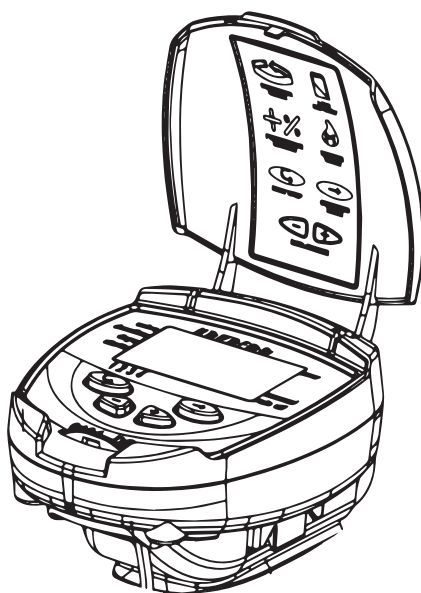




6100 Series

Battery Operated Irrigation Controller Installation and Operating Instructions



Main Features (Not including "S" series*):

- Independent programming of each individual valve
- Weekly or cyclical programming
- 4 operations per day at each valve in weekly program mode
- Irrigation duration: 1 minute to 12 hours
- Irrigation frequency in cyclical program: from once a day to once every thirty days
- Waterproof (IP68)
- Weather resistant
- Irrigation duration modifiable as a function of percentage entered
- Operation of 1 to 6 valves and from master valve
- Option of manual computerized operation of each individual valve
- Option of sequential manual operation
- Powered by 9V alkaline batteries
- Option to connect to a sensor
- Operational temperature -10°C to 70°C

* The "S" series features are detailed in Chapter 7

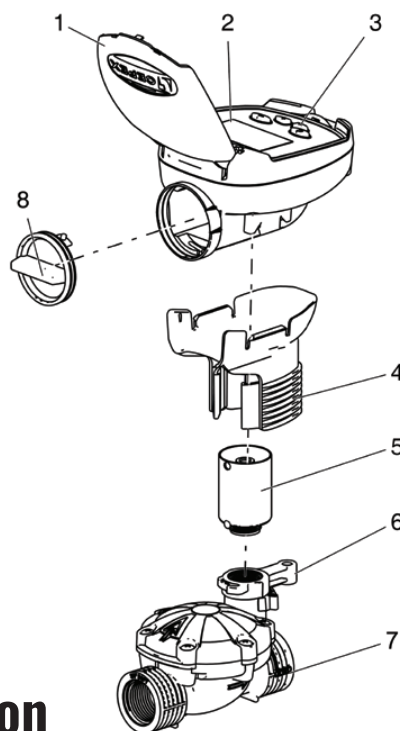
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1. Irrigation Controller Parts Identification

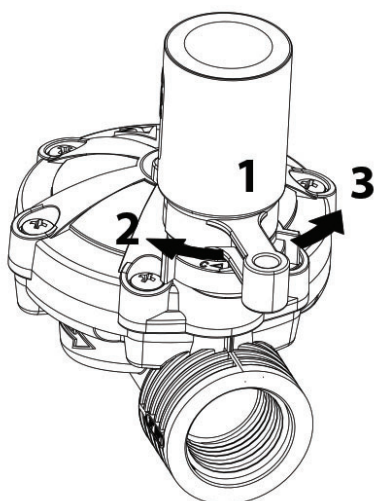
1. Cover
2. Controller display
3. Push buttons
4. Adaptor
5. Solenoid
6. Mechanical operation lever
7. Hydraulic valve
8. Battery compartment cover



2. Manual-Mechanical Operation

The irrigation valve can be opened regardless of the controller's operation. This mode is useful when immediate irrigation is required, and the controller is not assembled yet. The operating lever is below the solenoid.

The lever has 3 positions:



1. AUTO – Mid position
2. CLOSE - Rotating clockwise
3. OPEN - Rotating counter clockwise



NOTE: In normal working conditions, the lever should be in the middle, in AUTO position.

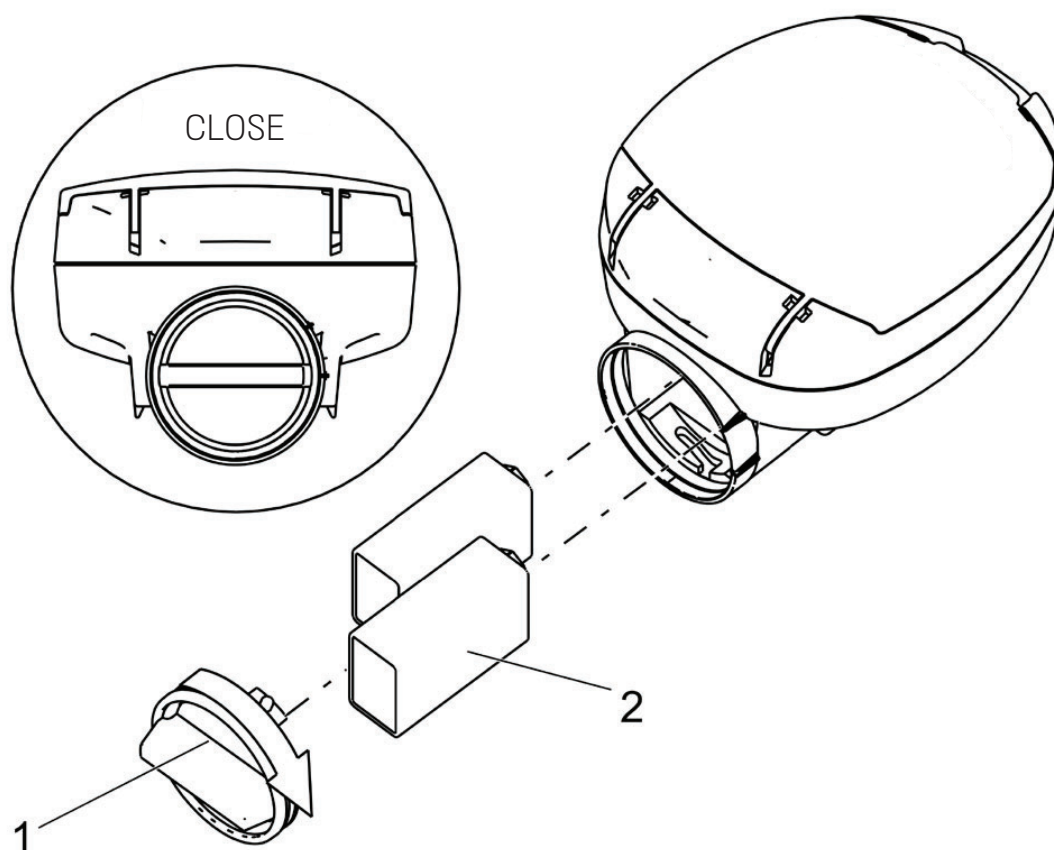
3. Installing the Controller in the System

3.1 Battery Connection

- a. Open the battery compartment cover (1).
- b. Insert the batteries according to your model (for 9V controller one battery needs to be inserted, and for 18V two batteries) (2).

NOTE - All controller display elements appear briefly on the display, followed by a blinking at 12:00. The controller is now ready to be programmed.

- !** Replace the battery compartment cover, making sure the pins are in place, and then rotate the cover 1/8 of a turn to the right. Be sure to do so, otherwise the battery cover pins might break!



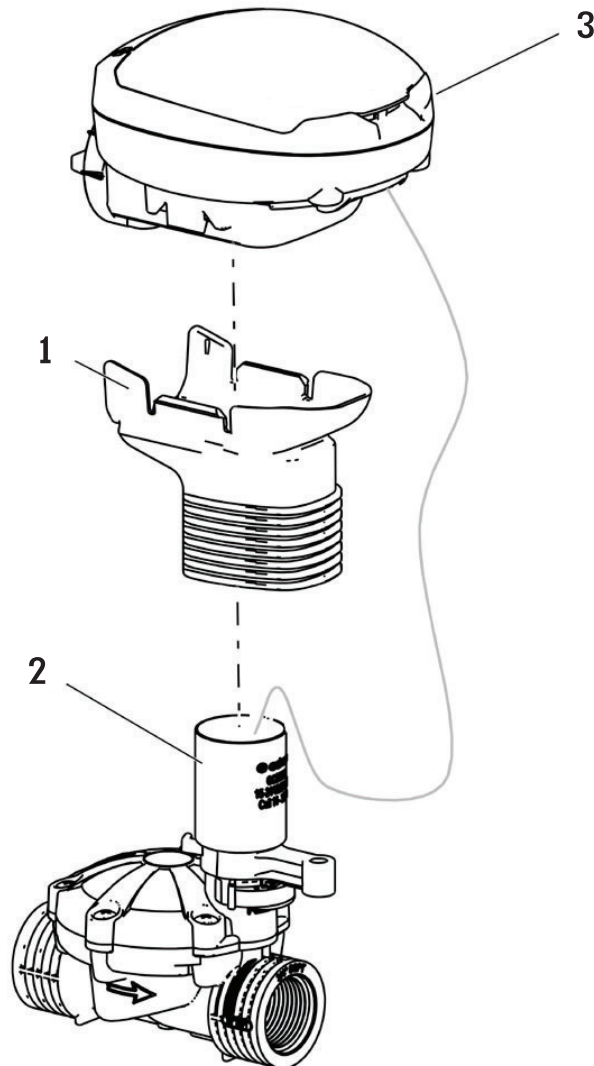
The controller can be installed on the solenoid or on the wall.

! NOTE: Assembly of a filter upstream of the valve is mandatory!

3.2 Installing on the Wall

Place the base of the controller (1) on the solenoid (2). Position the solenoid wires so that they will go through the opening in the base. Connect the controller (3) to the base.

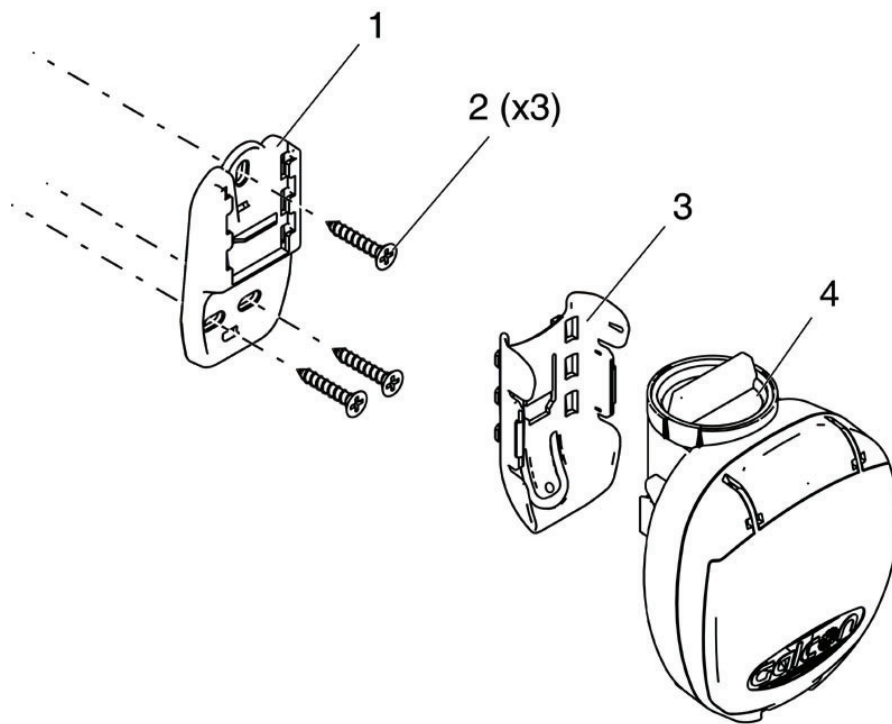
✓ The controller makes a soft click sound when properly connected to the base.



3.3 Installing on the Wall

- a. Attach the wall mounting plate (1) on the wall using 3 screws (2) (not included).
- b. Remove the bracket (3) from the controller and mount it on the wall adapter by sliding it downwards onto the mounting plate.
- c. Press the controller (4) into the bracket.

✓ The controller fits the bracket with a small click



3.4 Wiring the Controller to a 2-wire Solenoid

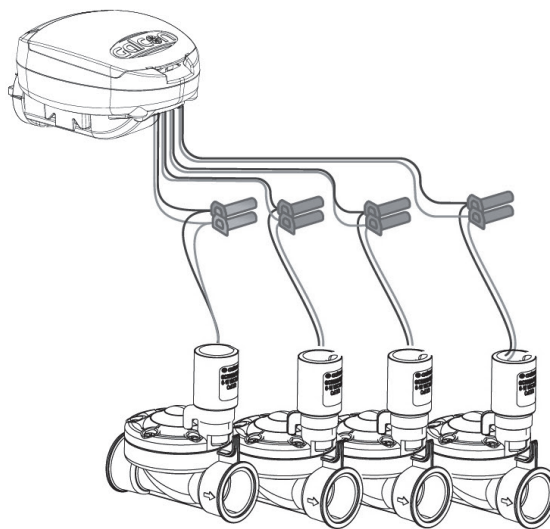
The controllers have pairs of red and black wires numbered for the number of valves in the controller. One set of wires (black and red) is stamped with the letter M, representing the master valve, and one set of wires (yellow) with the letter S representing the sensor connection.

1. Connect each pair of cables coming out of the controller to each pair of solenoid cables.
2. The wiring area should be protected from moisture by an airtight box.
3. Connect the black wire coming out from the solenoid to the black wire of the controller, according to the valve number. The valve number is marked on the wires on the controller
4. Connect the red wire from the solenoid to the corresponding red wire in the controller, according to the valve number

! NOTE - If you install a master valve, it will open automatically with each valve. No special programming is needed.

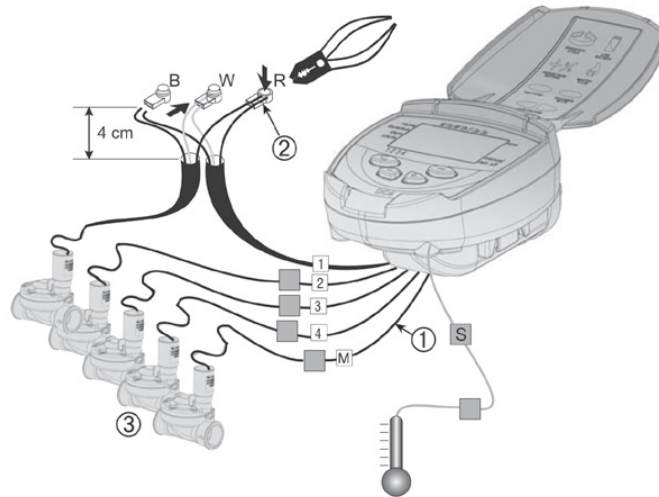
! NOTE: The controller and its cables are waterproof. In order to preserve the waterproof characteristics it is important not to expose the wires that are not being used.

! NOTE - Do not uncover the master valve or sensor wires, unless using master/sensor



3.5 Wiring the Controller to a 3-wire Solenoid

Connect the valves to the cables emerging from the controller according to the illustration and explanation below.



Labeled cables (1) emerge from the controller. The end of each cable is protected by a cover that must be removed prior to connecting the cable.

! NOTE: The controller and its cables are waterproof. In order to preserve the waterproof characteristics it is important not to expose the wires that are not being used.

To preserve watertightness the following instructions need to be followed:

- Connect the cables to the valves (3) using the special waterproof connectors (2) supplied with the product. See illustration.
1. Cut the cover of the cable coming out of the controller (1) near the end of the cable and expose the cable leads from the outer black insulating sleeve only. The solenoid cables have three wires: white, red and black. Do not expose the three wires from their colored insulation
 2. Connect the wires to the waterproof connector (2).

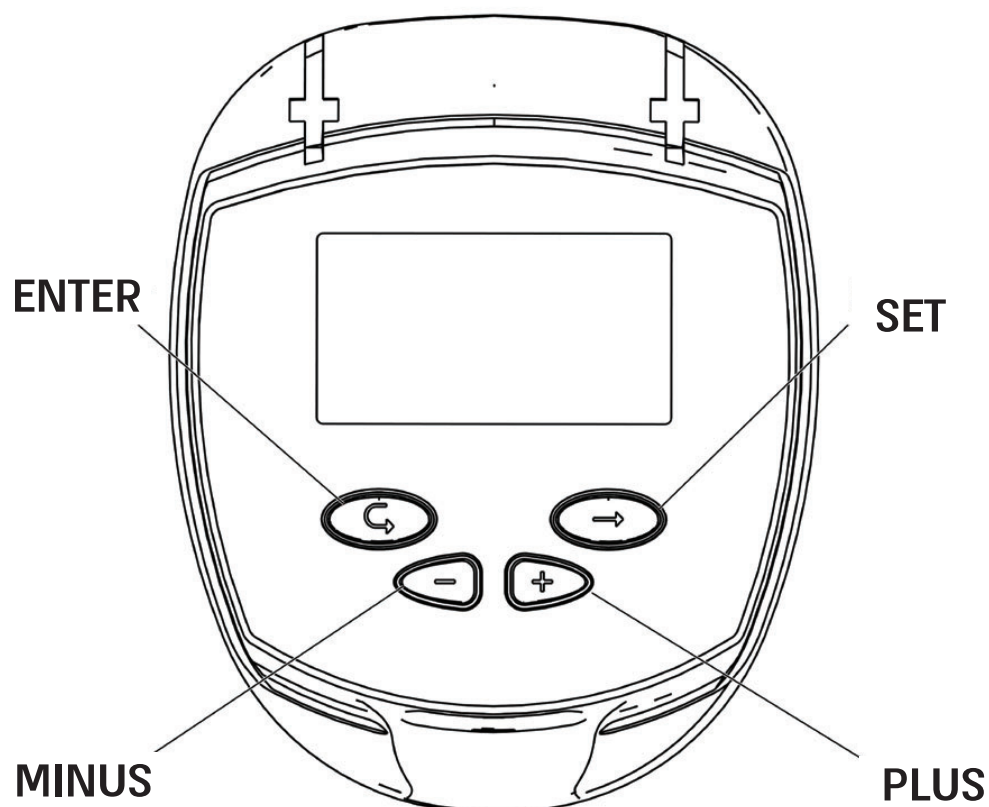
4. Irrigation Programming

This section describes the programming steps for a simple irrigation schedule.

The next section deals with more advanced irrigation operations.

The irrigation controller is programmed with the aid of 4 buttons:

-  Enter Button - Used to switch between the desired programming modes
-  Set Button - Used to select the parameter to be changed (e.g. hour, minute, etc.) The selected parameter can only be changed when its icon is blinking on the display.
-  Plus Button - Increases the value of the selected parameter (e.g. adds an hour).
-  Minus Button - Decreases the value of the selected parameter (e.g. decreasing an hour).



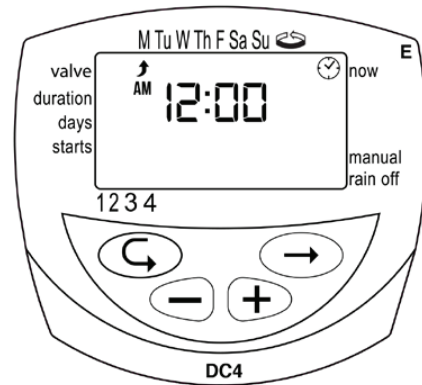
4.1 Setting the Current Time and Day of the Week

To enable the irrigation controller to operate the irrigation system at the correct times, the current time and day of the week must first be set.

1. Press "Enter"  several times until the "Clock"  appears.
2. Press "Set" . The hour digits will blink. Set the current hour using "Plus" or "Minus" (note the AM and PM terms).

Another click on the arrow  will cause the minute digit to flash. Set the desired duration of minutes using plus and minus .

3. Press "Set" . A blinking arrow appears at the top of the display. Place the arrow in front of the current day of the week using the "Plus" or "Minus" buttons. If the most recent data item stops blinking before you finish programming it, press "Set"  to continue the programming process.



4.2 Switching Between AM/PM and 24 Hour Time Format

The default time format is the AM/PM.

There is also the 24-hour time format.

To switch between the two formats:

1. Press "Enter"  several times until the "Clock"  appears.
2. Press "Set" . The hour digits blink.
3. Press "Plus"  and "Minus"  buttons simultaneously. The clock reading switches from AM/PM to a 24-hour time display or vice versa. You can switch the time display format at any step in the programming process.

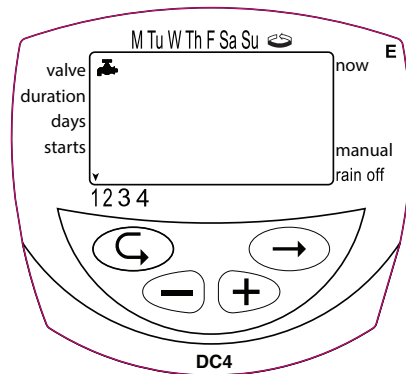


4.3 Valve Selection

This section does not apply to the DC-1 and DC1S models

An independent irrigation schedule program must be set for each valve individually. First select the main valve, and then proceed with the irrigation program as specified.

1. Press Enter (↻) until (🔌) appears.
2. Press Set (→). A blinking arrow will appear at the bottom of the display.
3. Place the arrow in front of the valve you want to program using (+) and (-).
4. Press Enter (↻) to proceed to the next step.



4.4 Setting the Irrigation Duration

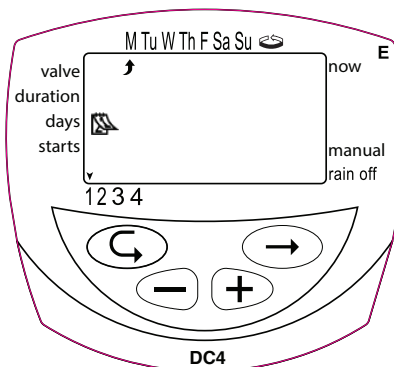
This setting determines how long the irrigation lasts.

1. Press "Enter" (↻) until "Duration" (⌚) appears.
2. Press "Set" (→). The hour digit blinks. Set the desired number of hours by pressing "Plus" (+) or "Minus" (-) buttons. Press "Set" (→) again - the minute digits blink. Set the desired number of minutes by pressing "Plus" (+) or "Minus" (-) buttons.
3. Press "Enter" (↻) to proceed to the next step.

4.5 Selecting Days of the Week for Irrigation

This setting determines on which days of the week the irrigation controller will operate the selected valve.

1. Press "Enter"  until "Days"  appears.
2. Press "Set" . A blinking arrow appears at the top of the display, under Monday.
3. Move the blinking arrow to the desired day of the week by pressing "Set" .
4. Selecting/adding irrigation days: Press "Plus" . The arrow under the selected day stops blinking, moves one position to the right, and blinks under the next day of the week. You can select additional days of the week in the same manner.
5. Canceling Scheduled Irrigation Days: Bring the blinking arrow under the day you want to cancel. Click Set . The arrow below the selected day will disappear, and the flashing arrow will move to the right, below the next day of the week. Additional days can be canceled in the same way.
6. When the blinking arrow reaches Sunday, pressing  again displays the word ONCE in the center of the display, and the symbol "Cyclical"  appears at the upper right corner of the display. To return to the "Selecting/Adding Irrigation Days" mode, press "Set"  once or twice. Click  to go to the next step.



4.6 Setting Irrigation Start Times

1. In this step, up to 4 separate irrigation start times can be programmed per day. The selected valve will open at each of the established start times, for the irrigation duration set as described in Section 4.4.
2. Press "Enter"  until "START1" appears. The word "OFF" or the last start time that was entered will appear on the display.
3. Press "Set" . The displayed item (or the last start time entered) will blink.
4. Set the desired start time ( note the AM and PM terms) by pressing "Plus"  or "Minus" . Repeat actions 2-3 for programming II-III-IV if required.
5. To cancel a specific start time, select it by pressing "Enter"  and press "Set" . The hour digits will blink. Press "Plus"  or "Minus"  until the word "OFF" appears on the display.
6. To program another valve, select it and repeat the above steps, starting from Section 4.3.



4.7 Example: Programming a Weekly Irrigation Program

Suppose you want to program the irrigation controller so that it irrigates three times a day. In the 24-hour format: 08:00, 13:00 and 19:00, for two and a half hours at a time, on Tuesdays and Fridays.

To switch to 24-hour format, see Section 4.3 (If you are using the DC-1 irrigation controller, start with step 4 below.)

1. Press Enter until  appears.
2. Click Set . A flashing arrow will appear at the bottom of the display.
3. Press  or  to move the arrow to the valve number you want to program.
4. Press ENTER until the icon  appears.
5. Click Set . The hour digit will flash. Press  or  until the number 2 will be displayed.
Click Set . The minute digit will flash. Press  or  until the number 30 will appear in units of minutes.
6. Press Enter . The days icon  will be displayed.
7. Click Set . A flashing arrow will appear at the top of the display, below Monday. Press Set  until the flashing arrow appears below Tuesday, and then click on the plus symbol . The arrow below Tuesday will stop flashing and move to the right, to Wednesday. Press Set  twice to move the arrow to Friday, and then click Plus .
8. Press Enter ; the start time STARTI will be displayed. Click Set . The hours digit will flash.
9. Set the start time to 08:00 by clicking on the plus  or minus  sign. Repeat this step to set the second start time (2) STARTII to 13:00, and the third start time (3) STARTIII to 19:00.
10. Press Enter  for the fourth start time (4) START IV will be displayed. Press  and the hours digit will flash.
11. Press the plus  or minus  sign until OFF is displayed. The fourth valve opening is now canceled.

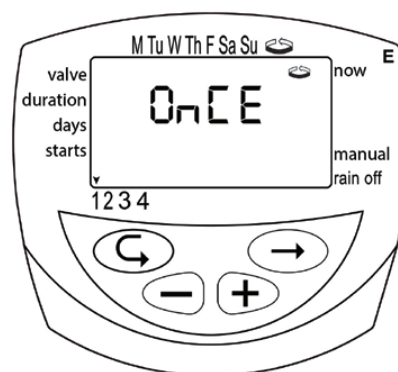
5. Additional Functions

5.1 One-time Irrigation

In this operation we program the controller to run the irrigation system once, for the duration and the time set.

! Note: The duration is determined according to Section 4.4

1. Press ENTER  until  appears.
2. Press Set  several times (for all days of the week) until the  icon appears and the word ONCE blinks in the display.
3. Go to Section 4.5 to determine the start day and time.

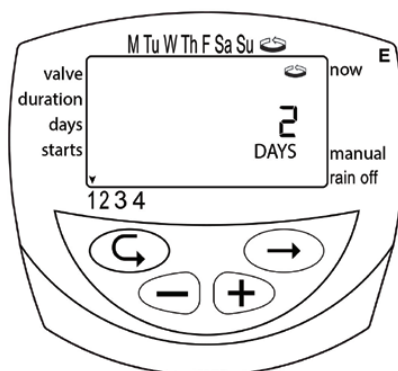


5.2 Periodic Irrigation

In this operation we program the controller to operate the irrigation system once for a fixed number of days, for the time allotted to irrigation.

! Note: The duration of the valve opening is determined according to Section 4.4.

1. Press Enter  until the  icon appears.
2. Press Set  repeatedly (for all days of the week) until the periodic symbol  appears, and the word Once will flash on the display.
3. While the display is blinking, press  or . The display will show the number of days between irrigations (irrigation cycle). For example, if you set 2 days, irrigation will take place every two days for the determined time.



5.3 Setting a Day and Time for Opening in A Periodic Plan and in a one-time Plan

In these programs it is possible to determine in advance the opening time of the valve. The number of days until the opening appears on the screen to the right of the opening time 0 above the word "days", meaning that the program will start today; 1 means that the program will start tomorrow, and so on (up to 30 days.)

1. Press Enter  until STARTI appears.
The display will show the last programmed opening time.
2. Click Set . The time display will flash.
3. Set the desired opening time using  (or ). Pay attention to the AM and PM terms.
4. Press Set  until the number to the right of the start hour flashes (the number above the word "days").
5. Set the number of days until the opening of the valve with  or .



 **Note:** Opening of 2, 3 and 4 are canceled in this program.

5.4 Example of Defining a Periodic Irrigation Program

Suppose you want to program the irrigation controller to open the valve at 12:45 at noon, for an hour, once every 5 days.

1. Determine the duration of irrigation in accordance with Section 4.4: defining the duration of the irrigation. Press Enter  until the icon  appears. Press  and set the duration of the irrigation by pressing  or .

2. Press Enter  until the days icon  appears.
3. Press Set  several times (for all days of the week) until the word Once flashes on the display.
4. While the display is blinking, press  or  until "5 days" appears on the display, which is the frequency of the irrigation.
5. Press Enter . The display will show .STARTI.
6. Click Set . The hours display will flash.
7. Set the start times and minutes, by pressing  or , as described in Section 4.6.

5.5 Computerized Manual Operation of the Valve

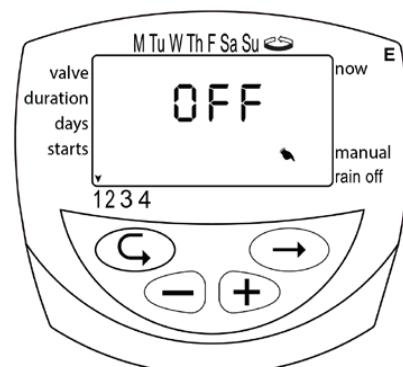
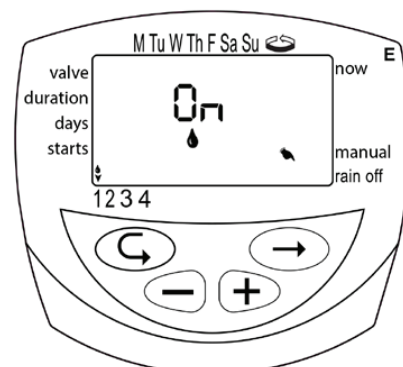
This operation turns on the selected valve for the irrigation time set in the program. The valve will close automatically at the end of the predetermined irrigation duration.

 **Note that the originally defined program continues to run according to the determined times.**

For setting-up times:

1. Press Enter  until the valve icon  appears. Select a valve according to Section 5.3 Valve Selection
2. Press Enter  until the 'Manual watering' icon  appears
3. Press  to open the valve. The word 'On' will appear in the display. After 5 seconds the remaining irrigation time appears , counting down on the monitor.

To close manually, press Enter  until the manual watering icon  appears, and press  in the display. The word 'off' will appear.



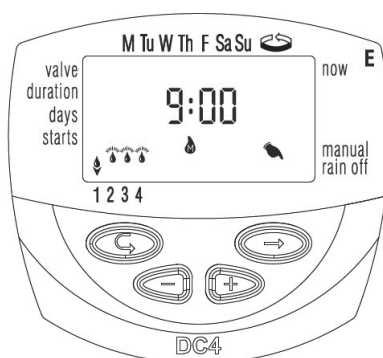
! Note: It is possible to turn on up to 2 valves simultaneously, by repeating the steps outlined above.

5.6 Serial Manual Operation for all Valves

It is possible to operate all the valves sequentially, one after the other.

1. Press Enter  until the clock icon  appears.
2. When nothing is flashing on the display, press and hold  for 5 seconds. Valve No. 1 will open and operate for the duration of the programmed irrigation. When valve No.1 closes, valve No. 2 will open and so on, until the end. All valves programmed to be opened will flash. You can intervene in the process. Clicking on  closes the current valve and opens the next valve after it.

! Note: You can exit this screen only after having opened all valves.



5.7 Downtime

This makes it possible to temporarily cancel the control of the controller on the valves, for example when it rains. The irrigation schedule is maintained, but irrigation is not carried out.

The shutdown operation prevents irrigation in all valves.

1. Press Enter  until the clock icon  appears.
2. Press and hold  (more than 5 seconds.)
The icon  (no irrigation) will be displayed flashing in front of the caption "Downtime." The controller is disabled now.
3. To return control to the controller, press Enter  until the clock icon  appears, and then press  continuously until the icon  disappears.
4. Downtime may be carried out while the valve is turned on.
5. In downtime mode, if you accidentally try to turn on a valve manually or if it reached its time to open, the word 'rain' will appear and the valve will not open.

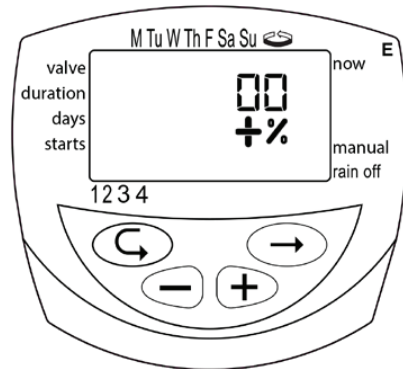


5.8 Addition and Reduction in Percentages

It is possible to add or reduce the duration of irrigation in all taps simultaneously in the form of percentages.

Example: If the irrigation duration is one hour and we add 10%, the new irrigation duration will be one hour and 6 minutes (66 minutes).

1. Press Enter  until a clock is displayed.
2. Wait until no digit is blinking.
3. Press  and  together. The display will show 00 +%.
4. Press , 00 will flash. By means of  and  will add or subtract the percentage as required (in steps of 10%). If you added or subtracted, % will show a fixed symbol of +% or -% on the main screen.



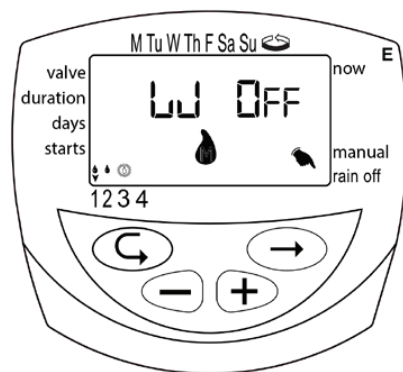
! Note: It is not possible to change a percentage to a single valve.

6. Additional Views

6.1 Valve in Waiting Mode

This section is not intended for DC-1 and DC-2 models. When two valves are On and a third valve is scheduled to open, this valve will switch to Waiting.

The flicker will appear above the number of the valve that is in Waiting mode. As soon as one of the valves closes, the waiting valve will open. When manually operating a computerized waiting valve - the letter W (Wait) will appear on the display, and the valve will open as soon as another valve closes.



6.2 Blinking Alert for Low Batteries

When the batteries are low, a blinking battery icon will appear on the display. In this condition there is still limited energy left in the batteries to operate the valve, and the batteries must be replaced as soon as possible. After the replacement, press one of the buttons to continue the operation of the controller.

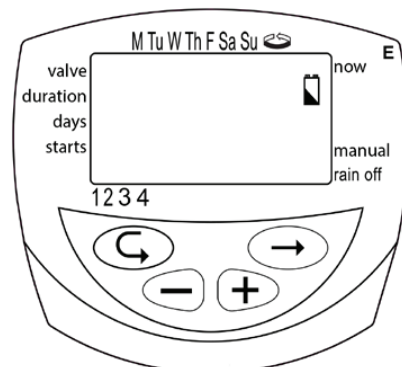
! The batteries can be replaced in 30 seconds without losing the program data.



6.3 Steady Alert for Low Batteries

When the batteries are low and are not replaced in time, the battery icon will appear steadily. All other displays will disappear, all valves will close and programs will disappear. Replace the batteries as soon as possible and reprogram the controller.

! Note: The batteries can be replaced in 30 seconds without losing the program data.



6.4 Missing Definition in the Irrigation Program

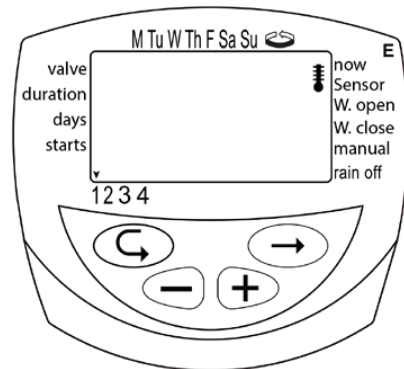
During manual operation using the irrigation controller, 'No Prog' will appear on the display, which means that the duration of the irrigation for this valve has not been programmed. In this situation it is not possible to open the valve.

! Note: To resume the valve operation, set the duration as described in Section 4.4



6.5 Sensor

The controller can be stopped by connecting it to a sensor. For example, if a rain sensor is connected to the controller, irrigation will be performed as long as the sensor is dry. Following a rainfall, the sensor will prevent the valves from opening.



All types of dry-contact N.C.sensors can be used. The sensor connection is performed as described in Section 3.4 – Wiring the controller to a two-wire solenoid (page 8).

As long as the sensor does not close the circuit (that is, a defined prevention condition has been identified), the icon  appears on the display. In this setting, valves will not be irrigating. S OFF will appear in the display in manual mode. This means that the sensor is activated, and is currently preventing irrigation.

7. Instructions for Series S Controllers DC-1S, DC-2S, DC-4S, DC-6S

7.1 Main Features of the S Series

- Duration of irrigation: from ten seconds to 12 hours.
- Frequency of irrigation: from once a minute to once every 30 days in a periodic program.
- The irrigation window in a periodic program in professional controllers allows periodic irrigation for short periods of time in part of the day.

7.2 Defining the Duration of Irrigation in a Periodic Irrigation Program

The irrigation window is available in the professional controllers of the S Series. The irrigation window is an advanced function that allows you to set part of the day (the irrigation window) in which only the defined periodic irrigation program will be carried out (see Section 6.2).

The irrigation window is set for a small irrigation cycle per day (up to 23:59' hours) and in a periodic plan framework only. If a cycle greater than 24 hours is defined, the window programming option is not available. This function is useful, for example, when irrigation is needed in hot hours only.



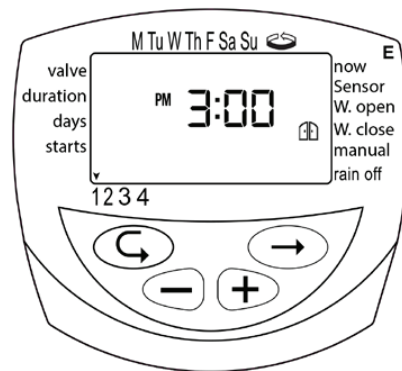
1. Press Enter  until the "Open Window" icon  appears. The screen will show the word OFF or the last entered window opening time.

2. Click Set . The word OFF will flash on the display.

3. Set the desired window opening time using either  or  (note the AM and PM terms).

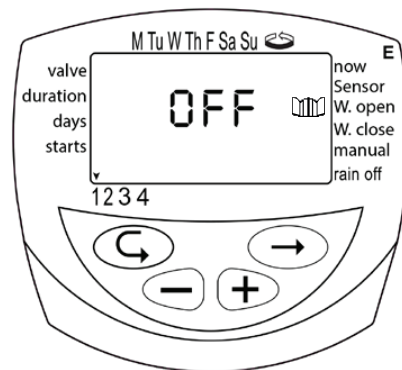
4. Press Enter  until the "Close Window"  icon appears. The screen will display 12:00 AM or the last window closing time entered.

5. Set the desired window closing time using  or  (note the AM and PM terms.)



To cancel the irrigation window:

1. Press Enter  until the icon  appears next to "Open Window"
2. Click Set . The opening time will flash on the display.
3. Press  or  until OFF appears next to the window icon.
4. The irrigation window is canceled.



7.3 Opening a Window After the Start Time

Example: 5 minutes of irrigation every 30 minutes from 9:00 AM to 5:00 PM. Programming is done at 09:20, so the program will not start on the current day but at 09:00 the next day. For the program to start on the programmed day, follow these steps:

1. Press  until you reach STARTI.
2. Using  or , program any time after the current time, for example 09:30 AM. This time will be the first opening of the current day. Starting from the next day, the program will work according to the planned settings.

The STARTI screen will display the next opening time as part of the window programming.

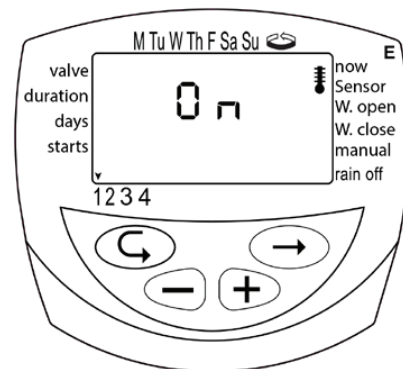
7.4 Sensor

In the Series S, each valve can operate subjected to the sensor.

1. Select the valve you want to associate to the sensor.
2. Press Enter , until the icon  appears next to the sensor you want to associate.
3. Press  to turn on the sensor in the valve irrigation program. The word ON will appear on the display

As long as the sensor is on, the icon  appears on the display. In this situation, the valve associated with the sensor will not irrigate.

Press  to stop the sensor. The word .OFF will appear on the display.



8. Maintenance, Troubleshooting and Repair

- If the controller is not intended to be used for a long time, it is recommended that the batteries be removed. The program will disappear. When reinstalling the batteries, the controller will have to be reprogrammed.
- It is mandatory to install a filter before the valve or valves system, and clean it once every few months. Working without a filter is like giving rise to malfunctions.
- In normal use the batteries will last for at least one year (alkaline batteries).
- Do not open water on the line when the solenoid is not mounted on the hydraulic valve.
- Recommended water pressure: 1-7 atmospheres (bar)

Problem/Effect	Cause		Correction	
The valve does not open in the automatic program or in computerized manual operation	1	The connection between the controller and the solenoid is faulty	1	Disconnect the solenoid from the controller and reconnect it
	2	Defective batteries	2	Replace batteries
	3	The operating lever is not in AUTO position	3	Move the lever to AUTO position
No display		Faulty batteries		Replace batteries
The valve is open although the lever is in position AUTO		The solenoid is electrically open		Connect the controller, install batteries and open/close manually through the controller
The valve does not close even though there is a click during the operation	1	Operating lever not in AUTO position	1	Put the lever in AUTO position
		Dirt and scale in the valve mechanism	2	Clean the valve or replace it

