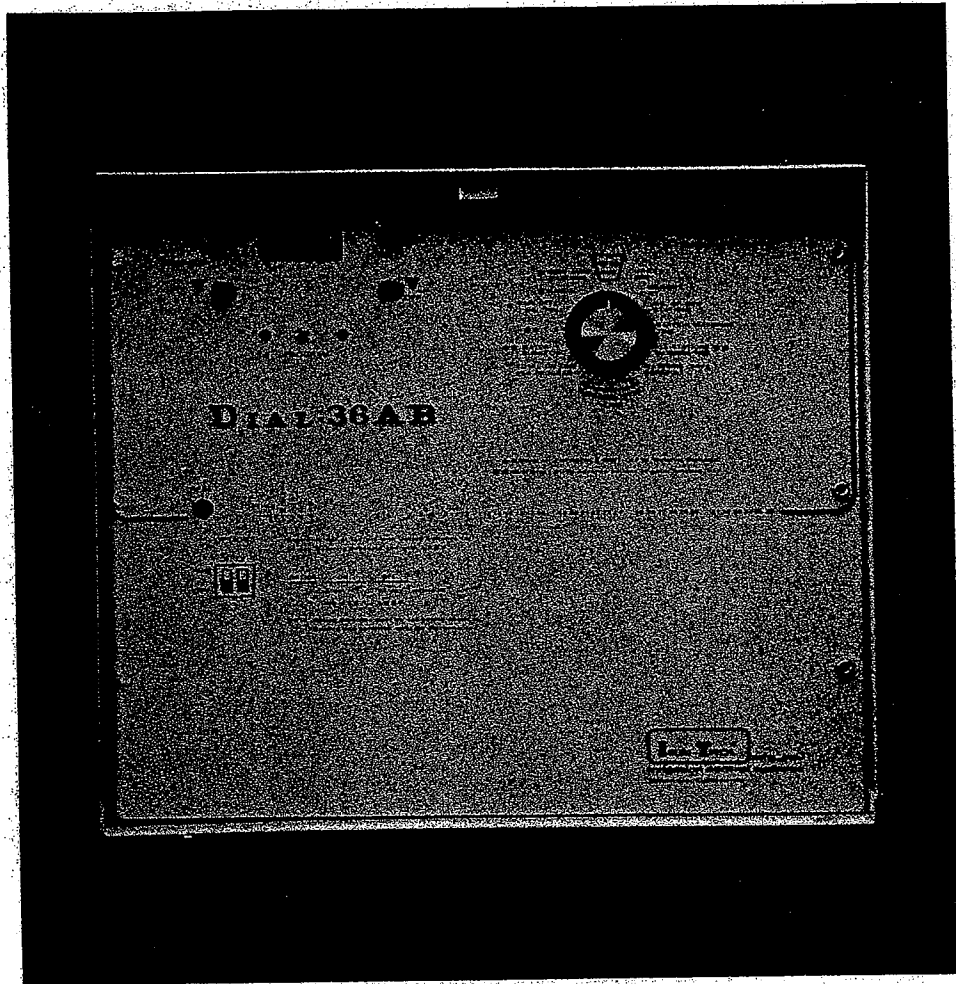


# DIAL AB SERIES CONTROLLERS



## OWNER'S MANUAL

5, 7, 11, 14, 16, 18, 24, 30 and 36 stations

**IRRI-TROL®**



Thank you for purchasing the Irri-Trol Dial AB Series 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.

- 6- or 14-day Watering Day Schedule
- Two Independent Programs capable of running concurrently
- Rain Off and Two-minute Test feature for all stations
- Semi-automatic and True Manual Operation (safety shutoff at midnight)
- Sensor Hookup capability
- Complete Rechargeable Battery Backup System—maintains programming memory and keeps time during power failures (Batteries included)
- Station Watering Time of 1-99 minutes in Program A
- 8-watt Output per station
- UL listed

**Dial-5AB—Dial-16AB unique features:**

- Cycle Looping feature—allows unlimited watering start times
- Station Watering Time of seconds, minutes or hours in Program B
- Each station can be programmed in two programs

**Dial-18AB—Dial-36AB unique features:**

- Single Entry All Stations On Time
- Total On Time Display
- Water Budgeting capability from 1% to 255%
- Selectable Automatic Safety Backup Program
- Station Watering Time of 1-99 minutes in Program B
- Number of Drip Stations feature—allows 1-9.9 hours of watering, selectable in sequence by station
- Each station can be programmed in one program

# TABLE OF CONTENTS

	DIAL-5AB THRU DIAL-16AB	DIAL-18AB THRU DIAL-36AB
<b>Installation and Wiring Instructions .....</b>	8	8
<b>Setting the Controller</b>		
Current Time .....	11	16
Current Day .....	11	16
Automatic Safety Backup Program .....	11	16
Program Erase (PE) .....	11	16
<b>Programming Instructions</b>		
Displaying and/or Setting Watering Days ...	11	17
Displaying and/or Setting Watering Time....	12	16
Setting All Stations Watering Times.....		17
Displaying and/or Setting Watering Start Times .....	12	17
<b>How To Use Program B .....</b>	13	
<b>How To Use Program 2 .....</b>		18
<b>Operating Instructions</b>		
Manual or Emergency Shut Down .....	14	19
Rain Off/2 Min. Test .....	14	19
Manual Operation .....	14	20
Semi-automatic Operation .....	14	20
Number of Drip Stations .....		19
Total On Time Per Program .....		19
Watering Budgeting .....		19
<b>Additional Features</b>		
Setting a 6-day Schedule .....	15	20
Selectable ASBP .....		20
Program B—Seconds/Loop Mode .....	15	
Program B—Hours Mode .....	15	
<b>Glossary .....</b>	21	21

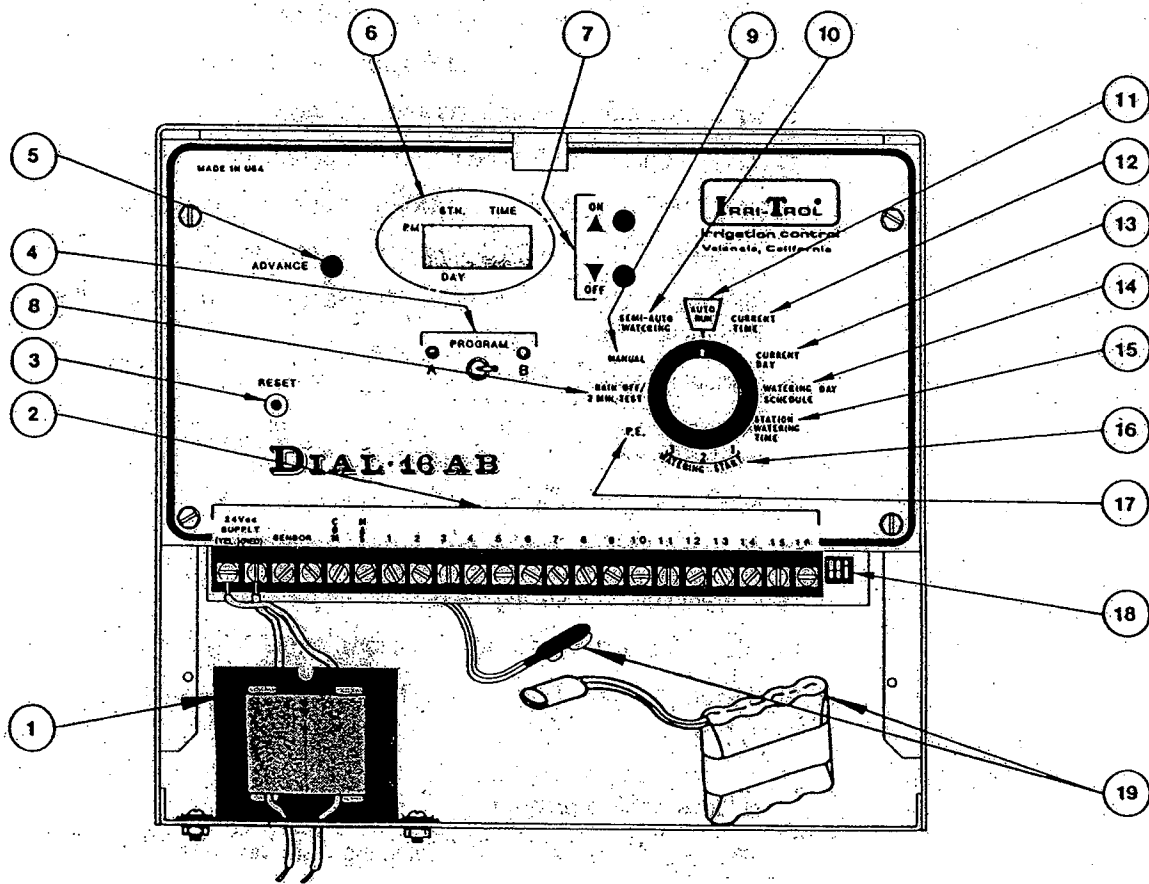
# DIAL AB SERIES CONTROLLERS

(Dial-5AB through Dial-16AB)

- 1 110/24-volt transformer
- 2 Terminal Strip—for 24v, sensor hookup, common, master valve and individual station hookups
- 3 Circuit Breaker—will reset when controller is overloaded to prevent damage to the controller; 24 VAC, 1.4 amps holding, 2.0 amps breaking (non-empirical)
- 4 Program indication LEDs and Program Select Switch
- 5 Advance Button—selects stations and days
- 6 Digital Display—for viewing time and program information
- 7 On/Off Buttons—for programming and operating functions
- 8 Rain Off/2 Min. Test—to select the Rain Off mode and/or the Two-minute Test
- 9 Manual Position—for true manual operation
- 10 Semi-automatic—to activate a Manual Watering Cycle that utilizes the programmed Station Watering Times
- 11 Auto/Run—to lock buttons when not programming
- 12 Current Time—for setting time
- 13 Current Day—for setting the day
- 14 Watering Day Schedule—for selecting watering days
- 15 Station Watering Times—for setting individual Station Watering Times
- 16 Watering Start Times—for setting the time of day a watering cycle will initiate
- 17 PE Position—for erasing programmed information
- 18 Option Switches—for selecting additional features
- 19 Rechargeable Battery Backup System

**NOTE:** Remote connector located on right of panel.

**IRRI-TROL®**

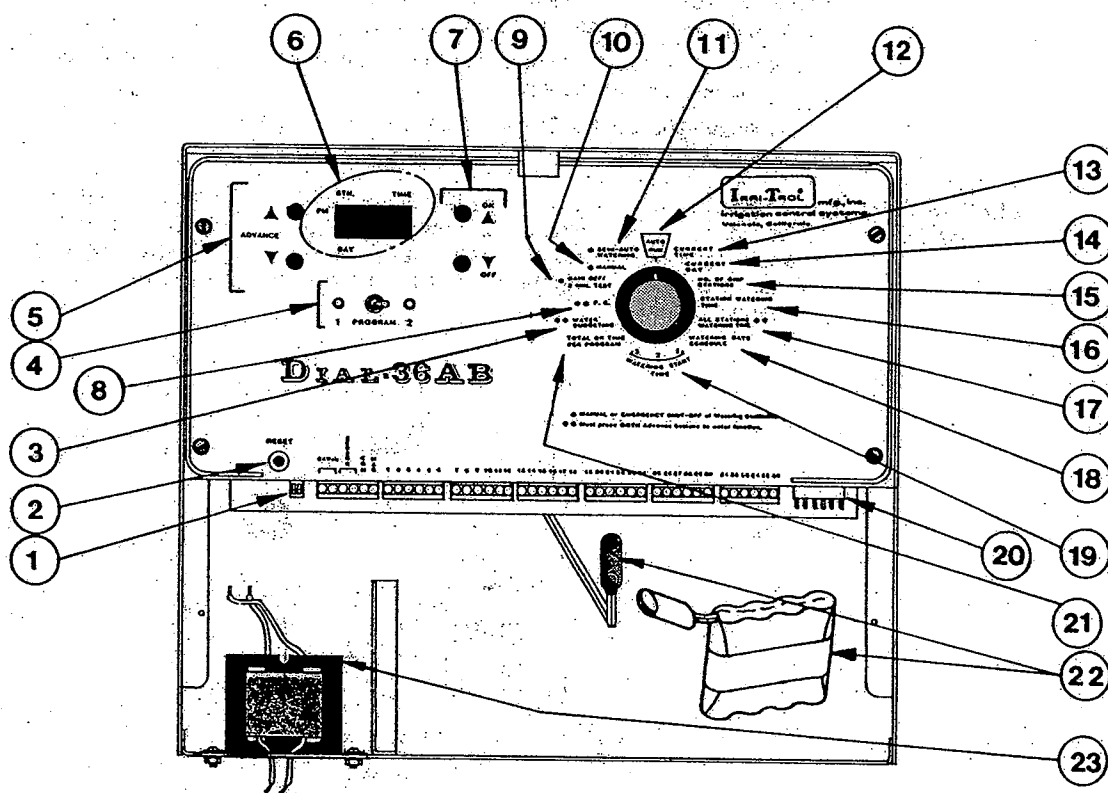


# DIAL AB SERIES CONTROLLERS

(Dial-18AB through Dial-36AB)

- 1 Option Switches—for selecting additional features
- 2 Circuit Breaker—will reset when controller is overloaded to prevent damage to the controller; 24 VAC, 1.4 amps holding, 2.0 amps breaking
- 3 Watering Budgeting—for single entry increase or decrease of watering times for all stations within a program
- 4 Program indication LEDs and Program Select Switch
- 5 Advance Buttons—selects stations and days
- 6 Digital Display—for viewing time and program information
- 7 On/Off Buttons—for programming and operating functions
- 8 PE Position—for erasing programmed information
- 9 Rain Off/2 Min. Test—to select the Rain Off mode and/or the Two-minute Test
- 10 Manual Position—for true manual operation
- 11 Semi-automatic—to activate a Manual Watering Cycle that utilizes the programmed Station Watering Times
- 12 Auto/Run—to lock buttons when not programming
- 13 Current Time—for setting time
- 14 Current Day—for setting the day
- 15 No. of Drip Stations—to select stations for drip irrigation (hours)
- 16 Station Watering Times—for setting individual Station Watering Times
- 17 All Stations Watering Time—for single entry watering times of all stations within a program
- 18 Watering Day Schedule—for selecting watering days
- 19 Watering Start Times—for setting the time of day a watering cycle will initiate
- 20 6-pin Connector—for hooking up ADP-I, remote adapter cable
- 21 Total On Time Per Program—for display of the accumulated watering times per program
- 22 Rechargeable Battery Backup System
- 23 110/24 volt transformer

**IRRI-TROL®**



# INSTALLATION INSTRUCTIONS

## MOUNTING THE CONTROLLER

The controller is in an outdoor, rain-tight, rust-resistant and dust-proof box. Nevertheless, controller **MUST** be installed away from direct sprinkler spray. It also should be placed in a shaded and dry location, if possible. **DO NOT** install in closed and humid environment, or in an area subjected to continual heavy condensation.

**WALL MOUNT:** For Wall Mounting, install controller vertically on flat, secure surface. Use the enclosed template to locate mounting screw holes. Follow complete mounting instructions on template.

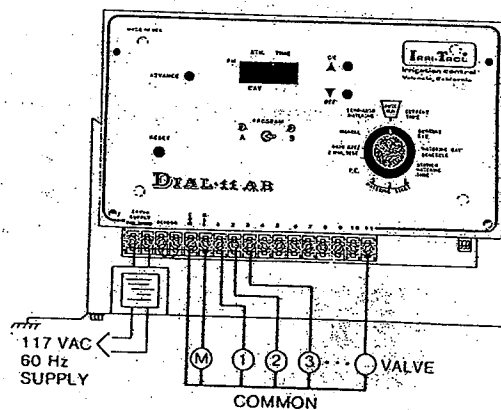
**PEDESTAL:** For free-standing installation on a pedestal, follow the installation instructions in the pedestal box.

**CAUTION:** The controller should not be placed where it is exposed to a temperature exceeding 130° F.

## ELECTRICAL HOOKUP

1. To begin, remove the lower panel by unfastening the screws located on each side. Follow the wiring diagram shown in Figure 1. Strip wires approximately  $\frac{1}{4}$ " (do not bend exposed end). Insert straight bare wire between plates of "sure grip" terminal. Tighten screw firmly. Follow all applicable local electrical wiring codes.

Figure 1



**IMPORTANT:** Use a separate (dedicated) valve common for each controller.

**Note:** Make certain that the 110 VAC 60Hz supply is attached to the black and white wires of the transformer. The yellow and red wires go to the 24 VAC input on the terminals of the controller.

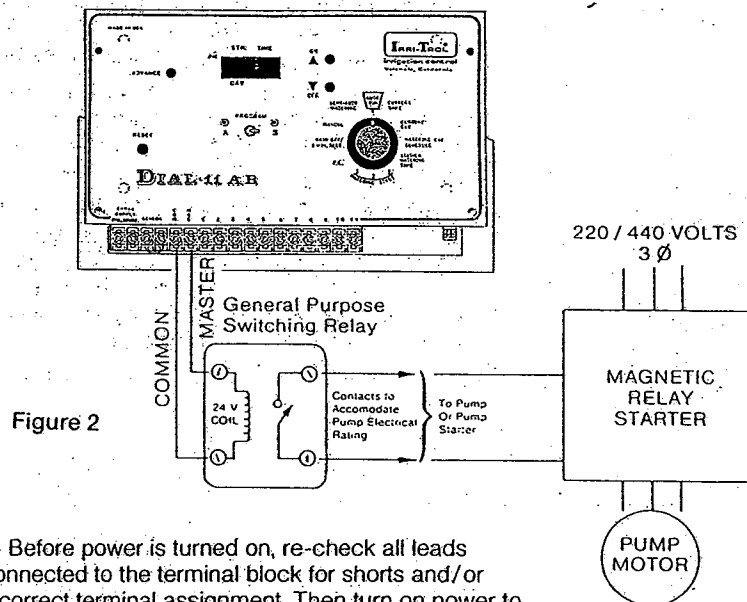
**CAUTION:** **NEVER** short wires in order to identify a station or to verify power from 24-volt side of transformer. This will result in damage to controller and/or transformer.

2. A maximum of **TWO** 4-watt solenoid valves may be connected to each station. A maximum of **FOUR** 4-watt solenoid valves may be programmed to operate simultaneously.

3. In cases where a pump is to be controlled by the master valve output, **DO NOT** drive the pump directly from the controller. The master station must be connected to the coil of a 24 VAC relay, such as an Essex #184-20105-101Z (Irri-Trol part no. I 1001). The pump latch relay should be set up by an



electrician so that a switch closure will activate the latch relay coil, turning on the pump. The switch contacts of the Essex relay should be connected to control the latch relay coil (See Figure 2). The relay should be mounted at least 5 feet from the controller box and the box **MUST** be grounded. Installation must follow all local electrical wiring codes.



4. Before power is turned on, re-check all leads connected to the terminal block for shorts and/or incorrect terminal assignment. Then turn on power to controller.

5. Battery Backup: The controller is equipped with a rechargeable battery backup circuit in case of a temporary power failure. The batteries will retain time and will hold all program information for about 4 weeks.

- a. The battery connector is located on the back of the P.C. Board. Install rechargeable batteries only.

**CAUTION:** Use of other types of batteries may damage controller.

- b. **IT IS MANDATORY** that the batteries be installed only **AFTER** power is turned on and programming has been completed.

**IMPORTANT:** Whenever working in the field while power is on, the common wire must be disconnected from the controller's terminal block. This will eliminate any possible 24-volt shock.

The controller is a solid-state microcomputer that may be affected by transient surges and electromagnetic interference. Care must be taken not to install controller on a circuit controlled by a switch or on the same circuit as a "high power user" (i.e., refrigerator, air conditioner or a large horsepower pump or motor). In addition, the controller must be installed at least 15 feet from a "high power user." Valve and power wires must also be routed away from "high power users."

This controller has been equipped with a floating valve common. It is not referenced to earth ground. This will not affect operation of your controller.



### **CONTROLLER GROUNDING TECHNIQUES**

For safety, transient protection and increased reliability, controller **MUST** be grounded.

Controller should be installed using a "three wire" 110 VAC supply with a verified third wire ground. Connect the green ground wire directly to the controller's case. **DO NOT** wire 110 volts directly to P.C. board terminals, the transformer supplied with controller **MUST** be used.

Whenever possible, controller should be installed on its own dedicated circuit breaker. Under no circumstances should the controller be installed on the same line or within 15 feet of a heavy inductive load such as a pump, motor, air conditioner, refrigerator, etc.

In areas where lightning is prevalent or the condition of the third wire ground is questionable, a ground rod must be installed. Connect the grounding rod to the controller's case ground using a #10 gauge or heavier stranded copper wire. The distance from the controller's case to the earth ground should be minimized. Additional 110-volt transient protection also may be necessary in areas where power frequently is disrupted.

# OPERATING INSTRUCTIONS

(Dial-5AB through Dial-16AB)

## SETTING THE CONTROLLER



CURRENT TIME



CURRENT DAY

1. SELECT PROGRAM A
2. CURRENT TIME—The current time of day
  - a. Set Function Dial to Current Time position.
  - b. Use ▲ to increase or ▼ to decrease time.
  - c. If Current Time is during the p.m. period, make sure PM indicator (") is displayed.
3. CURRENT DAY—The current day of the week
  - a. Set Function Dial to Current Day position.
  - b. The Current Day will appear in the left corner of the display as a number, 1 = SUN, 7 = SAT.
  - c. Press the Advance button repeatedly until number corresponding to the current day appears in the display.

## AUTOMATIC SAFETY BACKUP PROGRAM (ASBP)

At this point, the Dial-AB Controller automatically will operate the factory preset ASBP. Each station will water for 10 minutes, every day, starting at 4:00 a.m. (Please note that the ASBP is in program A only.)

If you wish to establish your own program, follow the instructions below.

Before reprogramming, you may use the Program Erase (PE) feature to erase the ASBP.



P.E.

**PROGRAM ERASE (PE)**—To erase all the Watering Times, Watering Start Times and the Watering Day Schedule:

- a. Set Function Dial to the PE position.
- b. Press both the ▲ and ▼ buttons at the same time.
- c. "PE" on display will flash, indicating that the existing program(s) have been erased. (Both programs will be erased regardless of program switch position.)

## ESTABLISHING A PROGRAM



WATERING DAY SCHEDULE

The following three steps are required to establish your own program. These steps apply only to the program indicated by the program switch and must be entered into each program that it is intended to operate automatically.

**STEP I—Watering Day Schedule**—What days of the week want to water.

**STEP II—Station Watering Time**—How long you want each station to water.

**STEP III—Watering Start Time**—What time of day you want each program to start the watering cycle.

**STEP I—WATERING DAY SCHEDULE**—The Dial-AB has a standard 14-day Watering Schedule. (6-day schedule instructions are listed under Additional Features). Please refer to the chart below for the numbers on the display corresponding to the days of the first and second weeks.

	SUN	MON	TUE	WED	THU	FRI	SAT
1st Week:	1	2	3	4	5	6	7
2nd Week:	8	9	10	11	12	13	14

1. Set Function Dial to Watering Day Schedule position.
2. Press Advance button to select day of week.
3. Press ON/ ▲ button to schedule a day on or OFF/ ▼ to schedule a day off.

#### To Display Watering Day Schedule:

1. Set Function Dial to Watering Day Schedule position.
2. Press Advance button repeatedly.
3. Display will indicate days ON and days OF (OFF).

Example:

1:ON = Sun of the 1st week is a scheduled watering day.

8:OF = Sun of the 2nd week is *not* a watering day.

**STEP II—STATION WATERING TIME**—The length of time each station will water. The watering duration may be set from 1-99 minutes in 1-minute increments. Watering times in seconds or hours are possible. See Additional Features, page 15.



STATION  
WATERING TIME

1. Set Function Dial to Station Watering Time position.
2. Display will indicate station number (left side) and station watering duration (right side).  
Example: 1:10 = station 1: watering time is 10 min.
3. Use ▲ button to increase or ▼ to decrease Watering Time. Watering Time may be set from 1 to 99 minutes in program A.
4. Press the Advance button to the next station.
5. Repeat steps 3 and 4 for each station.

#### To Display Station Watering Time:

1. Follow steps 1, 2 and 4 listed above.

**Note:** To skip a Station, enter zero (0) as Watering Time. If a station currently is watering, the station number and remaining watering time will be flashing on the display.

**STEP III—WATERING START TIME**—The starting time of each watering cycle on the scheduled watering days.



3 2 1  
WATERING START  
TIMES

1. Set Function Dial to Watering Start Time position 1.
2. Use ▲ to increase or ▼ to decrease time.
3. Be sure PM indicator (P) is displayed if Watering Start Time is in the p.m. period.

#### To Water More Than Once a Day:

1. Set Function Dial to Watering Start Time position 2 or 3.
2. Repeat steps 2 and 3 of Step III—Watering Start Time.

#### To Display a Watering Start Time:

1. Set Function Dial to Watering Start Time position 1, 2, or 3.
2. Display will indicate Watering Start Time(s).

**Note:** To cancel a Watering Start Time, set time to zero.

**IMPORTANT:** When programming of the DIAL AB Controller is completed, the Function Dial should be returned to the Auto/Run position.

**PROGRAM B**

Station Watering Times, Watering Start Times and the Watering Day Schedule are programmed once for each program. This can limit versatility with your system. That is why we have added Program B.

You can use Program B together with Program A to allow up to 6 Watering Start Times. You also can use Program B to provide Station Watering Times, Watering Start Times and a Watering Day Schedule that are different than those on Program A.

**Example:** You have programmed Stations 1, 2 and 3 on Program A to water 10 minutes, every day, starting at 6:00 a.m. You now want to add a fourth station, and you need it to water once a week, on Wednesday at 7:00 p.m. for 30 minutes. You would need to program Station 4 on Program B.

To program Station 4 on Program B you would:

1. Set program switch to Program B.
2. Follow programming **Step II** (Station Watering Time) for station 4 only and enter 30 minutes.
3. Follow programming **Step I** (Watering Day Schedule) and enter 4 (Wed. 1st week) and 11 (Wed. 2nd week).
4. Follow programming **Step III** (Watering Start Time) and enter 7:00 p.m.

**Note:** Station 4 is the only station with a Watering Time; therefore, it will be the only station operating on Program B.

You may overlap Watering Start Times using Programs A and B. This means that two stations will be watering at the same time—one on Program A and one on Program B.

**Example:** Stations 1, 2, 3 and 4 each are programmed on Program A to water 10 minutes, every day, at 7:30 a.m. You now want to Station 1 to repeat watering once a week for 45 minutes, at 8:00 a.m.

To program Station 1 on Program B you would:

1. Set program switch to Program B.
2. Follow programming **Step II** (Watering Time) for station 1 only.
3. Follow programming **Step I** (Watering Day Schedule) and **Step III** (Watering Start Time) listed for Program A.

**Note:** Station 1 and Station 4 will be watering at the same time once a week.

**IMPORTANT:** When programming of the DIAL AB Controller is completed, the Function Dial should be returned to the Auto/Run position.

# MANUAL OPERATION

(Dial-5AB through Dial-16AB)

## MANUAL OFF

To shut down a station that currently is watering:

1. Set Function Dial to Manual, Semi-automatic or Rain Off position.
2. Press the Off button.

## RAIN OFF/ 2 MIN. TEST

This position has a dual function.

1. **Rain Off:** Turns off all stations without affecting the program.

Stations currently watering will turn off after a two-second delay. While in Rain Off position, display will read "OFF." Taking function dial out of Rain Off position will return controller to normal operation.

**IMPORTANT:** Any operation initiated while in the Rain Off position will override the Rain Off mode. See 2 Min. Test.

2. **2 Min. Test:** Tests all stations in Program A, beginning with Station 1, without affecting the program.

To begin test, place program switch in the A position and press On key. The display will flash "OFF" during the test.

**IMPORTANT:** Activation of the Two-minute Test overrides the Rain Off function. To activate the Rain Off mode after the Two-minute Test has been initiated, the Function Dial must be turned out of the Rain Off position and turned back. This may be done during the test cycle.

## MANUAL OPERATION



In this position, any station can be turned on manually. Press the Advance button to desired station number, then press the On button. Station will water until turned off. To turn off the station, press Off button or move Function Dial out of Manual position.

**Note:** If any station is unintentionally left on in the Manual position, it will automatically turn off at 12:00 a.m. (midnight). The controller can only MANUALLY water one station at a time.

## SEMI-AUTOMATIC WATERING



In this mode, any station can be activated and the unit will sequentially water the remainder of the stations for the programmed Watering Times. Only stations with Watering Times entered in the program will water.

Press the Advance button to the first station, then press the On button to start the watering sequence. Return Function Dial to the Auto/Run position. The controller will return to the Automatic Mode at the end of the Semi-automatic Cycle.

# ADDITIONAL FEATURES

(Dial-5AB through Dial-16AB)

The additional features of the Dial AB are described below. The 6-day Watering Schedule, Hours Mode and Seconds/Loop Mode all are user selectable options. The switches to select these options are located beneath the lower panel on the right side of the terminal strip. Remove lower panel to expose switches.

These dip switches read directly into the micro-processor. Therefore, each time a switch is activated or de-activated, power to the Dial AB Controller and battery backup must be disconnected; see instructions below.

1. Set switches to desired position.
2. Remove backup battery.
3. Disconnect 110 volt power supply to unit for 2 minutes.
4. Reapply power and reconnect rechargeable batteries.

## **6-DAY WATERING SCHEDULE**

SWITCH #3—When de-activated (down position), both programs will operate on a 6-day schedule. This will allow for every-other-day, every-3rd-day or every-6th-day watering.

## **SECONDS/ LOOP MODE**

*THE FOLLOWING TWO FEATURES APPLY ONLY TO PROGRAM B:*

SWITCH #1—When activated (up position) it will change the stations' watering durations to seconds and have loop capability. The watering duration will be from 0.1-9.9 minutes with .1 minute- (6 second-) increments.

**IMPORTANT:** The last station's watering duration always will be in hours. The last station is to be used as a delay between loop repeats. Watering Start Time number 1 will initiate the loop and Watering Start Time number 2 will terminate the loop. Watering Start Time number 3 will remain a standard watering start, cycling only once.

## **HOURS MODE**

SWITCH #2—When activated (up position) it will change the watering durations in Program B to hours. The programmed watering duration for each station will be from .1-9.9 hours with .1 hour- (6 minute-) increments.

# OPERATING INSTRUCTIONS

(Dial-18AB through Dial-36AB)

## SETTING THE CONTROLLER



1. SELECT PROGRAM 1
2. CURRENT TIME—The current time of day
  - a. Set Function Dial to Current Time position.
  - b. Use ON/ ▲ to increase or OFF/ ▼ to decrease time.
  - c. If Current Time is during the p.m. period, make sure PM indicator (') is displayed.
3. CURRENT DAY—The current day of the week
  - a. Set Function Dial to Current Day position.
  - b. The Current Day will appear in the left corner of the display as a number, 1 = SUN. . . 7 = SAT.
  - c. Press the Advance button repeatedly until number corresponding to the current day appears in the display.

## AUTOMATIC SAFETY BACKUP PROGRAM (ASBP)

At this point, the Dial AB Controller automatically will operate the factory preset ASBP. Each station will water for 10 minutes, every day, starting at 4:00 a.m. (Please note that the ASBP is in program 1 only.)

If you wish to establish your own program, follow the instructions below.

Before reprogramming, you may use the Program Erase (PE) feature to erase all programmed information.

**PROGRAM ERASE (PE)**—To erase all the Watering Times, Watering Start Times and the Watering Day Schedule:



1. Set Function Dial to the PE position.
2. Press both the Advance buttons at the same time.
3. "PE" on display will flash, indicating that the existing program(s) have been erased. (Both programs will be erased regardless of program switch position.)

**Note:** Program Erase will NOT erase Number of Drip Stations 1-9.9 HRS.

## ESTABLISHING A PROGRAM

The following three steps are required to establish your own program. These steps apply only to the program indicated by the program switch and must be entered into each program that is intended to operate automatically. Station placement is limited to one station per program.

**STEP I**—Station Watering Time—How long you want each station to water.

**STEP II**—Watering Day Schedule—What days of the week you want to water.

**STEP III**—Watering Start Time(s)—What time of day you want each program to start the watering cycle.

**STEP I—STATION WATERING TIME**—The length of time each station will water. The watering duration may be set from 1-99 minutes in one-minute increments. Station Watering Times in hours are possible. See Number of Drip Stations, page 19.



1. Set Function Dial to Station Watering Time position.
2. Display will indicate Station Number (left side) and Station Watering Time (right side).  
Example: 1:10 = station 1; watering duration of 10 minutes.
3. Press the Advance buttons ▲ or ▼ to the desired Station Number.
4. Use ON/ ▲ button to increase or OFF/ ▼ to decrease Watering Time.
5. Repeat steps 3 and 4 for each station.



**Note:** To skip a station, enter zero (0) as Watering Time. A station may only be assigned to one of the programs—Program 1 or Program 2.

**To Display Station Watering Time:**

1. Follow steps 1, 2 and 3 listed above.
2. If display indicates Station Number (left side) and P1 or P2 (right side), it means that this station is programmed on the other program.  
Example: 1: P2 means that Station 1 is programmed on Program 2. Entering a Watering Time while in Program 1 will erase the Watering Time in Program 2 and re-assign Station 1 to Program 1.

**Note:** In the Auto/Run position, if a station currently is watering, the Station Number and remaining Watering Time will be flashing on the display.

**ALL STATIONS WATERING TIME**—This position allows you to enter, with a single entry, the same Watering Time for all stations within a program.

1. Set Function Dial to All Stations Watering Time position.
2. Use ON/ ▲ to increase or OFF/ ▼ to decrease watering time.
3. Press ▲ and ▼ Advance buttons together to enter. Display will flash to indicate entry was accepted.

**STEP II—WATERING DAY SCHEDULE**—The Dial AB has a standard 14-day Watering Schedule (6-day schedule instructions are listed under Additional Features). Please refer to the chart below for the numbers on the display corresponding to the days of the first and second weeks.

	SUN	MON	TUE	WED	THU	FRI	SAT
1st Week:	1	2	3	4	5	6	7
2nd Week:	8	9	10	11	12	13	14

1. Set Function Dial to Watering Day Schedule position.
2. Press ▲ Advance button to select day of week.
3. Press ON/ ▲ button to schedule a day on, or OFF/ ▼ button to schedule a day off.

**To Display Watering Day Schedule:**

1. Set Function Dial to Watering Day Schedule position.
2. Press ▲ Advance button repeatedly.
3. Display will indicate days on and days off  
Example:  
1:ON = Sunday of 1st week is a scheduled day on.  
8:OF = Sunday of 2nd week is not a watering day.

**Note:** OF = OFF.

**IMPORTANT:** When programming of the DIAL AB Controller is completed, the Function Dial should be returned to the Auto/Run position.

**STEP III—WATERING START TIME**—The starting time of each watering cycle on the scheduled watering days.

1. Set Function Dial to Watering Start Time position 1.
2. Use ON/ ▲ to increase or OFF/ ▼ to decrease time.
3. Be sure PM indicator (') is displayed if Watering Start Time is in the p.m. period.



**ALL STATIONS  
WATERING TIME**



**WATERING DAY  
SCHEDULE**



**3 2 1  
WATERING START  
TIMES**



3 2 1  
WATERING START  
TIMES

## PROGRAM 2

### To Water More Than Once a Day:

1. Set Function Dial to Watering Start Time position 2 or 3.
2. Repeat steps 2 and 3 of Step III—Watering Start Time.

### To Display a Watering Start Time:

1. Set Function Dial to Watering Start Time position 1, 2 and 3.
2. Display will indicate programmed Watering Start Times.

**Note:** To cancel a Watering Start Time, set time to zero.

Station Watering Times, Watering Start Times and the Watering Day Schedule are programmed once for all stations in a program. This can limit versatility with your system; that is why we have added Program 2.

You can use Program 2 to provide Station Watering Times, Watering Start Times and a Watering Day Schedule that are different than those on Program 1.

**Example:** You have programmed Stations 1, 2 and 3 on Program 1 to water 10 minutes, every day, starting at 6:00 a.m. You now want to add a fourth station, and you need it to water once a week, on Wednesday at 7:00 p.m. for 30 minutes. You would need to program Station 4 on Program 2.

To program Station 4 on Program 2 you would:

1. Set program switch to Program 2.
2. Follow programming **Step I** (Station Watering Time) and for station 4, enter 30 minutes.
3. Follow programming **Step II** (Watering Day Schedule) and enter 4 (Wed. 1st week) and 11 (Wed. 2nd week).
4. Follow programming **Step III** (Watering Start Time) and enter 7:00 p.m.

**Note:** Station 4 is the only station with a Watering Time; therefore, it will be the only station operating on Program 2.

# MANUAL OPERATION

## MANUAL OFF

To shut down a station that currently is watering:

1. Set Function Dial to Manual, Semi-automatic or Rain Off position.
2. Press the Off button.

## NUMBER OF DRIP STATIONS



NO. OF DRIP  
STATIONS

This position allows you to select how many stations will be for Drip Irrigation (.1 to 9.9 hrs.). The selected stations always will be the last stations on the controller.

**Example:** (DIAL-36AB) You need 3 stations to operate in hours, while the remaining stations operate in minutes. (The selected "drip stations" will be 36, 35 and 34.)

1. Set Function Dial to Number of Drip Stations position.
2. Press ON ▲ button to 3.
3. Set Function Dial to Station Watering Time position.
4. Program Station Watering Time for Stations 34, 35 and 36.

**Note 1:** You may select any number of stations for drip irrigation, beginning with the last station and going backwards.

**Note 2:** The Program Erase (PE) function will **NOT** erase the Number of Drip Stations. To delete Number of Drip Stations, set number of stations to zero.

## TOTAL ON TIME PER PROGRAM

TOTAL ON TIME  
PER PROGRAM



This position will display the accumulated watering time per program.

## WATER BUDGETING

WATER  
BUDGETING



This position allows you to ▲ increase watering (above 100%), or ▼ decrease watering (below 100%), from 1% to 255% in one-percent increments. All stations' watering times will be altered by the same ratio, with one entry.

1. Set Function Dial to Water Budgeting position.
2. Display will indicate 100%.
3. To increase by 50% enter 150.
4. To decrease by 50% enter 50.
5. Press both the ▲ and ▼ Advance buttons.
6. Display will flash, indicating entry was accepted.

## RAIN OFF/ 2 MIN. TEST

RAIN OFF/  
2 MIN. TEST



This position has a dual function:

1. **Rain Off:** Turns off all stations without affecting the program. Stations currently watering will turn off after a two-second delay. While in Rain Off position, display will read "OFF." Taking Function Dial out of Rain Off position will return controller to normal operation.
2. **2 Min. Test:** Tests all stations in Program A, beginning with Station 1, without affecting the program.

To begin test, place program switch in the A position and press On key. The display will flash "OFF" during the test.

**IMPORTANT:** Activation of the Two-minute Test overrides the Rain Off function. To activate the Rain Off mode after the Two-minute Test has been initiated, the Function Dial must be turned out of the Rain Off position and turned back. This may be done during the test cycle.



### MANUAL

MANUAL



In this position, any station can be turned on manually. Press the Advance button to desired station number, then press the On button. Station will water until turned off. To turn off the station, press Off button or move Function Dial out of Manual position.

**Note:** If any station is unintentionally left on in the Manual position, it will automatically turn off at 12:00 a.m. (midnight). The controller can only MANUALLY water one station at a time.

### SEMI-AUTOMATIC WATERING

SEMI-AUTO  
WATERING



In this mode, any station can be activated and the unit will sequentially water the remainder of the stations for the programmed Watering Times. Only stations with Watering Times entered in the program will water.

Press the Advance button to the first station, then press the On button to start the watering sequence. Return Function Dial to the Auto/Run position. The controller will return to the Automatic Mode at the end of the Semi-automatic Cycle.

## ADDITIONAL FEATURES

(Dial-18AB through Dial-36AB)

The 6-day Watering Schedule and the Selectable ASBP are user-selectable features. The switches that select these features are located beneath the lower panel on the left side of the terminal strip. Remove lower panel to expose switches.

These dip switches read directly into the micro-processor. Therefore, each time a switch is activated or de-activated, power to the Dial AB Controller and battery backup must be disconnected; see instructions below.

1. Set switches to desired position.
2. Remove backup battery.
3. Disconnect 120 volt power supply to unit for two minutes.
4. Reapply power and reconnect rechargeable batteries.

### 6-DAY WATERING SCHEDULE

SWITCH #1—When activated (up position), the controller will operate on a 6-day Watering Schedule. This will allow every-other-day, every-3rd-day or every-6th-day watering.

### SELECTABLE ASBP

SWITCH #2—When activated (up position), it will eliminate the Automatic Safety Backup Program.

# GLOSSARY

<b>ADVANCE BUTTONS</b>	Used to select Station, Current Day and Watering Days.
<b>ASBP</b>	Automatic Safety Backup Program. A safety feature that automatically operates controller in case program is lost during temporary power failure because batteries failed or were not installed. When the ASBP is activated, each station in Program #A waters for 10 minutes every day at 4:00 a.m., or four hours after power is restored. Selectable ASBP page 20 (Dial-18AB—Dial-36AB only).
<b>BATTERY BACKUP</b>	Use a four AA (1.5v) Nicad rechargeable battery pack. Batteries will hold program in memory and keep relative real time, for up to four weeks, during power failures.
<b>DIGITAL DISPLAY</b>	Displays programmed data, time and currently operating stations.
<b>LOOP</b>	The loop feature refers to the controller continually repeating the watering cycle for a specified length of time.
<b>NO. OF DRIP STATIONS</b>	Used to select the number of individual stations for 1-9.9-hour watering times in Program B. Selection begins with the last station of the controller.
<b>ON ▲ OFF ▼</b>	These buttons are used for: (1) On/Off operation; (2) Increase or Decrease of time functions. Please note, when pressing ▲ or ▼ buttons, count will advance slowly for approximately 5 seconds, then it will accelerate for expediency.
<b>PROGRAM ERASE</b>	Erases all previously programmed information, including ASBP. It does not erase the Current Time or the Current Day.
<b>PROGRAM SWITCH</b>	Used to select a program. LEDs indicate which program is operating.
<b>RAIN OFF</b>	Turns off all stations without affecting the program. It will not allow automatic activation of a Watering Cycle.
<b>SEMI- AUTOMATIC WATERING</b>	Manual activation of a Watering Cycle for its programmed station Watering Times.
<b>TOTAL ON TIME</b>	The sum of all the individual station's Watering Times. (Dial-18AB—Dial-36AB only).
<b>TRUE MANUAL</b>	When activated, station will water until manually turned off or will automatically shut off at midnight.
<b>WATER BUDGETING</b>	Changes all Watering Times within a program by a percent value ranging from 1% through 255% in 1-percent increments. (Dial-18AB—Dial-36AB only.)
<b>WATERING CYCLE</b>	The sequential watering of all stations programmed with Watering Time, beginning with the first programmed station and continuing through to the last programmed station.
<b>WATERING START TIME</b>	The time of day a Watering Cycle will start. Each program can initiate a cycle 3 times per day.

# NOTES