

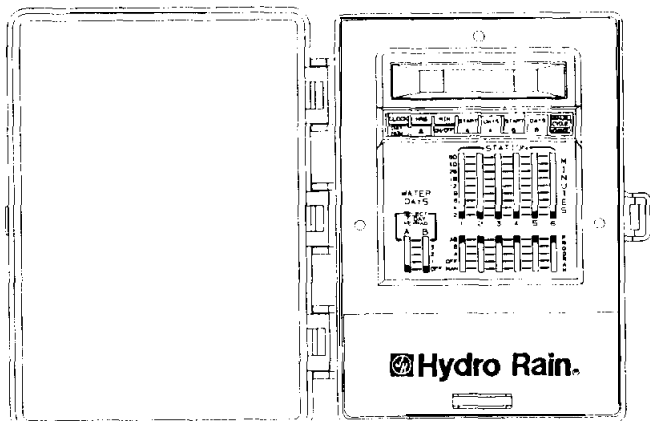
Hydro Rain®

Dual-Program Electro-Mechanical
Controller

Installation and Operation Guide

◆ *For Models HRH-6/HRH-6i/HRH-9/HRH-9i*

● *Please read instructions completely before attempting to install or operate controller*



Contents

This manual explains how to install your Hydro Rain sprinkler controller and program it for the watering schedule that's right for your garden. The following sections are arranged to match the most efficient installation sequence. Refer to them in the order presented for best results.

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Introduction

Your Hydro Rain sprinkler controller is the heart of your automated watering system. It lets you supply different parts of your lawn and garden with precisely the water they require, exactly when they require it. All without any effort on your part once you've programmed your system. The Hydro Rain HRH-6, HRH-6i, HRH-8, and HRH-9i controllers give you four ways to control how you distribute water to various parts of your yard. Here's how they work:

Station Control

Lawns, shrubs, flower beds and other foliage all need different amounts of water. You can tailor the water delivered to different parts of your yard by assigning a

different run time to one or more sprinkler heads controlled by a single valve. Each valve and the sprinklers it controls are called a Station. The HRH-6 and HRH-6i let you divide your yard into as many as six Stations; the HRH-8 and HRH-9i allow as many as nine.

Programming options

Certain parts of your yard may need water every day. Other parts may need water only twice a week. Dual programming lets you divide your stations into two different groups and assign each group a different interval between watering days. For example, Program A may water Stations 1, 2, 3, and 7-day select every third day, and Program B may water Stations 2 and 6 daily.

It's also possible to assign

a Station to both A and B Programs at once. For details, see "Selecting the right Program" on page 18.

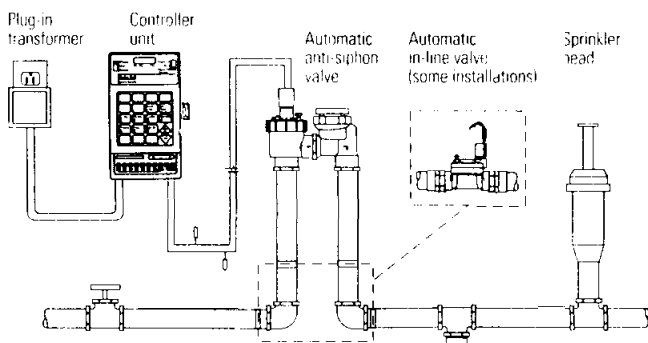
Start Times

Each Program lets you specify up to four different times to start watering the Stations it controls. For example, you might have Program A water all its Stations twice a day starting at 6 AM and 4 PM, while Program B waters its Stations at 8 AM and 2 PM.

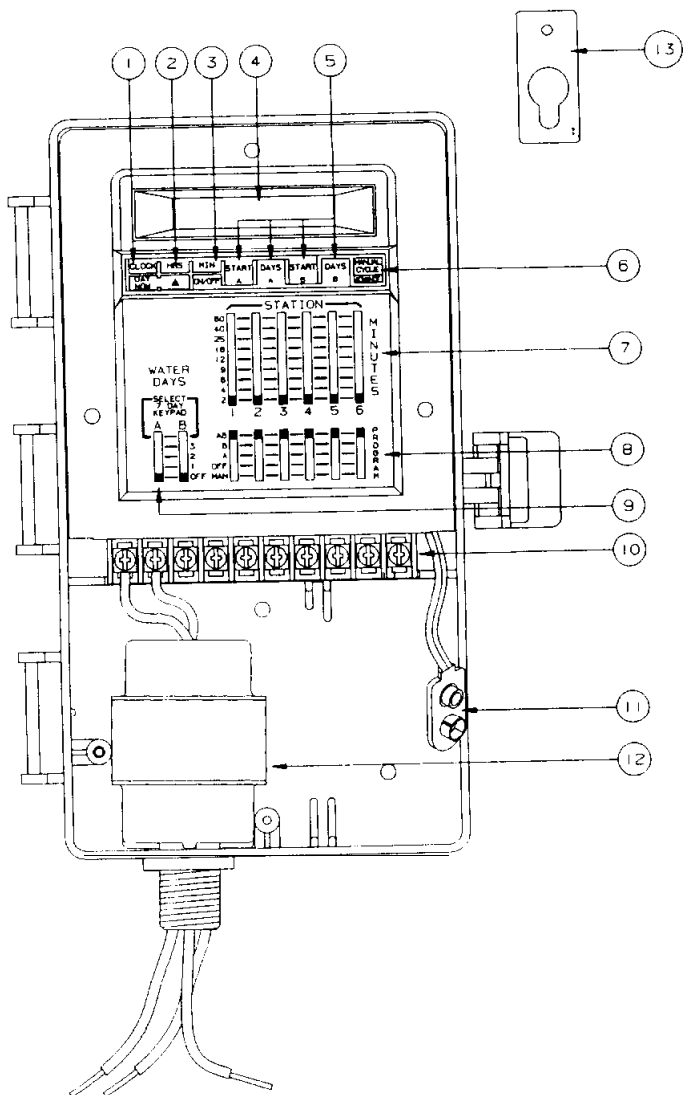
Watering run times

To deliver the correct amount of water to the foliage within each Station, you can set each Station to shut off after a specified period of time—from 2 to 80 minutes.

Here's how the controller connects to your system



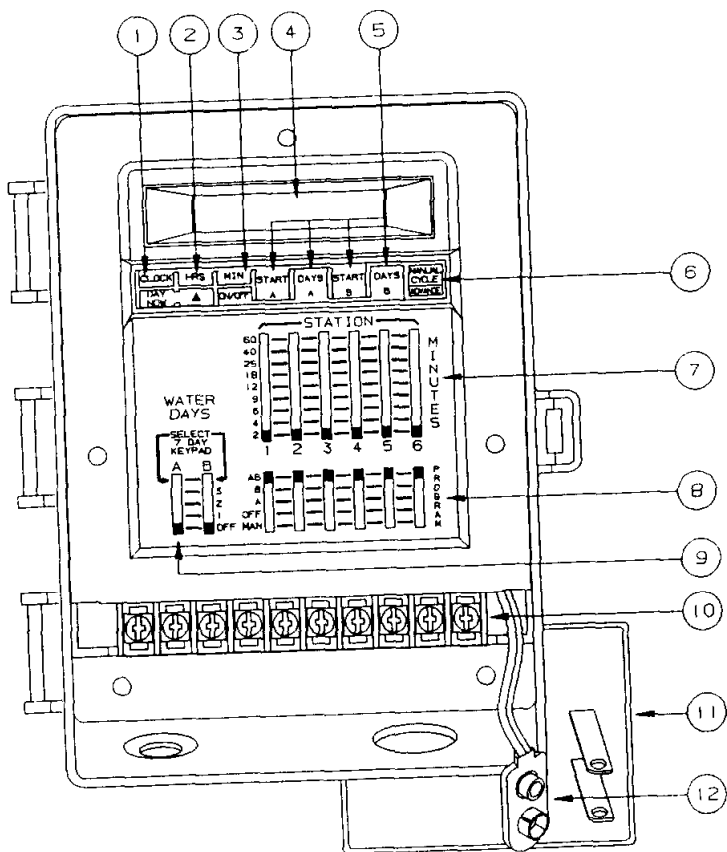
Outdoor Controller



Features of outdoor controller

- 1. Clock, Day Now key**
A dual function key that selects the time of day or day of the week
- 2. Hours key, ▲ key**
A dual function key for setting current hour and hours of start times or setting the day of the week.
- 3. Minutes, ON/OFF key**
A dual function key for setting current minute and minutes of start times or provide "ON/OFF" control of the days selected by "Days A", "Days B", keys.
- 4. Display**
Shows current time of day, Stations being watered and watering run time; also indicates programming errors and short circuit.
- 5. Start keys**
For setting up to eight start times per day (4 on Program A and 4 on Program B).
Days keys
In the 7 day select mode, enables you to program specific days of the week to be "ON" or "OFF" per program.
- 6. Manual Cycle/Advance key**
A dual function key for initiating a semi-automatic watering cycle and advancing sequentially through the cycle to the next Station.
- 7. Station-Minutes switches**
For setting separate watering run times for each Station—from 2 to 60 minutes.
- 8. Station-Program switches**
For separately assigning each Station to Program A, B, or both. Also for manually watering a selected Station or programming "OFF" to prevent watering.
- 9. Water Days switches**
For assigning each Program a different interval between watering days, and "Select 7-day keypad" for 7 day specific programming or "OFF" to prevent watering.
- 10. Terminal screws**
For connecting valve wires to controller.
- 11. Battery connector**
For installing 9-volt battery for backup power in case of power failure.
- 12. Internal transformer**
For converting 120-volt household current into safe, low-voltage power.
- 13. Hanger**
For mounting case to wall.

Indoor Controller



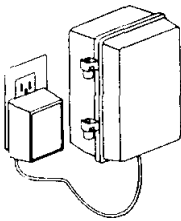
Features of indoor controller

- 1. Clock, Day Now key**
A dual function key that selects the time of day or day of the week.
- 2. Hours key, ▲ key**
A dual function key for setting current hour and hours of start times or setting the day of the week.
- 3. Minutes, ON/OFF key**
A dual function key for setting current minute and minutes of start times or provide "ON/OFF" control of the days selected by "Days A", "Days B", keys.
- 4. Display**
Shows current time of day, Stations being watered and watering run time; also indicates programming errors and short circuit.
- 5. Start keys**
For setting up to eight start times per day (4 on Program A and 4 on Program B).
Days keys
In the 7 day select mode, enables you to program specific days of the week to be "ON" or "OFF" per program.
- 6. Manual Cycle/Advance key**
A dual function key for initiating a semi-automatic watering cycle and advancing sequentially through the cycle to the next Station.
- 7. Station-Minutes switches**
For setting separate watering run times for each Station—from 2 to 60 minutes.
- 8. Station-Program switches**
For separately assigning each Station to Program A, B, or both. Also for manually watering a selected Station or programming "OFF" to prevent watering.
- 9. Water Days switches**
For assigning each Program a different interval between watering days, and "Select 7-day keypad" for 7 day specific programming or "OFF" to prevent watering.
- 10. Terminal screws**
For connecting valve wires to controller.
- 11. Battery connector**
For installing 9-volt battery for backup power in case of power failure.
- 12. External transformer**
For converting 120-volt household current into safe, low-voltage power.

Installing the Controller

The HRH Series Controllers require 24 volts AC current from the plug-in or internal transformer to operate. Plug-in transformer models are NOT weather protected and must be installed indoors (garage, work shed, etc). Outdoor models have a lockable weather resistant case and may be installed outdoors. The built-in transformer must be connected directly to a grounded, three-wire, 120 VAC power source by a licensed electrician or contractor.

Select the Location

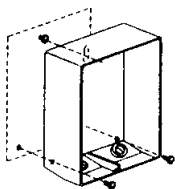


A. For the HRH-6i and HRH-9i choose an indoor location near a standard 120 volt dual electrical outlet.

B. For the HRH-6 and HRH-9, if the controller is installed outdoors, choose a location that is dry and away from direct water spray. A dry shaded location is best. Plan ahead for the 120 VAC conduit routing.

CAUTION: Don't place the controller where temperatures may exceed 130° F (55°C), on a circuit controlled by a switch, or on the same circuit as a high power user (refrigerator, air conditioner, etc.). Malfunctions may result.

Mount the Controller



For indoor model HRH-6i

A. Install a No. 8 screw at eye level in the wall leaving 1/8" of screw head projecting.

B. Slip the keyhole opening on the back of the controller over the screw head.

C. Open the controller case and install two screws through the holes in the wiring compartment at the bottom of the controller.

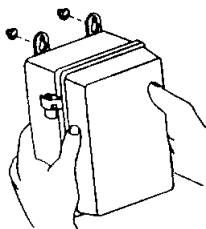
For outdoor model HRH-6

A. Screw the enclosed wall hanger into the top backside of the controller.

B. Install a No. 8 screw at eye level in the wall leaving 1/8" of screw head projecting.

C. Place wall hanger over screw to hold the controller.

D. Open the controller door and remove the lower wiring cover plate. Install two additional screws in the lower wiring compartment holes to stabilize the controller.



For models HRH-9 and HRH-9i
A. Mount the two hangers by attaching each to the upper back of the controller with a screw.

B. Remove the controller's lower panel by removing two screws then pulling out and down.

C. Position controller at eye level on wall, then fasten using two No. 8 screws through the mounting hangers. Secure by installing screw through hole at center bottom of wiring cavity.

NOTE: To install controller on a plaster or masonry wall, use plaster or lead anchors to secure screws.

Connecting the Valves

Wire the valves

A. Run valve wiring underground wherever possible. For line runs less than 800 feet long, use 18-gauge plastic jacketed thermostat control wire; over 800 feet, use 14-gauge wire. Your dealer can provide this wire in 2, 3, 4, 5, 6, 7 and 8-wire color-coded strands.

B. Connect a single common wire to one of the wires from each valve.

C. Solder or join all splices with wire nuts; then seal with vinyl or waterproof cement to assure a water-resistant connection.

IMPORTANT: The power transformer is protected by an electronic circuit breaker. Do not connect a combination of valves requiring an inrush current of more than 1 amp at 24 VAC.

Connect the valve wires to controller

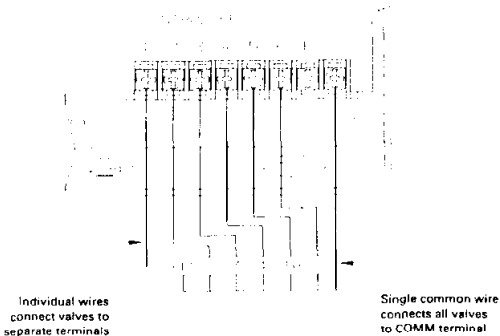
A. Run all valve wires up through hole in bottom of controller.

B. Connect the wire from valve number 1 to the terminal screw marked 1 on the controller; the wire from valve number 2 to the terminal 2, and so on. This allows your controller to selectively water the Station controlled by each valve.

NOTE: On the HRH-6 and HRH-6i. terminal designations are marked on the inside of the wiring cover.

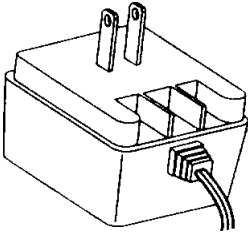
C. Connect the common wire to the terminal marked **COMM.**

D. If using a water pump or master valve, refer to page 27 for installation details.



Connecting the transformer

Connect the transformer



For indoor models HRH-6i and HRH-9i

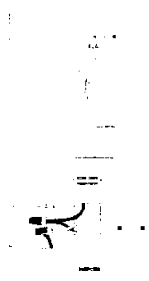
A. Connect one lead of the power cable from the controller to each terminal screw on the transformer. Make sure terminals at end of cable do not touch.

B. Plug in the transformer.

C. If Your controller must be mounted a greater distance from the outlet, replace the power cord supplied with a similar electrical cord (available from hardware and electrical supply stores).

CAUTION: Use with supplied transformer ONLY!

For outdoor models HRH-6 and HRH-9

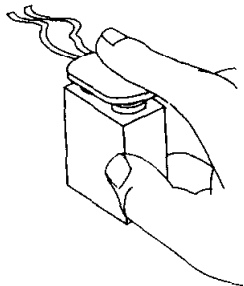


Outdoor controllers have a built-in transformer which must be connected directly to a grounded, three-wire, 120-VAC power source. This connection should be made by a licensed electrical contractor in accordance with all requirements of the National Electrical Code and applicable state and local codes. **CAUTION: DO NOT** connect the controller to one phase of a three-phase power system used by a pump or other electrical equipment.

To connect power to an outdoor model controller, complete the following:

1. Turn OFF installation site power at the associated circuit breaker.
2. Verify that power has been turned off at the installation site by using an appropriate AC voltage meter.
3. Install the conduit and associated fittings.
4. Connect power and ground wires per electrical codes.
5. Turn power on.
6. Check for 24 VAC power. If the voltage is not correct, turn power off and check wiring.

Connect the battery



A battery back-up system is built into your Hydro Rain controller to maintain your programmed watering schedule in memory in case of temporary power failure.

A. Connect a 9-volt alkaline battery (not supplied) to the battery connector in the wiring compartment of the controller case.

B. Place the battery in the wiring compartment.

C. Replace the wiring compartment cover.

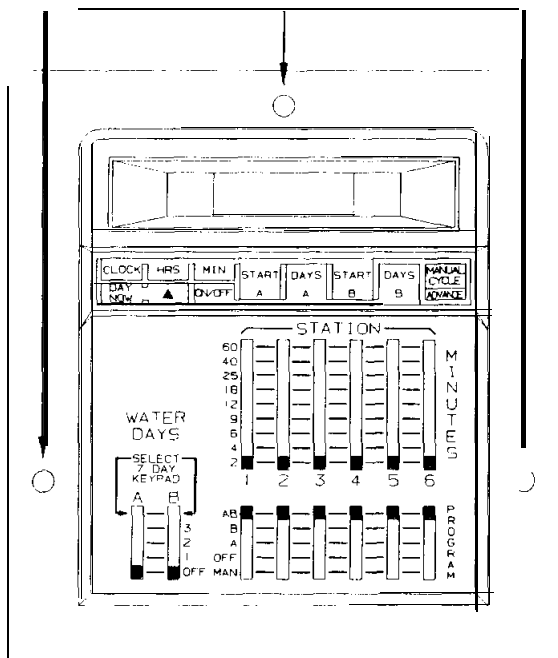
D. Replace the battery at least once a year. More often if frequent power failures occur.

CAUTION: Do not allow the battery connector to touch the controller's terminal strip (directly above the wiring compartment). Also, do not connect or disconnect valve wires while any Stations are in operation.

NOTE: Check local codes to ensure that wiring and installation meet all requirements.

To remove controller chassis

To withdraw the controller chassis from its case for repair or other reasons, remove the three screws that hold it in place as shown.



Setting the current time

In the controller's display, 12P represents 12PM, or noon, and 12A represents 12AM, or midnight. When the power is first turned on, the controller always displays a time of 400P (4:00 PM).

400 P
PM

Set the current time:

Setting the current time is easy. Here's how you'd do it if the time were now 10:03 AM.

A. Press CLOCK DAY NOW

B. Press HRS ▲ and hold key down until display shows current hour and A (AM) or P (PM).

1000A
AM

1000P
PM

C. Press MIN ON/OFF and hold key down until display shows current minute. To advance time quickly, hold down HRS ▲ or MIN ON/OFF until desired time approaches. To advance time slowly, digit by digit, press HRS ▲ or MIN ON/OFF or once for each hour or minute of advance.

1003A
MIN

NOTE: You must begin setting time within

10 seconds after pressing ^{CLOCK}
you must press ^{CLOCK} ^{DAY} ^{NOW} **Otherwise,**
^{CLOCK} ^{DAY} ^{NOW} **once again.**

Set the current day:

A. Press ^{CLOCK} ^{DAY} ^{NOW} **key twice. (Display will show**
day-of-week.1

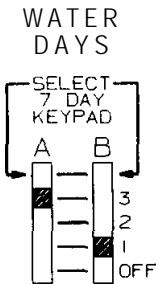
B. Press ^{HRS} **key repeatedly until the correct**
day code number appears in the display. The correct day
will be displayed as a number. Please refer to the chart
below for the correct day.

Day Chart

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|-----|-----|-----|-----|-----|-----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

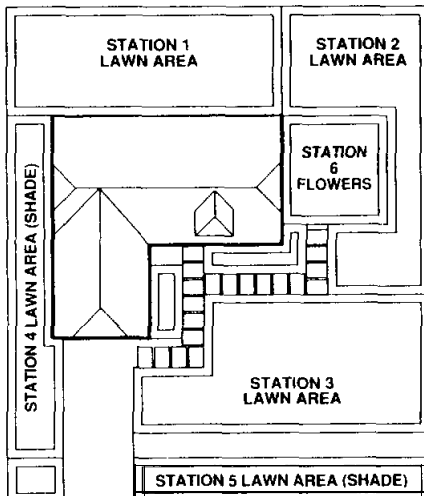
Selecting the right program

Divide up your yard



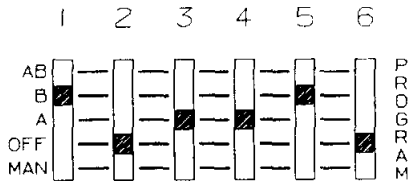
To accommodate the special watering needs of different parts of your yard, you can assign Stations to *two* separate watering Programs (A and B). Each Program activates the Stations assigned to it as a group with its own specific set of watering days and start times.

Decide how frequently each Station should be watered. If, for example, Stations covering lawn areas need water every third day and Stations covering shrubs and ground cover need water every day, you might assign all lawn Stations to Program A and all shrub/ground cover Stations to Program B.



Assign a Program to each Station

Now simply set the PROGRAM switch under each Station to desired A or B Program. Unused Stations should be programmed in the OFF position. For newly seeded lawns or drip irrigation systems requiring multiple daily waterings, you can select a combination AB setting for up to eight start times per day. For use of the manual MAN setting, see page 29.



Setting watering day schedules

Select the interval between watering days for each program

A. Set the DAYS switch to the desired watering frequencies for Programs A and B. 3 every 3rd day, 2 every 2nd day and 1 every day. Set switch to OFF if Program is not in use.

Stations programmed to water on a certain day will operate sequentially, skipping those Stations programmed to OFF. During watering, the Station number will appear on the left of the display and its run time on the right. The display starts at one minute and counts up to the total run time before changing to the next Station to be watered.

NOTE: The HRH Series controllers have a preset factory program which will keep Your system operating in the event of a power failure and an inactive battery. This preset program will start a watering cycle by day interval as programmed by the DAYS switch, and beginning 10 hours after the time that controller's clock was first supplied with power.

Set a 7-day specific calendar:

A. Refer to the "Day Chart" for day number information.

Day Chart

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|------------|------------|------------|------------|------------|------------|------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

- B. Move the switch under “Water Days A” to the “Select 7-day keypad” position.
- C. Press the $\begin{matrix} \text{Days} \\ \text{A} \end{matrix}$ key. (Display will show “1 ON”, day 1 ON.)
- D. Press the $\begin{matrix} \text{Min} \\ \text{ON/OFF} \end{matrix}$ key to Program “OFF” or press again to program “ON”.
- E. Press the $\begin{matrix} \text{Days} \\ \text{A} \end{matrix}$ key again to advance to the next day (i.e., “2 ON, 2 OFF”).
- F. Repeat procedure for all 7 days.
- G. If using Program B, repeat procedure for “Water Days B”, “Days B”.

Setting start times

Setting the start times

Working Cycle Start Times

| Station | Station | Station | Station | Station | Station |
|---------|---------|---------|---------|---------|---------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| A | | | | | |
| B | | | | | |
| A | | | | | |
| B | | | | | |
| A | | | | | |
| B | | | | | |
| A | | | | | |
| B | | | | | |
| A | | | | | |
| B | | | | | |

Now that you've assigned each Station to either Program A or B, you're ready to select the times of day that each Program's watering cycle will begin. You can set as many as four start times a day for each Program-watering all Stations under that program up to four a day. You'll use the two keys under the display, ^{START} _A and ^{START} _B. Each key will set a time when a watering cycle will start for those Stations set to the corresponding A or B program.

NOTE: *It is not necessary to use all start times available. Chart above is shown as an example of 3-start times only.*

Here's how you'd set Program A to start watering at 7:30 PM.

A. Press the ^{START} _A key.

(The display will show 200A.f)

200 A

B. Press the ^{HRS} _▲ key and hold until display shows the

desired hour and A (AM) or P (PM).

700 P

C. Press the **MIN ON/OFF** key and hold until display shows the desired minute.

730 P

NOTE: Once you've *pressed a*

START key, you must
press **HRS** **▲** OF
MIN ON/OFF *within 10 seconds.*

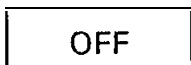
*Otherwise, you must press **START** once again before making changes. To simplify programming, write down your watering schedule first, using the reference chart on the back cover of this manual.*

D. Repeat procedure for all remaining start times.

NOTE: *Enter start times in any order. Start times are activated in chronological order, regardless of programming sequence.*

Setting run times

E. If any start time is not needed, be sure to set it to the OFF position. Hold the ^{HRS} ▲ key down until OFF appears in the display. This occurs just after 11 OOP.



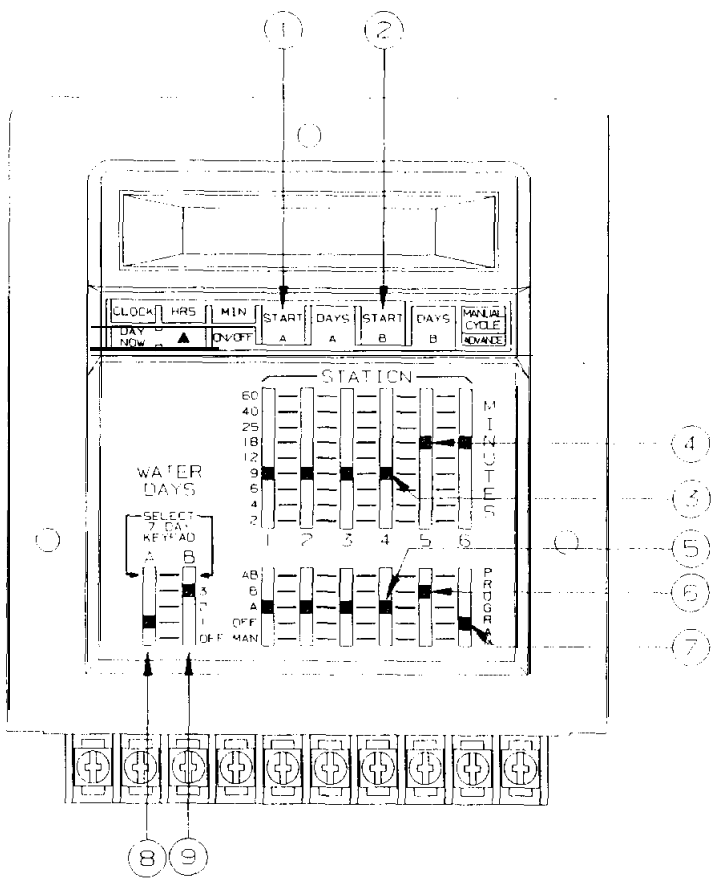
NOTE: *Any Station whose Program switch is in the AB position will water at every start time programmed (up to 8).*

Since all Stations on a Program water in sequence, beginning with the lowest numbered Station, make sure all Program start times are far enough apart to prevent watering cycles from overlapping. If overlap occurs, the controller will automatically delay the next start time to allow completion of the current watering cycle. A watering cycle that runs past midnight will cancel any overlapping start times before midnight.

Setting the watering run time-how long to water

Your controller gives you a wide range of run times to provide precisely the right amount of water to each Station. Settings may vary from 2 to 60 minutes.

To program the watering run time for each Station, simply move the corresponding MINUTES switch to the appropriate setting (2-60 minutes). Make sure you position switches only on the minute marks and not between them.



Typical program for lawn and garden

Here's how you might use your Hydro Rain controller to program a watering schedule for a typical lawn and garden. Please refer to instructions on the preceding pages for details on specific keystroke procedures.

Set start times (up to four per day) for each Program:

- 1. Push to set 6:00 AM start time for Program A.
Watering cycle will start at 6:00 AM in Station 1 and progress sequentially through Stations 2, 3, and 4.
Push again to set second start time for Program A.
Watering cycle will start at 2:00 PM in Station 1 and progress sequentially through Stations 2, 3, and 4. Set additional start times to OFF.**
- 2. Push to set 10:00 AM start time for Program B.
Watering will start in Station 5 only at 10:00 AM.
Set additional start times to OFF.**

Set run times for each Station:

- 3. Set Stations 1-4 to water lawn areas for 9 minutes.**
- 4. Set Station 5 to water shrubbery for 18 minutes.**

Assign Stations to Program A, B, or OFF:

- 5. Assign Stations 1-4 to Program A.**
- 6. Assign Station 5 to Program B.**
- 7. Set Station 6 of OFF.**

Set watering day schedule:

- 8. Set Program A to water every day.**
- 9. Set Program B to water every third day.**

Installing a pump-start relay

To connect your controller to a well pump or master valve:

If your water doesn't come from the pipes of a standard public water supply, you may be using an electrically operated master valve or pump to draw directly from a well, pond, or similar source. In these cases, you'll need to make the following wiring connections so your sprinkler controller can activate the valve or pump.

A. Bring two wires up through the same hole in the controller cabinet used for the valve wiring.

B. Connect one wire to the terminal marked PUMP.

C. Connect the second wire to the terminal marked COMM.

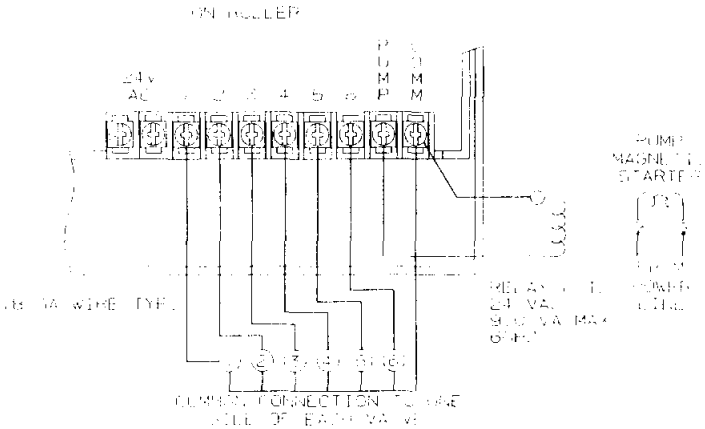
D. For master valve installations, connect both wires to a master valve rated at 24 VAC and a current no greater than 9 VA.

E. For pump start relay installations, connect the two wires to an auxiliary relay with a coil rated at 24 VAC and a current no greater than 9 VA. Then wire the relay's contact to supply voltage to the pump's contactor. A qualified electrician can make these connections for you. A Hydro Rain HSR-1 Pump Starter can control a pump up to 2 HP at 240 volts.

Installing a pump-start relay

NOTE: The controller's pump output will turn on whenever a Station is watering manually or automatically.

IMPORTANT: The power transformer is protected by an electronic circuit breaker. Do not connect a combination of pump relay and valves requiring an inrush current of more than 1 AMP at 24 VAC.



Special functions

Manual watering

To water a single Station at a time, move the PROGRAM switch for the Station you wish to water to MAN. If more than one Station's Program switch is placed in the MAN position, only the lowest-numbered Station will water. When that switch is moved off MAN, the next highest-numbered Station will begin watering. The MAN setting overrides any automatic or semi-automatic watering cycle, including any cycle in progress.

NOTE: *The manual setting will water continuously until the switch is moved.*
DO NOT LEAVE SWITCH IN THIS POSITION!



Semi-automatic watering

To start a complete watering cycle at times other than those you've programmed, press the ^{MANUAL} key. All _{CYCLE ADVANCE} Stations not set to OFF will water. To step through the stations during a semi-automatic cycle, press the key a second time. Each time the key is pressed, the controller will advance sequentially to the next station with watering time.

Turning off the system

To prevent automatic watering (for example, if rain is expected), move the DAY A and DAY B switches to OFF when no cycle is in progress. You may still water manually in this mode.

Special functions

Electronic circuit breaker operation

If the controller detects a short circuit, it will automatically turn off power to the shorted Station's automatic valve. The display will flash FUS and the shorted Station's number and run time. The controller will continue to automatically water all other Stations under the programmed watering cycles, while the display continues flashing the Station number with the short circuit. To return the controller and display to normal operating mode after repairing the short, press

DAY
NOW or any START key.

Trouble-shooting

Malfunctions aren't common, but when they occur, they're often due to one of these frequently overlooked causes.

Problem

Possible Cause

One or more valves do not water

- 1. Faulty solenoid**
- 2. Poor wire connection**
- 3. Possible break in wire**
- 4. Valve flow stem screwed down too far**

FUS and a Station number are flashing on display and no watering will occur

- 1. Faulty solenoid**
- 2. Poor or shorted wire connection**

Clock won't keep correct time

- 1. Controller on circuit controlled by a switch**
- 2. Controller on same circuit as high power user (refrigerator, air conditioner, garage door opener, etc.)**

Stations turn on when they're NOT programmed to start

- 1. Total combined run times have overlapped with another start time**

Trouble-shooting

Clock has correct time and Stations appear to be functioning properly, but no valve will turn on

- 1. One or more Station switches are in the OFF position**
- 2. The common wire is not connected**
- 3. Valve flow stem is screwed down too far**

One Station won't shut off electrically

- 1. Station switch is in MAN position**
- 2. Faulty valve**
- 3. Particles of dirt or debris are stuck in valve**

WARNING: *Do not link two or more controllers using a common transformer or common wire.*

For additional assistance call our Customer Service Hot Line (800) 231-5117.

Watering considerations

If possible, schedule watering cycles in the early morning when water pressure is at its highest. This allows ample time for water to soak in while evaporation and wind drift are low. Evening watering can leave foliage damp for too long, leading to mildew under some circumstances.

Ask your local nursery or garden center for a schedule suited to the special weather and soil conditions in your area.

1- Year Limited Warranty

LIMITED WARRANTY

Hydro Rain warrants to the purchaser of its products for a period of one (1) Year from the date of original purchase that any defective product proved to be caused by faulty workmanship or faulty materials, when installed per instructions and used in a normal manner, will be repaired or replaced at Hydro Rain's option at no charge, providing the product is received at the Hydro Rain factory or authorized factory service center with all transportation charges prepaid within one Year of the date of original purchase. This warranty does not apply to damages or malfunctions resulting from accidents, misuse, or neglect. Hydro Rain will not pay labor or other costs of removal or reinstallation of any so-called defective products.

NO IMPLIED WARRANTIES (INCLUDING BUT NOT LIMITED TO) FITNESS FOR A PARTICULAR PURPOSE, WHERE APPLICABLE, AND MERCHANTABILITY SHALL EXTEND BEYOND THE PERIOD OF THE EXPRESS WARRANTY DESCRIBED ABOVE. IN NO EVENT SHALL HYDRO RAIN BE RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES TO PROPERTY WHICH MAY ARISE FROM OR RELATE TO THE PURCHASE OF ANY HYDRO RAIN PRODUCT.

Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so one or both of the above limitations may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

To exercise your warranty, send unit with photocopy of dated receipt postage prepaid to:

Hydro Rain
9455 Railroad Drive
El Paso TX 79924

800-231-5117
915-757-2586

Zone Legend

| Station | Watering Days | Run lime | Location |
|---------|---------------|----------|----------|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |

| Program | Start Times | Program | Start Times |
|---------|-------------|---------|-------------|
| 1-A | | 3-A | |
| 1-B | | 3-B | |
| 2-A | | 4-A | |
| 2-B | | 4-B | |



Hardie Irrigation

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