# Single Station Battery Operated Propagation and Irrigation Controller

**710-000P**
**710-XXXP**


# INSTRUCTION MANUAL

## TABLE OF CONTENTS

## CONTROLLER MODELS

710-000P

710-XXXP
with in-line Valve

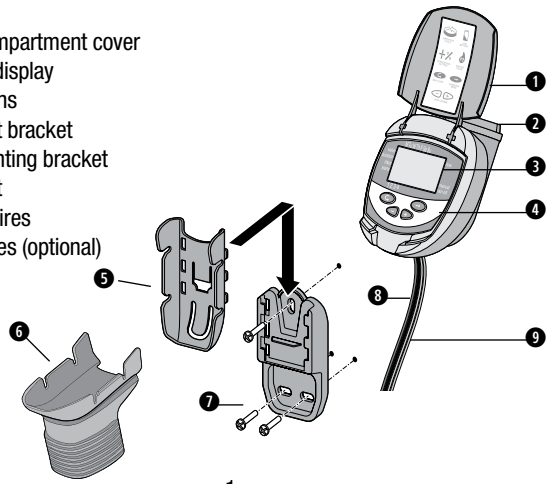
Thank you for purchasing DIG's 710-xxxP propagation controller. This manual describes how to get the 710-xxxP up and running quickly. After reading this manual and having been familiarized with the basic functionality of the controller, this manual can be used as a reference for less common tasks in the future.

## 1. ABOUT THE CONTROLLERS

The 710-xxxP battery operated controller employs the latest engineering improvements for better operation. The 710-xxxP single station controller can provide advanced and simple programming features for all types of light commercial, greenhouse and nursery applications. The 710-xxxP controller is powered by 1, 9-volt battery and wrapped in a compact housing design that provides enhanced waterproofing capability. The 710-xxxP controller operates in conjunction with DIG's 2-wire DC solenoid, model R710DC. Adapters are available to attach the solenoid to many brand name valves available on the market. DIG in-line globe valves are also available in sizes 3/4" to 2" with the solenoid pre-installed.

## 2. PARTS IDENTIFICATION

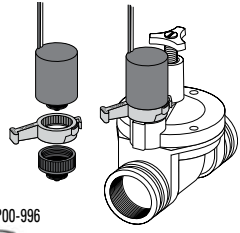
1. Cover
2. Battery compartment cover
3. Controller display
4. Push buttons
5. Wall mount bracket
6. Valve mounting bracket
7. Wall mount
8. Solenoid wires
9. Sensor wires (optional)



## 3. SYSTEM COMPONENTS

**To properly install 710-xxxP propagation and irrigation controller, the following components are needed:**

- 710-xxxP single station controller with R710DC solenoid or with DIG in-line valve assembly
- Optional valve adapter (see below)



VALVE ADAPTER

- Model P00-996 used with RAIN BIRD, DV, PGA, PEB (3/4" and 1" only), GB, EFB-CP, BPE, PESB and ASVF valves (adapter sold separately).

Model #P00-996

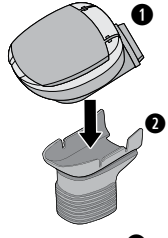
O-ring 200-021
Model #03-077

## 4. VALVE OR WALL MOUNTING

### 4.1 VALVE MOUNTING

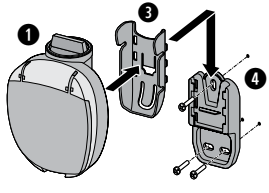
1. Press the controller ❶ into the controller valve mounting bracket ❷.
2. Press the controller with the valve mounting bracket onto the solenoid and arrange the controller in a preferred position (see also pg 6).

### 4.2 WALL MOUNTING




1. Attach the mounting plate ❹ on the wall using 3 screws (not included).
2. Press the controller ❶ into the wall mount bracket ❸.
3. Press the controller onto the wall mount to secure it. In this situation the valve mounting bracket ❷ is not used.

**NOTE:** Be aware that the length of the controller connecting cable limits the distance between the controller and the solenoid.

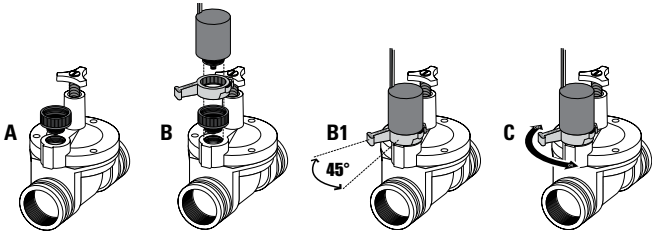


## 5. INSTALLATION

### 5.1 VALVE AND SOLENOID ASSEMBLY

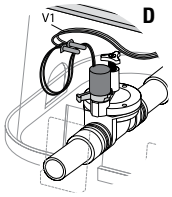
**NOTE:** Suggested operating pressure: 10-120 PSI (.7 to 10.5 BAR)
Use DIG's DC valve assembly or solenoid model R710DC.

1. Shut off the mainline to the valve.
2. Install the DIG valve and latching solenoid assembly or unscrew the conventional solenoid from the valve used and remove the solenoid housing, solenoid stem, plunger, spring, and O-ring (if necessary).
3. Converting SUPERIOR valves: First, remove the SUPERIOR solenoid and O-ring and replace with one O-ring (DIG part #30-492) inside the solenoid thread cavity (this O-ring is included). Install the adapter then, slip the manual handle into the adapter. Attach the solenoid with the plunger and position the handle at a 45° angle towards the valve outlet (**see B1-C**). This creates a manual lever, helpful for manual on/off. Firmly tighten the solenoid by hand, but do not over tighten.
4. Converting IRRITROL (HARDIE) valves: Leave Irritrol manual handle in place (not applicable for 205 series). Screw the provided adapter into Irritrol adapter or directly into valve (205 series only). DO NOT use the orange manual handle provided with this installation. Screw the R710 DC solenoid with the plunger into the adapter.
5. Converting RAIN BIRD valves: Unscrew and remove Rain Bird AC solenoid. Install adapter model P00-996 into a Rain Bird valve and tighten the adapter with a wrench. Next, install the R710DC latching solenoid directly into the adapter clockwise and hand tight. DO NOT use the adapter with the orange handle provided.



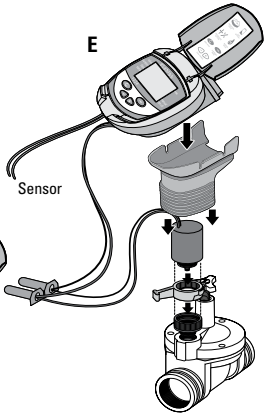

6. **Splice the solenoid hot wires (red) to the single station controller color-coded wires (red).** Splice the solenoid black wire to the single incoming white wire.

**USE CONVENTIONAL DRY-SPLICE WATERPROOF CONNECTORS.** Leave some slack on each side of the wires so that repairs, if needed, can be carried out easily **(see D)**.

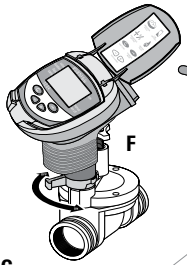


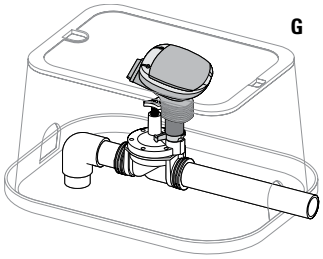

**NOTE:** ***Subsequent 710 Models (only) will have the solenoids hard wired into the controller eliminating the need for waterproof connectors.***

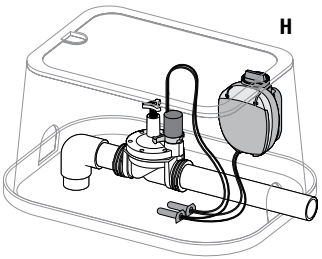
7. Mount the controller – see section 4 on page 4 for wall or valve mounting (**see E, G, H**).
8. After installation is complete, turn on the water supply and pressurize the mainline. The valves will open momentarily and then shut off. Test each valve in manual operation by moving the manual handle from left to right to open and right to left to close. Do this to make sure that the valve is operating correctly (**see F**).
9. Program the controller (see section 8 on page 11).




***WARNING: FAILURE TO USE WATERPROOF CONNECTORS WILL VOID MANUFACTURER'S WARRANTY***

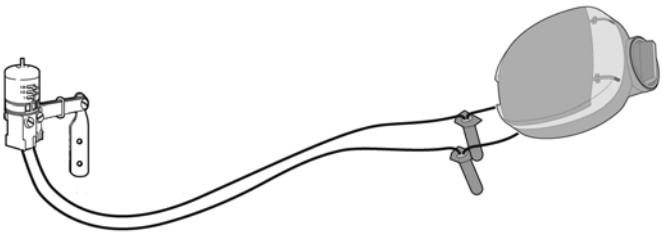


## 6. USING A SENSOR

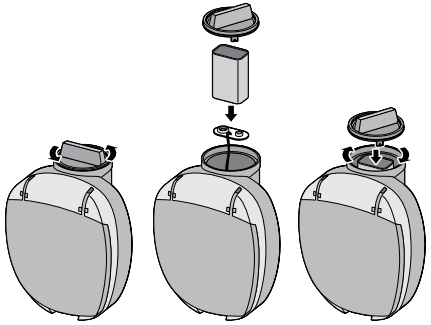
1. Carefully strip each of the controller's two yellow sensor wires.
2. Select a normally open sensor, or configure the sensor to be normally open.
3. Connect 1 of each yellow wire from the controller to each of the normally open wires from the sensor **USING WATERPROOF CONNECTORS**.
4. When the sensor is active, appears on the display and the sensor will override the program when triggered.
5. Do not strip or cut the wire if a sensor is not used.
6. Follow the sensor manufacturer's instructions for calibrating the sensor.
7. Compatible rain sensors: Irritrol RS500.



## 7. BATTERY INSTALLATION

Rotate the battery compartment cover handle counter clockwise to the “11 o’clock” position to remove the cover (see drawing). Insert one 9-volt alkaline battery onto the terminal clips and slide the battery into the sleeve. Insert the battery into the battery compartment and reinstall the cover. The controller display appears briefly followed by a water droplet on the lower left side of the display. The droplet will flash momentarily and shut off. When the display flashes “12:00” the controller is ready to be programmed.

**IMPORTANT:** To replace the battery compartment cover, insert the battery compartment cover with the handle in the “11 o’clock” position and then rotate the cover 1/4” clockwise to avoid breaking the cover guide pin.



## 8. PROGRAMMING

This section explains the programming features, use of buttons and the steps necessary to assign irrigation schedules. To program the controller use the left button to select the desired programming mode, the right button to make the entry flash and the plus minus buttons to change the value.

**Note:** Only a flashing character can be changed.

**DIG controllers are programmed with the aid of four buttons:**

Use to select the desired programming mode

Use to lower the value of the selected parameter (e.g. deducts an hour)

Use to raise the value of the selected parameter (e.g. adds an hour)

Use to select the parameter to be changed (hour, minute, etc.). To implement the changes, the selected parameter must be flashing.

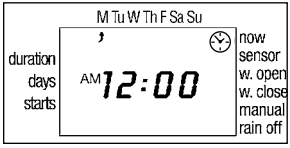
If no changes are implemented, the controller will always revert to the main screen.

## 9. PROGRAMMING CURRENT TIME AND DAY OF THE WEEK

To enable the controller to operate properly, the current time and current day of the week must first be set. Steps below explain how to set the day and time.

Press the → hour digit will flash. Use the + or −, to set the current hour (note: use of AM and PM designations). Press → the minutes digit flash, set the current minute using + or −. Press → A flashing arrow will appear under "M" for "Monday". Use the + or − to move the arrow to current day. Press ↻ to proceed to the next step.

***Note: If the last data entered stops flashing, press the → again to resume programming.***



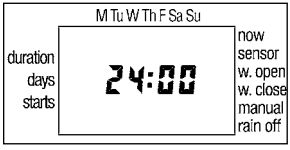

## 10. TIME FORMAT (SWTICHING BETWEEN AM/PM AND 24 HOUR)

The default time format is AM/PM. There is also a 24 hour time format option that can be switched between the two formats.

Press ↻ several times until 🕒 appears.

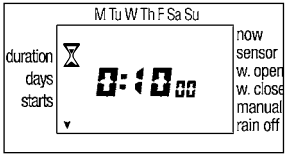
Press → hour digit will flash. Press the + or − simultaneously. The clock reading switches from AM/PM to a 24 hour tiime display or vice versa.

***Note: You can switch the time display format at any step in this section of the programming process.***



## 11. SETTING WATERING TIME (DURATION)

This setting determines the length of time that the valve will remain open. Press ⟲ until ⧗ appears. Press ⊕, the hour/minute digits flash. Set the desired number of hours by pressing ⊕ or ⊖. Press ⊕ again, the minute digits flash. Set the desired number of minutes by pressing ⊕ or ⊖. Repeat the same steps for seconds. Press ⟲ to proceed to the next step.




## 12. PROGRAMMING WATERING SCHEDULE

This setting determines which days the controller will operate. Choose either “A. Watering According to the Days of the Week” or “B. One-time Irrigation or Cyclical Irrigation”.

Press ⟲ until ⧄ appears. Press ⊕. A flashing arrow appears at the top of the display, under Monday. At this stage you can set one of two options:

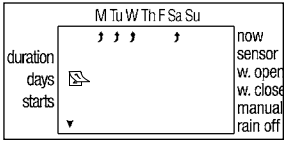
a) Watering according to the days of the week,

b) One time only watering, cyclical watering in minutes, hours or days.

### A. WATERING ACCORDING TO THE DAYS OF THE WEEK.

To select a watering according to the days of the week, move the flashing arrow to the desired day of the week by pressing ⊕. Press the ⊕. The arrow under the selected day stops flashing, and in a few seconds moves one position to the right, and flashes under the next day of the week. You can select additional days of the week in the same manner.

Press ⟲ to proceed to the next step, or to cancel a scheduled watering day: Press ⊕ and move the arrow under the selected day. Press ⊖ under the selected day, the arrow will disappear and the flashing arrow will move one position to the right, and appear at the next day of the week. Cancel additional scheduled irrigation days in the same manner. Press ⟲ to proceed to the next step.

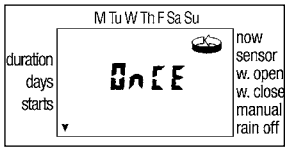


**B. ONE-TIME IRRIGATION OR CYCLICAL IRRIGATION**

This option is used to program the controller to operate the irrigation system one time only, for the irrigation period as set in watering time (durations).

Press ⟲ until 🚿 appears. Press ⊕ several times (for all the days of the week) until 🌧 appears, and **OnCE** flashes on the display.

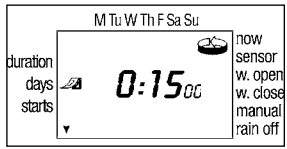
***Note: In cyclical mode only 1 start time per day is available.***




**CYCLICAL IRRIGATION**

This option is used to program the controller to operate the system in a cyclical manner. Once every 1 minute up to 5 minutes, every 5 minutes up to 15 minues, every 15 minutes up to 1 hour, every 1 hour up to 24 hours, and every day up to 30 days.

Press ⟲ until 🚿 appears. Press ⊕ several times (to advance all the days of the week) until 🌧 appears, and **OnCE** flashes on the display. With the display flashing, press ⊕ or ⊖ . The number of minutes, hours or days between watering cycles appears on the display. For example if “every 15 minutes” is selected, your programmed watering duration will activate every 15 minutes during a 24-hour period. (see #19 for irrigation window). For example, if “every 30 days” appears, watering will take place once every thirty days, for the irrigation period as set in duration. To change the number of days press ⊕ or ⊖. Press ⟲ to proceed to the next step.

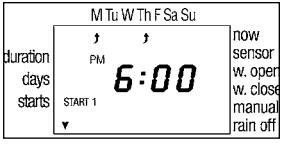


## 13. SETTING A START TIME

In this step, up to 4 separate irrigation start times can be programmed in the weekly mode (watering according to the days of the week).

Press ⟲ until START I appears. The word OFF (or the last start time entered) appears. Press → the word OFF flashes. Press ⊕ or ⊖ to set the desired start time hour (note AM and PM). Press → the minute will flash. Press ⊕ or ⊖ to set the desired start time minute. Press ⟲ to set START II and repeat the same steps for start times number 2, 3 and 4 as needed.

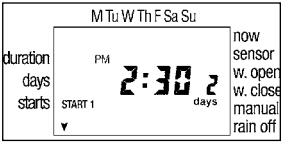
**To cancel one of the start times select it by pressing ⟲. Press → the hour digit will flash. Press the ⊕ or ⊖ until the word OFF appears.**




## 14. SETTING A CYCLICAL OR ONCE START TIME (WITH OPTION TO DELAY VALVE START TIME)

This program is used to pre-set the valve start time (only one start time available) and the number of days to delay the valve start time, the number of day(s) to delay option will appear on the display to the right of the irrigation start time above the word “days”.

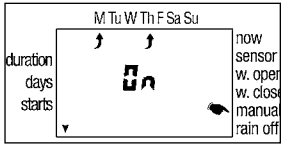
In this feature 0 days = program starts today; where 1 = program starts tomorrow, etc. (up to 30 days delay).



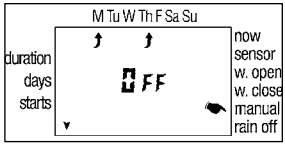

Press ⟲ until START I appears or the last opening time entered appears on the display. Press →. The hours and the AM/PM digits flash. Set the desired opening hour by pressing the ⊕ or ⊖ (note: AM and PM designations appear to the left of the hour digits). Press →. The minute digits flash. Repeat the same step for setting the minutes and then the number of days to delay between watering cycles. Start time must be later than the current time in order for the cycle to start today (day = 0).

## 15. MANUAL OPERATION

This option operates the valve for the defined irrigation period. The valve will automatically close at the end of the irrigation period. Note that the originally programmed irrigation schedule continues to function at the times set.




Press ⟲ until 🔧 appears. Press ⊕ to open the valve. The word ON is displayed and a water droplet appears on the lower left side of the display.



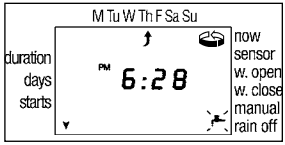

To close the valve manually before the end of the manual cycle press ⟲ until ON appears again. Press ⊖ to close the valve.

## 16. RAIN OFF (SHUTDOWN)

This option is used to temporarily suspend the controller operation. The irrigation schedule remains stored in the controller memory, but is not implemented until the suspension is canceled. The suspension option disables the valve.

In the “now” mode, press and hold ⊖ until the rain off icon appears in the lower right corner of the display. To resume automatic operation, repeat the process – the icon will disappear.

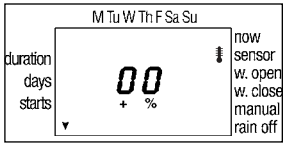
RAIN OFF can be used while a valve has been activated.



## 17. BUDGET

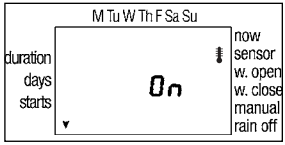
You can extend or shorten the time durations by specifying a percentage increase or decrease.

Press ⟲ until ⏲ appears, wait until no digit is flashing. Press ⊕ and ⊖ simultaneously. 00+% is displayed. Press ⊕, the 00 flashes. Press ⊕ and ⊖ to increase or decrease the percentage as necessary (in 10% increments from –90% to +90%). +% or –% is displayed on now ⏲ screen when a budget choice is entered.



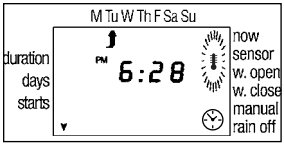

## 18. SENSOR OPERATION

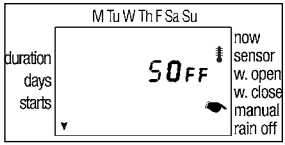
1. Press ⟲ until ⫴ appears next to SENSOR.
2. Press ⊕ to activate the sensor in the irrigation program selected.




* With the sensor circuit closed (i.e., the sensor detects the existence of a defined program lockout condition) the ⫴ symbol flashes on the display. In this situation, irrigation will not take place through the valve.

3. Press ⊖ to disable the sensor. The word “OFF” appears on the display.



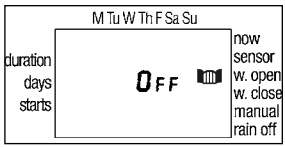
## 19. IRRIGATION WINDOW IN THE CYCLICAL PROGRAM MODE

The irrigation window is an advanced feature which enables cyclical irrigation program operations (see Section B) to take place only during a defined part of the day (window). The irrigation window is defined as a part of a day (up to 23 hours), in the cyclical irrigation mode only.

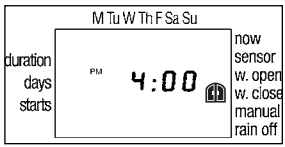
This function is useful when irrigation is only required during the hot hours of the day. For example, open window 9 am, closed window 4 pm.

Make sure that appears on the display.

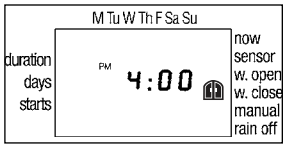
1. Press until appears on the display next to W.OPEN, with the word OFF or last OPEN WINDOW time setting displayed.




2. Press . The word OFF flashes on the display.
3. Press and to set the desired OPEN WINDOW time (pay attention to the AM/PM designation).



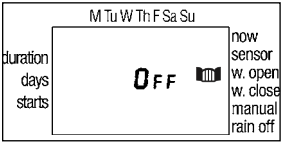

4. Press until appears on the display next to W. CLOSE, with the 12 am or the last close window time setting displayed.
5. Press . The 12 am flashes on the display.




6. Press and to set the desired CLOSE WINDOW time (pay attention to the AM/PM designation).
7. Irrigation will not occur until the next window opens.

**To disable the irrigation window function**

1. Press ⊕ until 🚿 appears next to OPEN WINDOW, with the last OPEN WINDOW time setting displayed.
2. Press ↻. The irrigation window open time flashes on the display.
3. Press ⊖ until OFF appears next to 🚿.




**VALVE IN OPERATION**

A 💧 icon will appear. If the 💧 flashes, the valve has not opened, the possibilities are:

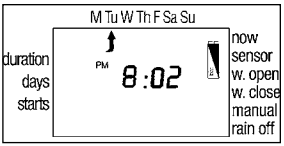
- Valve is in "short mode". The 💧 icon will flash once every 1/2 second (120 times every minute).

## 20. FLASHING LOW BATTERY WARNING

A flashing battery icon appears on the display when the batteries are weak. In this state, a limited amount of energy still remains in the batteries for valve operation, and they should be promptly replaced.

Press any button after replacing the batteries to resume irrigation controller activity.

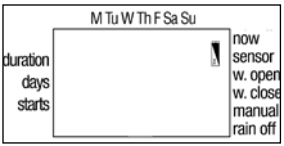
Program data will be retained for approximately 20 seconds during battery changing.




## 21. CONSTANT LOW BATTERY WARNING

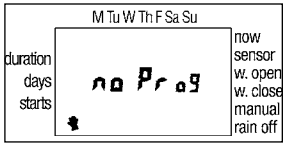
When weakened batteries are not replaced in a timely manner, the battery icon appears constantly. All other display elements disappear and all valves are closed.

Replace batteries promptly, then press any button to resume irrigation controller activity. Program data will be retained for approximately 20 seconds during battery changing.



## 22. NO PROGRAM

During “manual” irrigation system operation via the irrigation controller, “no prog” appears on the display, meaning that no irrigation period has been set for the valve. In this case, the irrigation controller “does not know” when to close the valve. In this situation valve opening is disabled.




## 23. MAINTENANCE, TROUBLESHOOTING AND REPAIRS

- Batteries should be removed if the irrigation controller will not be operated for a prolonged period.
- Under normal usage, batteries (alkaline) will last for a minimum of 1 year to a maximum of 2 years.
- It is good operating practice to replace old batteries with new ones at the start of the irrigation season.
- In-line valve recommended operating water pressure range: 10-80 PSI.
- In-line valve operating pressure range: 10-150 PSI.
- Actuator recommended operating water pressure range: 25-90 PSI.

**PROBLEM:** In-line valve does not open during automatic operation or during “manual” operation via irrigation controller
CAUSE: Weak battery
SOLUTION: Replace battery

**PROBLEM:** No display
CAUSE: Weak battery
SOLUTION: Replace battery

**PROBLEM:** Valve does not close despite solenoid activation
CAUSE: Valve is installed backwards
SOLUTION: Reverse valve

**PROBLEM:** In-line valve does not close despite solenoid activation
CAUSE: Outlet flow may be too low
SOLUTION: Increased flow rate by adding drip emitters or micro sprinkler
CAUSE: Solenoid orifice or adapter inlet if used is blocked
SOLUTION: Flush and clear port

**PROBLEM:** In-line valve does not fully close
CAUSE: Debris stuck in diaphragm
SOLUTION: Remove bonnet and diaphragm and clean diaphragm

**PROBLEM:** Actuator does not fully close
CAUSE: The actuator widely open
SOLUTION: Adjust flow rates by turning the actuator body slowly clockwise 1/4 turn at a time until valve closes

## 24. WARRANTY

DIG CORPORATION warrants these products to be free from defects in material and workmanship for a period of three years from date of purchase. This warranty does not cover damage resulting from accident, misuse, neglect, modification, improper installation or subjection to line pressure in excess of 150 lbs per square inch for inline valves and 90 PSI for actuators. This warranty shall extend only to the original purchaser of the product for use by the purchaser. This warranty shall not cover batteries or any malfunction of the product due to battery failure.

The obligation of DIG CORPORATION under this warranty is limited to repairing or replacing at its factory this product which shall be returned to the factory within three years after the original purchase and which on examination is found to contain defects in material and workmanship. DIG CORPORATION SHALL IN NO EVENT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND; THE SOLE OBLIGATION OF DIG BEING LIMITED TO REPAIR OR REPLACEMENT OF DEFECTIVE PRODUCTS. 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.

Unattended use for prolonged periods without inspection to verify proper operation is beyond the intended use of this product, and any damage resulting from such use shall not be the responsibility of DIG CORPORATION. There are no warranties, which extend beyond the description on the face hereof. In the case of purchase of the product for use other than, for irrigation purposes, DIG CORPORATION hereby disclaims any implied warranties including any warranties of merchantability and fitness for a particular purpose. In the case of the purchase of the product for personal, family or household purposes, DIG CORPORATION disclaims any such warranties to the extent permitted by law. To the extent that any such disclaimer or implied warranties shall be ineffectual, then any implied warranties shall be limited in duration to a period of three years from the date of the original purchase for use by the purchaser. Some states do not allow limitation on how long an implied warranty lasts, so the above limitation may not apply to you.

In order to obtain performance under this warranty, the unit must be returned to the factory, along with proof of purchase indicating original date of purchase, shipping prepaid, addressed as follows:

DIG CORPORATION, 1210 Activity Drive, Vista, CA 92081. Repaired or replaced units will be shipped prepaid to the name and address supplied with the unit returned under warranty. Allow four weeks for repairs and shipping time. Repair of damaged units not otherwise within warranty may be refused or done at a reasonable cost or charge at the option of DIG CORPORATION.

This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

## 25. TECHNICAL ASSISTANCE

Should you encounter any problem(s) with this product or if you do not understand its many features, please refer to this instruction manual first. If further assistance is required, DIG offers the following customer support:

TECHNICAL SERVICE USA

- DIG's Technical Service Team is available to answer questions in English and Spanish from 8:00 AM to 5:00 PM (PST) Monday-Friday (except holidays) at 800-322-9146.
- Questions in English and Spanish can be e-mailed to questions@digcorp.com or faxed to 760-727-0282.
- Specification documents and manuals are available for downloading in English and Spanish at www.digcorp.com.

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