

DIY Unpowered Evaporative Valve Kit

User Manual



DIY Unpowered Evaporative Valve Kit

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1. Introduction to the DIY Unpowered Evaporative Valve

Measured irrigation is an irrigation scheduling method that satisfies the following two conditions:

1. Variations in the water usage throughout the year are controlled by the prevailing net evaporation rate (evaporation minus rainfall).
2. The volume of water discharged by each emitter during an irrigation event is controlled directly without the need to control the flow rate or the duration of the irrigation event.

It is assumed that the irrigation system (either pressurised or gravity feed) for your garden or small plot of land has already been established.

The DIY Unpowered Evaporative Valve can be used for gravity feed or pressurised irrigation, for drip or sprinkler irrigation, for pressure compensating drippers (PC) or non pressure compensating drippers (NPC).

The DIY Unpowered Evaporative Valve K1Y can be purchased online from the Measured Irrigation website: <https://www.measuredirrigation.com/product-page/diy-unpowered-measured-irrigation-kit>

I recommend that you watch the Measured Irrigation video: DIY Unpowered Measured Irrigation Controller Kit:
https://www.youtube.com/watch?v=iN_DZOaqyM

2. Instructions for assembling the DIY Unpowered Evaporative Valve Kit

The Kit includes everything that you need except for an evaporator. The components in the kit are as follows:

- Valve assembly
- Cylindrical float with magnet
- 7 float rings
- 2 threaded pipes (200mm x 15mm BSP)
- 2 19mm rubber grommets
- Inlet adaptor 15mmF x 20mmM
- Adjustable control dripper assembly



Components in the Kit

Step 1. Choose a suitable evaporator. The evaporator is a plastic container with vertical sides with an opening of at least 30cm x 30cm and a height of at least 12cm.



Step 2. Drill two 22mm holes opposite each other in opposite sides of the evaporator. The centres of the holes should be about 10cm lower than the overflow level of the evaporator. Insert a grommet into each hole.

Step 3. For each threaded pipe, lubricate one end of the pipe with Vaseline and push the pipe through grommet.



Step 4. Connect the threaded pipes to the valve assembly (use teflon tape).



Step 5. Slide the cylindrical float over the float shaft.



Step 6. Attach the inlet adaptor to the inlet pipe (use teflon tape).



Step 7. Attach the adjustable control dripper assembly to the outlet pipe (use teflon tape).



Step 8. Connect the water supply to the inlet side of the evaporator.



Step 9. Connect the irrigation application to the outlet side of the evaporator.



Step 10. Turn on the water supply and the irrigation should start. Check that there are no leaks.



Step 11. Position the control dripper so that water drips into the evaporator.

Step 12. Fill the evaporator with water until the float jumps up and the irrigation stops.



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.

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 evaporator regularly to remove algae and other contaminants.

The DIY Unpowered Evaporative Valve is completely automatic and does not need any electricity. The irrigation frequency is directly proportional to the net evaporation rate (that is, evaporation minus rainfall). You can adjust the irrigation frequency by adjusting the float using the float rings provided. You can adjust the dripper discharge during the irrigation event by adjusting the control dripper.

When it rains water enters the evaporator and delays the start of the next irrigation.

3. How to adjust the irrigation frequency

To increase the options for the irrigation frequency, the DIY Unpowered Evaporative Valve Kit is provided with an adjustable float consisting of a 7 cm diameter cylindrical float and 7 float rings that can slide over the cylinder to increase the outside diameter of the float (the bottom of the float ring should align with the bottom of the cylindrical float).



Cylindrical float and seven float rings



Slide the float ring over the cylindrical float

The following table shows the irrigation frequency for various float rings. The irrigation frequency is determined by the net evaporation from the evaporator between irrigation events.

Outside diameter of float	Number of float rings	Net evaporation between irrigation events
7 cm	0	29.3 mm
8 cm	1	24.6 mm
8 cm	2	20.3 mm
9 cm	1	16 mm
10 cm	1	11.6 mm
11 cm	1	9.3 mm
13 cm	1	6 mm
15 cm	1	4 mm

Table 1. Irrigation frequency for the Unpowered Evaporative Valve

Provided that the water level in the evaporator is below the high level, you can start the irrigation manually at any time by pressing the float down. You can stop the irrigation at any time by lifting the float up.

You can delay the next irrigation by removing the float. The irrigation cannot start again until the float is replaced.

When you adjust the irrigation frequency, the water usage rate (litres per week for example) does not change. The irrigation frequency is directly proportional to the net evaporation rate.

4. How to adjust the dripper (or sprinkler) discharge during the irrigation event

Position a measuring container under one of irrigation drippers. The amount of water in the measuring container at the end of the irrigation event is the dripper discharge during the irrigation event.

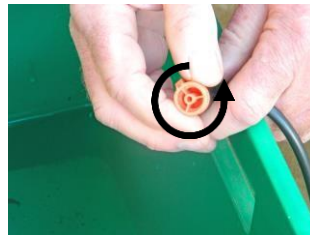


If your plants are not getting enough water, turn the control dripper clockwise to reduce the flow rate of the control dripper.

If your plants are getting too much water, turn the control dripper anticlockwise to increase the flow rate of the control dripper.



Turn the control dripper clockwise to reduce the flow rate



Turn the control dripper anticlockwise to increase the flow rate

5. Key features of the DIY Unpowered Evaporative Valve

1. Completely automatic
2. No electricity is needed (no batteries, no solar panels, no solenoids, and no electronics)
3. Smart irrigation controller – the irrigation is controlled by the prevailing weather conditions rather than a program
4. Use for gravity feed or pressurised irrigation (water supply pressure at least 10 kPa)
5. Use for sprinkler or drip irrigation
6. Use for pressure compensating drippers or non pressure compensating drippers
7. You can adjust the dripper discharge by adjusting the control dripper
8. You can adjust the irrigation frequency by adjusting the float
9. The irrigation frequency is directly proportional to the net evaporation rate (evaporation minus rainfall)
10. When it rains, water enters the evaporator and delays the start of the next irrigation
11. Water supply pressure 10 kPa to 800 kPa
12. Can deliver water to at least 500 2 L/H drippers
13. Uses much less water without affecting the yield
14. Simple and low tech and so fewer things to go wrong
15. Provided you have a continuous water supply, you can leave your irrigation application unattended for weeks on end
16. A tap timer may be used so that irrigation is only available between sunset and sunrise

