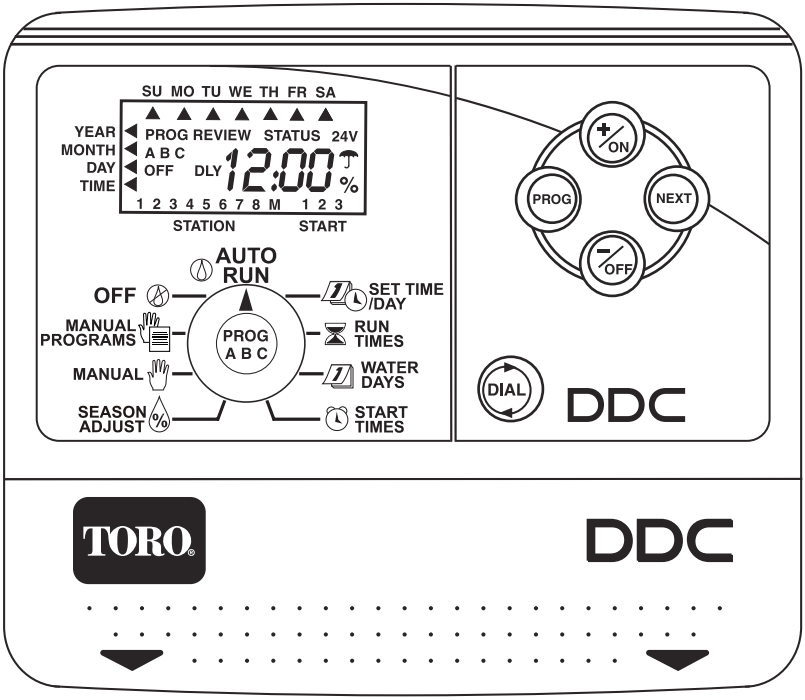
TORO Count on it.

DDC™ Series
Digital Dial Controller



INSTALLATION AND OPERATING INSTRUCTIONS

TORO

Count on it.

Thank you for choosing the Toro DDC™ (Digital Dial Controller) irrigation controller. The DDC incorporates the latest programming technology in an easy-to-use, "digital dial" display.

The following instructions will help you get started. As you follow the simple steps, please pay attention to the important NOTES, which will give you helpful hints and programming advice to maximize the feature capability of the DDC.

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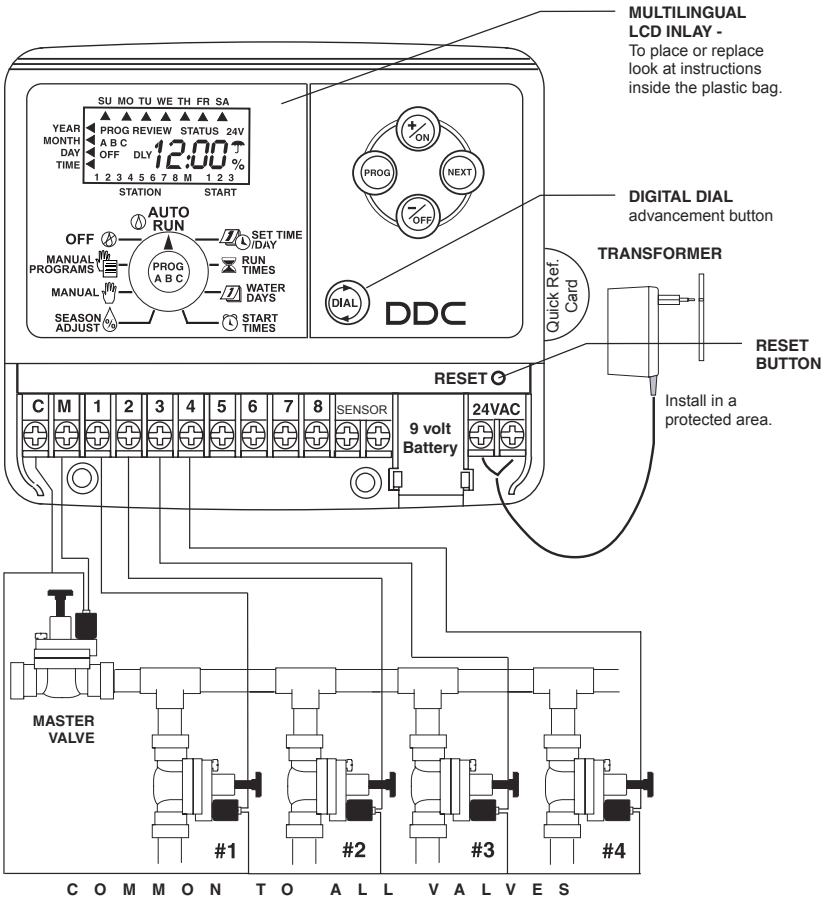


Remove the lower cover of the DDC controller. Place the unit on the wall using the top screw slot. Level the controller, then insert screws into the two lower screws holes under the terminal block. Connect the solenoid wires to the terminal block. Connect one wire from the solenoid to its respective station number on the terminal block and the other wire to the C-common terminal. Finally, connect the transformer wires to the 24 VAC terminal. Next install the battery.

NOTE: The 9 VDC battery must be installed for the proper operation of the controller. The 9 volt battery compartment is located between the sensor terminal and the 24VAC terminal. A standard 9V battery is required for Armchair Programming™ and to maintain clock time during an extended power loss.

Note: Only after all the wiring is completed and checked should the transformer be plugged into AC power.

INSTALLATION INSTRUCTIONS: OUTDOOR MODELS

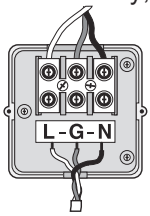
Remove the lower cover of the DDC controller by sliding it down. Place the unit on the wall using the top keyhole screw slot. Level the controller, then insert screws into one or more of the three lower screws holes at of the cabinet bottom. Drive the screws through the plastic flashing that keeps the cabinet weather resistant. If installing the controller on drywall or masonry, install screw anchors to prevent the screws from loosening. Connect the solenoid wires to the terminal block through the 12mm (1/2") hole in the right side of the cabinet bottom. If the solenoid wires are being installed in conduit, there is a knock-out on this hole that will accept a 24mm (1") male conduit adapter. Connect the wires as shown for the indoor model. Last, connect the power wires.

Warning: AC power wiring must be installed and connected by qualified personnel only. All electrical components and installation procedures must comply with all local and national electrical codes. Some codes may require a means of disconnection from the AC power source installed in the fixed wiring and having a contact separation of at least 3mm (0.120") in the line and neutral poles. Make sure the power is OFF prior to connecting the controller.

The hole on the left side of the cabinet bottom accepts a 12mm (1/2") male conduit adapter. Route the power and equipment ground wires from the power source, through the conduit and into the transformer connector compartment.

NOTE: The terminal block accepts wire size up to 4mm (12 AWG).

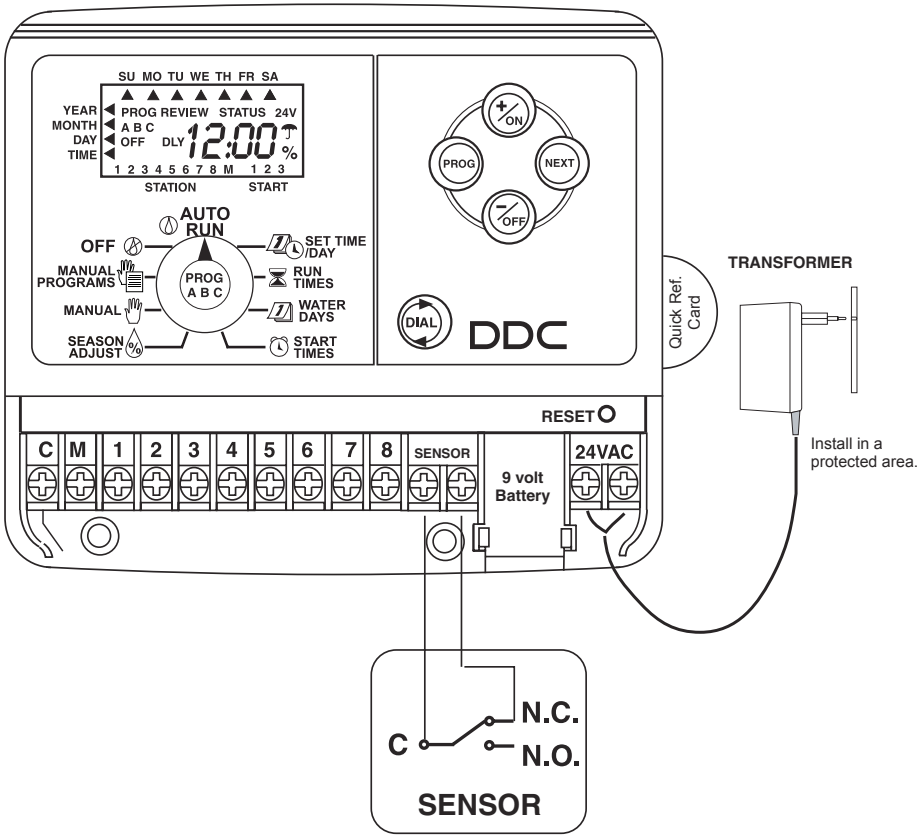
Remove 10mm (3/8") of insulation from the wire ends. Using a small flat bladed screwdriver, secure the wires as follows: Line or Line 1 (L1) to L, Neutral or Line 2 (L2) to N and Equipment Ground to G. Install compartment cover. After first installing a 9 VDC battery, apply AC power to the controller.



9 VDC battery. The 9 volt battery compartment is located below the 24VAC terminals.

A standard 9V battery is required for Armchair Programming™ and to maintain clock time during an extended power loss.

Sensor connection and operation:



To connect a rain sensor, remove the jumper wire from the sensor terminal and connect one wire of the Toro RainSensor™ to the C-common terminal and the other wire to the N.C. (normally closed) terminal. As soon as the Toro RainSensor™ contacts change from the N.C. position to the N.O. (normally open) position, irrigation will be suspended. Irrigation will resume as soon as the Toro RainSensor™ dries and its contacts return to the N.C. position.

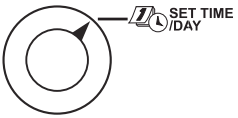
When irrigation is suspended due to the Toro RainSensor™, the display shows: **OFF**

NOTE: When using the Toro RainSensor™, follow the Basic Connection Installation Instructions supplied with the Rain Sensor.

PROGRAMMING:

It is recommended to press the RESET button to clear the memory.
Press DIAL to advance to SET TIME/DAY

Dial Position: SET TIME/DAY



Set the current YEAR, MONTH, DAY & TIME.

Set the YEAR with +/ON or -/OFF

Press NEXT

Set the MONTH with +/ON or -/OFF

Press NEXT

Set the DAY with +/ON or -/OFF

Press NEXT

Select 12 or 24 hour mode with either +/ON or -/OFF button.

Press NEXT.

Set the TIME with +/ON or -/OFF

Press NEXT if you wish to go back to YEAR setting.

NOTE: If you press and hold either +/ON or -/OFF continuously, the digits will advance more quickly.

Press DIAL to advance to RUN TIME

Dial Position: RUN TIME

The DDC has 3 independent programs: A, B & C.
Program A has a default program with each station set for a 5 minute run time, every day watering and a 0400 (AM) start time. This initial program can be erased by following the “Program Erase” function described on page 10 or it can be modified by following these programming steps.

Press PROG to select the program to be set.

Press +/ON or -/OFF to set the desired RUN TIME for the first station. Run time is in one minute increments from 1 minute to 4 hours.

Press NEXT to advance to next station.
Continue to assign stations to a program by entering RUN TIMES for those stations. Unselected stations in a program will remain OFF.

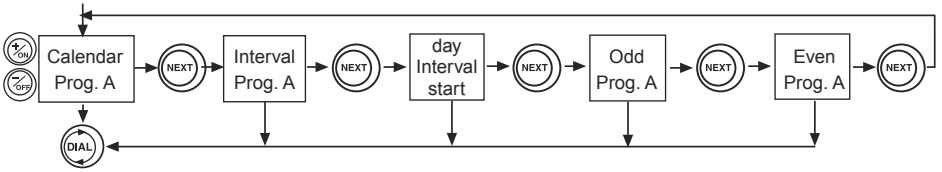
Enabling/Disabling MASTER VALVE

After the last station is the MASTER VALVE position. The display will show “ON”. To disable the master valve/pump start for this program, press -/OFF. Press +/ON to resume master valve/pump start operation.

NOTE: To turn off a station which has previously been programmed, press both +/ON and -/OFF buttons and hold them for a few seconds.

Use this option if you have a station with RUN TIME and you want this station to be OFF or if you have a start time and you want to cancel it (set it to OFF).

Dial position: WATER DAYS



There are 4 choices for your days selection:
CAL - Select days of the week. (All days are ON as the default)
Int - Select days interval, 1-7 days, and the 1st day to start the interval
Odd - Irrigation on Odd days (31st day is skipped)
En - Irrigation on Even days.

In CAL position: Press +/ON for operating day or -/OFF to skip the day. Press NEXT for Interval selection or DIAL for next programming step.

In "Int" position: Press +/ON or -/OFF to select the watering day interval. Press NEXT to select the 1st day to start the watering (using the +/ON or -/OFF buttons).

In Odd position: Press NEXT to select Even days or DIAL.

In Even position: Press NEXT if you wish to go back to CALENDAR. Press DIAL to advance to START TIME and enable the screen function you set.

Dial position: START TIMES

3 start times per day are available for each program. (A, B or C)

Press +/ON or -/OFF to set the first start time.

Press NEXT for start 2 and use +/ON or -/OFF to set the time.

After setting start times, you can Press PROG to start entering data for another program. The Dial position will automatically move back to the RUN TIME position for that program.

Note: Start times are stacked to avoid operating more than 2 solenoids at a **time and exceeding the power output of the transformer.**

Note: To reset the START TIME back to OFF press +/ON and -/OFF buttons until display shows OFF.

Press DIAL to advance to the SEASON ADJUST position.

Dial position: SEASON ADJUST/ADJUST WATER

In this dial position you can increase or decrease the RUN TIME of all stations in that program by percentage scaling from 0% to 200% in 10% increments. Watering percentage is adjusted by month with the default setting being 100% of set runtimes. This water management feature allows you to stop irrigation for the months not requiring irrigation and ramp up the irrigation times as the irrigation season advances.

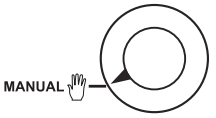
Press PROG to select the program you wish to percentage adjust.
The display will show 1:10%. This is January, month one, and it is set at 100%.
Press "+/on" to increase watering percentage or "-/off" to decrease watering percentage.

Press NEXT to advance to the next month. Repeat steps above to increase or decrease watering percentage for the month displayed.

To set a program to "OFF"
If you wish to stop irrigation of a program, set percentage scaling to 0%.
The display will show that program is OFF.
To resume normal operation of that program, set dial to SEASON ADJUST and increase the percentage to your desired value. Increasing to 100% will set RUN TIME to its original value.

Press PROG to select the program.

Press DIAL to advance to MANUAL.



Dial position: MANUAL/MANUAL STATION

The MANUAL mode allows immediate customized irrigation on one or more zones. You can set an individual RUN TIME for each of the stations you wish to start manually. The controller has a "programmable manual" function, so if you manually operate more than one station, they will open in sequence.

Press +/ON or -/OFF to set the station RUN TIME.

Press NEXT to advance to next station.

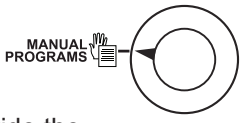
To turn ON the 1st station in the sequence:

Press DIAL to AUTO-RUN position.

Press -/OFF (in AUTO-RUN position) to turn OFF the sequence.
All stations with a manually programmed RUN TIME will be displayed. Operating stations will flash and the display will show the remaining RUN TIME of the station (count down). During Count Down, the seconds are not displayed until the last minute of runtime.

Press DIAL to advance to MANUAL PROGRAMS.

Dial Position: MANUAL PROGRAMS



The MANUAL PROGRAMS mode allows the immediate start of an entire program (A, B or C). When using the MANUAL PROGRAMS feature, the DDC will essentially override the normal start time and begin immediately. Using MANUAL PROGRAMS does not affect the previously scheduled run times. They will begin as programmed once the MANUAL PROGRAMS feature has completed its cycle.

Press PROG to select the program you wish to operate.

The display will show all the stations programmed in the selected program

Press NEXT if you wish to select a different station as the 1st station.

Press +/ON to turn ON the sequence.

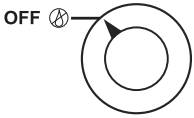
Press NEXT to skip from a station that is currently irrigating to the next one in the sequence.

Press -/OFF to turn OFF the sequence (before it is completed).

The display will show the remaining RUN TIME of each operating station.

Press DIAL to advance to OFF.

Dial Position: OFF/ WATER OFF



3 main functions can be performed in this dial position.

ALL PROGRAMS OFF - Irrigation is suspended for all programs. It will remain suspended as long as the DIAL stays in this position.

OFF

Press NEXT to set RAIN DELAY function OR Press DIAL to advance to AUTO-RUN

RAIN DELAY: - Irrigation is delayed for the selected number of days, 1 to 7 days. Press +/ON or -/OFF to select the number of days.

DLY

The display will show the umbrella, DLY (Delay) and the day the irrigation will resume (Flashing).

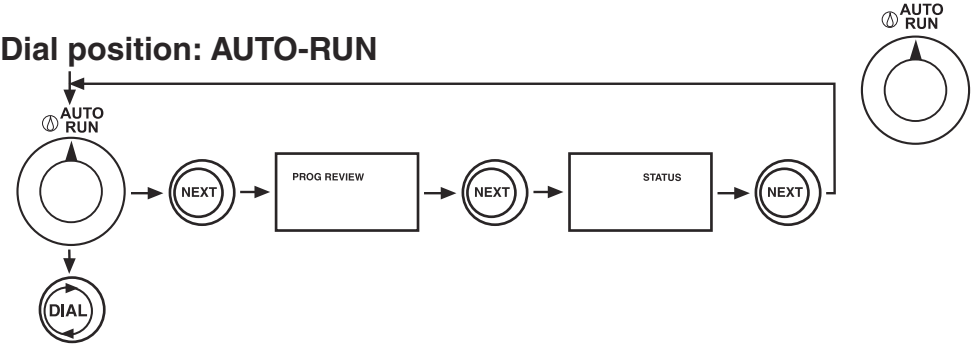
Press NEXT to set PROGRAM ERASE function OR Press DIAL to move to AUTO-RUN

PROGRAM ERASE – You can erase all program information for a selected program. This can be done for any selected program.

PE

Press NEXT to select the program to erase.
Press +/ON to erase. PE will flash 5 times.

Dial position: AUTO-RUN



The AUTO-RUN position is used to provide information regarding the controller's operation as well as for reviewing all data stored in the irrigation programs.
The following is a list of information you can observe on the display:

- Current Time & Day
- Program(s) in OFF position
- Information regarding the operating station: program, station and start times
- Active Rain Delay
- If irrigation is suspended due to SENSOR input
- Circuit breaker cut off the operation of a station(s)
- Power failure indication

To turn OFF the working cycle, press DIAL to MANUAL PROGRAM and press -/OFF.

Program Review: If you wish to review what data you have in each program: Press NEXT to **PROGRAM REVIEW.** Press PROG to select the program. Press +/ON to start the review.

Status: If you wish to have a complete status report on the operating station: Press NEXT to **STATUS.**

Remaining station **RUN TIME** will be displayed as well as the operating program.

Press NEXT to return to **AUTO-RUN** position.

Note: During programming, the dial will return to the AUTO-RUN position automatically after 3 minutes of inactivity.

Self Diagnostic Electronic Fuses

The Toro DDC controller will detect a short circuit caused by a defective solenoid or a short in the valve wiring. As soon as the short is detected, that station is turned OFF. The next station in the watering sequence is turned ON and the shorted station number will start flashing. The station number and the OFF icon will continue to flash in the AUTO-RUN mode until the problem is corrected.

Verification of a short circuit can be done in the MANUAL PROGRAM dial position
Press NEXT to the flashing station.
Check your wiring to this particular station. If the wire connection is fine, the cause of the short is the solenoid, which should be replaced.
Press +/ON to turn ON the station.
The station will operate normally if the short circuit condition has been corrected.

NOTE: The 9 VDC battery must be installed for the proper operation of the Self-Diagnostic feature.

About the DDC memory

Programs are stored in flash memory which is unaffected by power loss

Power failure indication

During a power failure the “24V” will start flashing and will continue until AC power is restored or the 9 volt battery is exhausted. A blank display indicates that there is no AC power and the 9 volt alkaline battery, if installed, is dead.

The Toro Promise — Limited Two-Year Warranty

The Toro Company and its affiliate, Toro Warranty Company, pursuant to an agreement between them, jointly warrants, to the owner, each new piece of equipment (featured in the current catalog at date of installation) against defects in material and workmanship for a period described below, provided they are used for irrigation purposes under manufacturer's recommended specifications. Product failures due to acts of God (i.e., lightning, flooding, etc.) are not covered by this warranty. Neither Toro nor Toro Warranty Company is liable for failure of products not manufactured by them even though such products may be sold or used in conjunction with Toro products. During such warranty period, we will repair or replace, at our option, any part found to be defective. Your remedy is limited solely to the replacement or repair of defective parts. Return the defective part to your local Toro distributor, who may be listed in your telephone directory Yellow Pages under "Irrigation Supplies" or "Sprinkler Systems," or contact The Toro Warranty Company P.O. Box 489, Riverside, California, 92502. Phone (800) 664-4740 for the location of your nearest Toro distributor or outside the U.S., call (951) 688-9221. This warranty does not apply where equipment is used, or installation is performed, in any manner contrary to Toro’s specifications and instructions, nor where equipment is altered or modified. Neither Toro nor Toro Warranty Company is liable for indirect, incidental or consequential damages in connection with the use of equipment, including but not limited to: vegetation loss, the cost of substitute equipment or services required during periods of malfunction or resulting non-use, property damage or personal injury resulting from installer’s actions, whether negligent or otherwise. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. All implied warranties, including those of merchantability and fitness for use, are limited to the duration of this express warranty. Some states do not allow limitations of how long an implied warranty lasts, so the above limitation may not apply to you. This warranty gives you specific legal rights and you may have other rights which vary from state to state. The DDC controller is covered by this warranty for a period of two years from the date of installation.

CUSTOM WATERING PLAN

3 Program Controller

Date: _____

		Program A	Program B	Program C
Station	**Description**	**Duration**	**Duration**	**Duration**
1				
2				
3				
4				
5				
6				
7				
8				

	Program A			Program B			Program C		
Irrig. Days	Su Mo Tu We Th Fr Sa			Su Mo Tu We Th Fr Sa			Su Mo Tu We Th Fr Sa		
Days Cycle		Odd	Even		Odd	Even		Odd	Even
Start 1									
Start 2									
Start 3									

Electromagnetic Compatibility

Domestic: 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 FCC 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.

International: This is a CISPR 22 Class B product.

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