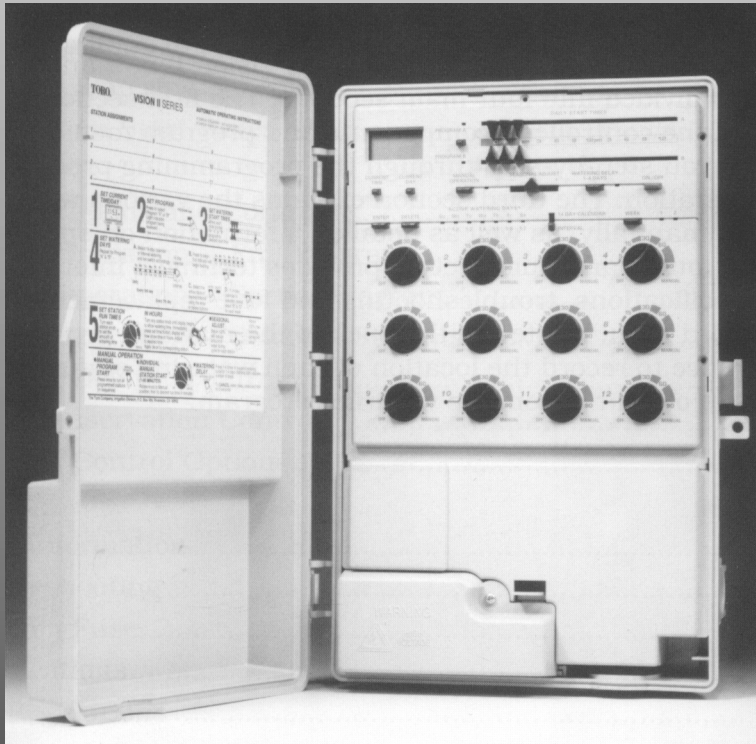

TORO VISION II

SERIES CONTROLLER



OWNER'S MANUAL

Introduction

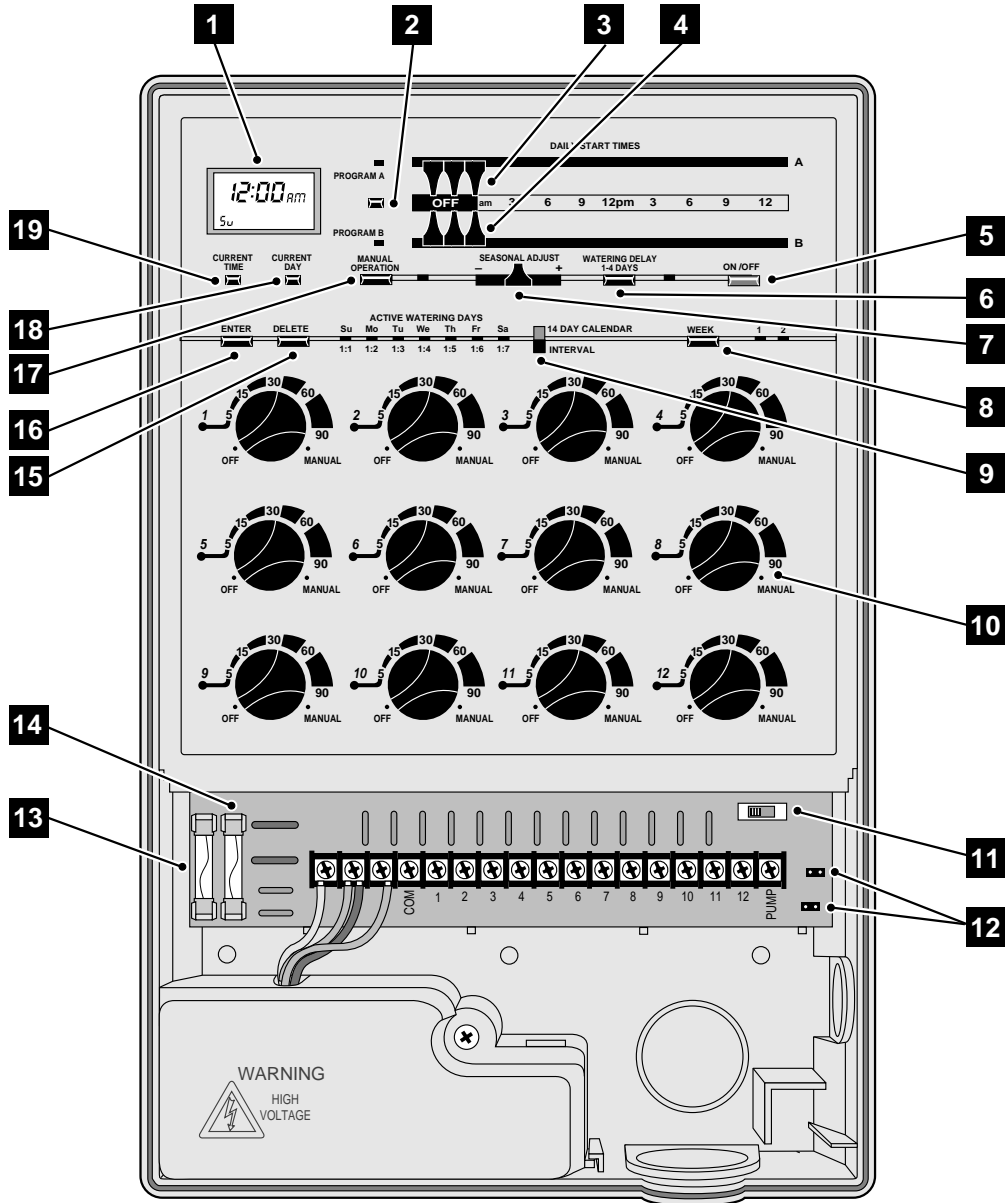
Congratulations on your purchase of the Toro Vision II controller. You have chosen one of the most sophisticated and technologically advanced irrigation system controllers available for residential and light commercial applications. Your new controller has some very unique features and operating characteristics. So please, take just a few minutes to read through this manual and familiarize yourself with the Vision II's various components, programming steps, and control features. We are confident that you will find the controller easy to program and easy to operate once you have taken this initial step.

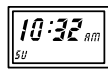
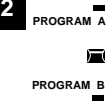




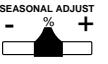



The information in this manual applies to all Vision II 6, 9 and 12 station models and is divided into four main sections. The first section provides a brief description of the controller's components and program memory. The second section takes you step-by-step through the programming procedure for automatic operation. The third section explains the various ways to operate the controller manually, as well as detailed information on specific control features. The fourth and final section provides technical information covering controller specifications, troubleshooting and fuse replacement. A Watering Program Record form, located in the back of the manual, provides a convenient place to record the location of each watering station area and specific details of your automatic watering program.


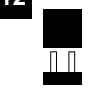
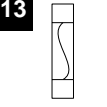
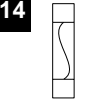






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Controller Components



<p>1</p> 	<p>Display - Shows current time and day of week, station run time (set and remaining), program start time(s), water conservation % and Off.</p>
<p>2</p> 	<p>Program Select Key & Indicators - Press key to select program "A" or "B". Indicator shows program selected.</p>
<p>3</p> 	<p>Program "A" Start Time Controls - Position sliding controls to select watering cycle start times for program "A".</p>
<p>4</p> 	<p>Program "B" Start Time Controls - Position sliding controls to select watering cycle start times for program "B".</p>
<p>5</p> 	<p>Controller On/Off Key - Press key to activate or deactivate controller. When deactivated, "OFF" is displayed. Clock continues to update time.</p>
<p>6</p> 	<p>Watering Delay™ Key & Indicator - Press key to suspend automatic operation from one to four days. Indicator shows number of suspended days remaining.</p>
<p>7</p> 	<p>Seasonal Adjust Control™ - Position sliding control to decrease or increase run time of all stations from 25% to 200%. See pg. 18 for details.</p>
<p>8</p> 	<p>Week Select Key & Indicators - Press key to select week 1 or 2 of Calendar watering schedule. Indicator shows week selected.</p>
<p>9</p> 	<p>Watering Day Schedule Switch & Indicators - Switch UP - 14 Day Calendar. Switch DOWN - Interval. Indicators show watering days or interval selected.</p>
<p>10</p> 	<p>Station Run Time Dials & Indicator - Rotate dial to select station run time. Indicator shows station is programmed or operating.</p>

<p>11</p> 	<p>Run/Program Switch - Position switch to "Program" only when assigning stations to programs. Switch must remain in "Run" position at all other times.</p>
<p>12</p> 	<p>Removable Jumper Plugs - Two removable jumper plugs are provided to select control options. See pg. 19 for details.</p>
<p>13</p> 	<p>Fuse - 1-1/2 Amp fuse protects 24 VAC output to field. See pg. 21 for details.</p>
<p>14</p> 	<p>Fuse - 3/4 Amp fuse protects controller timing circuitry. See pg. 21 for details.</p>
<p>15</p> 	<p>Delete Key - Press key to delete days or stations from a watering program.</p>
<p>16</p> 	<p>Enter Key - Press key to enter days or stations into a watering program.</p>
<p>17</p> 	<p>Manual Operation Key & Indicator - Press key to select manual operations. Indicator shows manual operation is active.</p>
<p>18</p> 	<p>Set Time Key - Press key to set current time of day or change run time mode.</p>
<p>19</p> 	<p>Set Day Key - Press key to set current day of week.</p>
<p> <i>Note: 12 station model shown. Although location of items 11-14 on 6 and 9 station models is slightly different, function is identical.</i></p>	

About the Controller's Memory

The Vision II controller utilizes a special device which permanently stores the automatic watering program information as it is entered. This protects the program information in the event of a power outage without the use of battery back-up. If controller power has been lost for an extended length of time, the display will begin flashing, signifying that current time and possibly current day will need to be reset. All other watering program information will remain unaffected by the loss of power.

When assembled at the Toro factory, a watering program is entered into the controller's memory to enable operation immediately upon installation. The program consists of the following information:

- All stations are assigned to programs "A" and "B".
- Watering will occur every Monday, Wednesday, and Friday or every other day (determined by Watering Day Schedule Switch position).

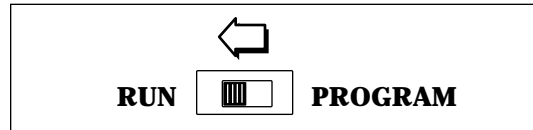
If you wish to use this program for automatic watering, all that remains to be set is Current Time and Day (pg. 5), Station Run Time (pg. 6-7), and Program Start Time (pg. 15).

To fully program the controller for your specific watering needs, follow the step-by-step procedure in the next section, "Programming For Automatic Operation".

Programming For Automatic Operation

STEP 1 - Prepare Controller For Programming

- Remove lower cabinet cover.
- Assure Run/Program Switch is positioned to "RUN"



- Observe display:

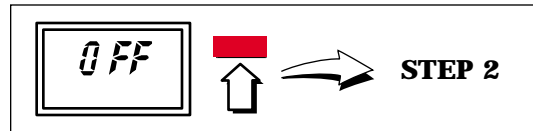
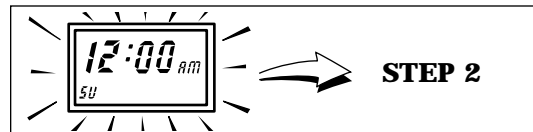
– If it is flashing, continue to STEP 2.

OR

– If it reads OFF, press On/Off Key; continue to STEP 2.

OR


– If it shows incorrect time and/or day, continue to STEP 2.

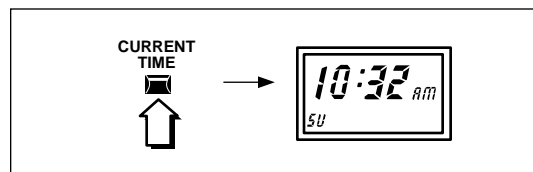


STEP 2 - Set Clock To Current Time and Day

■ To Set Time:

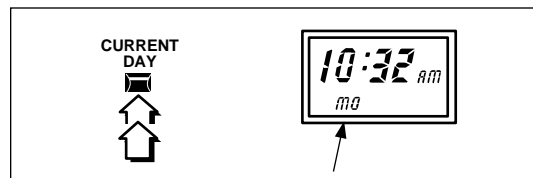
- Press and hold Set Time Key until display advances to current time.

 *Note: Digits will advance rapidly after 10 consecutive seconds.*



■ To Set Day:


- Press Set Day Key repeatedly until current day (abbreviation) is displayed.

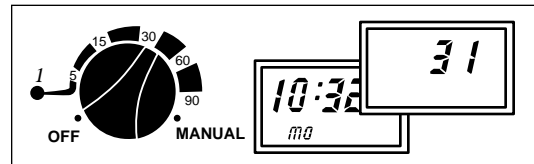


STEP 3 - Set Station Run Time

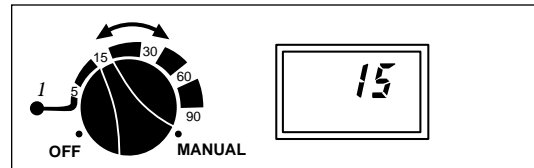
The length of time a station operates during a watering cycle is called Run Time. Each station can have its run time set in one of two modes: Minutes or Hours. *Minutes* mode provides a station run time from 1 to 90 minutes (in 1 minute increments). Generally, a run time under 90 minutes is more than adequate for most lawn and shrub sprinkler applications. However, drip irrigation emitters often require a run time of several hours in order to supply the proper amount of water. Selecting *Hours* mode enables run time to be set from 10 minutes to 9 hours (in 10 minute increments) for any drip watering requirements. Use the following procedure to set a run time for each station.

- ❑ Turn desired Station Dial slowly until display shows run time.


 *Note: Run time will be displayed for 5 seconds after dial is turned.*

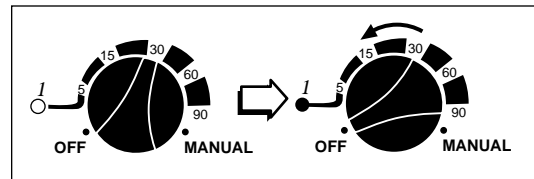


- ❑ Turn Station Dial in either direction to display exact run time. (Example shown: 15 minutes).

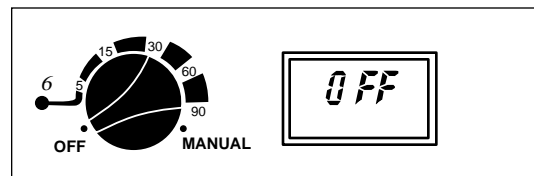


- ❑ Repeat procedure with each station dial to set a run time for each station.

 *Note: Turning Station Dial past 90 minute mark will manually activate station. If this occurs, simply turn dial counterclockwise to 0 (OFF) and reset to desired run time.*



- ❑ Set all unused stations to 0 (OFF).

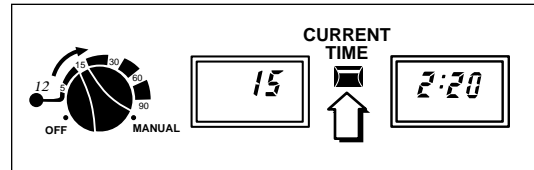


(continued)

(Set Station Run Time Continued)

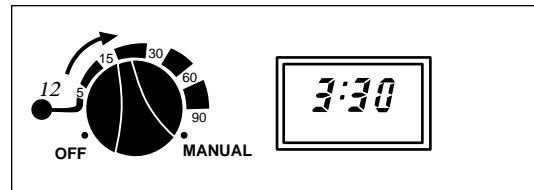
■ To Change Run Time Mode From Minutes To Hours, Or Hours To Minutes:

- Turn Station Dial slowly until display shows Run Time. Immediately press Set Time Key to change mode. (Example shown: Changing Minutes to Hours Mode.)



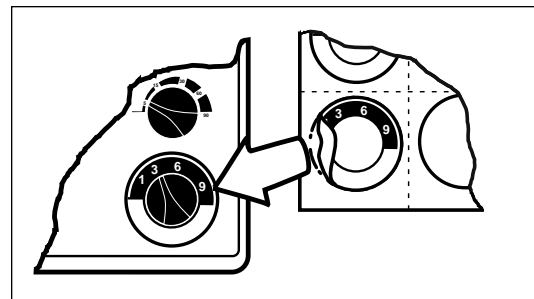
☞ Note: Hours Mode displays Run Time in three digits. (Example shown: 2 hours and 20 minutes.)

- Turn Station Dial to display exact Run Time. (Example shown: 3 hours and 30 minutes.)



☞ Note: To change back to Minutes Mode, repeat procedure.

- Apply Hours Decal (supplied) to stations set in Hours Mode.

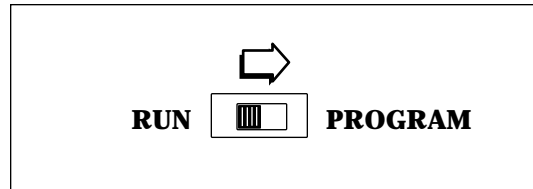


☞ Note: As each station operates during a watering cycle, its indicator will be On and its set run time will count down on display.

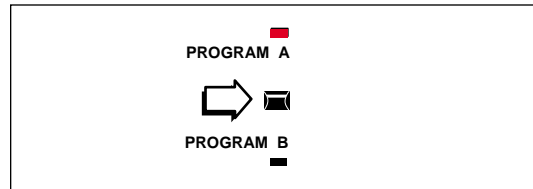
STEP 4 - Assign Stations to Programs


In order for a station to operate automatically, it must be assigned to a watering program. Each station can be assigned to Program “A” and/or Program “B”. For example, lawn stations are typically assigned to Program A and shrub stations to Program B. This enables the stations to operate on different schedules. Additionally, stations can be assigned to both programs if they are required to operate more frequently. Please note, that initially, all stations are pre-assigned to both programs before the controller is shipped from the factory. Therefore, it is important to use the following procedure for Programs A and B.

- Position Run/Program switch to “PROGRAM”.

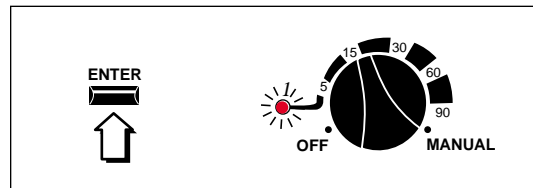


- Press Program Select Key to select Program A.



 *Note: Station Indicators will show which stations are currently assigned to program selected.*

- Press Enter Key. Station 1 indicator will begin flashing.

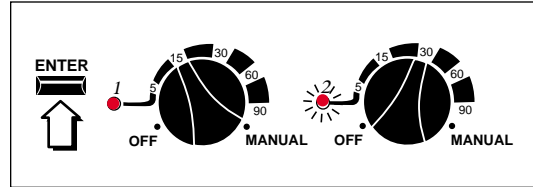


(continued)

(Assign Stations to Program Continued)

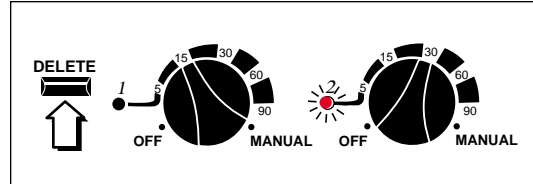
- ❑ Choose to *assign* or *delete* indicated station.

– To assign station to program, press Enter Key. Indicator stays on; next station indicator begins flashing.

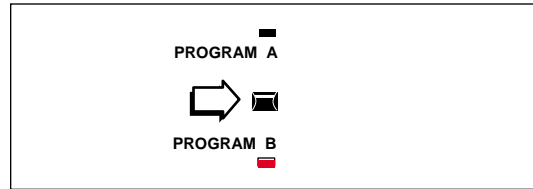


OR

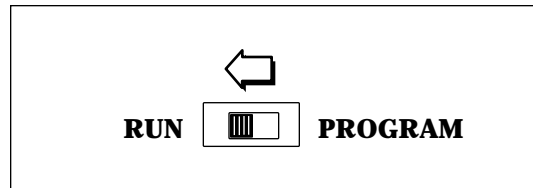
– To delete station from program, press Delete Key. Indicator turns off; next station indicator begins flashing.



- ❑ Continue to assign or delete all remaining stations for Program A.
- ❑ Press Program Select Key to select Program B.
- ❑ Repeat procedure to assign or delete stations for Program B.



- ❑ Position Run/Program switch to "RUN."

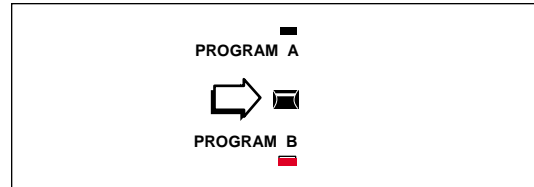


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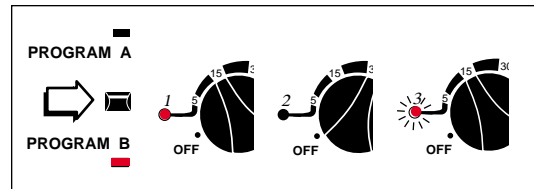
(Assign Stations to Program Continued)

■ To Review Current Station Assignment For Either Program:

- Press Program Select Key to select desired program.



- Press and hold key again. Station Indicators will show which stations are currently assigned. *A flashing indicator signifies Station Run Time is set in Hours Mode.*
(Example shown: Stations 1 and 3 are assigned to Program B. Station 3 has run time set in Hours Mode.)



STEP 5 - Set Daily Watering Schedule

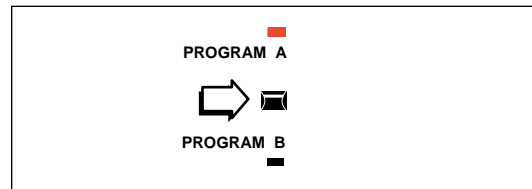
So far you have set a Run Time for each station and assigned it to one or both programs. This step will determine the daily watering schedule that each program will follow.

Two types of watering schedules are available: Calendar and Interval. The Calendar schedule enables you to select watering days in a two week (14 day) cycle. The Interval schedule allows you to select watering days by how often watering is required (or permitted in some areas). The Intervals are: every day (1:1), every other day (1:2), every third day (1:3) and so on, up to every seventh day (1:7).


Each program can have a Calendar schedule and an Interval schedule. However, only one type of schedule can be operational at a given time. This is determined by the position of the Watering Day Schedule Switch. UP for Calendar; DOWN for Interval. Use the following procedure to set a daily watering schedule for each program.

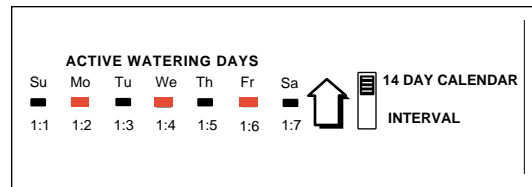
■ To Set A Calendar Schedule:

- Press Program Select Key to select Program A.

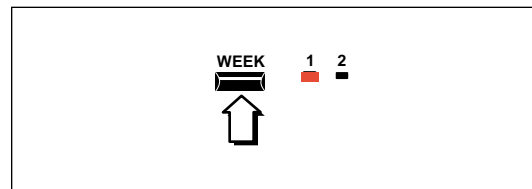


- Position Watering Day Schedule Switch UP.

 *Note: Indicators will show watering schedule currently set. (Example shown: Monday, Wednesday and Friday.)*



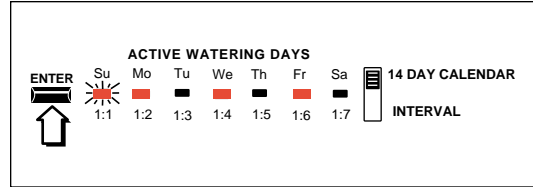
- Press Week Select Key to select week 1.



(continued)

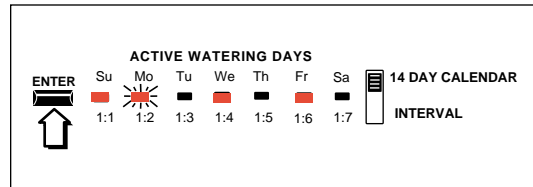
(Select Daily Watering Schedule Continued)

- Press Enter Key - Sunday Indicator will begin flashing.



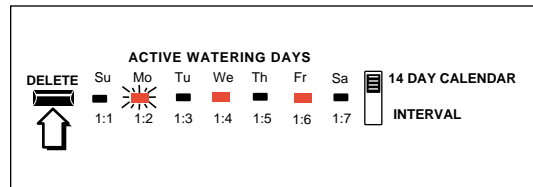
- Choose to Enter or Delete indicated day.

– To enter day into program, press Enter Key. Indicator stays on; next day indicator begins flashing.



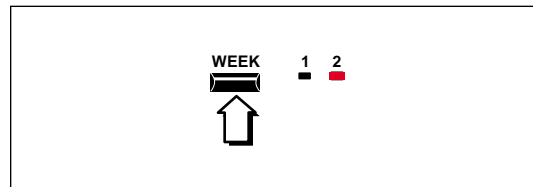
OR

– To delete day from program, press Delete Key. Indicator turns off; next day indicator begins flashing.



- Continue this procedure to enter or delete all days of week 1.

- Press Week Select Key to select week 2.

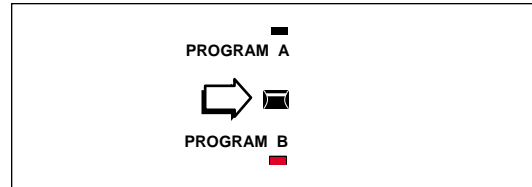


- Repeat procedure for all days of week 2.

(continued)

(Select Daily Watering Schedule Continued)

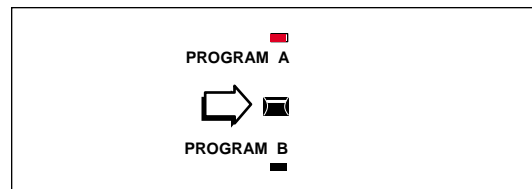
- ❑ Press Program Select Key to select Program B.



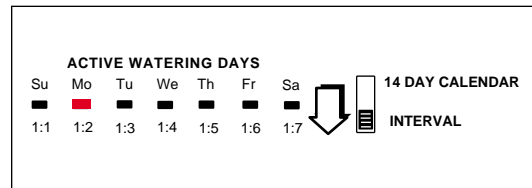
- ❑ Repeat procedure to set Calendar schedule for all days of week 1 and 2 in Program B.

■ To Set An Interval Schedule:

- ❑ Press Program Select Key to select Program A.

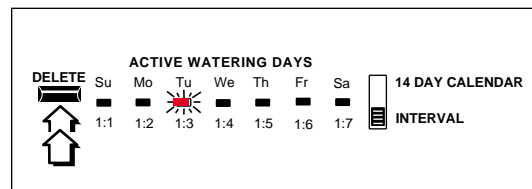


- ❑ Position Watering Day Schedule Switch down.



Note: Indicator will show watering interval currently set. (Example shown: 1:2 - every other day.)

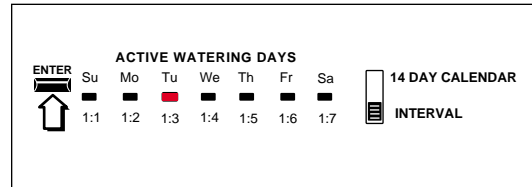
- ❑ Press Delete Key repeatedly until indicator flashes at desired interval. (Example shown: 1:3 - every third day.)



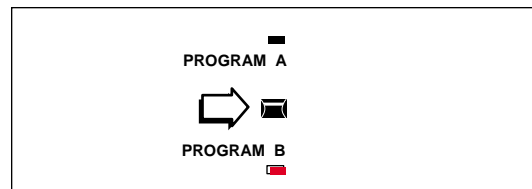
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(Select Daily Watering Schedule Continued)

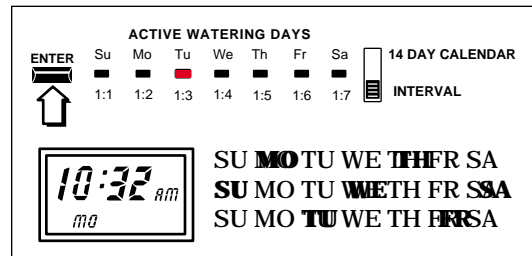
- ❑ Press Enter Key to select desired interval.



- ❑ Press Program Select Key to select Program B. Repeat procedure to set Interval schedule for Program B.



*Note: First active day of Interval schedule is the day when Interval was selected. (Example shown: An Interval schedule of 1:3 has just been selected and the current day is Monday. All watering days for this example are shown at right in **bold type**.)*



Note: If an automatic start time is already past for today, watering will not occur until the next Interval day (Thursday in the example shown).

STEP 6 - Set Program Start Times


The sixth and final step is to determine the time of day you want to start a watering program. Each program can be started up to 3 times per scheduled watering day. Start times are set by the position of the program start time controls. The upper controls set Program “A” start times and the lower controls set Program “B” start times.

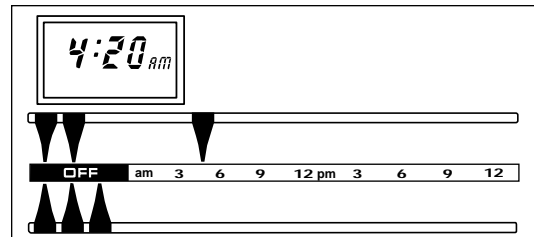
When selecting start times, please keep in mind the following operational characteristics:

- A start time initiates a complete program cycle, not an individual station.
- A start time can only be set to occur on the hour or in ten minute increments past the hour, such as 3:00, 3:10, 3:20 etc.
- If the same start time is selected in both programs, the “A” program will run first. Upon its completion, the “B” program will start. Both programs cannot operate at the same time.
- A start time which occurs during a watering program already in progress will be delayed until the program in progress is finished.
- The earliest start time will always occur first regardless if set for Program A or Program B.

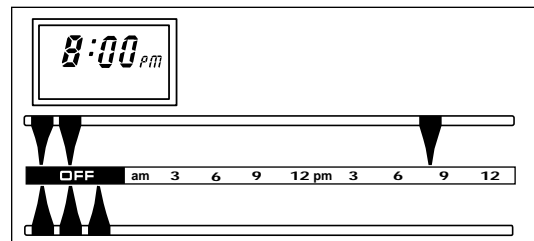
Use the following procedure to select program start times.

- Position all start time controls to left (OFF). Slide first control *slowly* to right until display shows start time.


 *Note: Display shows Start Time for 5 seconds after control is moved.*



- Slide control in either direction to display exact start time (Example shown: 8:00 p.m.).



- Repeat this procedure for all additional start times in both programs.

 *Note: The controller is now fully programmed for automatic operation.*

Manual Operations and Controls

Manual Operation

Manual Operation allows you to start the Automatic Watering Program or Individual Stations whenever needed. Three types of Manual Operations are available: Full Program, Partial Program and Selected Station(s).

Full Program enables all active stations assigned to Programs A and B to operate in sequence.

Partial Program allows all active stations following a selected station to operate in sequence.

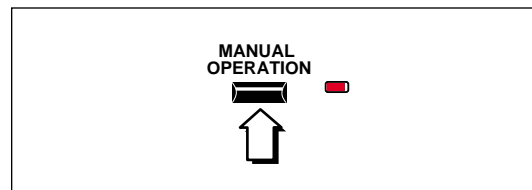
Selected Station(s) enables manual operation of a single station or a group of stations (six maximum) selected to operate in any chosen order.

Upon completion of any manual operation, controller will return to automatic mode.

To cancel Manual Operation, turn controller off by pressing On/Off Key. Press key again, returning controller to Automatic Mode.

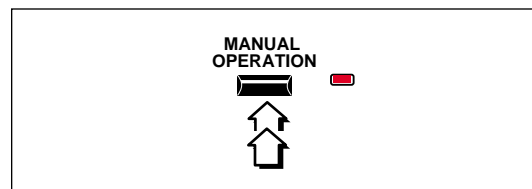
■ Full Program:


- Press Manual Operation Key one time. Program A will operate followed immediately by Program B.



■ Partial Program:

- Press Manual Operation Key repeatedly until indicator of first desired station in sequence is on. Station selected will operate followed in sequence by all remaining active stations.



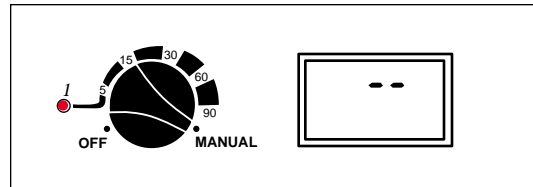
 *Note: If first selected station is assigned to Program A, all remaining stations assigned to Programs A and B will operate in sequence. If first selected station is only assigned to Program B (signified by Program B indicator On) only remaining stations assigned to Program B will operate.*

(continued)

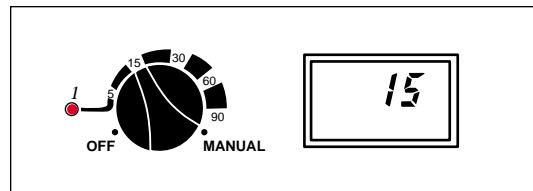
(Manual Operation Continued)

■ Selected Stations:


- Turn Station Dial of selected station (clockwise) until display shows two dashes.



- Turn dial (counterclockwise) to set run time. Station will start and operate for set run time. Display will count down run time remaining.



- Repeat this procedure to select up to 5 additional stations. Stations will operate in sequence selected.

 *Note: Station run time will remain (as set for Manual Operation) after controller returns to Automatic Mode. Reset run time for each station as necessary after Manual Operation is finished.*

Watering Delay™



Controller operation can be suspended from 1 to 4 days by pressing the Watering Delay Key. Each time the key is pressed, operation is suspended for one day. The Watering Delay Indicator will flash one, two, three, or four times (repeatedly) signifying the number of days remaining until controller operation resumes. Example: If you wish to suspend watering for the rest of today and tomorrow, press key twice.

Note: The controller recognizes the end of a day at 12:00 a.m. (midnight).
To cancel Watering Delay at any time, simply press and hold the Watering Delay Key for 5 seconds. Controller will resume operation.

Seasonal Adjust Control™

Changes in weather often require a change in sprinkler run time to prevent under or over watering. A unique feature of the Vision II, called Seasonal Adjust Control, enables station run times to be increased or decreased simultaneously by the movement of a single control.

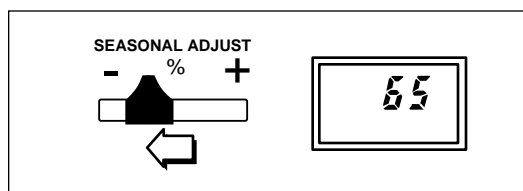
Sliding the control from center position (100%) toward minus (-) reduces run time in 5% increments down to 25% of setting. Sliding the control toward plus (+) increases run time in 5% increments up to 200%. To reduce the possibility of water run off, any setting above 100% automatically increases the set run time, calculates half of the increased value, and operates the watering cycle twice.

Example: A station has a set run time of 20 minutes. The Seasonal Adjust Control is set at 150% which increases the run time value to 30 minutes. The actual run time of the station will be 15 minutes per each of two concurrent watering cycles.

Note: Station run time will be displayed at 100% value regardless of Seasonal Adjust Control setting. Actual run time will appear on display and count down while station is operating.

■ To Change Setting From 100%:

- Slide Seasonal Adjust Control toward (+) or (-). Percentage of increase or decrease appears on display for 5 seconds after control is moved. (Example shown: 65%.)



Selecting Control Options

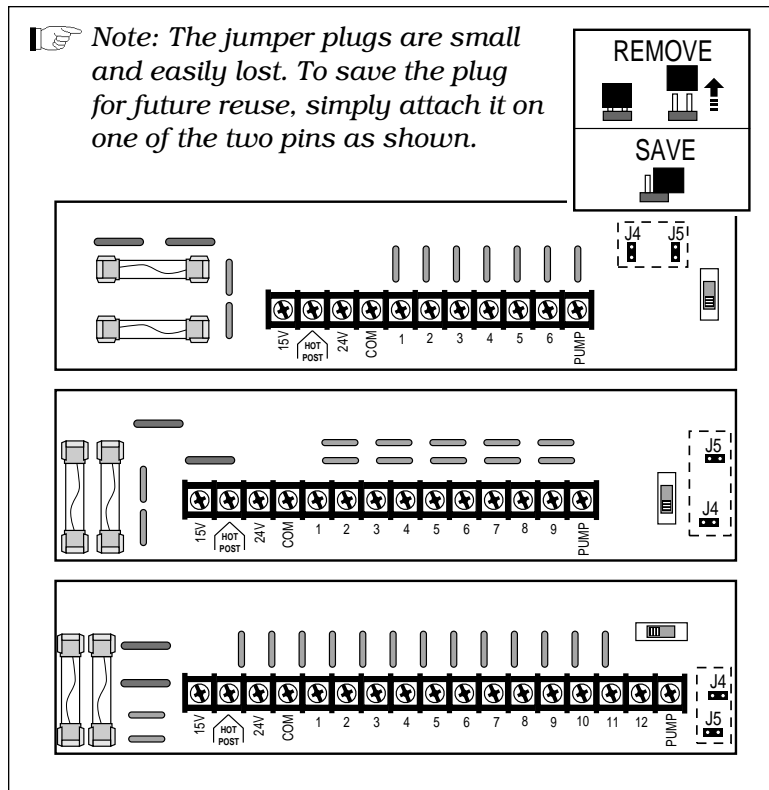
Two control options are provided to compensate for variations in sprinkler system design and operating requirements. Each control option is selected by the removal of a small jumper plug located on the printed circuit board. (See the illustration below for jumper plug location applicable to your controller model.)

Jumper J4

The pump circuit is active whenever a watering station is operating. If you have any stations with run time set in Hours Mode, the pump circuit can be deactivated for these stations only by removing Jumper J4. Generally, this option is selected when pump operation is not required for drip irrigation or when controlling an outdoor appliance such as a pool filter or a lighting system.

Jumper J5

A fifteen second delay, prior to station operation, enables the pump or master valve to operate before the first station control valve opens. It also provides time for the valve to close before the next station is activated. To eliminate the fifteen second delay, remove Jumper J5.



Technical Information

Troubleshooting

If you are experiencing a problem with the controller, check the following list of symptoms and remedies. If the problem cannot be solved, please contact your local Toro distributor or the Toro Customer Service department (800) 367-8676 for further assistance.

Symptom	Probable Cause	Remedy
Flashing display.	Extended power failure has occurred.	Reset clock to current time and day. See pg. 5.
Display blank, controller inoperative.	<ol style="list-style-type: none"> 1. One or both fuse(s) blown. 2. Controller power source disconnected. 3. Run/Program Switch set to Program position. 	<ol style="list-style-type: none"> 1. Replace fuse(s). See pg. 21. 2. Check for tripped circuit breaker at power source and reset. 3. Set Run/Program Switch to Run position.
OFF appears on display and controller cannot be activated with On/Off key.	Run/Program Switch set to Program position.	Set Run/Program Switch to Run position.
Stations do not activate immediately.	15 second delay before station operates is standard control feature.	Remove Jumper Plug J5 to omit delay. See pg. 19.
Pump does not operate with stations operating in Hours mode.	Jumper Plug J4 removed.	Replace Jumper Plug J4. For location of J4. See pg. 19.
Watering cycle starts again immediately upon completion of a scheduled watering cycle.	Seasonal Adjust Control setting over 100%.	See explanation of Seasonal Adjust Control on pg. 18.
A station does not operate.	Station run time set to zero.	Set station run time. See pgs. 6-7.
Make slight changes to Start Time, Run Time and/or Seasonal Adjust. Display did not change and controller did not respond accordingly	Slight control movements may not change controller memory. Controller memory will change only if display shows change.	Always verify change on display when adjusting these controls.

Servicing Fuse

Two fuses are used for controller circuit protection. Fuse F1 is rated at 3/4 Amp and protects the controller's internal electronics from an excessive increase in voltage (usually caused by a lightning strike nearby). Fuse F2, rated at 1-1/2 Amps, protects all 24 VAC output from the terminal strip. A blown F2 fuse generally indicates that a shorted wiring connection or faulty control valve solenoid exists. Before replacing fuse, check all wiring connections at the controller as well as the control valves. If replacing a fuse does not solve the problem, contact your sprinkler system contractor or local Toro distributor.

CAUTION

Never install a replacement fuse with a higher amperage rating. Severe damage to the controller can result.



WARNING

DISCONNECT 120 VAC POWER TO CONTROLLER AT SOURCE PRIOR TO SERVICING FUSES. FAILURE TO COMPLY MAY RESULT IN SERIOUS INJURY AND/OR EQUIPMENT DAMAGE.

To Replace Fuse:

1. Disconnect power to controller. See Warning above.
2. Remove lower cabinet cover.
3. Carefully remove fuse from retaining clip and replace with fuse of same amperage rating.
4. Install lower cover and reinstate power.
5. Reset controller clock to current time. (See page 5.)

Specifications

- Power Source – 120 VAC, 60 Hz
- Power Source – 220/240 VAC, 50 Hz (Export)
- Transformer Output – 24 VAC, 30 VA
- Fuses – F1 (Control Circuit) 3/4 Amp
F2 (Station and Pump/Master Valve Output) 1-1/2 Amp
- Maximum Number of Plastic Valves Allowed Per Station – Two Toro 1 in. Electric
- Output to Valves – .01 Amp to .374 Amp @ 24 VAC
- Output to Pump Relay/Master Valve – .01 Amp to .374 Amp @ 24 VAC
- Cabinet – Plastic, Indoor/Outdoor, Wall Mount
Dimensions - 13 in. H x 9 in. W x 3-1/4 in. D
(33 cm H x 23 cm W x 8.3 cm D)
Metal, Lockable, Indoor/Outdoor, Wall Mount
Dimensions - 13-1/2 in. H x 9 in. W x 3-3/4 in. D
(34.3 cm H x 23 cm W x 9.5 cm D)
Conduit Access – 1/2 in. (13 mm) Power, 1 in. (25 mm) Field
- **UL, TUV and CSA Approved**

Class B Irrigation Controller

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the irrigation controller with respect to the receiver.
- Move the irrigation controller away from the receiver.
- Plug the irrigation controller into a different outlet so that the irrigation controller and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems". This booklet is available from the U.S. Government Printing Office, Washington, DC 20402. Stock No. 004-000-00345-4.

Watering Program Record

Use this form to record the location of each watering station and the current automatic watering program information.

Station #	Location	Run Time	Program A and/or B
1	_____	_____ hrs. _____ min.	_____
2	_____	_____ hrs. _____ min.	_____
3	_____	_____ hrs. _____ min.	_____
4	_____	_____ hrs. _____ min.	_____
5	_____	_____ hrs. _____ min.	_____
6	_____	_____ hrs. _____ min.	_____
7	_____	_____ hrs. _____ min.	_____
8	_____	_____ hrs. _____ min.	_____
9	_____	_____ hrs. _____ min.	_____
10	_____	_____ hrs. _____ min.	_____
11	_____	_____ hrs. _____ min.	_____
12	_____	_____ hrs. _____ min.	_____

Watering Days

Program A Calendar Su Mo Tu We Th Fr Sa Week 1
 Su Mo Tu We Th Fr Sa Week 2
 Interval 1:1 1:2 1:3 1:4 1:5 1:6 1:7

Program B Calendar Su Mo Tu We Th Fr Sa Week 1
 Su Mo Tu We Th Fr Sa Week 2
 Interval 1:1 1:2 1:3 1:4 1:5 1:6 1:7

Start Times

Program A _____ am _____ am _____ am
 _____ pm _____ pm _____ pm
 Program B _____ am _____ am _____ am
 _____ pm _____ pm _____ pm



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