NOTE: Be Sure to use a Wire Nut and Properly Tape EACH of the Other Two (2)
Transformer "Hot" Wires to Completely Isolate Them and Prevent "Shorting Out".

Turn the 117 VAC power back on and you can proceed with the programming steps
in the "Programming and Operating Instructions" section of this manual.

Lightning/Electrical Surge Information

In certain parts of the country, lightning storms can generate high voltage electrical surges that travel to the controller along the field wires that are connected between the valves and the controller. Extreme surges are known to exceed the built-in protection in most controllers, including the HP Series. As such, no warranty can be made against electrical surge damage.

However, added protection is commercially available in the form of lightning protection kits which need to be connected to copper clad grounding rods. Though such added protection will increase your controller's ability to withstand lightning induced surges, there is always the chance that a particularly harsh lightning storm will exceed the protection.

Watering Tips

During hot weather, most lawns require $1/2''$ of water every other day. For clay soil, daily watering of $1/4''$ is preferred to reduce puddling and run-off. You can also utilize the HP Series repeat start times to apply $1/4''$ twice daily with a few hours of soak in time between cycles.

There are several other water conservation methods that the HP series allows you to apply. Shorter cycles on slopes to prevent run-off, long, 1 to 2-hour or more waterings per station for drip irrigation, and 10% incremental, water budget cut-backs on watering programs are some of these features for today's water conscious world.

NOTE: This manual is an important reference to the owner/operator of the Rain Bird HP (High Performance) Series automatic irrigation controller. Make sure it is handy should a question arise about the HP's operation or programming. The basic door label instructions, permanently affixed in the controller, are designed to cover most operational functions. However, this manual provides that information in greater detail.

RAIN BIRD SPRINKLER MFG. CORP. 626

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