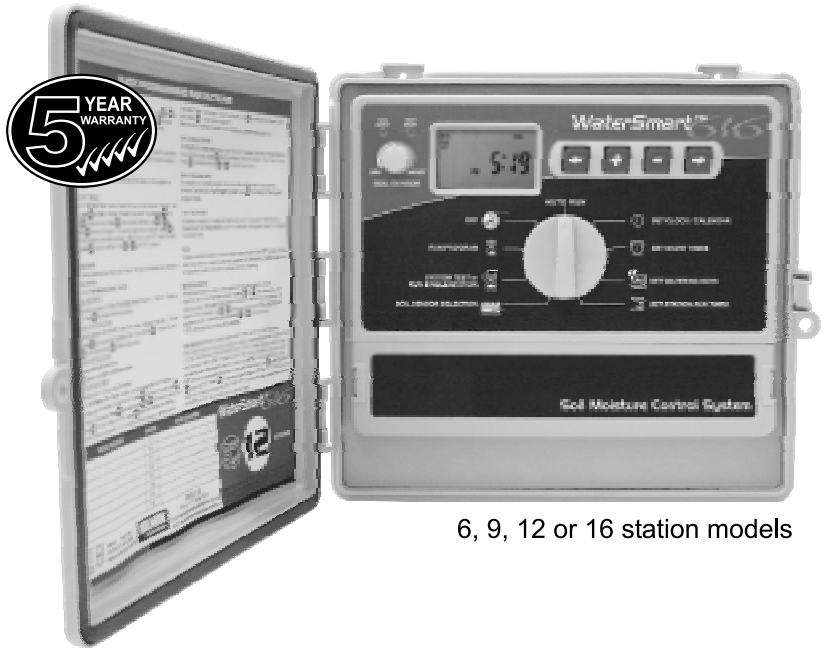# WaterSmart™ 616

Irrigation Controller
Instruction manual

6, 9, 12 or 16 station models

CE N10372

HOLMAN
Innovation in Watering

Table Of Contents

Introduction

The **WaterSmart™** control system uses a special sensing device to monitor the moisture in the soil at a selected location then automatically cancels irrigation programs when the soil is moist enough. When the soil dries down, the sensor lets the the controller run it's next programmed irrigation cycle.

How does the system operate?

The **WaterSmart™** control system should be programmed as any other irrigation controller. The start time(s), station run times and days of the week to water are selected and programmed.

Before a start time is activated the controller will check with the sensor to determine the soil moisture condition. If wet, it cancels the watering cycle scheduled to run.

Only 1 sensor is used to determine the garden moisture levels.

This sensor is located in a high demand part of the garden. All sensor controlled stations relate to this sensor reading & should have run times set to reflect the amount of water each station requires. Each time the sensor allows watering, the full programmed run time on each station will occur.

The "set point" of the sensor can be adjusted on the panel of the controller. When adjusted to the "wet" position the controller will allow more frequent waterings.

Watering sections are set up in the controller to provide sensor control of high water use areas such as lawns, shrubs, perennials and trees. Other sections can be set up on a normal basis to water special areas such as annuals, ferns, areas under eaves etc which may need to be on a time scheduled basis to water independently of the sensor controller sections.

Soil Sensor Operation

The soil sensor functions like a "fuel gauge" by responding to the moisture stored in the soil.

The sensor should be installed approx 50mm below the surface and located in a turf area that provides a dense root zone and a uniform leaf area. This is necessary for reliable control. When the sensor is moist, the green light on the controller remains on and watering of sensor controlled stations is cancelled.

The Sensor

Soil Sensor Operation (cont.)

"Soil Moist", green light will remain on, whenever the soil is moist enough

Soil moisture setting enables fine tuning of the sensor to suit the soil type and climate. As a standard, the dial position is set vertically in the centre.

"Next Start" amber light will come on when watering is required. The controller will then run the next scheduled watering cycle.

When the sensor is dry, the amber light comes on allowing the system to run on the next start time.

The moisture control should initially be set in the centre position then fine tuned to the right for the lighter soils and to the left for the heavier ones.

Grouping the sensor stations

All high water use areas such as lawns, shrubs, trees etc, should be sensor controlled stations. All sensor stations should all be grouped together in program 1.

Station run times should be set as normal so that each area receives the right amount of water (approx 10mm per start).

Start times for the sensor program should be set as often as possible because the system will automatically cancel starts when the soil is moist enough. Start times should be set for every day (except area's with water restrictions where allowed watering days are programmed) and preferably early in the morning to minimise evaporation.

Independent time control

Plants such as annuals, pots & baskets, ferns, under eave areas etc. are better suited as time controlled stations as they usually require specific watering independent of the sensor stations.

These areas should be grouped together into a programs according to their watering needs. Refer to example on page 11.

Sensor Installation

Soil Moisture Sensor

The sensor is constantly monitoring the soil moisture and basically provides an automatic interval control for the system.

Whilst the soil is moist enough, the sensor light is green and the sensor automatically cancels the scheduled irrigation times.

When the soil dries out to a pre-set level, the light goes to amber and the sensor permits the controller to run it's next scheduled irrigation.

The amount of water applied to each zone can be set by it's station run time according to it's needs relative to those at the sensor location.

SELECTING A TURF LOCATION

1. Always locate the sensor under turf as it has a dense root zone and uniform leaf area required for accurate sensing. Also it is least likely to be disturbed.

2. Turf location must have uniform spray from at least two sprinklers preferably three because this minimises wind effects.

3. A drier location than most other areas - This protects the drier areas as the sensor tightens the water control.

4. Avoid being too close to trees and shrubs as obstructions upset the turf water balance from the sprinklers.

INSTALLATION DEPTH

Install the sensor 50mm (2") deep to it's top surface which will give good results with most grasses, in most soils, but never deeper than 100mm (4")
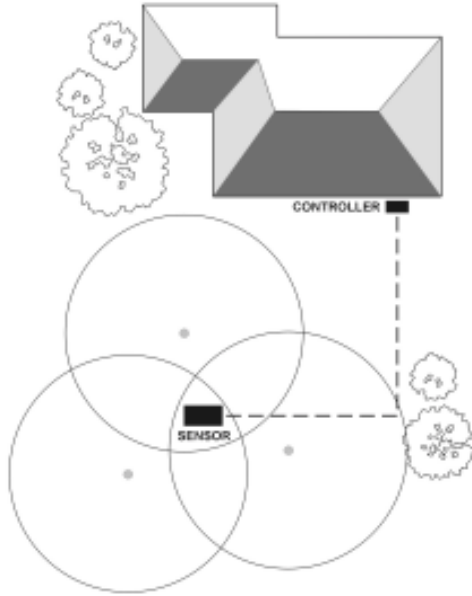
IMPORTANT POINTS TO REMEMBER

-   Take care in removing and replacing the turf sod to minimise it's root damage. This will enable the sensor to take control quickly.

-   It is important to saturate the area after installation to compact the soil around the sensor and roots.

-   Do not install the sensor until all landscaping and planting works are completed, coil the cable in valve box until safe.

Installation Instructions

The sensor when buried in the root zone, responds to the capillary tension which is related to the degree of moisture stress in the plant.

As the soil dries out, its tension increases and the sensor switches on, as the soil becomes wet its tension falls and the sensor switches off.

REMEMBER TO SELECT A TURF LOCATION WHICH:

- gets uniform spray from at leas two sprinklers, preferably three because this minimises wind effects.
- is drier than most other areas - This protects the drier areas as the sensor tightens the water control.
- is not too close to trees & shrubs as their roots upset typical soil moisture balance and obstructions disturb the spray accuracy from sprinklers.
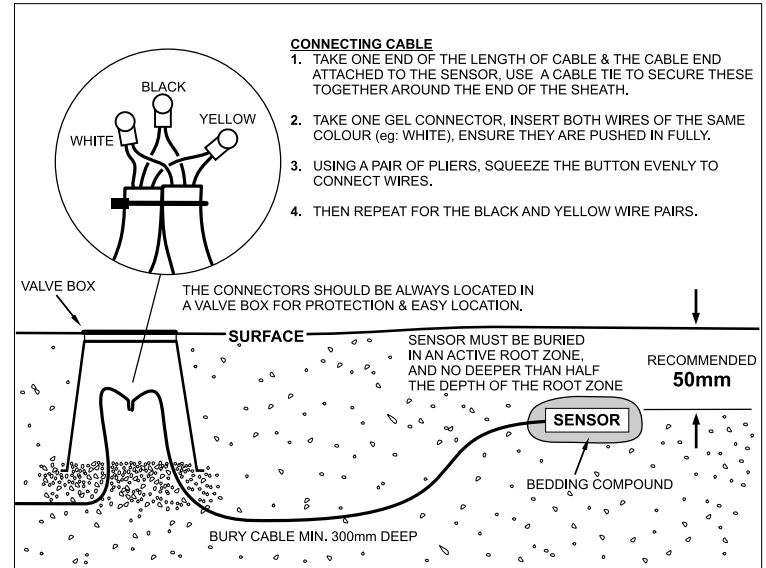
Installation Steps

Sensor Cable Installation & Connection

Use the supplied direct burial cable with 3 wires to connect the soil sensor to the controller.

The sensor can be up to 300 metres from the controller.

Bury the cable deep enough to prevent damage say at least 300mm (12") deep, where it is less than 200mm (8") or rises above the surface, it should be protected by conduit.

A moisture resisant connector kit is provided to make the join between sensor and connecting cable.

CONNECTING CABLE
1. TAKE ONE END OF THE LENGTH OF CABLE & THE CABLE END ATTACHED TO THE SENSOR, USE A CABLE TIE TO SECURE THESE TOGETHER AROUND THE END OF THE SHEATH.
2. TAKE ONE GEL CONNECTOR, INSERT BOTH WIRES OF THE SAME COLOUR (eg: WHITE), ENSURE THEY ARE PUSHED IN FULLY.
3. USING A PAIR OF PLIERS, SQUEEZE THE BUTTON EVENLY TO CONNECT WIRES.
4. THEN REPEAT FOR THE BLACK AND YELLOW WIRE PAIRS.

THE CONNECTORS SHOULD BE ALWAYS LOCATED IN A VALVE BOX FOR PROTECTION & EASY LOCATION.

SENSOR MUST BE BURIED IN AN ACTIVE ROOT ZONE, AND NO DEEPER THAN HALF THE DEPTH OF THE ROOT ZONE

RECOMMENDED 50mm

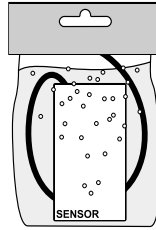BEDDING COMPOUND

BURY CABLE MIN. 300mm DEEP

DO NOT install the sensor until all landscaping work is completed, coil the connecting cable in the valve box until it is safe to install the sensor.
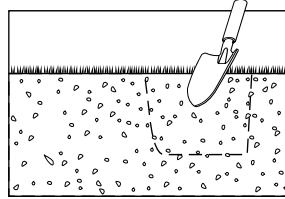
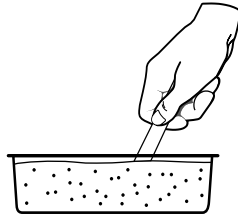# Installation Steps

Soil Moisture Sensor

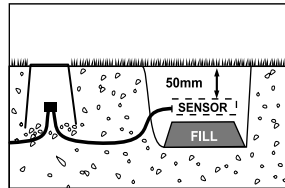**1**. Pour the priming fluid into the plastic bag provided and let the sensor soak for 2 - 5 mins.

2. Using a knife or spade, cut a sod 100mm x 150mm (4" x 6") and 75mm (3") deep. Removing with minimal damage, as much of the roots as possible.
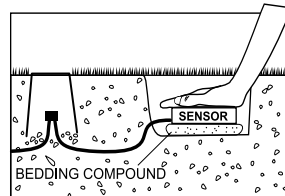
3. Using the clear tray provided, pour in ALL the bedding powder and bedding powder fluid, mix together until a smooth paste is achieved.

4. Prepare the hole by spacing the sensor to sit at it's correct height, allowing for bedding compound to go underneath. Pour enough bedding compound to create a pad for sensor to lie into, approx. 5 - 10mm thick.
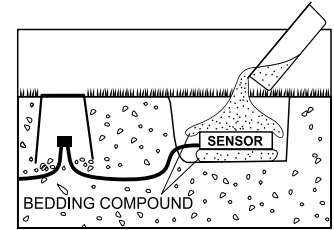
5. Remove the sensor from the priming fluid & lay the sensor on it's side, press into the compound so it stays in position.
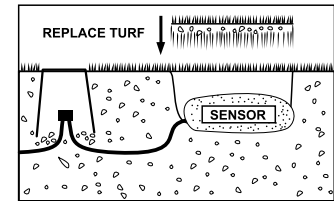
Installation Steps
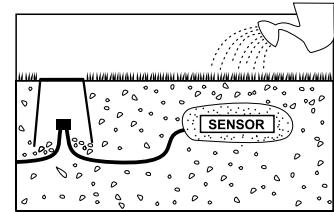
Soil Moisture Sensor (cont.)

6. Pour the rest of the bedding compound on top of the sensor, encasing the sensor, then sprinkle soil over and around to cover the compound entirely.

7. Tease the roots down from the sod then position back firmly, filling any gaps with soil.

8. Tread the turf down with your foot then saturate the area thoroughly with at least 5 litres of water.

9. It is most important to revive the turf sod to allow the sensor to operate correctly. Water well & lightly pat down with the back of a spade.

Care in removing and replacing the turf sod to minimise its root damage will enable the sensor to take control quickly.

It is most important to saturate the area after installation to compact the soil around the sensor and roots.

The Controller

This unit is available in six, nine, twelve & sixteen station configurations.

Designed for residential and light commercial applications, the **WaterSmart™** has the flexibility of four individual programs with up to sixteen start times a day to ensure efficient watering of different garden or turf areas.

These different areas may require individual watering schedules and often use different types of sprinklers.

Examples: Turf areas generally use pop-up sprinklers and require less frequent but heavier watering. However, flower beds use micro sprays and require more frequent watering. The valves (stations) which water similar garden areas are often grouped together and put into the same program as they need to be watered on the same days.

These stations (valves) will water in sequential order from the lowest number at the start time (or times) nominated and on the days selected. Maximum watering duration for a station (valve) is 12 hours and 59 minutes.

This controller has a 7 day watering schedule with individual day selection per program or a 365 calendar for Odd/Even day watering or selectable interval watering schedules from everyday to every 15th day.

A key feature of this controller is the soil moisture sensor which takes control of the irrigation required based on the moisture in the soil. As the seasons change, your garden will be watered more or less frequently according to demand. Individual sensor control is available on all stations. High water useage stations like lawn, shrubs & trees are best being used in conjuction with the sensor. Watering stations with pots baskets ferns & under eaves should still be watered independently of the sensor.

Glossary

SOIL SENSOR DIAL
Used for calibrating to the environment the sensor is buried in.

Large LCD DISPLAY
Easy to read

PROGRAMMING BUTTONS
Used for Adjusting programmed information

INDICATOR LAMPS
The green & amber lamps indicate the state of the soil.

SELECTION DIAL
Used for Operations & Programming.

TERMINAL COVER
Remove to access terminals for solenoid wires & to change 9V battery,
DIY access permitted.

TERMINATION COVER
Remove the terminal cover to access mains voltage termination.
Electrical contractor access ONLY.
"WARNING" HIGH VOLTAGE

Programming Instructions

Introduction

This controller has been designed with four separate programs to allow the different garden areas to have their own individual watering schedules.

A program is basically a method of grouping stations (valves) with similar watering requirements to water on the same days. These stations will water in sequential order from the lowest number at the start time nominated and on the days selected.

The key elements when programming your controller are:

- **Group the stations** (valves)

  Group together garden areas which have similiar watering requirements. Examples are: turf areas, flower beds, pergola / undercover areas, or vegetables. These different groups require individual watering settings.

- **Plan your watering program.**

  Complete your individual watering planner supplied at the back of this book.

- **Set the current time and correct day of the week**.

- **Set the automatic program**.

  Use the following 3 steps to program each group:

  ### 1. Set Starts.

  This sets the time when the watering schedule is to commence. Note: For each start time, all the valves selected for the program will come on in sequential order. If two start times are set, the valves will come on twice.

  ### 2. Set Watering Days.

  These are the nominated days when the automatic system will be active.

  ### 3. Set Station Run Times.

  This sets the watering duration required for each station (valve).

Programming Instructions

Programming Example

A typical example of a 12 station system is outlined below as a guide to assist you when planning your watering schedule. In this example, the lawn areas are using pop-ups and require less frequent watering. The vegetables are being watered using drippers, with the flower beds and pergola areas being watered using micro sprays.

VALVE NUMBER		
	5 GARDEN BED	11 BACK LAWN
	6 GARDEN BED	12 GARDEN BED
1 FRONT LAWN	7 BACK LAWN	13
2 FRONT LAWN	8 PERGOLA	14
3 FRONT LAWN	9 BACK LAWN	15
4 VEGTABLES	10 BACK LAWN	16

PROGRAM	START TIME	WATERING INTERVAL	STATION	RUN TIME (minutes)	SENSOR	STATION	RUN TIME (minutes)	SENSOR
1	Start Time 1: 4:00 am / 2nd Start Time: / 3rd Start Time: / 4th Start Time:	MONDAY / WEDNESDAY / FRIDAY	1 / 2 / 3 / 4 / 5 / 6 / 7 / 8	20 / 20 / 20 / / / / 20 /		9 / 10 / 11 / 12 / 13 / 14 / 15 / 16	20 / 20 / 20 / / / / /	
2	Start Time 1: 6:00 am / 2nd Start Time: / 3rd Start Time: / 4th Start Time:	EVERY DAY	1 / 2 / 3 / 4 / 5 / 6 / 7 / 8	/ / / 30 / / / /	NO	9 / 10 / 11 / 12 / 13 / 14 / 15 / 16		
3	Start Time 1: 5:00 am / 2nd Start Time: / 3rd Start Time: / 4th Start Time:	EVERY 2nd DAY	1 / 2 / 3 / 4 / 5 / 6 / 7 / 8	/ / / / 10 / 10 / /		9 / 10 / 11 / 12 / 13 / 14 / 15 / 16	/ / / 10 / / / /	
4	Start Time 1: 7:00 am / 2nd Start Time: 6:00pm / 3rd Start Time: / 4th Start Time:	EVERY DAY	1 / 2 / 3 / 4 / 5 / 6 / 7 / 8	/ / / / / / / 5	NO	9 / 10 / 11 / 12 / 13 / 14 / 15 / 16		

Programming Example (cont.)

Other Functions

This controller can also manually run a selected program once, or an individual station can be set to run once from 1 minute up to 12 hours and 59 minutes. During winter the automatic schedules can be suspended to prevent watering while it is raining. This feature can be facilitated for indivdual stations by using a soil sensor or by using the dial if no sensor is connected. A test facility for checking the valves and sprinklers is also provided.
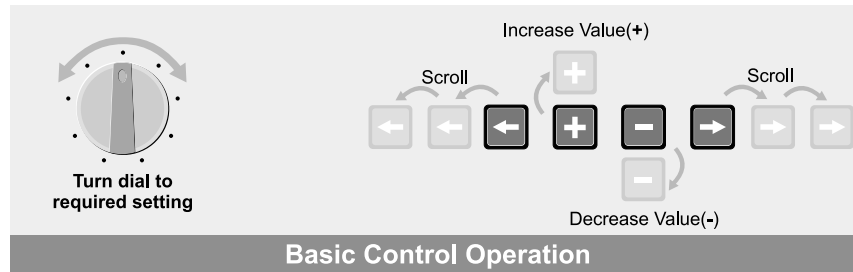
General tips for easy programming

Tips to help eliminate programming confusion.

1. Complete the spare watering planner.

2. When setting, one push of the button will increment one unit.

3. Holding one button down will fast scroll through units.

4. During programming, only flashing units are able to be set.

Adjust values by using [+] or [−] buttons.

5. Pressing [→] will scroll forward through the settings in an orderly sequence.

6. Pressing [←] will scroll back to previous settings and settings can be changed.

Increase Value(**+**)

Scroll   Scroll

Turn dial to
required setting

Decrease Value(**-**)

Basic Control Operation

Programming

Set Current Time & Correct Day

Turn the dial to *Set Clock/Calendar* position. The hour will be flashing.

Use [+] or [−] to adjust. Note: AM / PM must be set correctly. **Press** the

[→] button and the "minutes" will flash. Use [+] or [−] to adjust.

Press [→] and the "day of the week" will flash.

Use [+] or [−] to set correct day.

Set Calendar (Optional)

Note: The calendar only needs to be set when selecting Odd/Even day watering in areas where water restrictions may require this feature.

Press [←] button until the year, month and day are shown. the "year" will be flashing.

Use [+] or [−] to adjust, if required.

Press [←] button and the "month" will flash.

Use [+] or [−] to adjust.

Press [←] and the "day" will flash.

Use [+] or [−] to adjust.

Tip: To return to the clock, **press** [→], or **turn** dial to another position.

Programming

Before proceeding, ensure the spare watering planner has been completed. From your planner, you should be aware which stations (valves) are allocated to each program. Set one program at a time to ensure that the schedules are completed correctly.
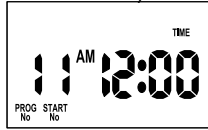
Example: SET PROGRAM 1

Step 1. Set Start Times

(Note: All the valves will come on in sequentialy order for each start time).

Turn the dial to *Set Start Times* and ensure that "Prog 1" is flashing.   **The display will show:**

Press ➡️ and "Start 1" willl flash.

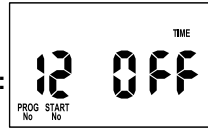**Press** ➡️ and the "hour" will flash. Use ➕ or ➖ to adjust.

Note: Ensure AM / PM position is correct

Press ➡️ and the "minutes" will flash. Use ➕ or ➖ to adjust, if required. Each program has up to four start times and should you require a second start time, **Press** ➡️ twice and "Start1" will flash.

Advance to start 2 by pressing ➕. **The display will show:**

Press ➡️ and proceed as per setting *Start 1.*

Tip: To turn an active start time off, turn the dial to *the **Set Start times*** position, *select* the program number by using ➕ and then press ➡️, *select* the start number required using the ➕ button. **Press** ➡️ until the "hour" is flashing. Use ➕ or ➖ until "OFF" is shown.

Tip: "OFF" position is between 12 and 1.
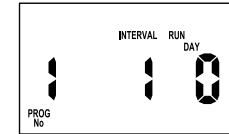
Programming

Step 2. Set Watering Days

This unit has interval watering from everyday to every 15th day or individual day selection or a 365 day calendar with odd/even day selection in areas where water restrictions require this feature.

Interval Day Selection

Turn the dial to *Set Watering Days*.
        The display will show:

"Interval 1" will be flashing. This means that watering will occur every day.

To change the interval day, **press** the ➕ button.

Examples: Interval 2 means watering will take place every second day, 3 means watering will take place every third day etc.

Interval watering can be set from everyday to every 15th day. The *Run Day* refers to the number of days before the next watering schedule will occur.

Individual Day Selection

Press the ➡️ button. This is the **selectable** day option.
        The display will show:

This refers to Mon being Day 1. To turn Monday off, **press** ➖ button. To leave Monday active, leave as is and advance to Tuesday (day 2) by **pressing** the ➡️ button. Again **press** the ➖ button to set the day off if required followed by ➡️ to advance.

Continue until all seven days have been set "on" ➕ or "off" ➖ .

Programming

Odd / Even Day Selection (Optional)

In some regions users are only allowed to water their gardens on ODD dates if their house number is ODD, or on EVEN dates when their number is EVEN .

This controller allows this to be done simply by setting the relevant selection of ODD or EVEN and setting the current date into the controller. The controller will account for leap years.

If you require the ODD / EVEN day option, simply **press** the [→] button until

"Odd" is shown. **Press** the [→] button and *"Even"* will be shown. This feature

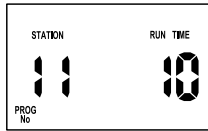may be required in areas where water restrictions are enforced.

Note: Remember to set the 365 day calendar when setting the clock, or this feature will be out of sequence. (Refer Page 6 "Set Calendar")

Step 3. Set Station Run Times

This is the length of time that each station (valve) is scheduled to water on a particular program. Maximum watering time is 12 hours 59 minutes for each station. A station can be assigned to 1, 2, 3 or 4 programs if required.

Turn the dial to the *Set Station Run Times* position.

The display will show :

STATION   RUN TIME

11   10

PROG No

This means station 1 has a default run time of 10 minutes in program 1. Station 1 will be flashing.

Programming

Step 3. Set Station Run Times. (Continued)

To adjust the **Run time** in minutes **press** [→], and use [+] or [−] . To set

the run time in hours, **press** [→] again and "0" will appear and flash. To

adjust use [+] or [−] . If not required press [→] and advance to station 2

by pressing the [+] button.

Continue until all the stations in Program 1 have been set with a run time or if a station (or stations) is not required to be active in this particular program, ensure that the Run time is set to "OFF".

Note: To set a station to **"OFF"**. Use [−] when the **"RUN TIME"** is flashing, or

press [+] & [−] simultaneously.

This completes the setting up procedure for automatic watering of Program 1. Select from 4 programs for different watering schedules.

Should you need the second program to have an automatic schedule, **turn** the

dial to "Set Start times" and "Prog 1" will flash. press [+] and change to

program 2 position and follow the same 3 steps for automatic watering.

1. **Set Starts**
2. **Set Watering Days**
3. **Set Station Run Times**

Tip: Remember to return the dial to the "Auto Run" position at the completion of the setting up of the automatic schedules. This will ensure that the automatic cycles will take place.

Manual Operations

Run A Single Station

The maximum Run time for a station is 12 hours 59 minutes. To manually run a single station once, **turn** the dial to *System Test or Run Single Station* position.   **The display will show:**

To adjust the Run Time, use the ➕ button and to advance to the next station

press the ➡ button.

System Test Facility

This feature can be used to test that your valves and sprinklers are working correctly. **Turn** the dial to *System Test or Run Single Station* position.
          The diplay will show:

The controller will run through all stations for 2 minutes in sequential order while you go and check your sprinklers.
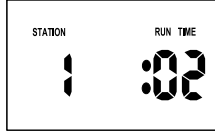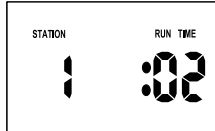
Note: The system test facility is preset at 2 minutes per station and can NOT be adjusted.

Run A Program

To manually run a complete program once for the run times as set in the automatic schedule. **Turn** the dial to the *Run Program* position. "Prog 1" will be shown in the display. To run program 1, leave or advance to program 2 by

pressing ➡ .

Note: If a soil sensor is connected and the display shows "SEN WET", the stations set to soil sensor "ON" will not activate. However individual stations can be watered by using the *Run Single Station* facility and system test.

Other Features

Stop

To stop an automatic or manual watering schedule, **turn** the dial to the *Off* position.

Tip: for automatic watering remember to **turn** the dial back to the *Auto Run* position, as the *Off* position will stop any watering cycles from occuring.

Stacking Start Times

Should you accidently set the same watering start time on more than one program, the Controller will stack them in sequential order from the lowest number. All programmed start times will be watered, but the start times will be shunted along.

Automatic BackUp Program

When the battery is not fitted or is flat there is a backup default program in program 1 watering every day at 12:00am for 10 minutes per station.

A standard 9 volt alkaline block battery should be fitted to the battery snap supplied to maintain the clock accuracy and hold the automatic programs during power outs.

Tip: The display has a warning indicator to let you know when the battery is low or not fitted. The word *BAT* appears just under the AM / PM indicator when the clock is shown.

Other Features

Setting Sensor Options

IMPORTANT: To set up the soil sensor you must have the mains AC power and the soil sensor connected to the controller unit. To commence, **turn** the large dial to the *Soil Sensor Selection* position.

The display will show:

Note: "Rain Sensor" refers to the soil sensor

The default setting for the soil sensor is "ON". This means ALL the stations & ALL the programs are being controller by the soil sensor. To bypass the soil

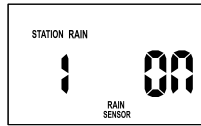sensor for ALL stations, **press** [—] for "OFF", and to re-activate

press [+] to turn "ON".

Setting Individual Stations to Sensor Control

To set individual stations to either sensor control "ON" or "OFF",

first **press** [+] and [→] simultaneously to enter into individual mode.

The display will show Station 1 & rain sensor "ON":

IMPORTANT NOTE: **Station 1 MUST always be "ON"** as it governs the use of the sensor for ALL the other stations.

The station 1 valve MUST WATER the area the sensor is buried in.

Station 1 acts like an origin that all the other stations use as a reference.

To advance to the next station **press** [→].

To turn individual stations to "ON" **press** [+] or "OFF" **press** [—].

Other Features

Soil Sensor Set Point

To check or change the wet / dry settings you will need to use the small dial in the top left hand corner of the product.

Adjusting this dial means you are referencing the "Set Point"of the soil sensor. Initially the set point set is positioned in the MIDDLE of the wet to dry zone allowing the opportunity to fine tune either way depending on soil types or changing watering conditions. Calibrating the controller & sensor to it's new environment will take from 2 weeks up to 2 months.

When the controller & sensor is first installed you need to simply program the controller with estimated run times (ref page 16) to ensure all areas are watered before the sensor will become effective.

First **turn** the large dial to the *Soil Sensor Selection* position. (note, this is the only large dial position where the LED lights show immediate feedback from the sensor to any water penetration.)

Adjust the sensor set point by **turning** the small dial in the top left hand corner. Clockwise adjustment will allow more frequent watering.

Initial set up: Station 1 MUST BE watering the area over the buried soil sensor. This needs to be observed for approximately 3 watering cycles to see how station 1 is watered. Adjust the watering run time to suit. Increase run time if the area is too dry or decrease if the area is too wet. It is important to leave this run time of the sensor controlled area CONSTANT.

After these few cycles of running the WaterSmart 616 controller with the soil sensor, you will get an understanding of the specific watering requirements for station 1. At this point, the sensor is now watering station 1 effectively and the other station run times can be fine tuned to an optimum. Once the system has been in place for a period of time you will be able to adjust your watering requirements globally by adjusting the soil sensor dial. All your sensor controlled stations will be calibrated together referencing station 1. It will be a global condition that will change like a long period of rain or a long period of dry weather.

If a non sensor controlled area/station requires more water simply increase the run time to that station.

Other Features

OFF Mode

To stop the automatic watering cycles, **turn** the large dial to the *OFF* position. The word *"OFF"* will appear in the display. This means the automatic programs will not come on, but the programmed information is still retained in the memory. To reactivate the automatic programs, **turn** the large dial back to the *Auto Run* position.

NOTE: When a soil sensor has been connected, it will turn the stations that are set to use the soil sensor control to OFF. This happens automatically when the sensor detects it is wet enough & watering is not required.
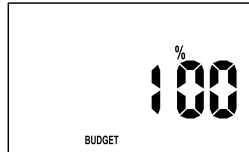
Water Budgeting

The automatic station run times can be adjusted by percentage. This will save time and money as the run times can be adjusted quickly in spring, winter and autumn to reduce the amount of water used.

Ensure that the large dial is in the *Auto Run* position,

then **press** the ← and → buttons simultaneously.

The display will show:

%
100
BUDGET

Displayed is the word *"Budget"* and *"100%"*. This represents the current automatic watering run times as being 100%. The percentage budget can be set in 25% increments from 25% up to 150%.

Example: 50% reduces watering by half.

To adjust in 25% increments, use **+** or **−** buttons.

To return to the clock **press** the ← and → buttons simultaneously.

The display will show the word *Budget* to indicate that the water budgeting feature is in use.

Fault Finding Guide

Symptom	Possible Cause	Suggestion
No display.	Faulty transformer, Fuse blown, Power turned off.	Check fuse. Check field wiring. Check transformer.
Single Station not working.	Faulty solenoid coil.	Swap faulty station wire on controller terminal block with known working station wire. If the faulty valve still does not work on the known working connection then the solenoid coil is faulty. The panel may need to be repaired.
Fuse blows.	Incorrect wiring or bad wiring joint. Too much load on controller	Check wiring and joints. Reduce load on outputs, max. 3 coils running at once
No automatic start.	Incorrect programming or blown fuse. Sensor wet.	If unit works manually check programming. Check fuse and field wiring.
Buttons not responding.	Programming not correct.	Check instruction book to ensure programming correct. If buttons still not responding return panel to supplier or call manufacturer.
System coming on at random.	Too many start times entered on automatic programs.	Check number of start times entered on each program. If programming is correct return panel to supplier or call manufacturer.
Pump start chattering.	Faulty relay or pump contactor.	Electrician to check voltage on pump relay or contactor.
Display cracked or missing segments.	Display damaged during transportation.	Return panel to supplier or manufacturer.
Lights not visable for soil sensor.	Sensor bypassed.	Activate sensor function.
SENSOR Lights flashing green & orange	Station 1 is disabled on the sensor.	Turn on station 1 to sensor "ON"

Installation Instructions

Mounting The Controller

Install the controller near a 240V AC mains outlet, preferably located in a house, garage or other covered area. For ease of operation, eye level placement is recommended.

Ideally, your controller location should not be exposed to rain or water ingress.

INBUILT MODEL:

The inbuilt controller unit is an OUTDOOR MODEL and can be exposed to light rain & is water resistant.

Fasten the controller using the two mounting holes positioned externally on the top, and the additional hole positioned internally under the terminal cover.

Electrical Hook-Up

WARNING

1 **All electrical work must be carried out in accordance with these instructions following all applicable Local, State and Federal codes, or warranty will be void.**

2 **Disconnect mains power supply before maintenance work to controller or valves and when connecting and disconnecting field wiring and pump or master valve hook-ups.**

Installation Instructions

Field Wiring Connections

PREPARATION

1 Prepare wires for hook-up by cutting the wires to the correct length and stripping approximately 6.0mm (¼ inch) of insulation from the end to be connected to the controller.

2 Ensure terminal block screws are loosened sufficiently to permit easy access for wire ends. Insert stripped wire ends into the clamp aperture and tighten screws. *Do not* over tighten as this may damage the terminal block.

3 A maximum of 0.75 Amps may be supplied by any output.Check the inrush current of your solenoid coils before connecting more than two valves to any one station.

Terminal Block Layout

The terminal block is laid out as follows:

EG: 16 station   **USE ONLY 1 AMP FUSE M-205**

GLOSSARY	
24VAC	24VAC Power Supply
COM	Common valve wire input
M	Master valve or pump start active wire
1 to 16	Station (Valve) active wire connection
YELLOW	Sensor cable input
WHITE	Sensor cable input
BLACK	Sensor cable input

Installation Instructions

Power Supply Connections

Inbuilt Transformer
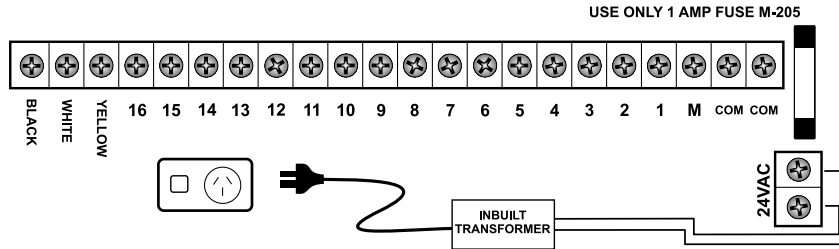
The inbuilt controller is already wired up and comes complete with 1 metre of lead and a 2 pin plug which is suitable for a normal power board (240V AC mains outlet). Simply insert the plug and turn on the power.

It is recommended that the transformer is not connected to a 240V AC supply which is also servicing or supplying motors (i.e. Air conditioners, pool pumps, refrigerators, etc.) Lighting circuits are suitable as a power source.

This inbuilt transformer model, is suitable for outdoor installation as the housing is waterproof and UV stabilised. However, it is recommended that the unit be installed in an area which is not exposed directly to the weather such as under the eaves or verandah.

Connections to the unit are as follows:

USE ONLY 1 AMP FUSE M-205

BLACK WHITE YELLOW 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 M COM COM

INBUILT TRANSFORMER

24VAC
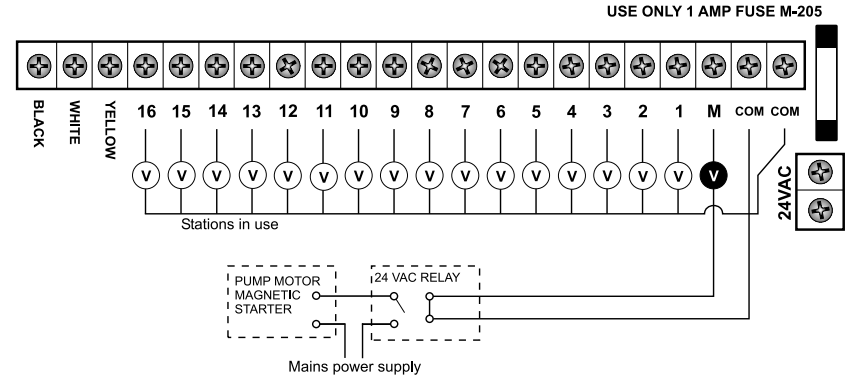
REPLACE 9V BATTERY ANNUALLY

Installation Instructions

Pump Hook-Up Connections

Do not attempt to drive a pump starter directly from the controller. Pump start is provided by connecting one side of the coil of a suitable relay to the Master Valve/Pump Start output of the controller and the other side to the controller common.

For systems supplied with water from a Pump, unused stations must be connected back to the last used station to eliminate the possibilty of the pump running against a closed head. Failure to do so could lead to pump damage.

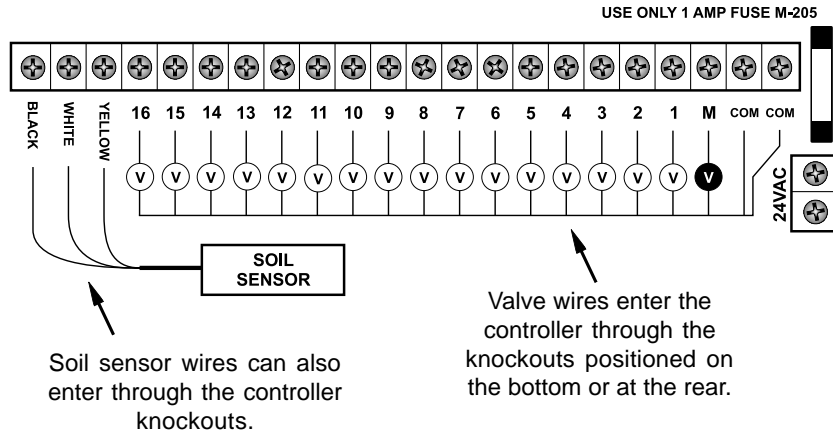The diagram shows an 16 Station Controller:

USE ONLY 1 AMP FUSE M-205

BLACK WHITE YELLOW 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 M COM COM

Stations in use

24VAC

PUMP MOTOR MAGNETIC STARTER

24 VAC RELAY

Mains power supply

Installation Instructions

Connection Of Valves & Soil Sensor

Up to three 24VAC Solenoid Valves can be connected to each station output and wired back to the common (COM) thus:

USE ONLY 1 AMP FUSE M-205

BLACK WHITE YELLOW 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 M COM COM 24VAC

SOIL SENSOR

Soil sensor wires can also enter through the controller knockouts.

Valve wires enter the controller through the knockouts positioned on the bottom or at the rear.

Electrical Characteristics

Electrical Outputs

Power Supply

MAINS SUPPLY: This unit runs off a 220 - 240VAC 50Hz delivering 24VAC through a 30VA rated transformer.

Electrical Power Supply:

Input: 240Volts AC 50Hz.

Electrical Outputs: Maximum of 1.0 AMP

To Solenoid Valves:

24 VAC 50/60 Hz 0.75 AMPs max.

(NOTE: Up to 3 valves with the inbuilt model.)

To the Master Valve/Pump Start:

24VAC 0.25 AMPs max.

NOTE:

Transformer and fuse capacity must be compatible with output requirements.

Overload protection:

Standard 20mm 1 AMP fuse.

Power failure:

9 Volt block type battery maintains clock and programs for up to 4 weeks.

Wiring:

The output circuits should be installed and protected in accordance with wiring rules.

Servicing The Controller

The Controller should always be serviced by an authorized agent.

"If the **external flexible cable or cord** of this transformer is damaged, it shall be replaced by the manufacturer or his service agent or a similiar qualified person in order to avoid a hazard".

Follow these steps:

1 Turn Mains power off to the controller.

2 Disconnect 24 Volt power leads at the controller 24VAC terminals.

3 Clearly mark or identify all valve wires according to the terminals they are connected to, (1 to 16). This allows you to easily wire them back to the controller, maintaining your valve watering sequence.

4 Disconnect valve wires from the terminal block.

5 Remove the complete panel from the box by unscrewing the two screws at both ends of the terminal block.

6 Carefully wrap the panel in protective wrapping and pack in a suitable box. Return to your service agent or the manufacturer.

Note: Tampering with the unit will cancel the Guarantee.

7 Replace your controller panel by reversing this procedure.

Spare Watering Planner

VALVE NUMBER	5		11	
	6		12	
1	7		13	
2	8		14	
3	9		15	
4	10		16	

PROGRAM	START TIME	WATERING INTERVAL	STATION	RUN TIME (minutes)	BREAKER	STATION	RUN TIME (minutes)	BREAKER
1	Start Time 1: 2nd Start Time: 3rd Start Time: 4th Start Time:		1 2 3 4 5 6 7 8			9 10 11 12 13 14 15 16		
2	Start Time 1: 2nd Start Time: 3rd Start Time: 4th Start Time:		1 2 3 4 5 6 7 8			9 10 11 12 13 14 15 16		
3	Start Time 1: 2nd Start Time: 3rd Start Time: 4th Start Time:		1 2 3 4 5 6 7 8			9 10 11 12 13 14 15 16		
4	Start Time 1: 2nd Start Time: 3rd Start Time: 4th Start Time:		1 2 3 4 5 6 7 8			9 10 11 12 13 14 15 16		

Spare Watering Planner

VALVE NUMBER			
	5		11
	6		12
1	7		13
2	8		14
3	9		15
4	10		16

PROGRAM	START TIME	WATERING INTERVAL	STATION	RUN TIME (minutes)	SENSOR	STATION	RUN TIME (minutes)	SENSOR
1	Start Time 1: 2nd Start Time: 3rd Start Time: 4th Start Time:		1 2 3 4 5 6 7 8			9 10 11 12 13 14 15 16		
2	Start Time 1: 2nd Start Time: 3rd Start Time: 4th Start Time:		1 2 3 4 5 6 7 8			9 10 11 12 13 14 15 16		
3	Start Time 1: 2nd Start Time: 3rd Start Time: 4th Start Time:		1 2 3 4 5 6 7 8			9 10 11 12 13 14 15 16		
4	Start Time 1: 2nd Start Time: 3rd Start Time: 4th Start Time:		1 2 3 4 5 6 7 8			9 10 11 12 13 14 15 16		

Your Guarantee

The manufacturer Guarantee to the original purchaser that any product supplied by the manufacturer will be free from defects in materials and workmanship for a period of five years from the date of purchase. Any product found to have defects in material or workmanship within the period of this Guarantee shall be repaired or replaced by the manufacturer **FREE OF CHARGE**.

The guarantor does not guarantee the fitness for a particular purpose of its products and does not make any guarantee, expressed or implied, other than the guarantee contained herein. The guarantor shall not be liable for any loss from use of the product or incidental or consequential damages including damages to other parts of any installation of which this product is part.

The guarantee shall not apply to any equipment which is found to have been improperly installed, set up or used in any way not in accordance with the instructions supplied with this equipment, or to have been modified, repaired or altered in any way without the express written consent of the company. This guarantee shall not apply to any batteries or accessories used in the equipment covered under this guarantee or to any damage which may be caused by such batteries.

If the Controller develops a fault, the product or panel must be returned in adequate packing with:

1. A copy of your original invoice.

2. A description of any fault.

It is the purchasers responsibility to return the controller to the manufacturer or their agent by pre-paid freight.

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