



## OPERATOR / OWNER MANUAL

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# **FEATURES:**

Thank you for purchasing the Rain Bird “Ultra” 116 Automatic Filter Controller. Listed below are some important features you should be aware of before you begin programming. Details on how to implement these features are described on the following pages.

- \* Operational with AC, 12 VDC or 12 VDC Battery power.
- \* Selectable 24 VAC or 12 VDC Solenoid Output Voltage. 12 VDC can be selected as either Continuous or Pulse Output
- \* Four (4) station base unit expandable to 16 stations with 4-station Plug-In Modules
- \* Stations can be enabled or disabled by the 4-position dip switches located on the rear of the front panel and on each Plug-In Modules and can be enabled in any combination. (Example: Enabled Stations-2,5,9 and 15)
- \* Capability of operating up to two valves per station plus a master valve.
- \* Periodic Flush and Delay Time Controls Actuation from a Pressure Differential (PD) Switch
- \* Re-settable flush cycle counter
- \* Manual start and advance function
- \* Manual stop function
- \* Elapsed time count since last flush cycle
- \* Outdoor lockable case (weatherproof NEMA 4X case option available)
- \* English / Spanish Controls

# **ELECTRICAL HOOK-UP:**

1. To connect wires from power source to controller, follow instructions in A or B below.
  - A. **110 VAC Power Source**
    - 1.) Screw a ½” conduit (customer supplied) to the threaded transformer nipple at bottom of enclosure feeding the transformer leads into conduit.
    - 2.) Install and secure rigid conduit or armored cable as may be required by local electrical codes to conduit routing wires from 120 VAC source into conduit
    - 3.) Connect one wire from power source to black transformer lead and the other to the white transformer lead using approved wire nuts.
    - 4.) To ground controller, connect green transformer lead to grounding wire. Grounding can also be achieved by securing metal conduit to the ½” conduit or by loosening the green screw at the bottom of the case, placing a grounding wire between the head of the screw and the case, and then re-tightening the screw.
  - B. **12 VDC Power Source**
    - 1.) Remove transformer from enclosure by first unscrewing locking nut from threaded nipple that protrudes through opening in bottom of enclosure. Transformer can then be removed from wiring compartment that is accessed by removing the lower panel.
    - 2.) Route two wires from power source through the smallest opening in the bottom of the enclosure using conduit or armored cable as may be required by local electrical codes.

**WARNING:** Do not use an alternator as a direct power source. Connecting the wires directly to an alternator or voltage regulator may cause sever damage to the controller and will void the warranty. Always connect the D/C power feed from the D/C battery to the controller.

- 3.) Connect wires to battery terminals located to the left of the main terminal strip, taking care to connect positive wire to positive terminal and negative wire to negative terminal.
  - 4.) Controller should be grounded by a.) Securing metal conduit to case or b.) by loosening the green screw at the bottom of the enclosure, slipping a grounding wire between the head of the screw and the enclosure and then re-tightening the screw.
5. Route station wires from solenoid valves through the largest opening in bottom of case. One wire is routed from each valve to the corresponding numbered station terminal. One common wire is connected in parallel with each valve and then to the "COMMON" Terminal.
  6. If the master valve is used, connect one wire to the terminal marked "M" and the other to the "COMMON" Terminal.
  7. Connect the wires from the Pressure Differential (PD) Switch to the terminals marked "PD" with the black wire connecting to the left terminal (under "P") and the white wire connecting to the right terminal (under "D").

## ***ELECTRICAL INFORMATION***

The Model 116 is designed to operate on either AC or 12 VDC power.

<b>AC POWER:</b>	<b>Input:</b>	120 VAC or optional 240 VAC, 50 or 60 Hz.
	<b>Output:</b>	Selectable 24 VAC or 12 VDC (continuous or pulse operation). 3 amps maximum output current.
<b>DC POWER:</b>	<b>Input:</b>	12 VDC
	<b>Output:</b>	12 VDC (either continuous or pulse operation) CAUTION: Continuous operation on Battery Power Source is allowed, but can drain your battery.
<b>Power Consumption:</b>		20 milliamps drain on the battery when operating in Pulse mode. 46 milliamps is consumed when a Display Function Switch is depressed. Three (3) amps maximum on continuous output operation are consumed.

# REAR PANEL CONTROLS and SET-UP:

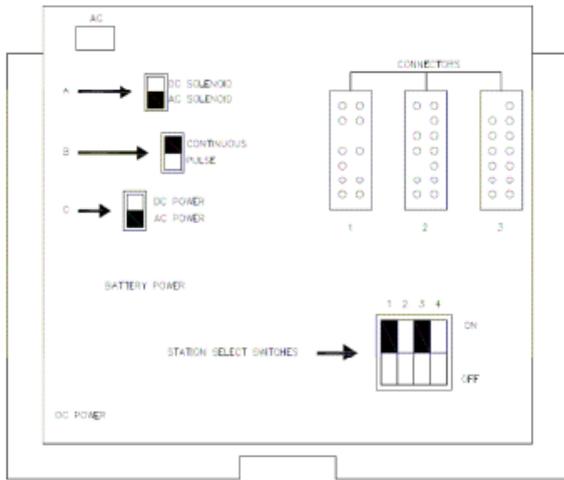
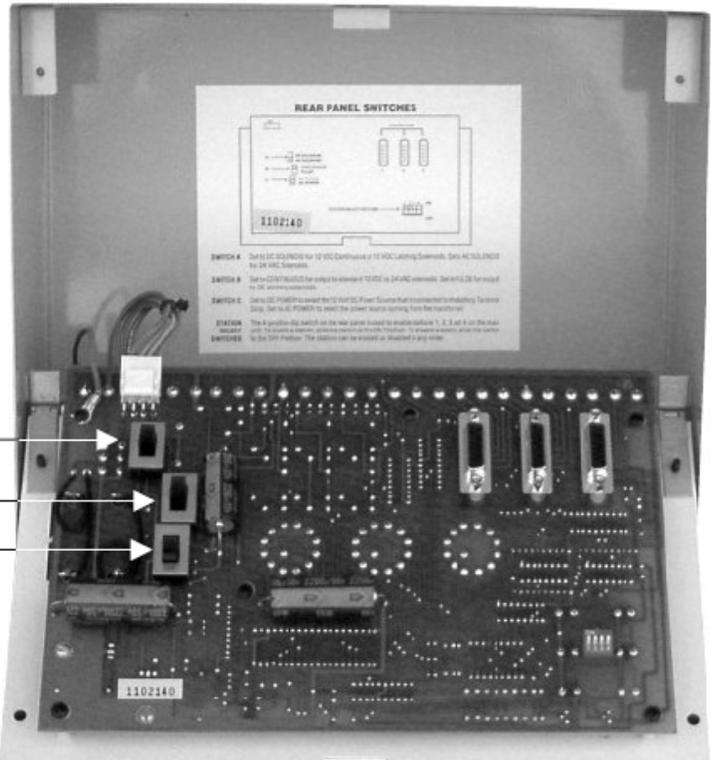


FIGURE 1



## POWER SELECT SWITCHES

### \*\*\*\*\*NOTE\*\*\*\*\*

With regard to the processor used in the Ultra 116/116i (After 3/07)

If the solenoid switches are set to A/C and PULSE, (an invalid setting) the circuit breaker will pop. No damage will occur, but the condition must be corrected before the system will operate properly.

These switches, located on the rear panel, are to be set by the user at the time of installation to meet input and output power requirements of the system. To gain access to rear panel, first remove bottom panel, then remove upper screws on top panel and swing downward. The switches are identified in the diagram above.

### Switch A

Set to **DC SOLENOID** for 12 VDC Continuous or 12 VDC latching Solenoids. Set to **AC SOLENOID** for 24 VAC Solenoids

### Switch B

Set to **CONTINUOUS** for output to standard 12 VDC or 24 VAC solenoids. Set to **PULSE** for output to 12 VDC latching solenoids.

### Switch C

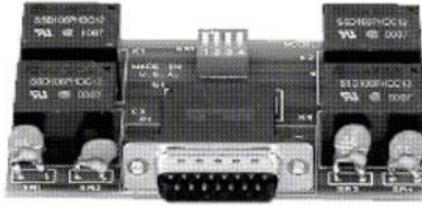
Set to **D/C POWER** to select the 12 Volt DC Power Source that is connected to the Battery Terminal Strip. Set to **AC POWER** to select the power source coming from the transformer.

## STATION SELECT SWITCHES

The 4-position dipswitch on the rear panel is used to enable stations 1, 2, 3 and 4 on the main unit. To enable a station, slide the switch to the ON position. To disable a station, slide the switch to the OFF position. The stations can be enabled or disabled in any order

# **PLUG-IN MODULE:**

## **4-STATION PLUG-IN MODULES**

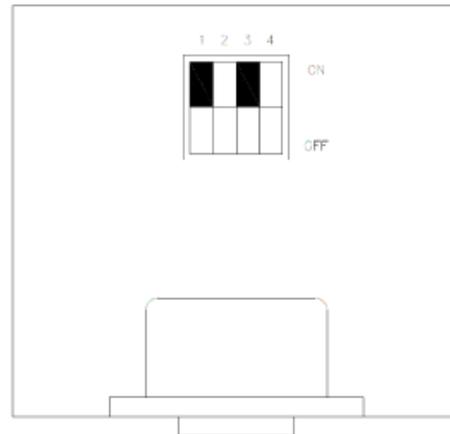


The number of stations can be increased from 4 to 16 in 4 station increments with modules that plug into the rear of the panel. The modules are interchangeable and can be inserted into any module position. Insert a module into connector: #1 to add stations 5 through 8 #2 to add stations 9 through 12 #3 to add stations 13 through 16

A 4-position dipswitch is located on each module. It is used to enable (ON) or disable (OFF) each of the added stations. Dipswitch positions are numbered 1 through 4 and they correspond to the added stations in ascending order. For example, on a module plugged into connector #2, position 1 corresponds to station 9; position 2 corresponds to station 10, etc.

Enable the stations to be included  
In the flush cycle by setting to ON  
The corresponding dip switch  
positions.

Secure the module in place by using  
the 4-40 screws on the module plug.



# **INSTALLATION INSTRUCTIONS**

## **MOUNTING THE CONTROLLER:**

The controller is mounted in an outdoor, rain-tight, rust resistant and dust-proof box. To gain access to mounting holes at the rear of the case, first remove the lower access panel. Next, remove the upper screws of the top panel and swing the panel downward. If additional support is desired, a third fastener can be added through a lower hole in the rear of the case.

# **PROGRAMMING**

**TIME CONTROL SETTINGS** Rotate the knob to desired setting for each of the following controls:

**Periodic Flush:** Period between flush cycles (Hours). If this knob is set to OFF, Flush cycles will occur only when activated by the pressure differential switch or by pressing the "MANUAL START" button. If the Periodic Switch is rotated during a Periodic Cycle Interval, the Periodic Time will restart at the beginning of the Periodic Interval.

**Flush Duration:** Duration of flush for each station (seconds).

**Delay:** Pause between stations after each flush (seconds).

**ON/OFF SWITCH:** Set switch to the OFF position to suspend operation. When the switch is returned to ON, three operations will take place.

- 1.) If the controller is in the Pulse Mode, each station enabled will be pulsed to the Off Position.
- 2.) The Cycle Count will be reset to zero
- 3.) Operation will resume at the beginning of a Periodic Cycle.

**DISPLAY & LEDS:** The display and LED's are used to view information on the current status of the system. The display and LED's will be enabled when the push button switches are depressed. The Display will show "PD" when the Pressure Differential Switch is closed.

**PUSH BUTTON SWITCHES:** The Push Button Switches are used to display the status of the controller and to perform manual start, advance and stop operations.

**Display:** Depressing this switch will show the status of the controller. The controller will be in either the Periodic Flush or Delay cycle. One of the three LED's will be lit, indicating which cycle is in process. The number appearing on the display indicates the following:

(CONTINUED ON THE NEXT PAGE)

# **PROGRAMMING (CONTINUED)**

**Periodic Mode:** Percent of Periodic Flush interval that has elapsed since the last Flush Cycle. For example, if the Periodic Flush is set at 2 hours, and 75 appears on the display, then 75% of the 2 hours (1 ½ hours) has elapsed since the last flush.

**Flush Mode:** Station is in progress.

**Delay Mode:** Station has just completed.

**Manual Start:** Pressing and holding this switch down for 2 seconds will advance the controller from one cycle to the next. Keeping the switch depressed will allow continuous station advancement every 2 seconds. The Display and LED's will light indicating the controller status.

**Manual Stop:** Pressing and holding this switch down for 2 seconds will reset the controller to the beginning of the Periodic Mode. If the controller is in the Pulse Mode, each station enabled will also be Pulsed Off in sequence.

**Count:** Depressing this switch will display a count of the number of Flush cycles (up to 99, the count will start over at 0 if exceeded) since the controller was turned on or since the last manual reset of the count. The count will increment every time a Flush cycle starts. This is initiated by one of the following:

- 1) Manual Start Operation
- 2) PD Switch Closure
- 3) Normal Flush Start

**Clear:** Depressing the Clear Pushbutton along with the Count Pushbutton will clear the count.

## ***PRESSURE DIFFERENTIAL OVERRIDE***

The controller will automatically initiate a Flush Cycle if the "PD" Switch is closed for 30 seconds. During this time, the display will show "Pd"