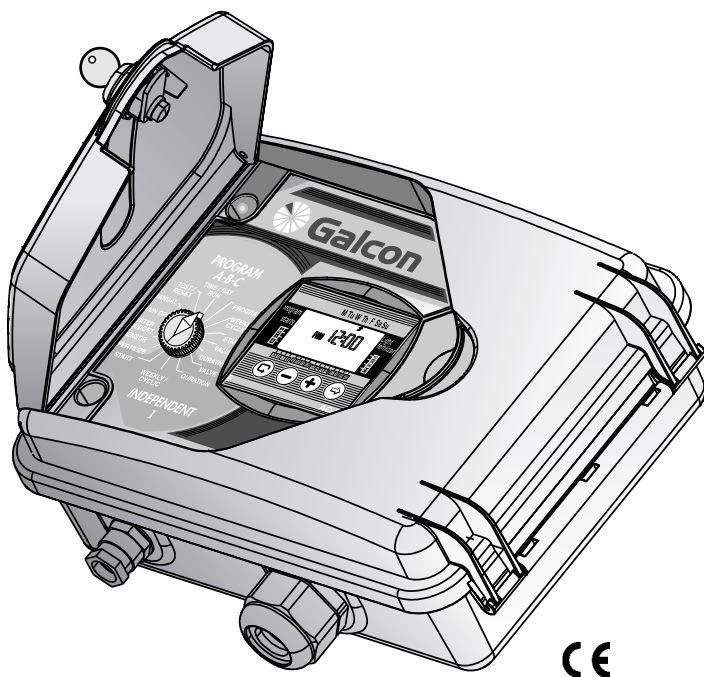# Electrically Operated Advanced Computerized Irrigation Controller

Installation and Operating Manual

Controller Model 800248 - Operating 1 to 24 valves + Main Valve or Pump

Controller Model 800244 - Operating 1 to 4 valves + Main Valve or Pump

- Controls the operation of 1 to 24 valves + main valve or pump
- Operates 24VAC electric valves
- Sensor input
- Weekly or cyclic irrigation programming for a group of valves
- Independent weekly or cyclic irrigation programming for individual valves
- Fertilization programming of individual valves
- Programming for garden lighting system
- Water budget: optional percentage modification of irrigation duration
- Irrigation duration from 1 minute up to 9 hours
- Irrigation cycle from once daily to once every 30 days
- Computerized manual operation of individual valves or valve groups
- Detection of short circuits. Circuit breaker identifies and overrides a short in a valve, with visual warning
- Memory backup of program for 20 years (batteries unnecessary)
- Clock backup with 9V battery (not included)
- Galcon's warranty and service

☞ **CONTENTS**   ❋**Galcon**

Maintenance

1. Adjusting the Irrigation Controller to the Valves

The irrigation controller is designed to operate standard electrical valves of up to 24VAC 2.2 W. The valves are not supplied with the controller.

1. Close the main water valve.

2. Install valves in the irrigation system.

> ⚠ **ATTENTION !**
> Direct water flow according to the water direction symbol on the valve.

A main electrical valve can be installed at the entrance to the irrigation system. The main valve will opened automatically when any valve is opened, and will close automatically with the closing of the last valve.
The main valve is shown on the display panel and on the terminal block by the letter M.
There is no need to program the main valve.

2. Mechanical Manual Operation

The irrigation valves may be opened/closed unrelated to the operation of the controller. This mode is useful when irrigation is necessary immediately, and there is no time for operating the controller.
The manual operating handle is located under the solenoid.

1. To open the valve turn the handle counter-clockwise ②

2. To close the valve turn the handle clockwise ①

* When the electricity is turned on the valve cannot be closed manually.

* To operate a valve with the controller, the manually operated handle must be in a auto position ①.
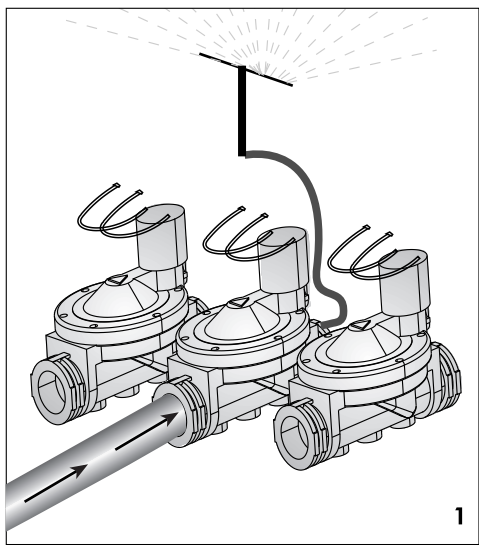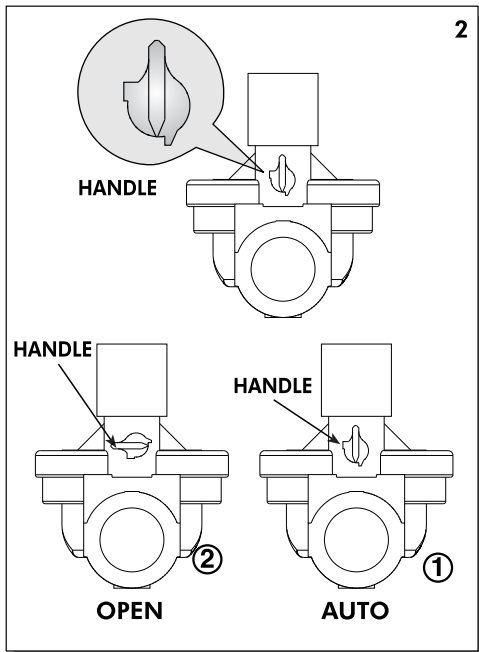
> ⚠ **ATTENTION !**
> If there is a main manual valve, it should be opened manually.

1

2

HANDLE

HANDLE

HANDLE

② OPEN   ① AUTO

⚠ **ATTENTION !**
It is recommended to position the controller in an accessible place and at eye-level

- Open the controller door with the attached key ①.
- To get to the connector board, release the lock screws on the left side of the controller beneath the main cover ② and open the panel ③.

① - controller door & key
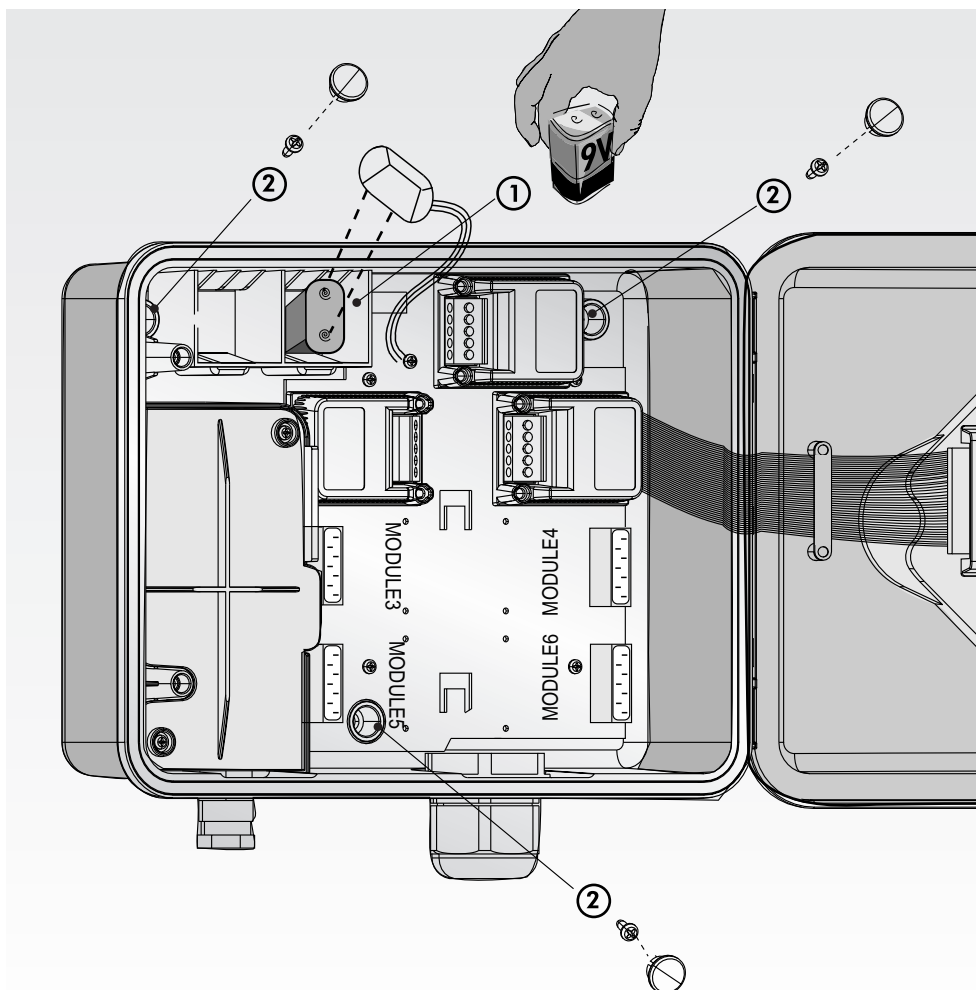② - lock screws
③ - panel
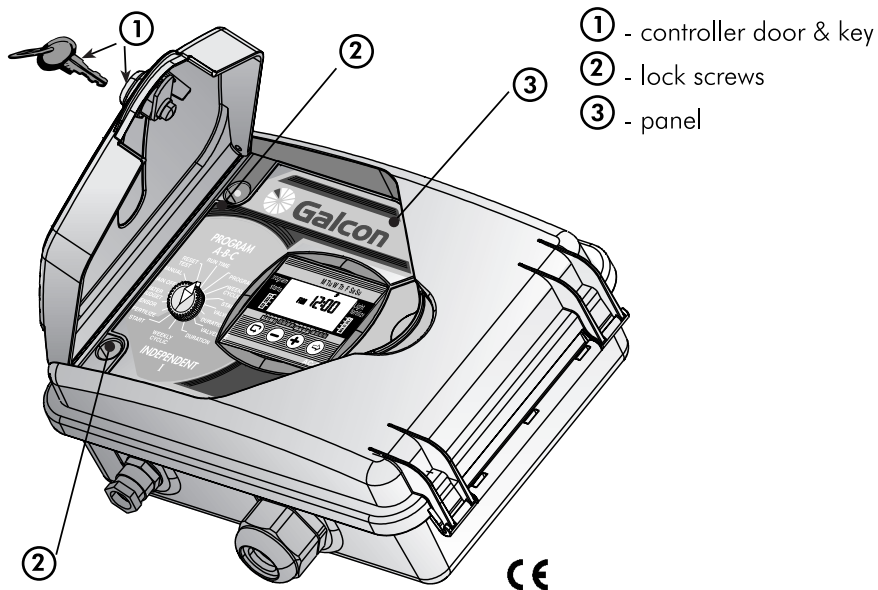
1. Controller Installation

Install the controller on the wall or in a controller cabinet by mounting it with three screws at the designated holes ②. Use the included plugs to cover these screws.

Place a 9V battery in the appropriate place ①.

2. Adding or Replacing 4 Valve Module
Attention: Modules may be added or replaced only in the AC-800248 Model

In order to add or replace a 4 valve module the following procedures must be performed:

1. Turn selector to Testing mode.
2. Disconnect the AC-24V wire.
3. Wait one minute.
4. Remove battery.
5. With a "cross-head" screwdriver, open screws on front of module.
6. Add or replace module by pushing it in or pulling it out.

7. Fasten screws at front of module.
8. Replace battery in position.
9. Reconnect the AC-24V wire.
• The number of valves the controller will now operate will appear on the LCD display.
• The current time must be set.

☞ *THE PROGRAMS INSTALLED IN THE CONTROLLER WILL BE STORED WHEN DISCONNECTED FROM ELECTRICITY (20 YEARS MEMORY!)*

① - module
② - screws
③ - connector
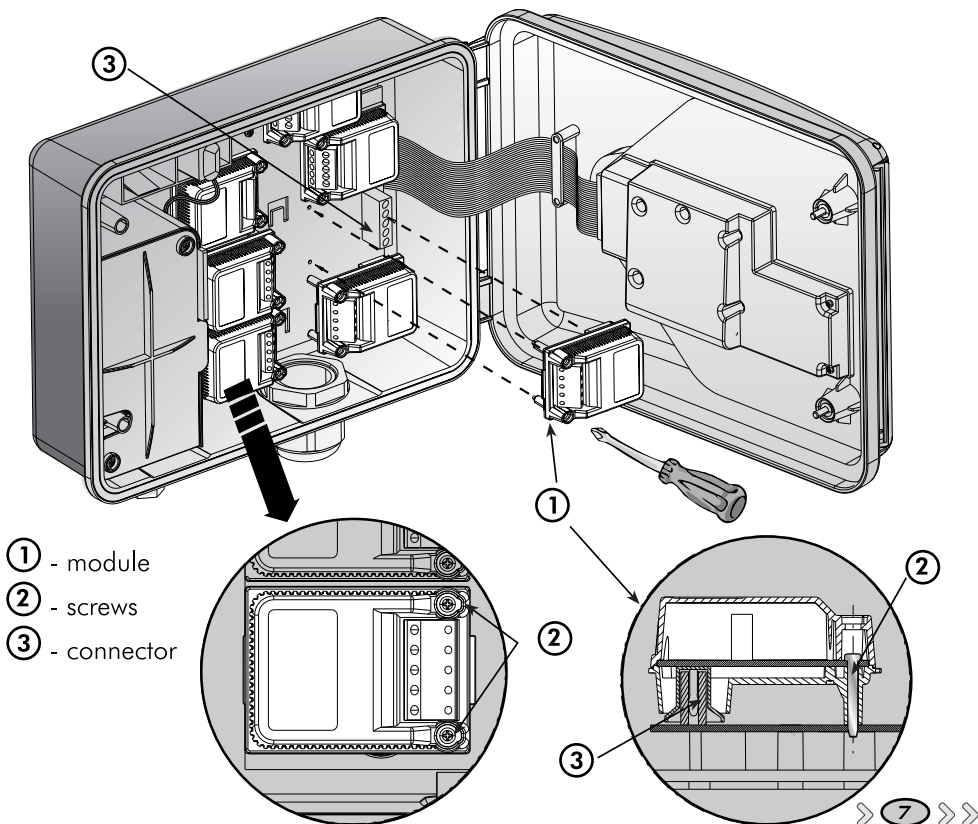
3. Connecting Solenoid Wires

General

Two wires, identical in color and polarity, are connected to each solenoid. One wire (either one) must connect to the desired valve in module. The second wire must be connected to point COM in module. The distance between the controller and the valves is usually longer than the solenoid wires. An extension cable may be used.

Extension wire information

· *The extension cable transmits only 24 volt.*
· *The cable must have at least two wires more then the number of required valves, One for "Master valve" and one for "Common".*
· *To facilitate wiring it is recommended to use different colored wires.*
· *Minimum diameter of the cable must be 0.5 mm., if the valves are at a distance of more then 100 meter from the controller, a bigger diameter will be needed. Please consult with your distributor.*
· *The cable must be installed properly on the wall with nail clips or underground in a protective pipe.*
· *If cable joins are requires, use protective connection box.*
· *Connection of the extension cable to the valves must be in a protective box. (Not included). It is recommended to have more connection points in the box then number of valves.*

24AC S G

VM
VF
com
VL
com

V1
V2
com
V3
V4

4
3
2
1
M
F

RELAY
L

COM   COM
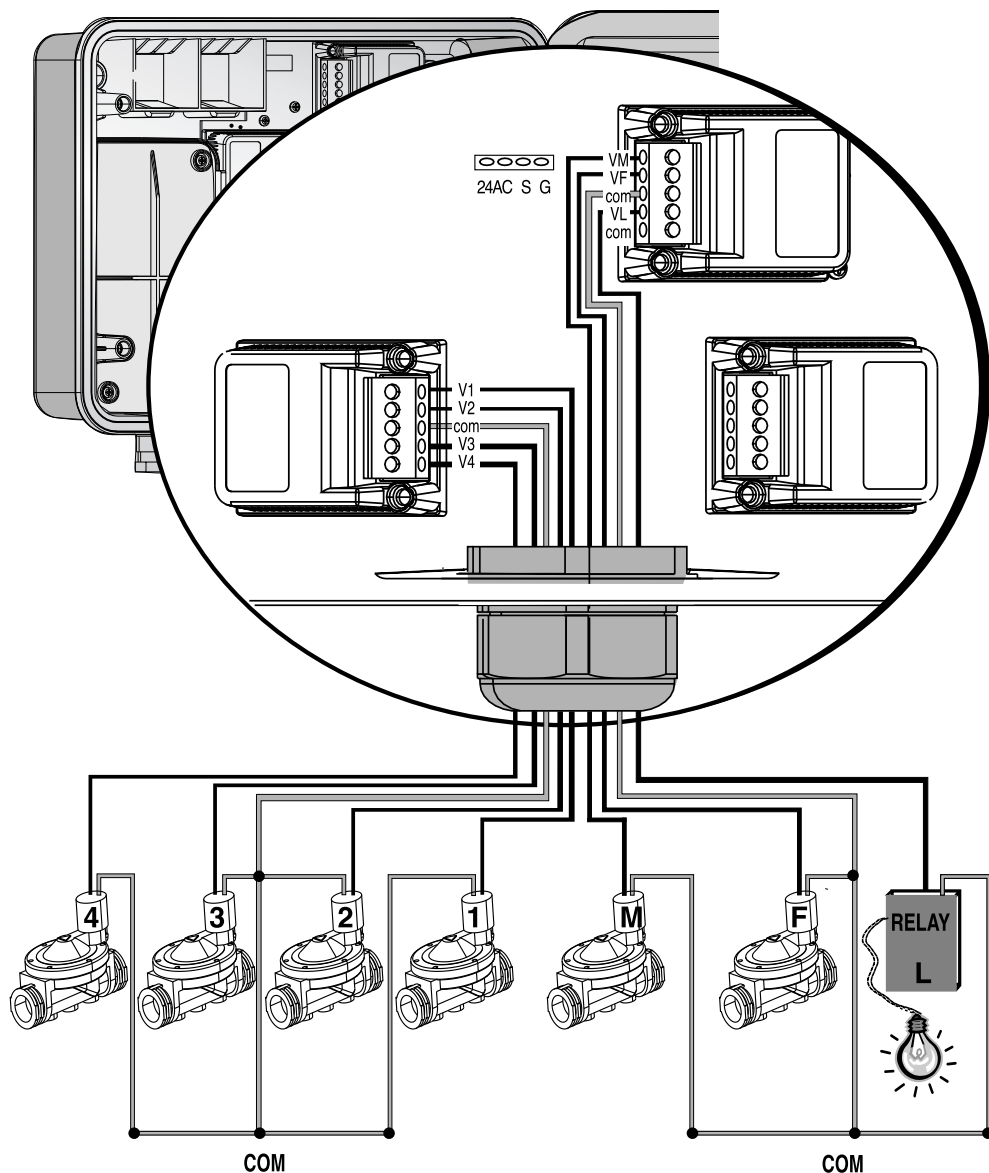
Connecting Extension cable

1. Open the controller panel by opening lock screws at the left side of the controller. (See diagram)
2. Insert the cable through the large cable protector ④.
   Connect the wires to the terminal block. Every module has a "com" connection point.
   Note the colors and positions of the connecting wires for your reference.
3. Connect the free end of the cable to the connection box adjacent to the valves,
   according to the color and number key you marked down previously.
4. Connect the valves to the connection box.

① - Connection box
② - Extension cable
③ - Valves
④ - Cable protector
⑤ - Cable tie
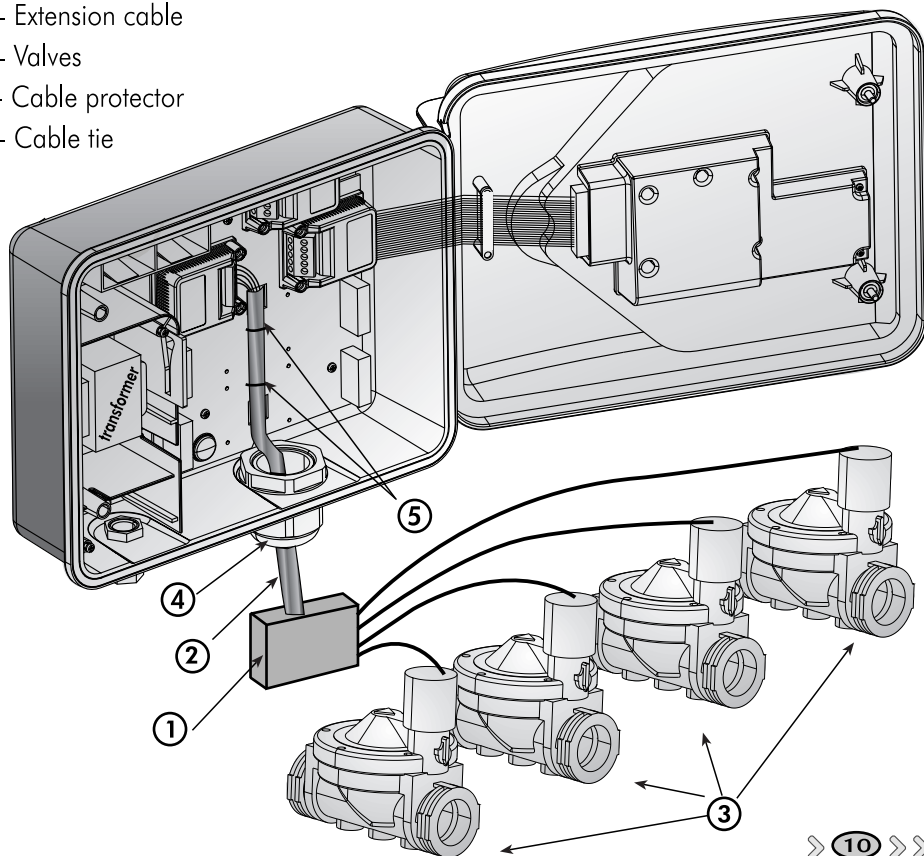
4. Connecting the Controller to AC voltage Source

If using an internal transformer, minimal wire diameter must be 0.7 mm. Check with standard measuring equipment that there is no voltage in the electric circuit. Thread the electric cables through the small cable protector at the left, connect the two transformer wires to the circuit by using the standard connector (included).
Affix the connector to the pin positioned on the bottom of the transformer box.

Transformer cover

Standard connector

1
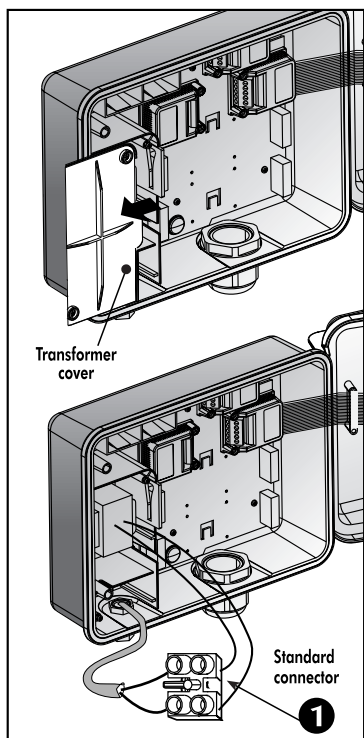
WARNING!

USE ONLY THE INCLUDED TRANSFORMER, OR A CE APPROVED TRANSFORMER, WITH 230 VAC, 50 Hz , AND 24 VAC VOLTAGE OUTLET, 830 mA. ADDITIONALLY, THE TRANSFORMER MUST BE OF THE SELV CATEGORY AND MEET THE IEC 61558 OR 700 VDEO STANDARDS. ANY CONNECTION MADE BETWEEN THE IRRIGATION CONTROLLER TO A POWER SOURCE OR ANY OTHER ELECTRICAL APPARATUS OTHER THAN IRRIGATION VALVES MUST BE INSTALLED BY A LICENSED ELECTRICIAN.

Connect the transformer cover with the two screws.

Notice!

It is necessary to connect a two-polar switch between the 110VAC/220VAC electrical supply to the controller.

The 110 VAC/220 VAC supply point, the circuit and connection to the transformer must be performed according to "Field Electrical Regulations" by a licensed electrician who is accredited with a license according to the Electrical Bill and security requirements.
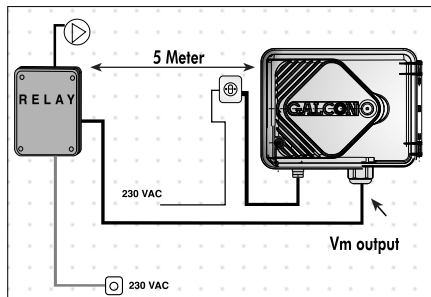
⚠ ATTENTION!

Do not connect the controller to a voltage point used for other electrical equipment.

If the controller is connected to relay station of any kind it must be distanced by a minimum of 5 meters.

RELAY

5 Meter

GALCON

230 VAC

Vm output

230 VAC

5. Sensor Connection (Optional)

Connect the wires of the sensor to the top terminal block, marked SNSR (G + S). The polarity of the connections is unimportant.
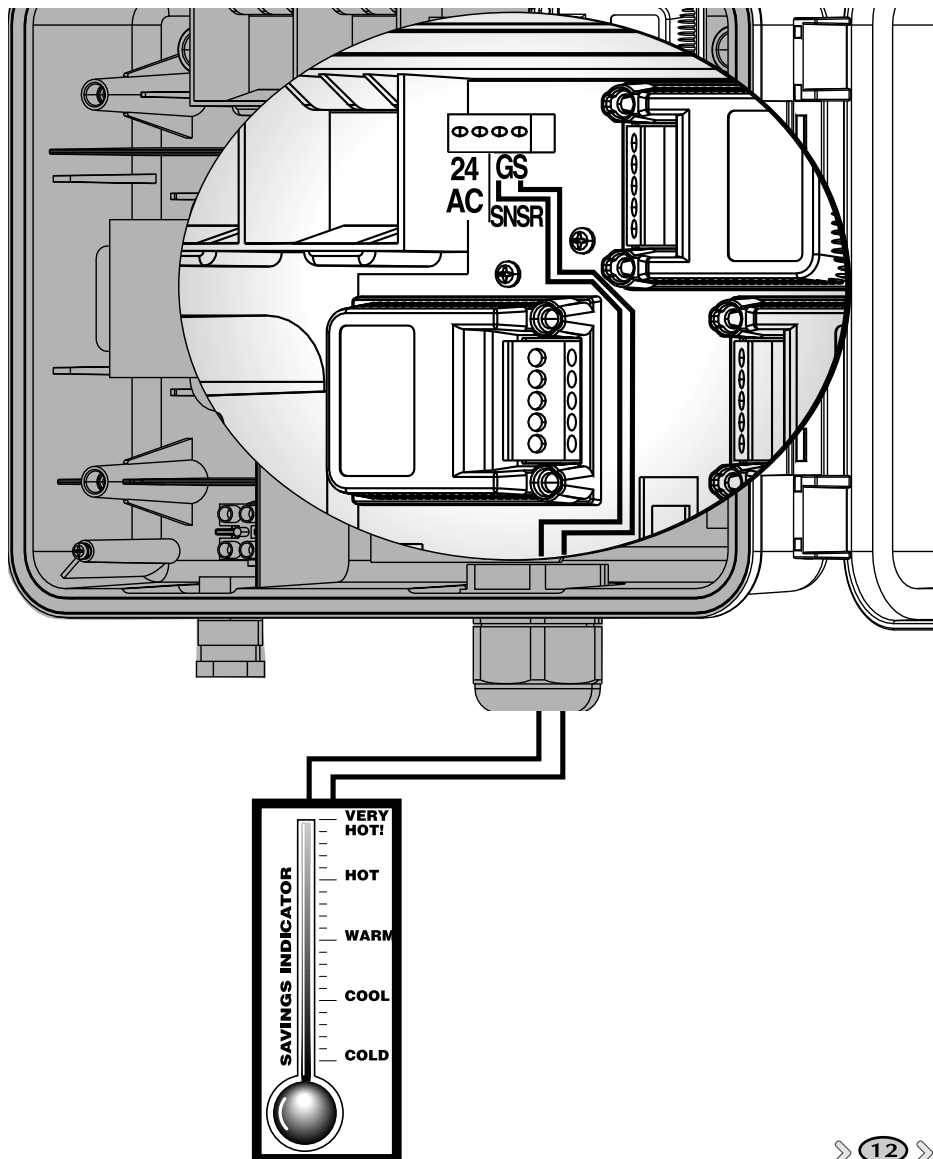
1. General Information

The AC-24 controller has two types of irrigation programming:
• Valve Group irrigation programming
• Independent valve irrigation programming
Other options
• Garden lighting
• Fertilization programming for each valve

Irrigation Programming for Valve Group:

Three programs (A,B,C) can be programmed.
For each separate program, irrigation days must be selected for all of the valves connected to the program group. A starting time is set for the first valve only, and duration of irrigation for each separate valve. The valves will open sequentially, according to the sequential number marked on the display - when the first valve closes the second will open, and so forth. Only one valve will be open at a time. If the programs A, B, and C have been programmed to overlap in irrigation time, Program A will open first, and only after the program has ended will Program B begin, and, finally, Program C.

Independent Program I

In this program the irrigation schedule is defined for each individual valve. First select the valve and then program: setting irrigation duration, days of irrigation, or irrigation cycle, and starting time for the designated valve.

General Information

To program the controller use the 16-position selector and 4 buttons.

⊙ Press Button to move between the fields in different positions of the selector.

⇨ Press Button to select the data to be modified (e.g. hour, minute, etc.).

⊕ Press Button to increase the value of the selected data (e.g. adding an hour)

⊖ Press Button to decrease the value of the selected data (e.g. decreasing an hour)
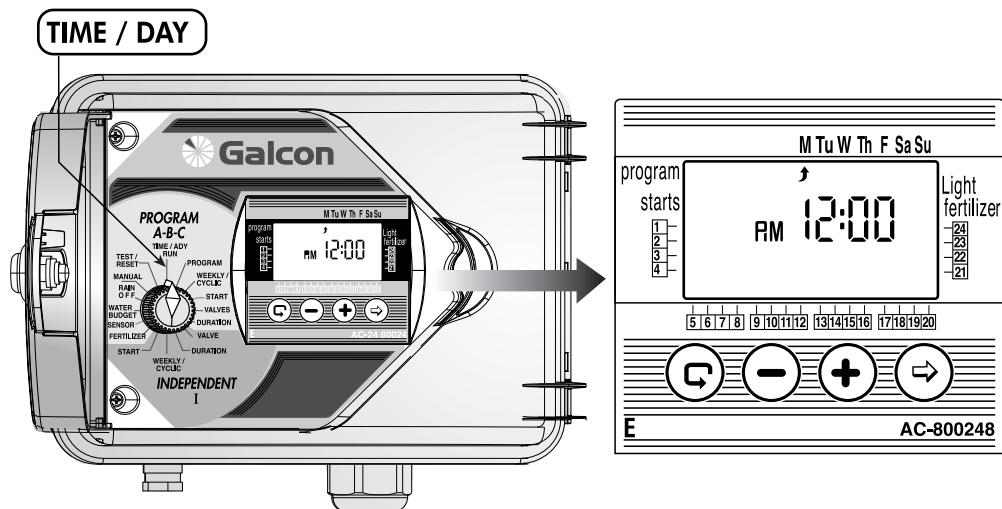
TIME / DAY

2. Setting the Current Time and Day of the Week

In order for the irrigation controller to operate the irrigation system at the desired times, the current time and current date must first be set.

• Set the selector to TIME/DAY position, press on ⮫. The hour digits will blink. Set the current time using the ⊕ and ⊖ as necessary. (Note the AM and PM designations).
• Press on ⮫.The minute digits will now blink. Set the current minute timing by using the ⊕ and ⊖ as necessary.
• Press on ⮫. A blinking arrow will appear at the top of the display panel. Position the arrow in line with the current day by using the ⊕ and ⊖ as necessary.
• It is possible to alternate to a 24 hour (European) time format by pressing simultaneously on ⊕ and ⊖ while blinking. An additional pressing on these buttons will switch the format back to the AM/PM format.
• After this programming, with the selector at the TIME/DAY mode, if there is an operating valve, a drop ⬦ will appear on the screen in line with the open valve, along with remaining irrigation time. (count down)

As stated, the controller allows for two types of valve programming:

1. Programs A, B, and C - programming designated for a group of valves.
2. Independent Program I - separate programming for each individual valve independently. For this program, turn to page 21.
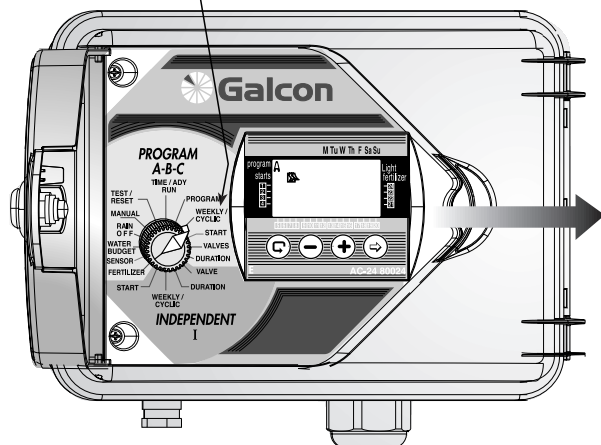
PROGRAM
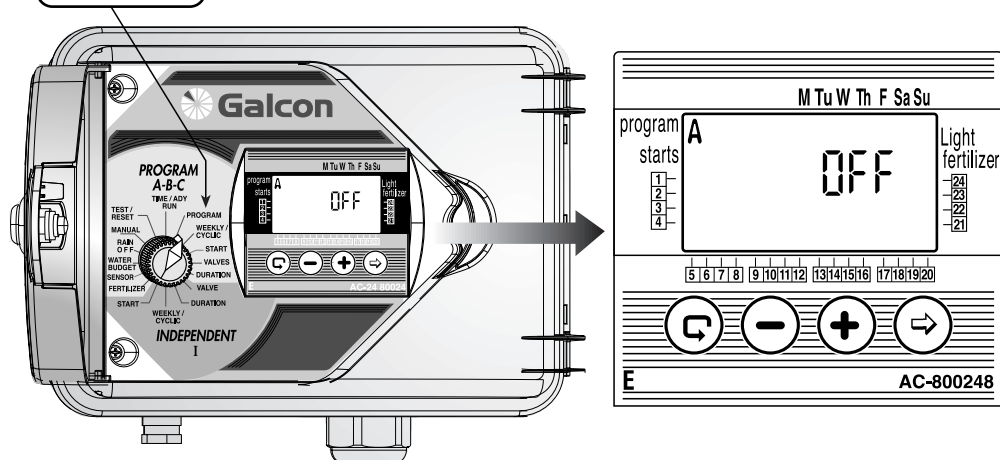
Controller Programming for a Valve Group (A,B, and C)

- To select Program A, or B, or C, or to select a Lighting Program (for the lighting program see page 28), turn selector to the **PROGRAM** mode.
- One of the three programs will appear on the display panel - press on ↻ until the desired program appears, for example A. (The ☼ symbol for the lighting program will appear, see page 28).
- In order to select the program press on ➡. The word OFF will begin to blink. Press the ⊕ ON blink. Program A has been selected.
- By pressing the ⊖ the program will be closed (OFF). The program is no longer operating.
- **Note**: at this stage continue with weekly/cyclic programming (Pages 16/18).

WEEKLY/CYCLIC

M Tu W Th F Sa Su

program starts A

Light fertilizer

1 2 3 4

24 23 22 21

5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

E   AC-800248
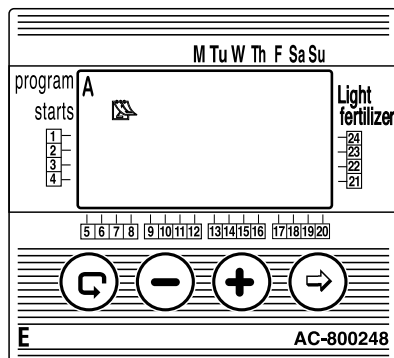
1.Weekly Programming 🗒

• In this operation the days of the week for irrigation will be set for valves connected to the designated program.
• Turn the selector to the **WEEKLY/CYCLIC** mode (Programs A, B, and C).
• Press on ↻ and select weekly programming 🗒.
• Press on ⇨. At the top of the display panel a blinking arrow ⬆ will appear under Monday. If you select Monday as an irrigation day press ＋. The arrow under Monday will remain set and stop blinking while the arrow under Tuesday will begin to blink. If you do not select Monday as an irrigation day press ➖. The arrow will disappear and an arrow under Tuesday will begin blinking, and so forth.

START

M Tu W Th F Sa Su

program
starts
1
2
3
4

A
I

OFF

Light
fertilizer
24
23
22
21

5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

E   AC-800248
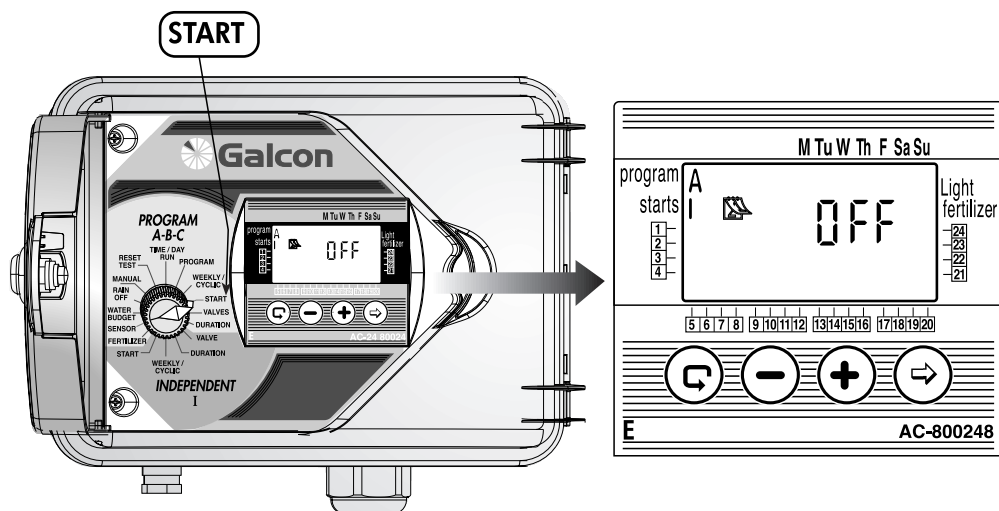
Programming Start Times for Weekly Irrigation
In this operation up to four daily starting times may be set for all of the programs (A, B and C). Each start time operates firstly the designated main valve for the program and sequentially the remaining valves will open.

• Set selector to **START** mode (A, B or C programs). The Display will show: **STARTS I**
Weekly Program symbol ☂ and OFF or the last programmed start time.
• Press on ➡.The start time will blink.
• Press ➕ or ➖ to set the desired start time. (Pay attention to AM and PM settings). If desired, repeat steps for **START** II, III , IV. To cancel a particular start time, designate with ⟳ and press ➡. Time will blink. Press on ➕ or ➖ until OFF appears on display panel.
• For additional programs select new program (e.g. B), then repeat the above steps. To continue programming see page 19 - Valve Selection.

2. Cyclic Irrigation Programming 🔄

The controller is programmed to operate the selected program at set cyclic times. The cycle can be set from one day up to 30 days. The cyclic time will be identical for all of the valves attributed to the selected program.

Cycle Time Selection
- Turn selector to **WEEKLY / CYCLIC** mode (in Programs A, B and C)
- Press on ⊖ until 🔄 symbol and **DAYS 1** appear (Irrigation cycle of 1 day).
- Press on ➡. **DAYS 1** blinks.
- Set cycle time using ⊕ or ⊖ as necessary up to DAYS 30.

Starting Irrigation Cycle for Cyclic Programming 🔄
In this operation the time and day for starting cyclic irrigation of the first valve is set (in cyclic programming there is only one start time). All of the valves attributed to the designated program will open in sequential order. As the first valve closes, the second will open and so forth.
The number of days preceding the start of the program must be set. **0 DAYS** - irrigation will start as of that day, **1 DAYS** - irrigation will start the following day and so forth. Days preceding start of cycle irrigation may be up to 14 days.   .
- Turn selector to **START** mode (Programs A, B and C). **STARTS I**, and the last displayed starting time or OFF will appear on display panel.
- Press on ➡. Hour digits will blink. Set the desired starting time using the ⊕ and ⊖ as necessary.
- Press on ➡. Minute digits will blink. Set the desired minutes for the starting time using the ⊕ and ⊖ as necessary.
- Press on ➡ until the number **1** and the word **DAYS** appear on display panel. Set number of days preceding start of cycle with ⊕ or ⊖ as necessary.
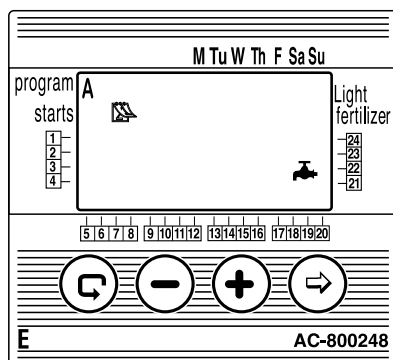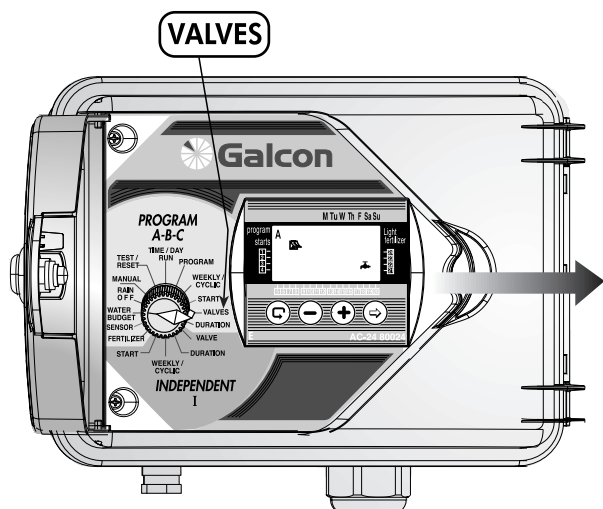
VALVES

3. Selecting valve/valves for a valve group (A, B or C)

In this operation choose which valves are to be attributed to the selected program.
One to 24 valves may be selected for a particular program.

> ⚠ **ATTENTION!**
> Each individual valve may be allocated
> to only one of the 4 programs (A, B, C, Ⅰ)

- Set selector to **VALVES** (Programs A, B, C). The display will show: the selected program, valve 🚰, and ☐ next to valves previously selected.
- Press on ⇨. First available valve ☐ will blink.
- Press on ⊕ to select valve. Selected valve symbol ☐ will stop blinking. Sequential valve will begin blinking, and so forth.
- In order not to select valve press ⊖. Valve will disappear. Sequential valve will begin to blink, and so forth.
- Press ⟳ in order to view all the valves available for this program.

> *The selector should be returned to the TIME/DAY mode*
> *following modification or ending of the program.*

19
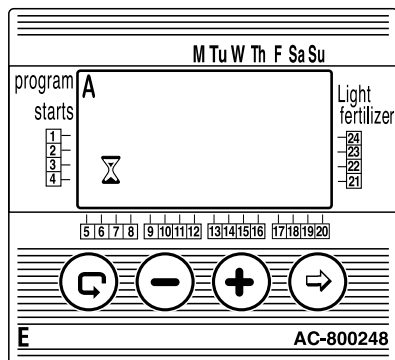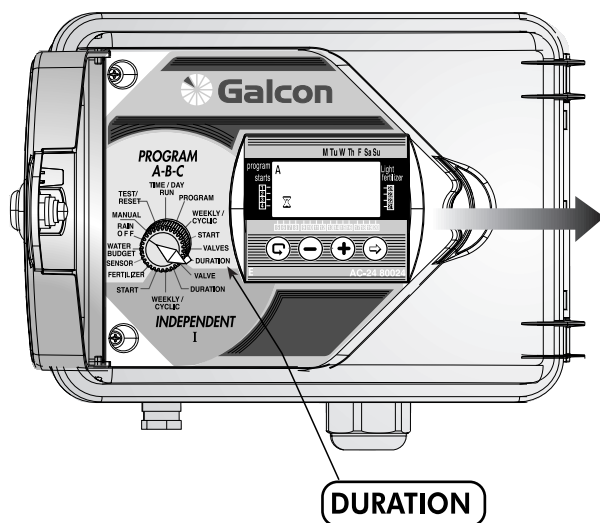
DURATION

4. Setting Irrigation Duration ⧗ for each Valve

The irrigation duration for each valve may be programmed for 1 minute and up to 9 hours (8:59).

- Set selector to **DURATION** mode (in Program A-B-C).
- On the display panel the symbol of the current program will appear, along with the type of program (weekly/cyclic), duration symbol ⧗ and valve symbol ☐ in line with the valve you have designated.
- Press on ⇨. The hour digits will blink. Using ⊕ and ⊖ as necessary set the number of desired hours.
- Press on ⇨. The minute digits will blink. Using ⊕ and ⊖ as necessary, set the number of minutes desired.
- Press on ↻ to advance the arrow to the next valve.

> ⚠ **ATTENTION!**
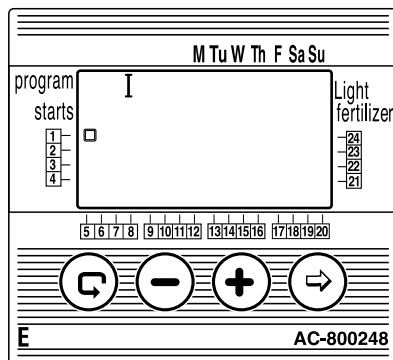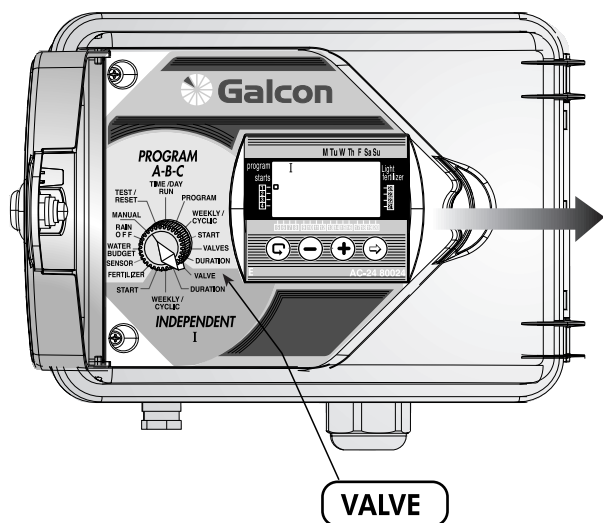> Irrigation duration set at 0:00 will not be opened.

The selector should be returned to the TIME/DAY mode following modification or ending of the program.

VALVE

Controller Programming for Individual Valve - Independent Program I

First select the desired valve and then continue programming the irrigation as follows:

1. Valve selecting (Independent Program I)

• Turn selector to **VALVE** mode (in Independent Program I). Symbol I and symbol of first available valve ☐ will appear on display panel. (It is possible to select any valve that has not been pre-designated for another program).
• Press on ⟲ several times until the symbol ☐ of the desired valve appears.
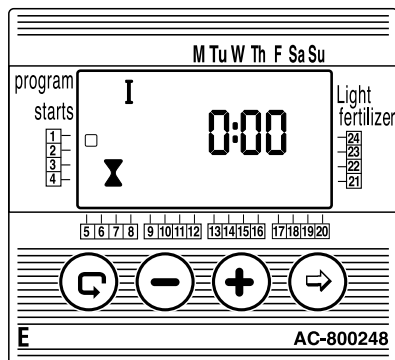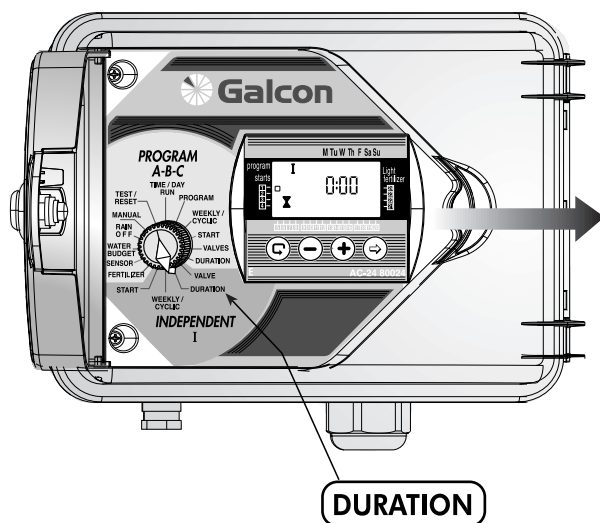• Turn selector to irrigation duration.

DURATION

2. Setting Irrigation Duration ⧗ (Independent Program I)

It is possible to program irrigation duration for each valve from one minute up to 9 hours (8:59).

- Turn selector to **DURATION** mode (in Independent I program).
- The display will show: symbol I, ⧗ duration, ☐ valve - in line with the selected valve, and hour digits.
- Press on ⇨. The hour digits will blink. Using ⊕ and ⊖ as necessary set the number of desired hours.
- Press on ⇨. The minute digits will blink. Using ⊕ and ⊖ as necessary, set the number of minutes desired.

⚠ **ATTENTION !**
A valve with irrigation time set
at 0:00 will not open.
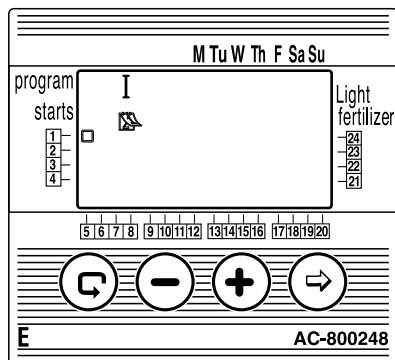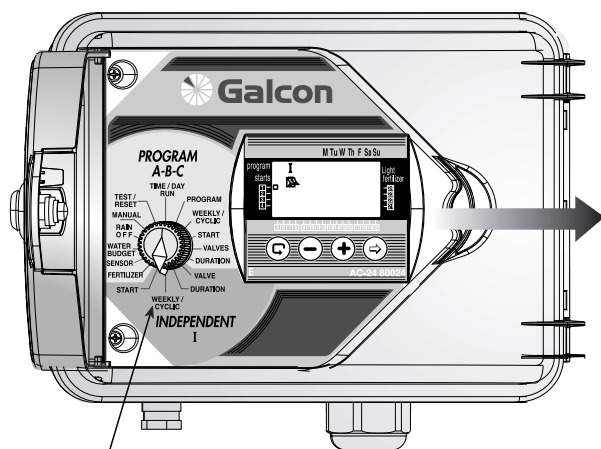
WEEKLY / CYCLIC

3. Irrigation by Day of the Week 🐦

Selecting Irrigation Days

- In this operation set the days of the week that the designated valve will operate.
- Turn the selector to **Weekly/Cyclic** mode (Independent Program I).
- Press on ↺ and select weekly program 🐦.
- Press on ➾. At the top of the display panel a blinking arrow ⬆ will appear under Monday. If you select Monday as an irrigation day press ➕. The arrow under Tuesday will remain set and stop blinking while the arrow under Monday will begin to blink. If you do not select Monday as an irrigation day press ➖ and the arrow will disappear and an arrow under Tuesday will begin blinking (and so forth).

*The selector should be returned to the TIME/DAY mode
following modification or ending of the program.*

START

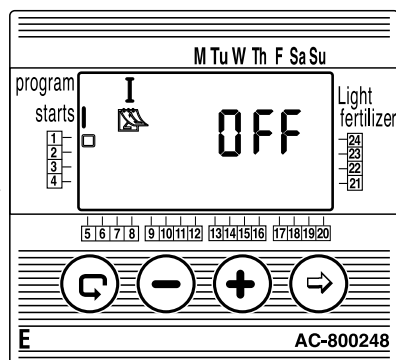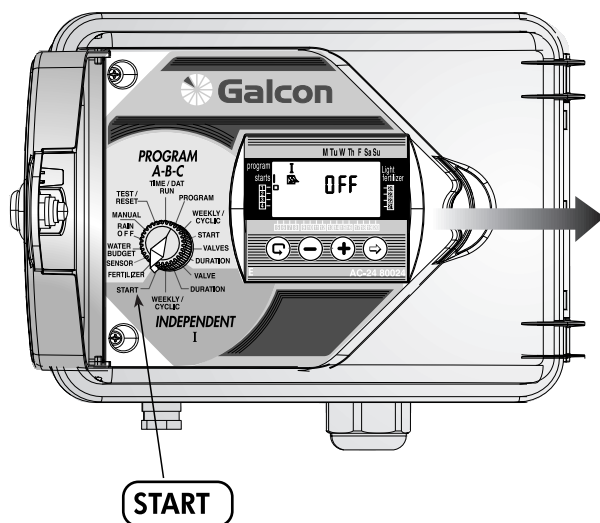## Starting Irrigation Time for Weekly Program

In this operation it is possible to program up to 4 different starting times for a 24 hour period. The valve will open at these starting times for the designated duration.

• Turn selector to **START** mode (Independent Program I). The display panel will show: starts **I**, the Weekly Program symbol ⚘, the word **OFF** or the last entered starting time, ☐ valve in line with the selected valve.
• Press on ⇨. The data appearing will blink (or the last starting time).
• Set the desired starting time using ⊕ and ⊖ as necessary. (Note AM/PM   designations).
• Repeat Steps 2 and 3 to Program **START** 2, 3, 4 (START II- III-IV) if desired.
• To cancel a specific starting time, select the time with ↻ and press on ⇨. The hour digits will blink. Press ⊕ or ⊖ as necessary until the word **OFF** appears on the display panel.

4. Cyclic Irrigation Programming ⟳

In this operation the controller is programmed to operate the selected valve at set cyclic times. The cycle can be set from one day up to 30 days.

Cycle Time Selection
• Turn selector to **WEEKLY/CYCLE** (mode Independent Program I)
• Press on ⟲ until ⟳ symbol and **DAYS 1** appears, meaning, the cycle is 1 day.
• Press on ⇨. **1** blinks.
• Set cycle time using ⊕ or ⊖ as necessary up to 30 DAYS.
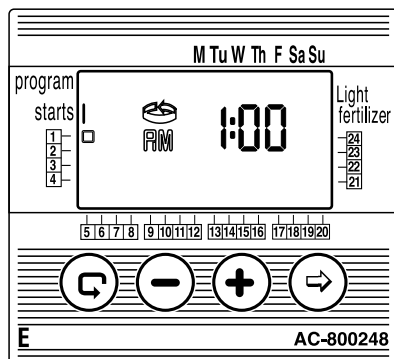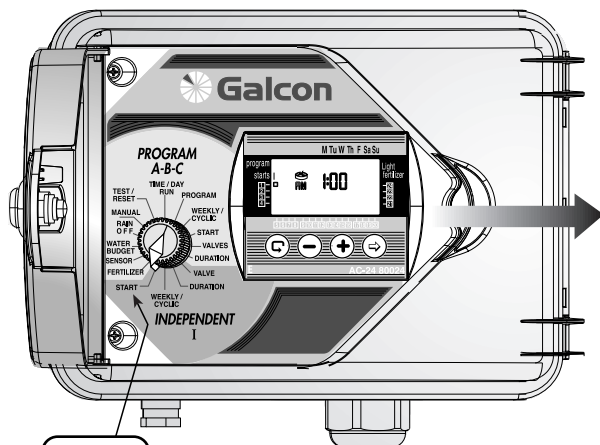
START

Starting Irrigation Cycle for Cyclic Programming
In this operation the time and day for starting cyclic irrigation of the selected valve is set. The number of days before the first start must also be set. **0 DAYS** - program will start operation as of that day, **1 DAYS** - program will start operation the following day and so forth. Days preceding start of cycle irrigation may be up to 14 days.   .
• Turn selector to **START** mode (Independent Program I). **STARTS I** will appear on display panel.
• Press on ⇨. Hour digits will blink. Set the desired starting time using the ⊕ and ⊖ as necessary.
• Press on ⇨. Minute digits will blink. Set the desired minutes for the starting time using ⊕ and ⊖ as necessary.
• Press on ⇨ until Number 0 and the word **DAYS** (or the last programmed number of days in cycle) appear on display panel. Set number of days preceding start of cycle with ⊕ or ⊖ as necessary.
   To program additional valves in Independent Program I return to page 21 "Select Valve" (Independent Program I).

The selector should be returned to the TIME/DAY mode following modification or ending of the program.
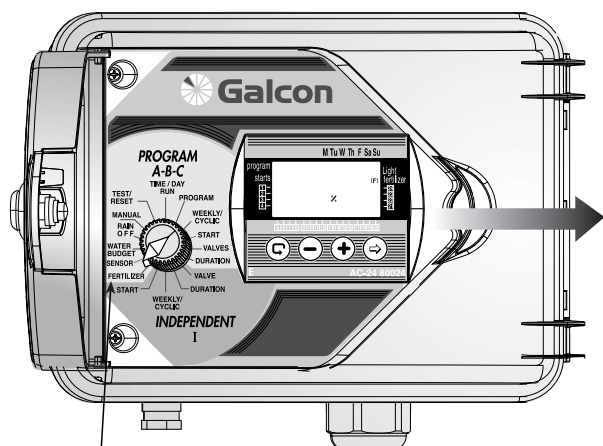
FERTILIZER

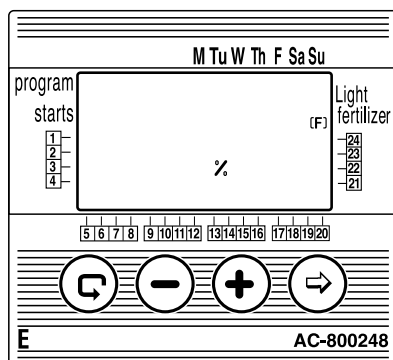## 1. Fertilization Supplement (F)

Fertilization time is set separatly for each individual valve.
Fertilization is added according to irrigation duration from 10% to 90% of the specific valve irrigation time. Fertilization will always take place in the middle of the valve irrigation time.

Example: A specific valve has been programmed for the duration of 60 minutes. Fertilization supplement is set for 20%. Regular irrigation will be operated for the first 24 minutes (without fertilization). Subsequently fertilization will be added for the next 12 minutes (20% of the scheduled time); then regular irrigation will continue for the next 24 minutes, so the line can be washed.

• Turn selector to **Fertilizer** mode. Symbol of the fertilization valve (F) and **%** will appear on display panel.
• Press on ↺ until the valve you want to select, blinks.
• **00 %** will appear on display panel. Press on ➡. **00** will blink. Set the percentage time using ➕ and ➖ as necessary.
• Repeat the above steps for any other valve needed.
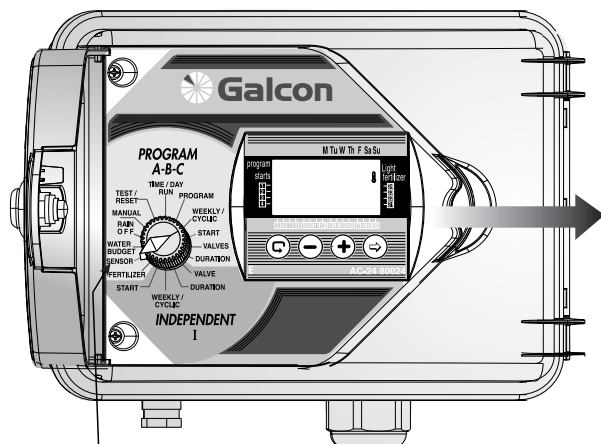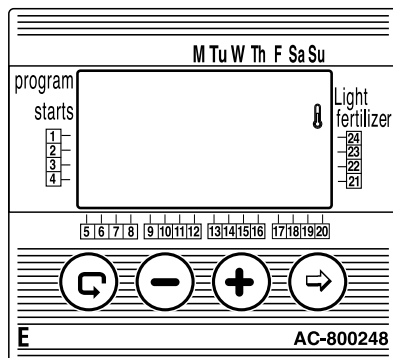
SENSOR

2. SENSOR 🌡

The sensor operates by closing the valve to which it is attributed according to relevant conditions, e.g. rain, temperature and moisture. An operating sensor will prevent the opening of the valve (or will close it). The operator may select any valve to be attributed to the sensor.

- Turn the selector to the **SENSOR** mode. Sensor symbol 🌡 will appear on the display panel.
- Press on ⇨. The symbol ☐ of the first available valve will begin to blink.
- Press on ⊕ to select valve. ☐ The respective valve symbol will stop blinking and symbol of the next available valve will begin to blink.

⚠ **ATTENTION!**
A valve programmed for 0:00 irrigation duration cannot be connected to the sensor!!!
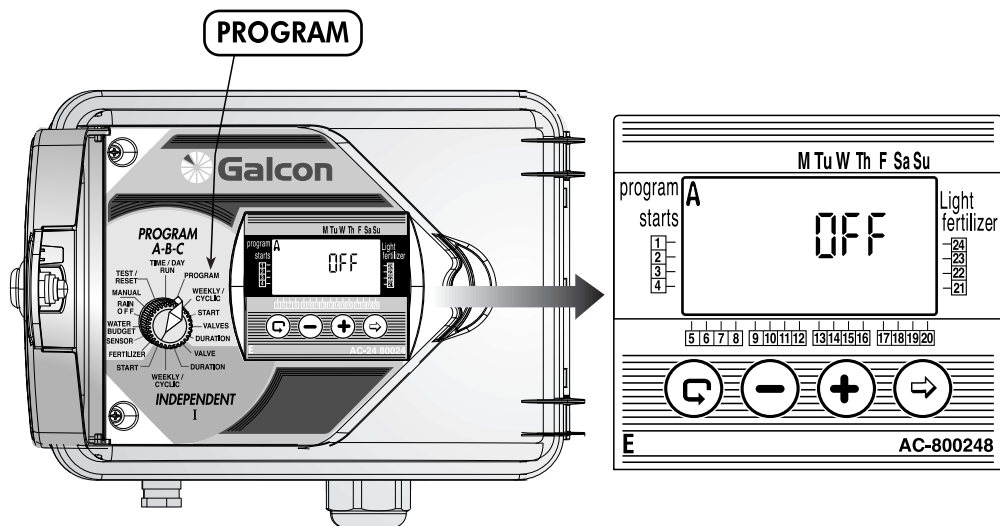
PROGRAM

3. Garden Lighting Program 💡

It is possible to operate garden lighting by weekly program only.
The garden lighting is a separate program. It will not affect the master valve, the sensor, the fertilization mode or the water budegt program.
Garden lighting operation is adaptable only to relay of 24VAC up to mA 40.

1. Programming Garden Lighting
Turn selector to **PROGRAM** mode.
• One of the programs will appear on display panel. Press on ↻ until the Light program appears 💡.
• Press on ⇨ . The word OFF will begin to blink. Pressing ✚ will change the OFF to ON blink. 💡 Garden lighting programming has been selected.
• Press ⚊ to close program (OFF).
• Continue programming desired data for garden lighting according to instructions of weekly programming on page 16.
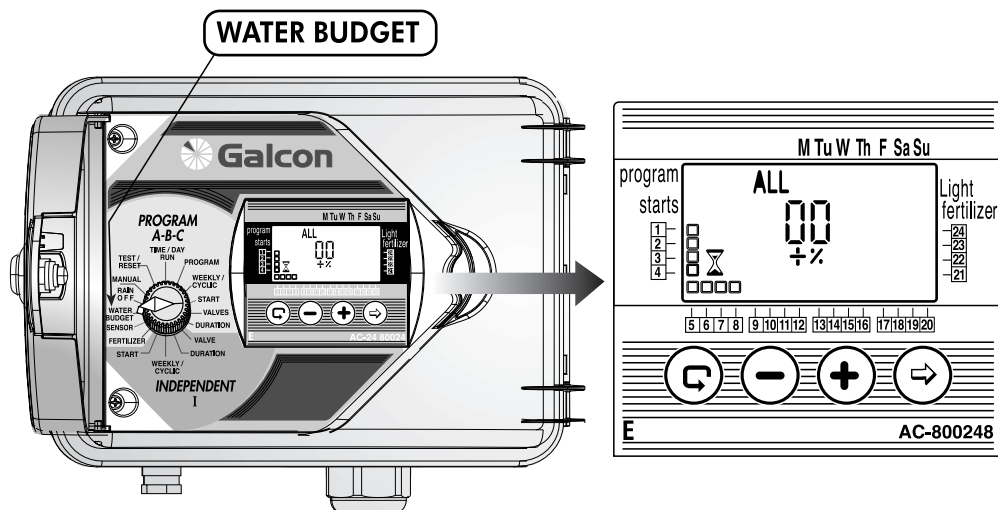
WATER BUDGET

4. WATER BUDGET
The programmed irrigation duration may be extended or shortened for all the valves by specifying a percentage for the duration. This may be inactivated by the following two alternatives:
1. Extending an identical percentage for all the valves.
2. Programming a varying percentage to different valves, according to the respective program A, B and C and Independent Valves I.

1. Modifying Water budget for All Valves
• Turn selector to **WATER BUDGET** mode. **ALL, 00, +, %** , duration symbol ⧖ and symbol of all designated valves ☐ will appear on display panel.
• Press on ⇨. **00** will blink. Set irrigation modification % for all the valves using ⊕ or ⊖.

Note! If WATER BUDGET has been programmed for one of the programs (A,B,C, I) it is not possible to reach ALL mode.

2. Modifying Water budget for Programs (A,B,C,I)
• Turn selector to **WATER BUDGET** mode. **ALL ,00 ,+, %** , duration symbol ⧖ and symbol of all designated valves ☐ will appear on display panel.
• Press on ↻ until Program A and the symbol for all attributed valves to Program A appear on display panel.
• Press on ⇨. **00** will begin to blink. Press ⊕ or ⊖ to increase or decrease the percentage necessary.
• Press on ↻ to program the above for Programs B, C and Independent Program I.
Note! If WATER BUDGET has been set to ALL it is not possible to reach any other programs (Programs A, B, C and I).
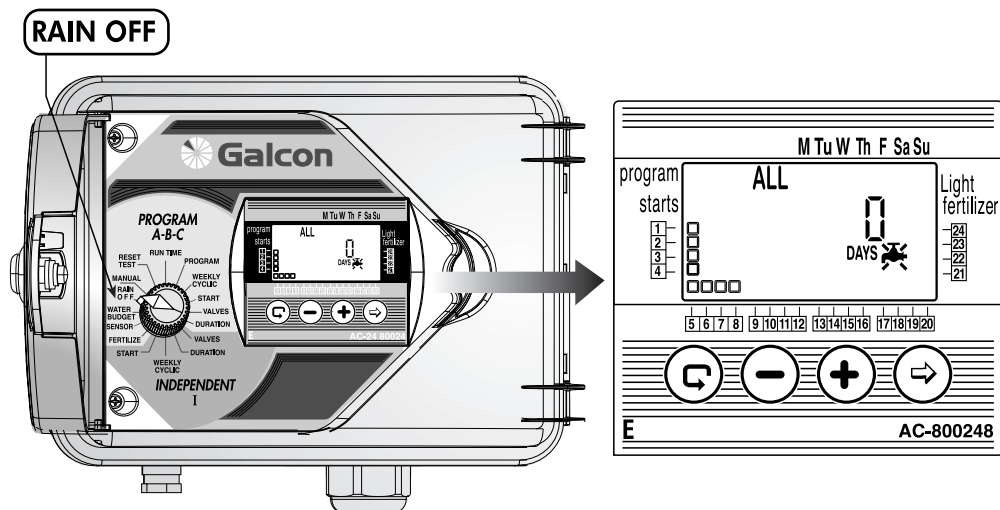
RAIN OFF

5. RAIN OFF ☒

This option is used to temporarily suspend the irrigation of a number or all of the valves, for example, when it is raining. The irrigation schedule remains stored in the controller but is not implemented.

In the **ALL** mode, suspension will disable all of the valves. Another option is to suspend a group of valves, according to their designation - **A**, **B**, **C** or Ι group.

Suspension may be operated from one day up to 99 days. At the end of the suspended time, the controller will return to its original schedule as previously programmed.

1. Suspension of All Valves
Turn selector to **RAIN OFF** mode.☒, **DAYS 0**, the word **ALL** and valve symbols ☐ will appear on display panel.
• Press on ➡. **DAYS 0** will begin to blink. Set the number of suspension days necessary for all of the valves using ⊕ and ⊖.

2. Suspension of Valves Attributed to Programs A, B, C or Ι
• Press on ↺ until Program A and Symbol of Valves ☐ attributed to Program A will appear on display panel.
• Press on ➡. **DAYS 0** will begin to blink. Set the number of suspension days necessary for all valves attributed to Program **A** using the ⊕ and ⊖.

Note! If valves attributed to one of the programs have already been programmed for suspension, it is not possible to suspend all valves in ALL mode.

MANUAL

6. Manual 🌢

Valves may be manually activated by the following five options:
1. ALL of the valves may be manually operated;
2. Valves attributed to a specific program (A,B or C) may be manually operated;
3. More than one program may be manually operated (e.g. A and B);
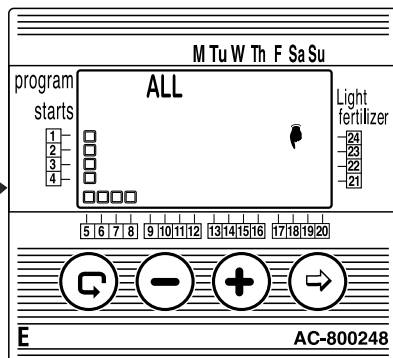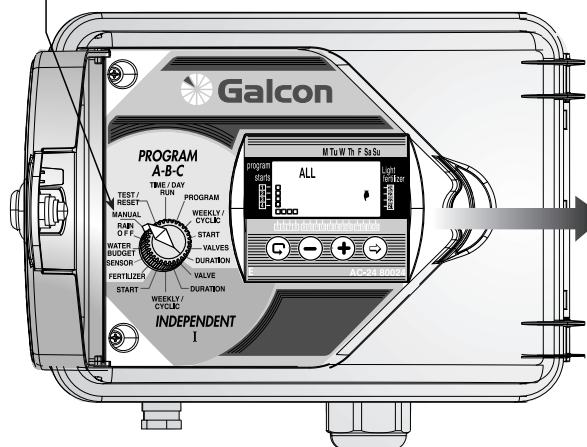4. All of the Independent Program I valves may be manually operated;
5. One or more of the Independent Program I valves may be manually operated.

1. Manual Operation of All Valves
• Turn selector to manual mode. 🌢 Symbol, the word **ALL** and all of the programmed valves ☐ will appear on display panel.
• Press on ➕. The word **HOLD** will immediately appear on the screen for a few seconds.
• The valves will open according to the following sequence: 1. Valves programmed in Independent Program I, from the smallest number upward. 2. Valves attributed to Program A, and then Program B, and Program C.

2. Manual Operation of a Number of Valves Attributed to Programs A, B, C or I
• Press on ➡. One of the programs symbol will blink.
• Press on 🔁 until the required program appears (for example, Program A). Symbols of the valves attributed to this program along with the 🌢 symbol will appear on the display panel.
• Press on ➕. The word **HOLD** will immediately appear on the display screen for a few seconds followed by the word ON.
• Valves attributed to the designated program will open sequentially.

3. Manual Operation of one of the Independent Valves I
• Press on 🔁 until I disappears, and the symbol of the first valve attributed to Group I blinks on the display panel.
• Using 🔁 select desired valve.
• Press on ➕. The word **HOLD** will appear on the screen for a few seconds followed by the word **ON**. The selected valve will immediately open.

The selector should be returned to the TIME/DAY mode following modification or ending of the program.

7. Testing
Turn the selector to **TEST/RESET** mode.

Serial Testing of the Programmed Valves
• Press simultaneously on ⊖ and the ↻ for 4 seconds. All the programmed valves ☐ will appear on the display panel and a drop 💧 will appear in line with the first valve – showing that this valve is open.
• Press on ⊕. The first valve will close and the sequential valve will open.
• If one of the valves is short-circuited the drop 💧 in line with the valve will blink. The valve must be detached or the short circuit repaired to enable the testing to be continued.

Testing of an Individual Valve
• Press on ⇨. The symbols ☐ of all the valves will appear, and the symbol of valve 1 ☐ will blink.
• Using ↻ select the necessary valve needed to be tested (the symbol of the selected valve ☐ will blink).
• Press on ⊕. The selected valve will open and the drop symbol 💧 will appear in line with it. Press ⊖.The valve will close.

Please Note: In order to enable the fertilizer valve to be tested, it is necessary to open one of the valves and the main valve (if there is a main valve) manually in order to ascertain a flow of water, and only then may an electrical testing of the fertilizater valve be done.

TEST/RESET

No of valve installed   MNF. Code
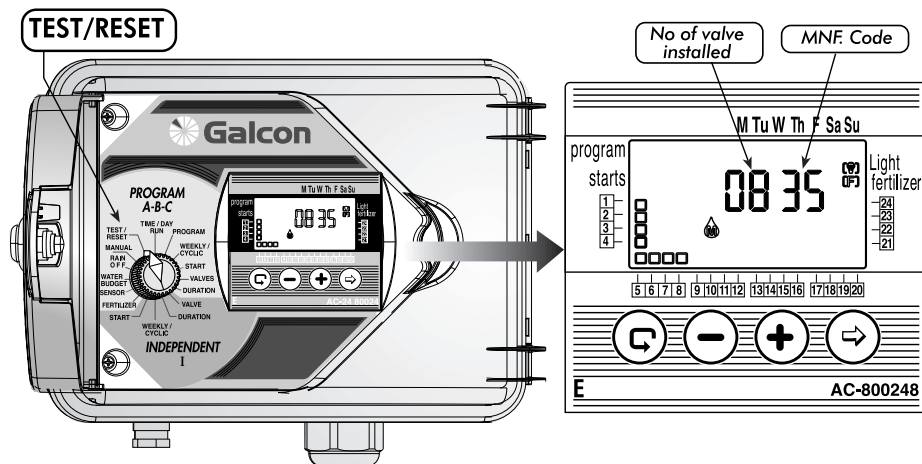
8. RESET
It is possible to delete all of the controller's programs.
• Turn the selector to **Test/Reset** .
• Press simultaneously on ⇨ and ↻ for 4 seconds. All of the controller's programs will be deleted. The full display will appear on the screen signifying the deletion of all of the programs. The procedure has been completed successfully. The no. of valves and MNF. code will appear on the screen. The controller must now be reprogrammed.

*The selector should be returned to the **TIME/DAY mode** following modification or ending of the program.*

1. Low Battery Warning ▭

When the battery power is low, a battery icon ▭ will appear on the display panel. The battery should be replaced as soon as possible. The battery serves as a backup power for the clock only. The program is stored in the memory of controller (up to 20 years!) without any source power.

Note! If power fails when battery is low the clock must be reset. When electric power is returned, the clock will blink and the programs will operate. The clock blinks to warn the operator that there was a power failure (i.e. state of no electricity and no battery backup), the battery should be replaced and the clock should be set.

* The battery should last for at least one year (alkaline battery).

2. No Power Warning

If for any reason electrical power is not reaching the controller ⊞ will appear on the display panel.

> ⚠　　　**ATTENTION!**
> When there is a loss of electric power the valves will not open but the controller will continue to show the program.

NOTE! Controller cannot be programmed when battery is low and there is no electric power.

3. Filter
* Filter must be installed in front of controller valve. Filter should be flaushed every few month or as needed.

4. Water Pressure
* Recommended water pressure: 1 - 6 bar.

5. Troubleshooting - Detection and Repair

Problem	Cause	Repair
Valve will not open in automatic program or Computerized manual operation	Disconnection of valve valve cable	Carefully check wire connections and valve cable
Blinking drop in line with one of the valves on display panel	Short-circuit in valve cable or solenoid	Check wire connections or replace solenoid
Controller cannot be programmed/Display does not appear	Problem in power circuit impaired battery	Check power source/ transformer or replace battery
Sensor icon blinking and valve does not open	Short circuited sensor	Replace sensor or repair connection
Valve will not close	Operating handle on valve in OPEN position	Turn valve handle to AUTO closed position
	Dirt and scale in valve	Clean valve
	Problem in valve (e.g. torn diaphragm)	Replace valve
Faulty controller activity	Defective Memory	* Operate RESET mode: Press ⮌ and Ⓒ simultaneously for 4 seconds. All controller programs will be deleted. On screen display will appear showing the programs that have been deleted. The process has been completed. Number of valves and MNF. Code will appear on screen. Controller must be reprogrammed. see page 32

* Note: This operation will cancel all of the programs previously programmed in the controller.

Accessories

3/4" Valve and 24 VAC solenoid
1" Valve and 24 VAC solenoid
1 1/2" Valve and 24 VAC solenoid
2" valve and 24 VAC solenoid
24 VAC / 230 transformer
2 wire Valve control cable (50 meter roll)
6 wire Valve control cable (50 meter roll)
8 wire Valve cable control (50 meter roll)
12 wire Valve control cable (50 meter roll)
Sensor
4 stationed module