

Hi-flow Unpowered Measured Irrigation Controller (HUMIC)

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Introduction

The Unpowered Measured Irrigation Controller (UMIC) has a limited flow rate because the magnetic valve is quite small. HUMIC uses a much larger magnetic valve. HUMIC uses an Irritrol 2400 Series solenoid valve with 25mm BSP inlet and outlet. The water supply pressure should be between 69 kPa and 1034 kPa (10 – 150 psi). Provided you have a continuous water supply to HUMIC, you can leave your irrigation application unattended for weeks on end.



Hi-flow Unpowered Measured Irrigation Controller (HUMIC)



Unpowered Irritrol solenoid valve

How large can the plot be?

It is assumed that you have already established your irrigation system. Provided that the irrigation system is already working effectively, you can use one or more HUMIC's to automate the irrigation system for any size plot. For irrigation systems that require a very large flow rate, you can use a Smart Solenoid Irrigation Controller.

Instructions for installing the Hi-flow Unpowered Measured Irrigation Controller (HUMIC)

Installing the Hi-flow Unpowered MI Controller is incredibly simple. Start with any pressurised irrigation application. Before installing the controller, it is assumed that the irrigation is operated manually by opening and closing the main valve.

- Step 1.** Position the evaporator in a suitable location so that the evaporation matches the evaporation in your garden.
- Step 2.** Connect the water supply to the inlet of the HUMIC (the inlet is on the opposite side to the adjustable control dripper).
- Step 3.** Connect the HUMIC outlet (next to the adjustable control dripper) to the irrigation zone.
- Step 4.** Position the float over the solenoid and use the two wing-nuts to secure the aluminium bar that prevents the float from jumping off the solenoid when the irrigation stops.



Position the float over the solenoid



Use the two wing-nuts to secure the aluminium bar

- Step 5.** Turn on the water supply and the irrigation should start. The adjustable control dripper drips water into the evaporator.
- Step 6.** Fill the evaporator with water until the float jumps up as the solenoid valve closes.
- Step 7.** The float falls as water slowly evaporates from the evaporator. When the float reaches the low level, the irrigation starts automatically. The float rises as the control dripper drips water into the evaporator. When the float reaches the high level the irrigation stops automatically. The cycle continues indefinitely.



Fill the evaporator



The irrigation starts when the float reaches the low level



The irrigation stops when the float reaches the high level

- Step 8.** Adjust the control dripper to suit the water requirements of your plants
- Step 9.** You may wish to protect the evaporator to prevent animals drinking the water, but make sure that you do not impede the evaporation (chicken wire is ideal).

Replace the water and clean the HUMIC regularly to remove algae and other contaminants.

Because the HUMIC is so simple, there are fewer things to go wrong.

How to adjust irrigation frequency for UMIC

To increase the options for the irrigation frequency, HUMIC is provided with the following float components:



Float with magnet (1 provided)



Float without magnet (2 provided)



Half float (2 provided)



Full slide (2 provided)



Cut slide (2 provided)



UV resistant rubber bands

The following diagrams shows the irrigation frequency for various float assemblies. The irrigation frequency is controlled by the net evaporation from the evaporator between irrigation events.



13mm net evaporation between irrigation events (zero gap between magnet and bottom of full slides)



19mm net evaporation between irrigation events (zero gap between magnet and bottom of full slides)



23mm net evaporation between irrigation events (zero gap between magnet and bottom of full slides)



26mm net evaporation between irrigation events (20mm gap between magnet and bottom of full slides)



31mm net evaporation between irrigation events (zero gap between magnet and bottom of cut slides)



37mm net evaporation between irrigation events (10mm gap between magnet and bottom of cut slides)



44mm net evaporation between irrigation events (15mm gap between magnet and bottom of cut slides)



48mm net evaporation between irrigation events (20mm gap between magnet and bottom of cut slides)

Provided that the water level in the evaporator is between the low level and the high level, you can start the irrigation manually at any time by pressing the float down.

For example, you may wish to irrigate at sunset each day assuming that the water level is between the low level and the high level at sunset. Simply push the float down at sunset to start irrigating.

You can delay the next irrigation or stop the irrigation at any time by removing the float. The irrigation cannot start again until the float is replaced.

It is important to realise that when you adjust the irrigation frequency by adjusting the float, the water usage (litres per week for example) does not change. Both the irrigation frequency and the water usage are directly proportional to the net evaporation rate.

How to adjust water usage for the HUMIC

Adjusting water usage by adjusting the control dripper

If your plants are not getting enough water, turn the control dripper clockwise to reduce the flow rate of the control dripper. If your plants are getting too much water, turn the control dripper anticlockwise to increase the flow rate of the control dripper

changing the water usage does not change the irrigation frequency

changing the irrigation frequency does not change the water usage

This is important because it means that the water usage and the irrigation frequency can be adjusted independently.

Adjusting water usage by adjusting the surface area

You can also adjust the water usage by adjusting the surface area of evaporation.

To increase the water usage, select one or more containers with vertical sides and connect the containers to the HUMIC evaporator. One way to connect containers is to drill in hole in the side of each container and to insert a rubber grommet into each hole. Insert a barbed connector into each grommet, and then use a length of flexible tube to connect the containers. The water level will be same in all containers and the surface area of evaporation is increased.

You can decrease the water usage by decreasing the surface area of evaporation (for example, by placing full bottles of water in the evaporator).

Pressure compensating drippers

If you have a pressurised irrigation system with pressure compensating drippers, then you should replace the adjustable control dripper with a precision adjustable dripper made from a combination of pressure compensating drippers (see Section 2.2). You can alter the water usage by either adjusting the precision adjustable dripper or changing the surface area of evaporation.

Key features of HUMIC

1. HUMIC is completely automatic
2. No electricity is needed (no batteries, no solar panels, no computers, and no electronics)
3. HUMIC is a smart irrigation controller – the irrigation is controlled by the prevailing weather conditions rather than a program
4. You can adjust the water usage by adjusting the control dripper
5. You can adjust the irrigation frequency by adjusting the float
6. Adjusting the control dripper does not change the irrigation frequency
7. Adjusting the float does not change the water usage
8. The irrigation frequency and the water usage are directly proportional to the net evaporation rate
9. If there is an unexpected heat wave, HUMIC will respond appropriately
10. When it rains, water enters the evaporator and delays the start of the next irrigation
11. The water usage is independent of the water supply pressure
12. HUMIC uses much less water without affecting the yield
13. HUMIC is incredibly simple and low tech and so there are fewer things to go wrong
14. Provided you have a continuous water supply, you can leave your irrigation application unattended for weeks on end



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