



# RAINBOW CONTROLLER

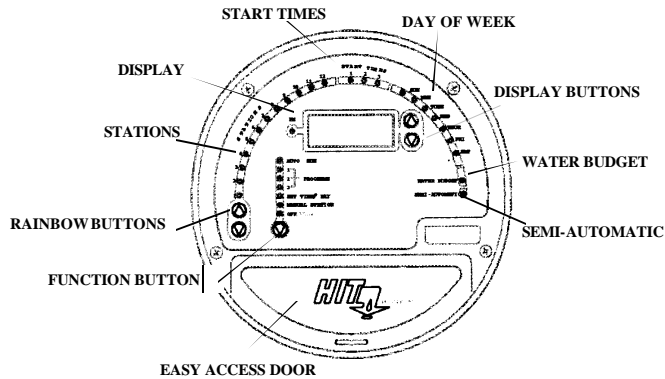
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Programming is Easy.... Just Follow the Rainbow!

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# THE RAINBOW



## Installation – Indoor Model

### Mounting the Controller:

The Rainbow Controller Indoor Model should be located in a weather protected area such as a garage or covered area, within 5’ of a 120 Volt outlet.

On the back of the controller there is a “keyhole” shaped mounting slot as well as 2 mounting holes. To attach to wall studs, use a #10 screw, leaving 1/4" of the shank exposed to slip into the “keyhole” slot. To secure and stabilize the controller, drive additional screws through the bottom mounting holes into the stud or cross bracing.

**WARNING: Only plug the transformer into a 120 Volt power source and only AFTER the transformer leads have been connected to the terminals marked 24 VAC Input, and the controller has been securely attached to its selected location.**

### Connecting the Power Leads:

The Rainbow Controller is equipped with a 24 Volt direct plug in transformer. The supplied transformer leads are approximately 6’ in length. Rout the transformer leads up through the hole in the bottom of the case and insert under the two “24 VAC INPUT” screws located on the Terminal Strip at the left of the case.

## Installation – Outdoor Model

### Mounting the Controller:

The Rainbow Controller Outdoor Model can be located almost anywhere, yet it is still best to protect it from direct exposure to the elements or south facing walls in hot climates.

At the back of the controller there is a “keyhole” shaped mounting slot as well as 2 mounting holes. To attach to wall studs, use #10 screw, leaving 1/4" of the shank exposed to slip into the “keyhole” slot. To secure and stabilize the controller, drive additional screw through the bottom mounting holes into the stud or cross bracing. When attaching the controller to hollow walls, masonry or cinder blocks, use appropriate toggle bolts, masonry shields or compression drive bolts. For additional weather proofing, after mounting, run a silicon bead around the case between the controller and the wall.

**WARNING: Only connect the transformer leads to a 120 Volt power source and only AFTER the transformer leads have been connected to the controller terminals and the controller has been securely attached to its selected location.**

### **Connecting the Power Leads:**

The Rainbow Controller has 2 power leads extending from the internally mounted 24 Volt transformer down through the conduit hole. The leads may be connected in any order and a ground is not required since the controller housing is made of durable reinforced engineering grade resin.

**Please Note:** The wire gauge used to connect the power to the controller must be of sufficient size to compensate for any voltage drop due to electrical resistance in wiring runs. Connection methods used should be according to National Electrical Code requirements, using either wire nuts or solder, as required. Most local building and electrical codes require that approved electrical conduit be used when running power to any exterior wall or pedestal mounted controller requiring a 120 Volt power supply.

### **Installation – Both Models**

#### **Connecting the Battery:**

Battery backup requires on standard 9 Volt alkaline battery. To install, just open access door and connect battery. Low battery notification is displayed as “Batt” every 60 seconds when battery needs to be replaced.

**Please Note:** The battery does not contain enough power to operate valves. The purpose of the battery is to maintain your unique programmed information during power outages.

In case of a power outage, a fully charged alkaline battery will provide power to retain current time and all programming up to 24 hours. Automatic recharge circuit will keep an alkaline battery charged between power outages within the life of the battery. When controller is re-powered with standard line power, within the life of the backup battery, controller will immediately commence all current activity as programmed.

#### **Automatic Backup Program:**

**If the duration of a power outage exceeds the battery life, the Rainbow Controller contains an automatic backup program of 10 minutes per station, watering everyday at 6:00 a.m., with clock resetting to 12:00 p.m. when power resumes.**

#### **Connecting the Valves:**

**Warning!** Before connecting the valves, make sure the transformer is unplugged or that there is no power to the controller.

Open access door and route one wire from each valve through the hole at bottom of controller. Connect each lead under the appropriate numbered screw on terminal strip. The “common” wire from each valve should be attached to a single common wire that will be routed through the hole in the bottom of controller and connected to the terminal strip labeled “Common”.

**Note:** This controller is designed for use with 24 VAC, .25 amp solenoid operated valves. A maximum of two valves per “valve station” may be used and no more than 4 valves (or solenoids) should be “ON” at any one time. This includes the master valve and/or pump start, if one is being used. Current requirements should not exceed .50 amps for any single station output.

### **Connecting a Master Valve or Pump Start Relay:**

To use a Master Valve or Pump Start Relay which operates throughout the watering cycle, simply connect one master valve solenoid lead wire to the terminal strip screw labeled “Master” and the remaining lead to the terminal strip screw labeled “Common”.

**Note:** The master valve must be equipped with a 24 VAC, .25 amp solenoid. If a pump is used, simply connect a 24 VAC relay lead to the same terminal used for the master valve connection. The pump relay should have a nominal coil voltage of 24 VAC at .25 amps maximum.

**CAUTION:** If you are using a pump start circuit, the “Fail-Safe” program will activate the pump for all valves for 10 minutes each (on Program 1 only). If all valves are not being used, the pump will be running against a “Dead Head” on each unused valve. This can cause a burn-out of the pump. To avoid this, simply connect a jumper wire from the unused valve terminals over to a valve terminal that is being used.

### **Programming is EASY**

1. To design your first program, use the function selector button to highlight PROGRAM 1.
2. Use the **Rainbow buttons** to select the STATION to set. Use the **display buttons** to set the run time for this station. Continue along the rainbow to set the other stations in this program.
3. Continuing along the rainbow with the **Rainbow buttons**, highlight a start time for your program. Up to three cycle start times are available for each program. Use the **display buttons** to set each start time. OFF is between 11:59PM and 12:00AM.
4. Each day of the week can be **ON** or **OFF** for your particular watering schedule. Use the **Rainbow buttons** to highlight each day of the week, and use the **display buttons** to turn each day ON or OFF. Each program is totally independent.

\*\*\* The Rainbow Controller has the capacity of storing and operating simultaneously three separate and independent programs.

### **To Set the Current Time/Day:**

The Rainbow Controller constantly shows the current time, current day of the week and current irrigation activity. To set the current time/day, highlight the SET TIME/DAY with function button and set the current time with the **display buttons** and then highlight current day of week with the Rainbow buttons.

### **To use “Water Budget”:**

Each program can be independently “Water Budgeted” from 0%-250% of scheduled run time for each station. Select WATER BUDGET on the rainbow and use the display buttons to set the desired percentage of run time. 00% Water Budget will shut off that program. 100% equals actual runtime displayed.

EXAMPLE:

Regular runtime = 10 minutes = 100%

At 150% Water Budget = 15 minutes run time

### **To use “Semi-Automatic”:**

Any complete program may be initiated manually for supplemental watering. Use the **function button** to select the appropriate program (1,2, or 3) you desire to run and then use the **Rainbow buttons** to select SEMI-AUTOMATIC. After completion of the program the controller will return to AUTO RUN.

## **Controller Functions**

### **Manual Station:**

Any single station can be manually activated for a programmable duration. Highlight MANUAL STATION with the function button. Use the Rainbow buttons to select a station and use the display buttons to set the desired manual run time. When the manual run time is completed, controller will return to AUTO RUN.

### **Off/Rain:**

Turns off any manual, semi-automatic or programmed run time in progress. Controller will remain in OFF providing no output until operator returns function selector to any other position.

If controller is in OFF/RAIN position and if a prolonged power outage has occurred beyond the back-up battery life, the “Automatic Back-up Program” (see page 4) will be activated upon resumption of 110 VAC power.

### **Automatic Short Circuit Detection Notification and Override:**

Should station output wires or solenoid “short”, controller will immediately discontinue output to that station and the Master Valve/Pump Start terminal for duration of that programmed run time for that specific station. Controller will then continue as programmed for the next station and for the remainder of that cycle start and all future programs. No fuse, circuit breaker or resetting of any type is required. “Short” condition has been experienced during that specific station’s programmed run time. Each cycle or manual start thereafter will check for “short” condition during each valve’s activation. If no shortage condition exists or short has been repaired, the “short” notification will cease.

### **Surge Protection:**

Controller does **Not** require replacement of fuses or resetting of circuit breakers. Controller shall automatically continue to operate after brief (2 seconds) delay. Controller will continue to operate as if no surge had occurred, with no lost start time or station watering time.

## Electrical Specifications

- ❖ Input: 24 Volts AC from the supplied U.L. Approved Class 2 Transformer. 120V or 220/240 50/60 Hz (Specify either 50 Hz or 60 Hz when ordering)
- ❖ Output: 24 VAC, any single station may draw .50 amps continuous. 4 outputs may operate simultaneously including master valve/pump start with total output not to exceed 2.0 amps.
- ❖ U.L. Approved transformers. Battery backup require one 9 Volt standard alkaline battery. (Battery not included)

## Trouble Shooting

<b>Problem:</b>	<b>Possible Cause:</b>	<b>Correction:</b>
Valves don't operate:	Function Button In OFF/Rain	Set Function Switch to Auto Run or Manual
	Solenoid defective	Test & Replace if necessary
	Loose Wire Connection	Secure wire connections. Check for continuity.
	Day in "OFF" mode	Check display to see if Day is in ON or OFF mode
	All Start Times set to "OFF"	Reprogram start times
	Water Budget at 0%	Change Water Budget Value to 10% - 250%
Valves Open at Wrong Times	"Current Time" of day incorrectly set.	Check and reset current time
	Multiple Programs Activating	Check all program start and run times.
No Display:	No Power at Source	Check circuit breaker panel
	No Power to controller	Check wiring & connections. Check transformer to make sure it's plugged in.
Display reading Incorrectly (After a power outage or after being plugged in)	Battery is weak, or no battery is being used	Remove AC power and battery for 1 minute. Replace battery, restore power and reprogram.
Intermittently display "BATT"	Battery is low or missing	Install new Alkaline battery
"Current Time" is Wrong	Power outage occurred with low or no battery	Replace battery and reprogram controller

## Enter Your Programs Below For Easy Reference

LOCATIONS		Program 1	Program 2	Program 3
	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
	11			
	12			
START TIMES	1			
Enter start times	2			
For each program	3			
DAYS ON/OFF	M			
Days of week	T			
Program will run.	W			
Enter ON or OFF	TH			
For each day of	F			
The week	SA			
	SU			