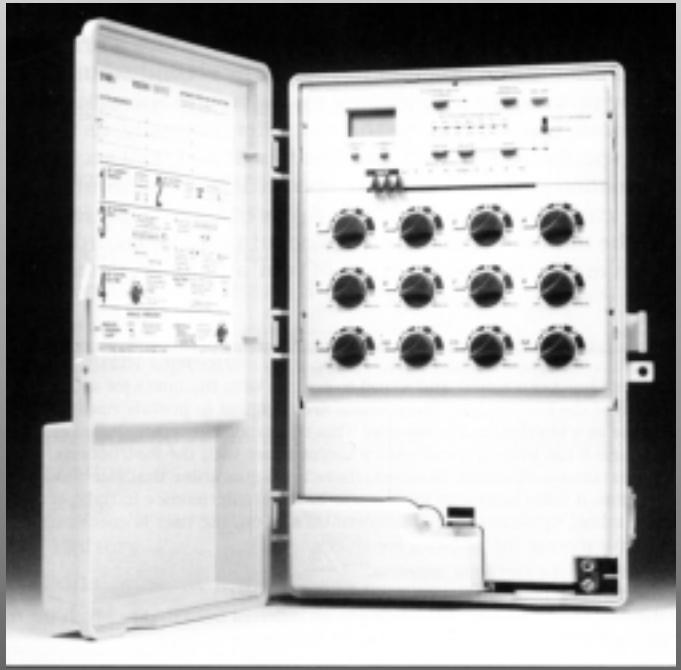
TORO VISION I

SERIES CONTROLLER



OWNER'S MANUAL

Introduction

Congratulations on your purchase of the Toro Vision I 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 study the information in this manual and familiarize yourself with the Vision I'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 I 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 and troubleshooting in addition to servicing the battery and fuse. A Watering Program Record form, located in the back of the manual, provides a convienent place to record the location of each watering station area and specific details of your automatic watering program.

To The User:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful 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 or relocate the receiving antenna.
- Increase the distance between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This equipment has been verified to comply with the limits for a Class B computing device, pursuant to FCC Rules. **The user is cautioned that changes and modifications made to the equipment without the approval of the manufacturer could void the user's authority to operate this equipment.**

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicablex aux appareils numériques de las classe B prescrites dans le Règlemente sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

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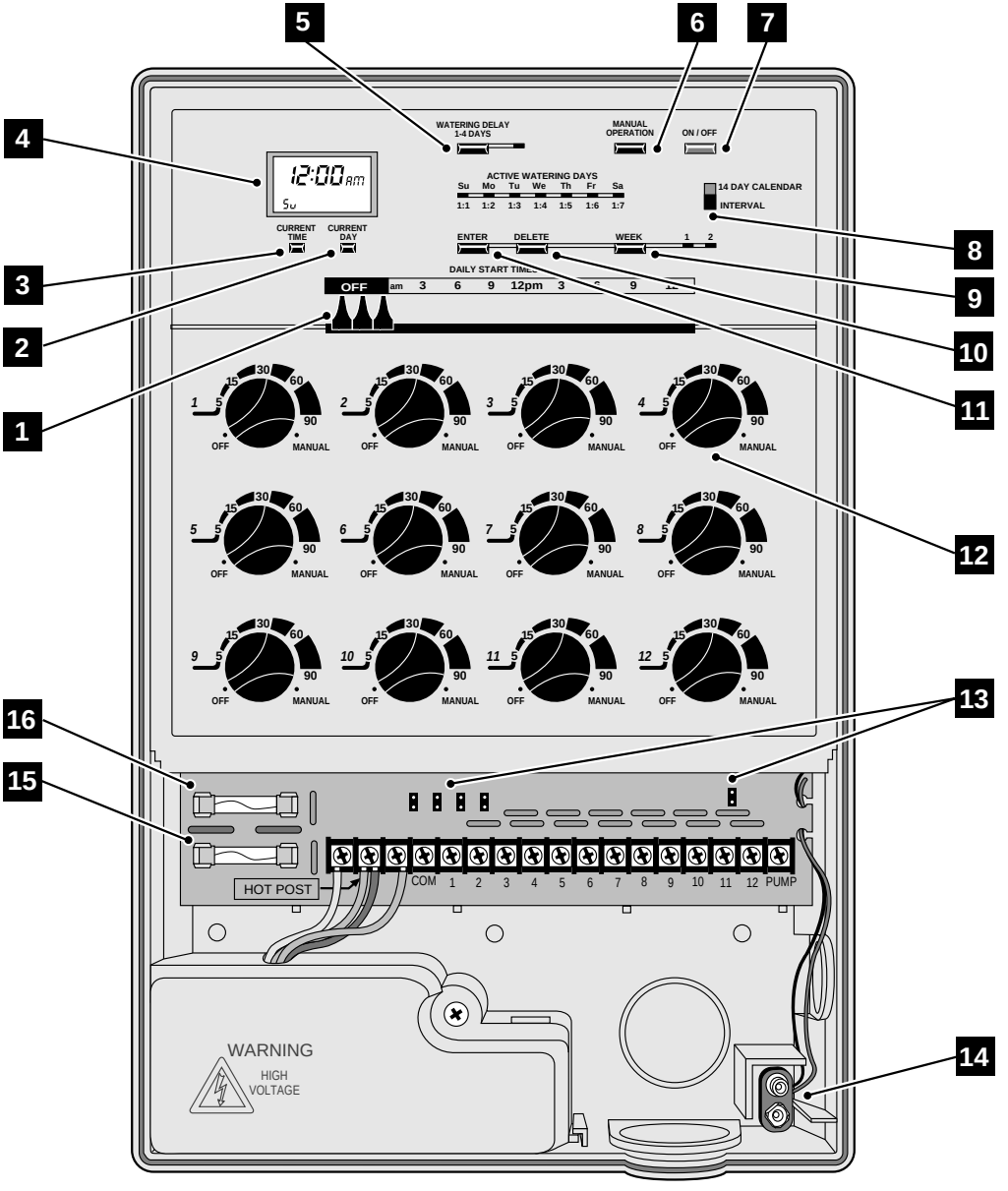
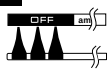
Controller Components



1 

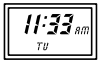
Watering Cycle Start Time Controls - Position sliding controls to select up to three watering cycle start times.

2 CURRENT DAY

Current Day Key - Press key to set current day of week.

3 CURRENT TIME

Current Time Key - Press key to set current time of day.

4 

Display - Shows current time and day, station run time, active station and its remaining run time, program start time(s) and Off.

5 WATERING DELAY 1-4 DAYS

Watering Delay™ Key & Indicator - Press key to suspend automatic operation from one to four days. Indicator shows number of suspended days remaining.

6 MANUAL OPERATION

Manual Operation Key & Indicator - Press key to select manual operations. Indicator shows manual operation is active.

7 ON / OFF

Controller On/Off Key - Press key to activate or deactivate controller. When deactivated, "OFF" is displayed. Clock continues to update time.

8 

Watering Day Schedule Switch & Indicators - Switch UP - Calendar, Switch DOWN - Interval. Indicators show watering days or interval selected.

9 WEEK 1 2

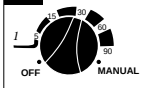
Week Select Key & Indicators - Press key to select week 1 or 2 of Calendar watering schedule. Indicator shows week selected.

10 DELETE

Delete Key - Press key to delete days from the watering program.

11 ENTER

Enter Key - Press key to enter days into the watering program.

12 

Station Run Time Dials - Rotate dial to select station run time, manually activate station, or turn station off.

13 

Removable Jumper Plugs - Removable jumper plugs are provided to select control options. See pg. 7 & 14 for details.

14 

Battery Connector - For 9-Volt alkaline battery. See pg. 16 for details.

15 

Fuse (F1) - 1 Amp fuse protects 24 VAC output to field. See pg. 16 for details.

16 

Fuse (F2) - 1/2 Amp fuse protects controller timing circuitry. See pg. 16 for details.

About the Controller's Memory

The Vision I controller utilizes a 9-volt alkaline battery (installed by the user) to maintain its programmable memory during a power outage. Once installed, a new battery can maintain the memory continuously for approximately three hours. While powered by the battery, the controller will remain in a stand-by power mode; the display will be blank and all sprinkler operations will cease. Since station run time and watering cycle start time(s) are set by control knob position, they will not be affected by changing power conditions.

If a power outage occurs during a watering cycle in progress, sprinkler operation will cease until power is returned; then continue from the point of interruption. If the outage duration exceeds the battery life, the display will begin flashing and the program memory will revert to the default operating program. Battery replacement will be required.

Default Operating Program

The purpose of the default operating program is to provide continued (or initial) controller operation when the programmable memory is erased. The default program operates as follows:

- Clock Setting -
  Clock will start at 12:00 AM, Sunday, Week 1 and display will be flashing.
- Daily Watering Schedule -
  Calendar Mode - Monday, Wednesday, and Friday of Week 1 and 2.
  Interval Mode - 1:2 (every other day).

☞ ***Note:*** *Daily watering schedule is determined by the position of the Watering Day Schedule Switch.*

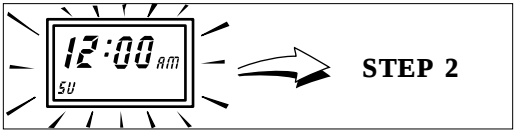
- Start Time(s) and Station Run Time -
  As set by control knob positions.

Programming For Automatic Operation

STEP 1 - Prepare Controller For Programming

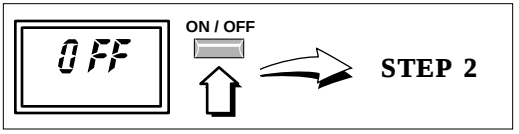
❑ Observe display:

– If it is flashing, continue to STEP 2.



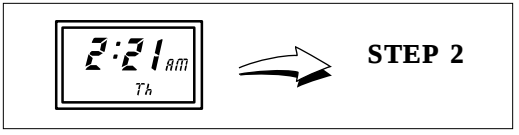
OR

– 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.

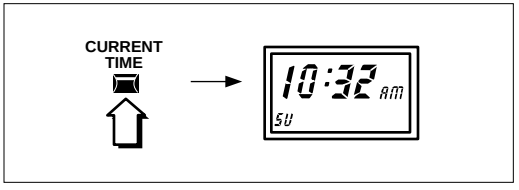


STEP 2 - Set Clock To Current Time and Day

■ **To Set Time:**

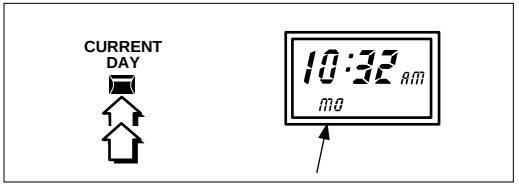
❑ Press and hold Current Time Key until display advances to current time.

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



■ **To Set Day:**

❑ Press Current Day Key repeatedly until current day (abbreviation) is displayed.



STEP 3 - Set Station Run Time

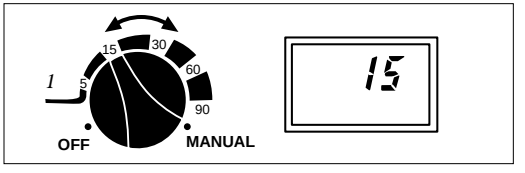
The length of time a station operates during a watering cycle is called Run Time. All stations can be set to run from *1 to 90 minutes* (in 1 minute increments). Generally, a station run time of less than 90 minutes is adequate for most lawn and shrub sprinkler applications. However, drip irrigation emitters often require a run time of several hours in order to supply the proper amount of water. To accomodate drip watering applications, the last two stations (on 6 station models) and the last three stations (on 9 and 12 station models) can be set in Hours Mode for extended run time up to 9 hours.

Use the following procedure to set a run time for each station:

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

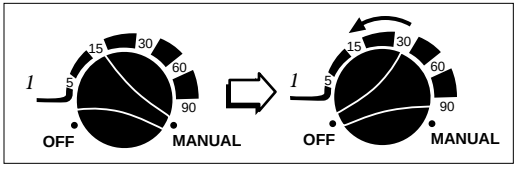
☞ *Note: Run time will be displayed for 5 seconds after dial is turned.*

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

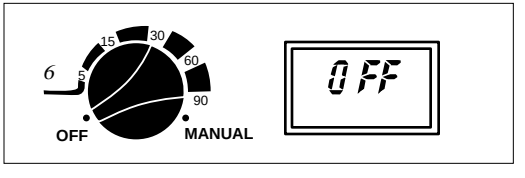


❑ Repeat procedure with each station dial to set a run time for each station.

☞ *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 Select Run Time in Hours Mode:

❑ Remove lower cabinet cover.
Refering to photo on page 2, locate jumper plugs J3 and J4 (6 station models) or J3, J4 and J5 (9 and 12 station models).
Refering to chart at right, remove proper jumper plug(s) to select station(s) for hours mode.

☞ *Note: To save jumper plugs for reuse, reinstall on one pin.*

❑ Turn Station Dial to display exact Run Time.

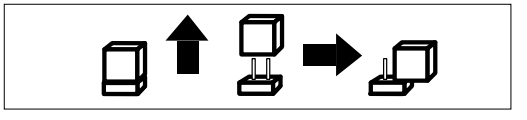
☞ *Note: Hours Mode displays run time in three digits. (Example shown: 3 hours and 30 minutes.)*

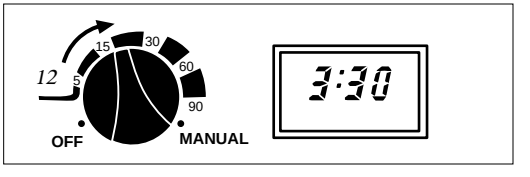
❑ Apply Hours Decal (supplied) to stations set in Hours Mode.

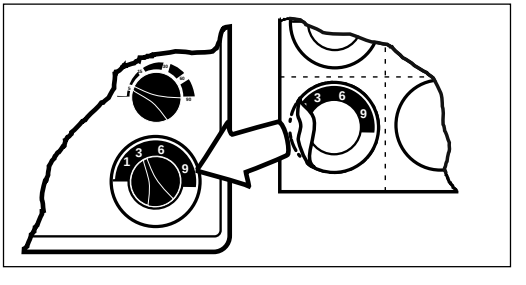
☞ *Note: To revert to minutes mode, reinstall jumper(s) and adjust run time as needed.*

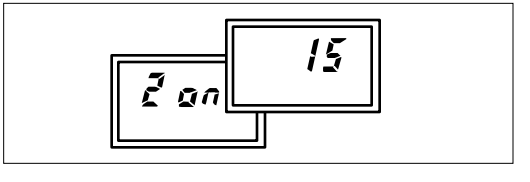
☞ *Note: As each station operates during a watering cycle, display will alternate between active station number and remaining station run time. (Example shown: Station 2 active; 15 minutes run time remaining.*

Convert Station Run Time from Minutes to Hours Mode.									
Model	**6 Sta.**		**9 Sta.**			**12 Sta.**			
For Sta. #	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Remove Jumper #	**J3**	**J4**	**J3**	**J4**	**J5**	**J3**	**J4**	**J5**









STEP 4 - Set Daily Watering Schedule

So far you have set the clock to the current time and day and established a run time for each station. This step will determine which days the watering cycle will be active.

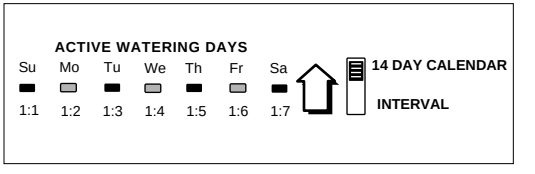
Two types of watering schedules are available: 14 Day Calendar and Interval. The Calendar schedule enables you to select watering days in a two week (14 day) cycle. The Interval schedule allows you to select watering days by how often watering is required (or permitted in some areas). The Intervals are: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

Both types of watering schedules can be set. 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 active watering day schedule(s).

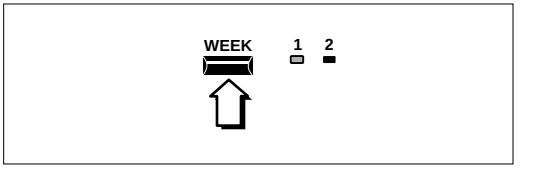
■ To Set A 14 Day Calendar Schedule:

❑ Position Watering Day Schedule Switch UP.

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



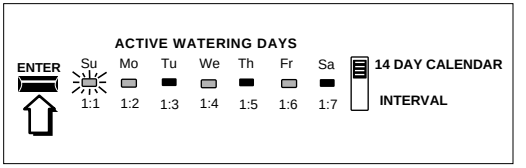
❑ Press Week Select Key to select week 1.



(continued)

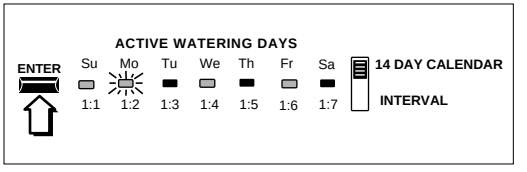
(Select Daily Watering Schedule Continued)

❑ Press Enter Key - Sunday Indicator will begin flashing.



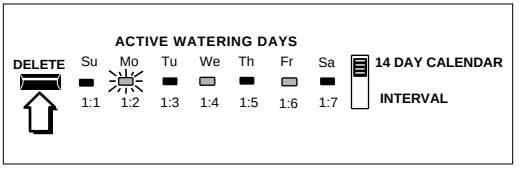
❑ Choose to Enter or Delete indicated day.

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



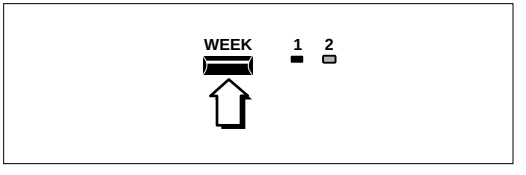
OR

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



❑ Continue this procedure for all days of week 1.

❑ Press Week Select Key to select week 2.



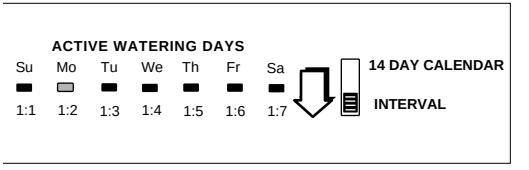
❑ Repeat procedure for all days of week 2.

(continued)

(Select Daily Watering Schedule Continued)

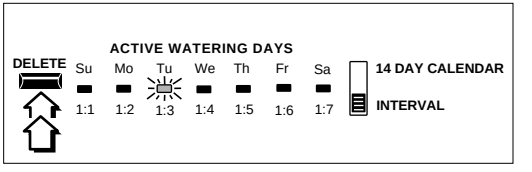
■ To Set An Interval Schedule:

❑ Position Watering Day Schedule Switch down.

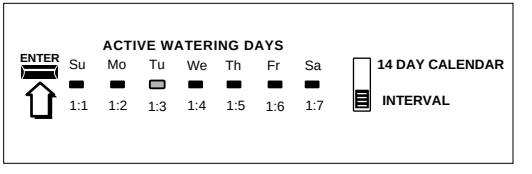


☞ *Note: Indicator will show watering interval currently set. (Example shown: 1:2 - every other day.)*

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

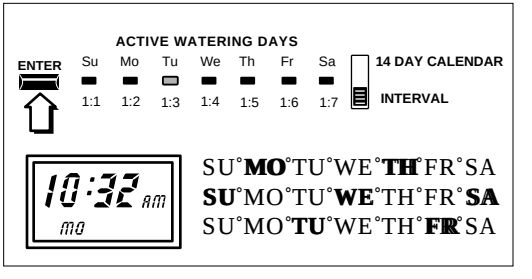


❑ Press Enter Key to select desired interval.



☞ *Note: The first active day of an Interval schedule is the day when the Interval is 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****.)*

In addition, if watering cycle start times are already past for today, watering will not occur until the next Interval day (Thursday in the example shown).



STEP 5 - Set Watering Cycle Start Times

The fifth and final step is to determine the time of day you want the watering cycle to start. The cycle can be started up to 3 times per scheduled watering day. Start times are set by the position of the Watering Cycle Start Time controls.

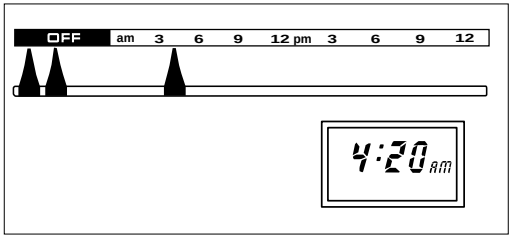
When selecting start times, please keep in mind the following operational characteristics:

– A start time initiates a complete watering 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.
– A start time which occurs during a watering program already in progress will be delayed until the program in progress is finished.

Use the following procedure to select program start times:

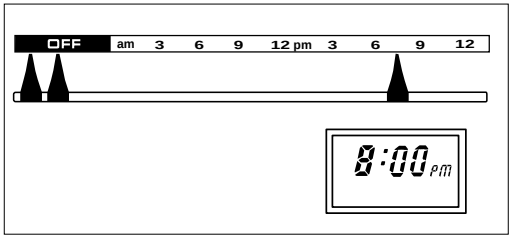
❑ Position all start time controls to left (OFF). Slide first control *slowly* to right until display shows a start time.

☞ *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 additional start times.



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

Manual Operation

Manual Operation allows you to start an automatic watering cycle or operate 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 to operate in sequence.

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

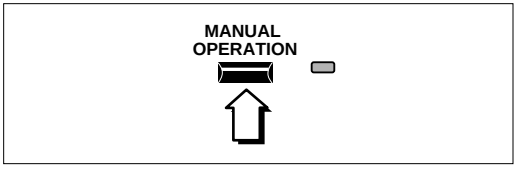
Selected Station(s) enables manual operation of a single station or a group of stations (six maximum) selected to operate in any chosen order.

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.

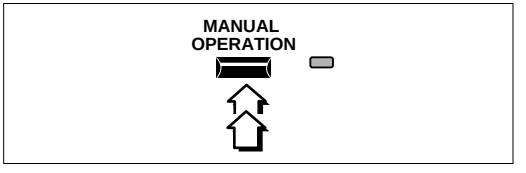
■ **Full Program:**

❑ Press Manual Operation Key one time. All active stations will operate in sequence.



■ **Partial Program:**

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



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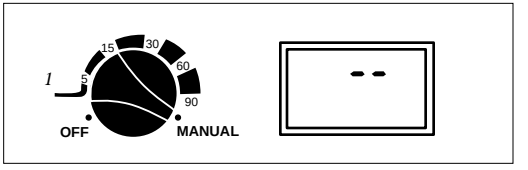
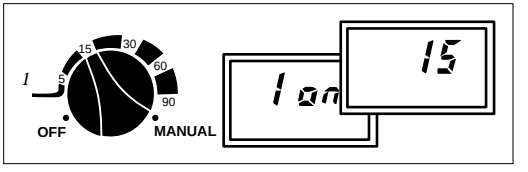
(Manual Operation Continued)

■ 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 alternate between active station number and 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.

☞ *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. The controller will resume Automatic Mode.

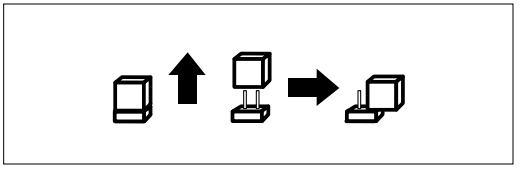
Selecting Control Options

Two control options, in addition to extended station run time, are provided to compensate for variations in sprinkler system design and operating requirements. The control options are selected by the removal of jumper plugs J1 and/or J2. (Refer to the photo on page 2 for jumper plug location).

Jumper J1
Removing jumper plug J1 provides a 15 second delay prior to station operation. The delay enables the pump or master valve to become operable before the first station control valve opens as well as providing time for each station control valve to close before the next station is activated.

Jumper J2
Removing jumper plug J2 deactivates the pump/master valve circuit during operation of stations **selected to run in Hours Mode**. Generally, this option is selected when pump operation is not required, such as during drip irrigation or when controlling outdoor lighting.

☞ ***Note:*** *To save jumper plugs for reuse, reinstall on one pin as illustrated.*



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.	1. Power failure, battery dead or disconnected.	1. Check battery connection and/or replace battery - reset clock and watering day schedule.
Controller inactive.	1. F2 fuse blown. 2. Incorrect power or transformer connections.	1. Replace fuse. (See pg. 16.) 2. Check for proper connections and correct as needed.
Pump does not operate with stations set in Hours Mode.	1. Pump Omit selected by removal of Jumper plug J2.	1. Replace Jumper plug J2.
Controller On - Valves not operating.	1. F1 fuse blown. 2. Improper valve connection(s) or malfunctioning valve(s).	1. Replace fuse. (See pg. 16.) 2. Check connections. Repair valve(s) - Use Hot Post to check valve operation.
Station operates in excess of 90 minutes.	1. Station run time set in Hours Mode.	1. Replace Jumper plugs J3, J4 or J5 as necessary.
Stations do not activate immediately.	1. 15 second station delay selected with Jumper J1.	1. Replace Jumper plug J1.
No Power to Hot Post.	1. F1 fuse blown.	1. Replace fuse. (See pg. 16.)
Made slight changes to Start Time and/or Run Time. 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 F2 is rated at 1/2 Amp and protects the controller's internal electronics from an excessive increase in voltage (usually caused by a lightning strike nearby). Fuse F1, rated at 1 Amp, protects all 24 VAC output from the terminal strip. A blown F1 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.

ATTENTION

Ne jamais remplacer un fusible par un fusible d'un ampérage de valeur supérieure. Il pourrait en résulter des dommages importants au programateur.

WARNING

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

AVERTISSEMENT

DEBRANCHER LE SECTEUR 120 V ALT. ARRIVANT AU PROGRAMMATEUR AVANT DE REMPLACER LES FUSIBLES. SI L'ON NE SE CONFORME PAS A CET AVERTISSEMENT IL POURRA EN RESULTER DE SERIEUX DOMMAGES CORPORELS ET/OU MATERIELS.

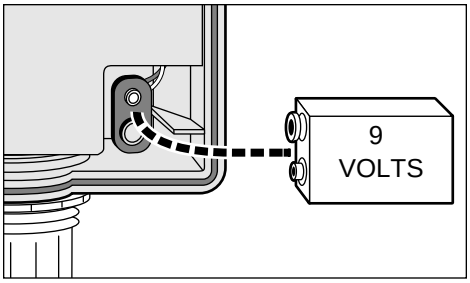
To Replace Fuse:

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.

☞ ***Note:*** *Flashing display indicates dead battery and loss of programmed memory. Replace battery; reset clock and watering day schedule.*

Servicing Battery

1. Remove dead battery from battery clip.
2. Install new 9-volt alkaline battery.



Specifications

- Power Source – 120 VAC, 60 Hz
- Transformer Output – 24 VAC, 20 VA
- Fuses – F1 (Control Circuit) 1/2 Amp
  F2 (Station and Pump/Master Valve Output) 1 Amp
- Maximum Number of Plastic Valves Allowed Per Station – 1 Toro 1 in. Electric
- Output to Valves – .01 Amp to .2 Amp @ 24 VAC
- Output to Pump Relay/Master Valve – .01 Amp to .2 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)
  Conduit Access – 1/2 in. (13 mm) Power, 1 in. (25 mm) Field
- **UL and CSA Approved**

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
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

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

_____ am pm _____ am pm _____ am pm

Notes

Notes

Irrigation Division
P.O. Box 489
Riverside, California 92502
Printed in U.S.A.

PRINTING DATE
JANUARY 1994

FORM NO.
368-0026