



WaterMate

Setup and installation guide

V7 upwards control unit

Doc version 9

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Part 1 - Contents



Control unit



Air temp sensor



Power supply
(mains model)



Solar panel
(solar model)



Braided inlet hose
4m mini / 6m pro
With 3 large jubilee clips



Hose connector



Water valves
With pipe fitted



Jubilee clip **x3**
13-23mm

WaterMate Pro pump & inlet strainer



Water pump



Inlet strainer

WaterMate Mini pump & inline filter



Water pump



Inline filter

Optional extras, available via our website:

- Pump extension cable (4m or 10m)
- Solar panel extension cable (4m)
- Wireless temperature and humidity sensor
- Greenhouse mounting plate for control unit

13mm distribution pipe



10m LDPE
x1 mini / x2 pro



Straight joiner **x2**



End plug
x4



Elbow joiner
x4



Tee joiner
x2

Pipe fixing kits - depending on your choice at time of purchase

For greenhouses (P clips & bolts)

For polytunnels (wire & cable ties)



P-clip
x10



M6 nut
x20



M6 bolt
x10



Garden wire
30m x1
Or 10m x2



Tensioner
x2



Cable tie
x100

Micro-irrigation kit



Dripper
x24



360° Sprayer
x10



180° Sprayer
x10



4mm take-off
x12



4mm tap
x6



Tee joiner **x24**



Hole plug **x10**



Hole punch



Ground stake
x24



4mm hose
20m

Part 2 - System overview

Introduction

Thank you for buying a Harvst WaterMate - this guide will walk you through the concepts, modes of operation, and how to install the system.

WaterMate is a complete kit of parts; containing everything you need to set up automatic irrigation.

WaterMate comes in two sizes:

Mini

Designed for smaller greenhouses, up to 6m² of watered area.

Pro

The Pro kit comes with a more powerful pump, and more pipework, for larger greenhouses and polytunnels, up to 40m² of watered area.

There are three power options:

Solar

Powered by a solar panel, or plugged in using a mains charger for additional watering time throughout the year when there may not be as much sunshine, or if your location does not get much sun.

Mains

Powered by a 240v power supply, for installations which require heavy duty watering or have no sun.

4-season

As per the mains version, with 3 additional power outputs for extra pumps, grow lights or low voltage heaters. Powered by a 240v power supply.

Control unit options

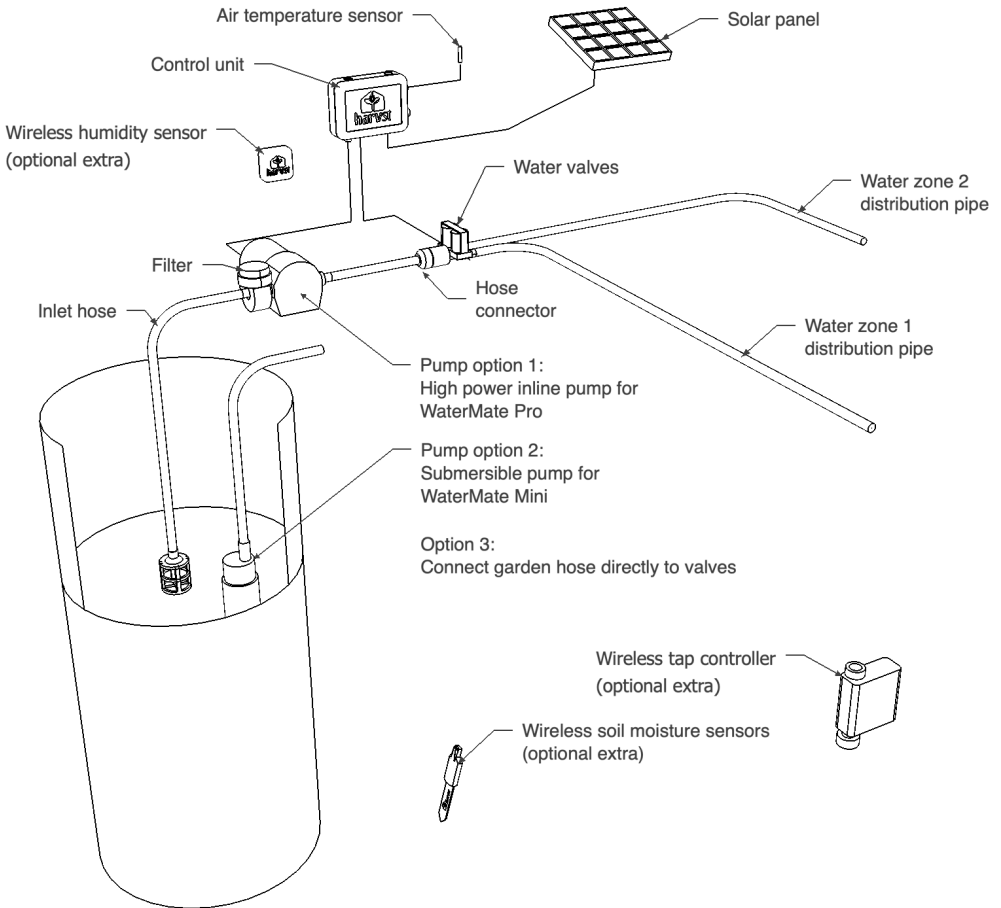
- Solar power
- Mains power
- 4-Season

Watering options

- 1 - Mini pump (submersible)
- 2 - Pro pump (inline)
- 3 - Garden hose

Sensors

- Temperature (supplied)
- Humidity (optional)
- Soil moisture (optional)



Control unit

The brains of the system, it controls the pumps and valves.

- **Timer** - from twice a day, to once every 5 days. A straightforward timer routine is a good baseline to work with. As the seasons change, update your program.
- **Temperature** - Choose to water more when it's hot, or less when it's cold.

Settings and control

Settings are managed on a smartphone, tablet or laptop. If the control box is within range of home WiFi, you can also monitor and control your system from anywhere that has an internet connection. Read more about the control unit, and how to manage settings, in **Part 3** of this guide

Dual zone valves

Watering can be managed in two separate zones via an electric water valve, depending on what's growing in each zone. You might want misters or sprayers for seedlings on greenhouse staging, and drippers for larger plants such as tomatoes or peppers. Or, you can water your two zones based on how much water they need; a dryer zone for one plant and a wetter zone for another.

Water supply

Garden hose

Feed directly into the water valves. Leave the hose tap turned on and Watermate will manage the rest.

Mini pump

A submersible pump capable of providing water for small greenhouses.

Pro pump

An inline pump capable of providing larger amounts of water at a high pressure, for larger greenhouses and polytunnels.

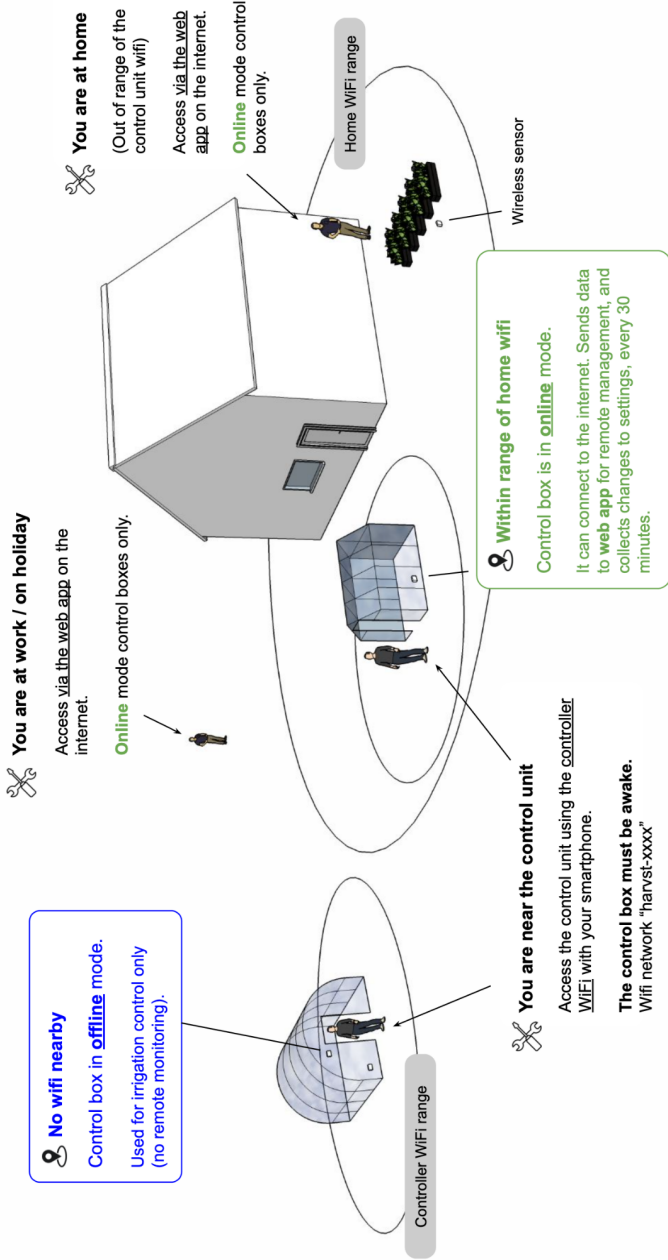
Irrigation parts

Supplied with the Watermate are a range of pipes, hoses and fittings for you to install into your own greenhouse or polytunnel. See how to install the valves, pump and other components in **Part 4** of this guide.

Operating mode - online or offline?

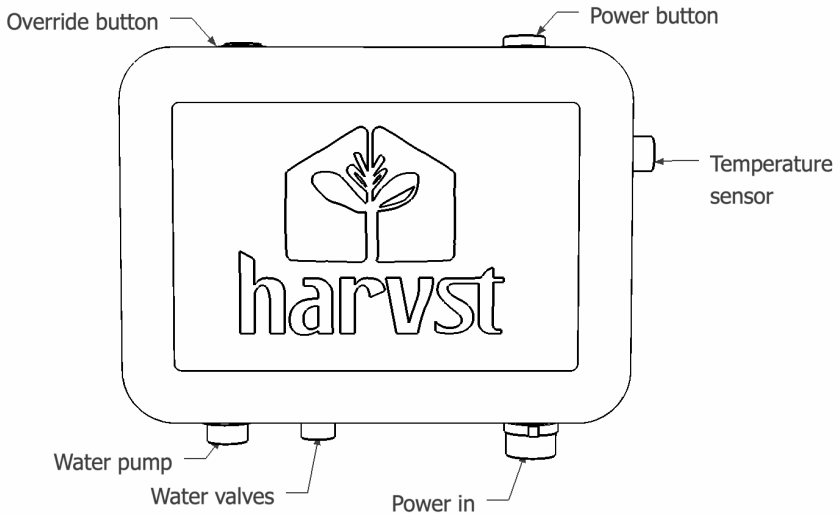
 Choose online mode or offline mode, based on the location of your control unit.

 See how to change the settings on your control unit, depending on where you are.



Part 3 - The control unit

Solar powered systems



Solar powered control boxes have a built-in battery, which must be kept charged using the solar panel. As soon as you receive your WaterMate system, plug in the solar panel and put it in a sunny location so that the battery is fully charged when you come to set up and test.

The solar panel must be plugged in at all times, to keep the battery in good condition.

The solar panel should be mounted outside the greenhouse or polytunnel; try to position it so that it catches the most sun possible.

The built-in battery will provide enough power for up to ten minutes of watering per day, and will recharge fully on a sunny summer day; more than enough for most greenhouses and polytunnels.

Charging will be disabled below 5°C or above 45°C to ensure a long battery life. If possible, do not mount the control unit in full sun, so that you get more charging time in the summer.

Power saving (sleep)

The control unit will go to sleep when it is not doing anything, to save battery power. It wakes up every 30 minutes to take readings, and to turn on the water pump if required.

To change settings, or override the watering, *the control box needs to be awake.*

To wake the unit up press the **override button** on the top until you hear a rising tone.

Winter commissioning

When you set up your system for the first time, you'll want to run the pump to test your pipes and fittings. This will probably run the battery down - when the battery is low, you will hear a falling tone from the control unit and the pump won't run for long, if at all.

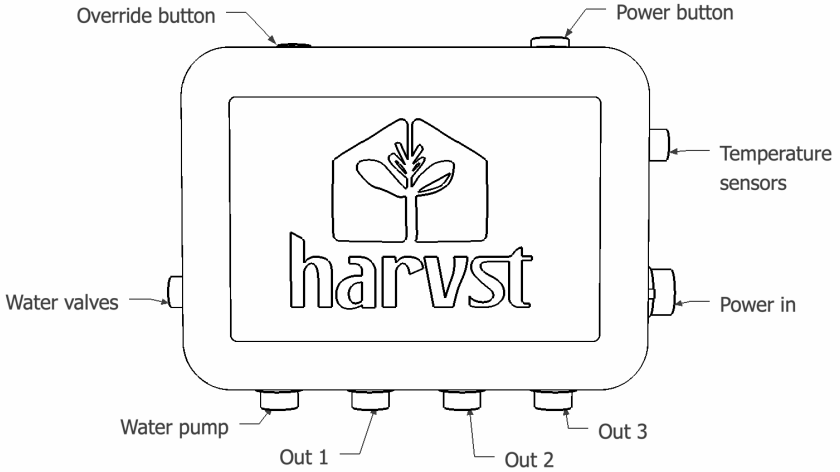
In the winter, with overcast skies and a low sun, your battery may not recharge fully within a few days. You can either wait until you have more sun, or you can buy a top-up / trickle charger to take the place of the solar panel over winter.

Mains powered systems

Mains, 4-season : full environmental control

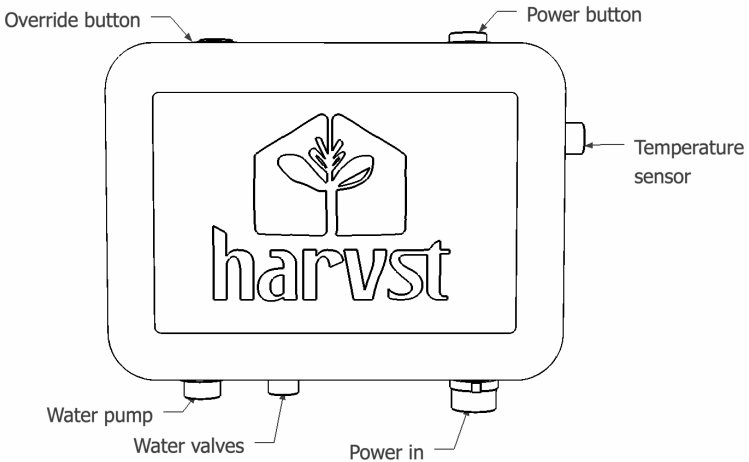
240v power supply included.

3 additional output ports for either heaters, grow lights, or extra pumps.



Mains (Irrigation only)

240v power supply included.



Controlling your WaterMate

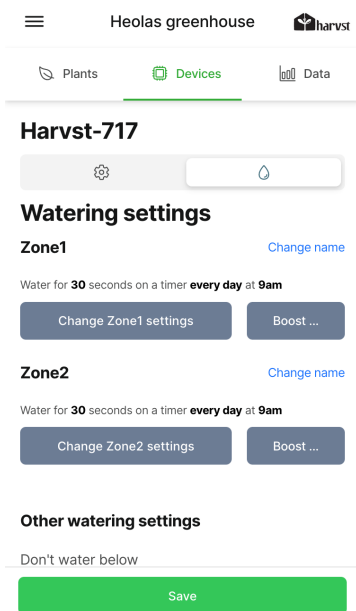
There are two ways WaterMate can operate: online or offline.

Online mode

Control unit is **within range** of a WiFi network.

The unit connects to the internet on a regular basis to send information to your Harvst cloud account, where you can view activity.

Use the **Harvst web app** to update settings, which are collected by the control unit each time it sends an update.



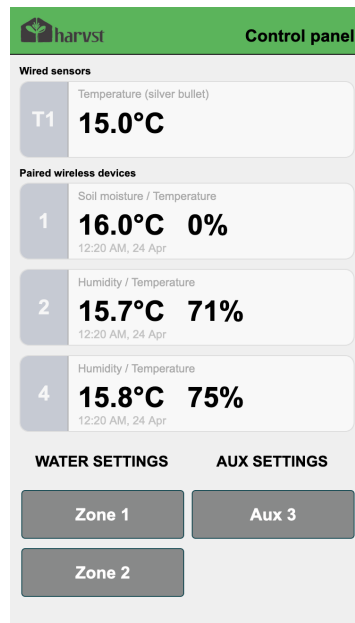
The web app (grow.harvst.co.uk)

Offline mode

Control unit is **not** in range of a WiFi network.

The unit operates without an internet connection, monitoring sensors and watering as per your settings..

Use the **system control panel** on your phone to update settings and view recent activity.



System control panel

Setting up : Online mode

Step 1

Turn the control box on while holding the override button down. You are booting the box in offline mode first (it's faster). Wait for the beeps to stop. The light on the override button will be flashing. It is now transmitting a WiFi signal for you to connect to, so that you can tell the box which network to use.

Step 2

On your phone or tablet, look for the wifi network which starts HARVST (you may have to refresh your wifi on your phone a few times). The next 4 characters are unique to your control box. For example; **harvst-AF4C**

Connect to this wifi network. You should be automatically redirected to the control unit welcome screen. If not, open a web browser and type **192.168.4.1** into the address bar.

If the harvst control page doesn't show up or wont connect, try turning off your mobile data (4G/5G). Your phone may also decide to reconnect to your home wifi, if this is the case turn off 'auto reconnect' for your home wifi and try again.

Step 3

From the device control panel, click the green button "Wifi setup"
(or Settings > Wifi setup)

Step 4

Choose your home wifi network from the list. If it's not found, click "Re-scan" at the top of the screen. You might need to do this a couple of times.

Step 5

Enter your home wifi password, if you have one. Click save. The box will reboot and beep fast while searching for a connection. If a connection is made OK, you'll hear a "celebration" beep.

If a connection cannot be made, it's possible you have entered an incorrect password, or the signal is not strong enough. You'll hear two low beeps. The box will try three times to connect. After the third time, you can log on to the box wifi network (harvst-xxxx) and try again.

Assign the control unit to your Harvst account

For online mode, you will need a Harvst web account (it's free). The control unit will send data to the Harvst cloud, and your web account will let you view the data, and let you update settings from anywhere.

First, you'll need to get the control unit device ID. This is a unique 12 character code which is printed on a sticker on the back of the unit. Alternatively, you can get the code from the device control panel (where you set up the WiFi earlier)

Sign up for a Harvst web app account

Reconnect to your usual WiFi or 4G data, and sign up for a Harvst account at <https://grow.harvst.co.uk>. If you already have an account, log in.

Assign the control unit to your account

1. In your Harvst web app, go to "My account".
2. Click the grey button to assign a new device.
3. Input the device ID, and give your new garden location a name and description.
4. Click on the save button.

A new garden location will be created and the control unit will be assigned to it.

How to reset wifi details

To clear wifi details and set the control box into online mode, perform a **factory reset**:

Hold the "wake" button down until you get 4 low beeps; (about 15 seconds) or click the "reset wifi" button on the settings page.

Setting up : Offline mode

You will need to be within a few metres of the control unit to update the settings, and the control unit will need to be awake.

To set up offline mode as the permanent mode of operation

Hold the override button down *while you turn on the control unit*. When it's on, you'll hear a long beep. The device is now set and will always turn on in offline mode.

Connecting to the device dashboard

The control unit will transmit its own WiFi signal with SSID "**harvst-XXXX**". The number **XXXX** is specific to your system.

Connect to this WiFi network using your smartphone WiFi settings. A few seconds after you have connected, you will be redirected to the device dashboard.

If you are not redirected automatically, once you have connected to the network, you can open a web browser and go to <http://192.168.4.1>

Firmware updates

The firmware is the program running on the control box. If yours is running in online mode, the firmware will be updated automatically when there is a new version released by Harvst.

In offline mode, firmware is not updated automatically. You can connect in online mode from time to time to update firmware if you wish.

The Harvst web app

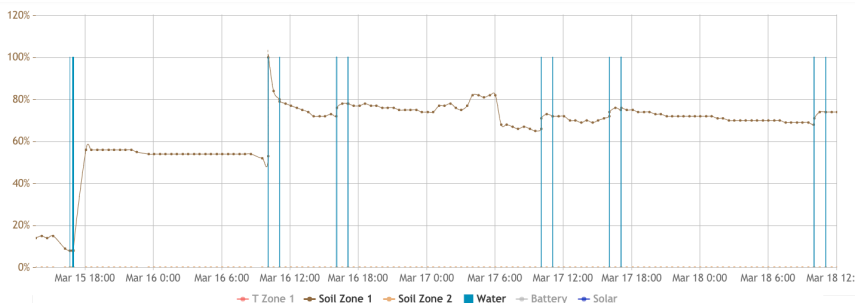
Free with every WaterMate kit is the **Harvst web app**. It runs on any smartphone, tablet or computer, in a web browser. It provides three main features:

- Control system settings and data view (for units in online mode only)
- Garden journal
- Harvst community forum

1. Control system settings

If your control system is operating in **online mode**, you can manage and monitor it from anywhere using the web app. Any changes you make to settings in the app will be reflected on the control system within 30 minutes or so, when the box next wakes up to send an update.

Data from the control system is sent to your online account. Up to 7 days of data is available to view.



Your system will be set up as a “location” in your garden, from where you can access the dashboard for your control unit.

2. Garden journal

Browse crops, learn about growing, record plantings, thinnings, transplantings, store photos and get reminders for when to sow next. If your control system is operating in “offline mode”, you’ll be updating watering settings directly using the system control panel. You can still use the web app as a garden journal.

Getting the app

It’s a “web app” which means **you won’t find it on an app store**.

Register for an account at <http://grow.harvst.co.uk>

Manual watering / override

If you're in your greenhouse and decide that you want to water, you can either use your phone, or the button on the top of the control box.

With your phone / tablet and the system control panel

1. Wake the control unit up by pressing the override button on top once. Wait until the box is awake.

Water now

10 sec

20 sec

30 sec

60 sec

2. Log onto the control unit WiFi network (harvst-xxxx).

3. Wait until you are directed to the system control panel, and then choose a blue button on the appropriate zone.

If you're not automatically redirected to the system control panel, open a browser and enter 192.168.4.1 in the address bar.

With the manual watering (override) button

1. Wake the control unit up by pressing the override button on top once.

2. Hold the watering button down until you get a single beep.

If you let go now, it will water zone 1 for 30 seconds. If you hold the button down for longer, until you get two long beeps and then let go, it will water zone 2 for 30 seconds. If you continue to hold for 3 beeps, manual override has been cancelled and you can let go.

1 beep = water zone 1 2 beeps = water zone 2 3 beeps = cancel

Automatic watering

Control units in **online mode**

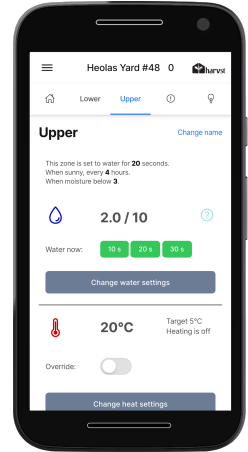
Log into the Harvst web app (<http://grow.harvst.co.uk>) and visit the dashboard for your control unit. Change the settings there.

When the control unit next wakes up to send data, it will collect the new settings from the server.

Alternatively : via the system control panel

If you want to access the control unit directly, and change settings immediately, follow the steps as for offline mode.

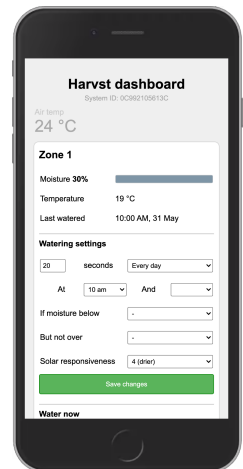
Change settings on the device itself, and they will be updated in the web app when the system next sends data (every 30 minutes or so).



Control units in **offline mode**

Here you are accessing the device control panel directly.

1. Wake the control unit up.
2. Connect to the control unit WiFi network (harvst-xxxx) and wait to be directed to the dashboard. It might take a few seconds.
3. Change your settings there. They will take effect immediately.



Automatic watering using a timer

The simplest approach for automatic watering is a timer system. A typical place to start is 1 or 2 minutes in the morning and 1 or 2 minutes in the evening - you'll see what works best for your plants with some experimentation.

Automatic watering using temperature

On a hot day, plants will want more water. Watermate can deliver an extra dose of water, using the temperature settings in the web app (online mode), or on the system control panel (offline mode).

Remote water boost

If you're away from your system and you would like to water more, you can set a one-off "boost" in the web app, which will be done when the control unit next connects to send an update.

Battery capacity

The built-in battery can provide up to 10 minutes of watering per day, assuming an average amount of summer sun. To keep the battery in good condition, spread this watering across multiple periods, rather than all at once. This helps prevent the battery running too low at any one time.

Automatic sensor based watering is not done after 9pm, to preserve battery life and to prevent noise. You can choose timer watering for any time between 1am and 11pm.

If the battery is low, the system will not pump water until the battery has become sufficiently charged again. If your control unit is operating in online mode, you can request low battery alerts via email on the notifications tab of the web app.

Frost protection

The system will not pump water when the air temperature is below 2 degrees C.

Additionally, you can choose to turn off pumping below your own threshold, to prevent soaking plants in cold water. Choose the threshold temperature setting on the web app or the device dashboard (for offline devices).

Low water alerts

If the system is trying to water but there is none left in the tank, you'll hear a two-tone beeping while the pump is running. Low water is detected by the pump itself.

If your system is running in online mode then you can choose to receive an alert when the system detects that there is no water left : set this up on the notifications tab in the web app.

We recommend you turn off low water alerts for situations where the pump might be cutting out due to the pressure switch (such as when connected to a soak hose). Do this via the watering settings for the respective zone.

Calibrating the low water threshold

The low water alarm is triggered when the pump back pressure falls (it starts pumping air). Each system will have different pressures when the pump is pushing air and water. The default settings work for most setups, but sometimes it needs to be calibrated.

1. Log on to your device control panel / dashboard
2. Click the "Reset backpressure" button on the settings page
3. Run the pump with no water for ten seconds or more (connected to your irrigation).
4. Run the pump with water, again connected to your irrigation, for ten seconds or more.

The control unit will continue to adjust the calibration as it detects pressure changes in the system.

4-season environment control (heating and lighting)

4-season control boxes are supplied with 3 additional outputs which can be used to power Harvst 12v devices:

- Heater cable
- Grow lights
- Additional pumps

Each output is rated to a maximum of 6 Amps.

To ensure that the power supply is not overloaded, only two of the three outputs can be on at any one time.

Plug the power supply into an indoor power point, or an outdoor waterproof power point. The power supply comes with 5m of cable. If this is not enough to reach your greenhouse or polytunnel you will need to get a qualified electrician to install a power point.

WARNING : Do not use a temporary mains extension cable in a wet environment.

Part 4 - Installation

We recommend turning on your control unit indoors, and connecting it to your home WiFi network before you start installation in the greenhouse or polytunnel. If a firmware update is due, it will be automatically downloaded by the control unit.

The watermate control unit is a sealed unit. To ensure that it lasts as long as possible, follow these guidelines.

- Avoid positioning the control box in direct sunlight, to prevent it overheating.
- The control unit is waterproof, but is not intended to be placed under direct pressurised irrigation. Mount the control unit away from water where possible.
- When you plug in electrical connectors, ensure they are secure to avoid water ingress.

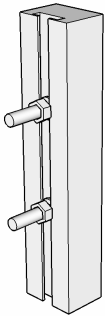
Install the water valves

Mounting the valves securely, in the correct position for your setup, will prevent the pipes from kinking, which obstructs the water flow. The valves are water resistant, not waterproof. Mount them away from direct watering or spray.

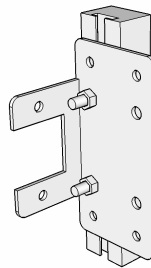
Fit the water valve mounting bracket

First mount the bracket to the greenhouse or polytunnel. Position it so that when the valves are fitted to it later, there are no tight bends on either the inlet side (garden hose) or outlet side (LDPE pipe).

Greenhouse fitting:



Step 1
Slide greenhouse bolts into the channel in your greenhouse frame, and secure them with one nut, to make studs.



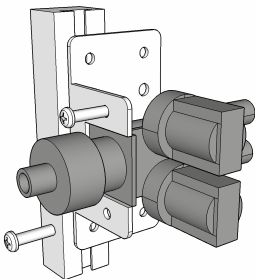
Step 2
Fix the mounting bracket onto the studs using two more nuts.

The bracket can be mounted horizontally or vertically to suit your location.

Position the studs to fit the larger holes in the mounting plate.

Polytunnel fitting : Use the supplied screws to mount the bracket to a suitable piece of timber attached to the polytunnel or staging / bench.

Mount the water valves to the bracket



Bolt the water valves to the bracket as shown in the diagram, using the M4 bolts supplied.

Assemble and mount the water pump (Pro model)



Note the direction of flow marked on the pump casing. It points away from the water tank. The filter element is always connected to the water inlet side of the pump. Fit the push-in hose connectors and filter to the water pump on the **inlet** side. See our video : “Setting up the Pro pump”

The black braided inlet hose will push on to the fittings. Secure the inlet/ outlet pipes to the fittings with the larger jubilee clips supplied.

Mount the pump securely inside the greenhouse or polytunnel, where it is sheltered from direct water spray. It’s water resistant, but not waterproof.

The pump is self priming and will draw water from up to 10 metres away, with up to 4 metres head. Pumps are supplied with a 3m cable. Pump extension cables are available.

Route the inlet pipe

1. Fit one end of the inlet garden hose to the pump inlet strainer. Secure the hose to the strainer with the larger supplied jubilee clips.
2. Place the strainer into your water tank.
3. Run the inlet hose to your pump, and cut the pipe to the right length.
4. Place the larger jubilee clips over the hose before connecting the hose to the pump inlet filter.
5. Connect the hose to the pump inlet filter.
6. Secure the hose with the supplied larger jubilee clips on the inlet side.
7. Use the rest of the hose between the outlet of the pump and the water valves.
8. Use the snap-on connector for the water valve end of the hose.

Many greenhouses are well sealed, and may require drilling through the sheet above the door, or somewhere under the sides. Don’t kink the hose, and keep it as straight as possible to help water flow. Use 90 degree elbows if needed.

Fit the water pump (Mini model)



The WaterMate “Mini” version is supplied with a submersible pump which is placed into your water tank or water butt.

It’s designed to remain underwater permanently.

The mini pump comes fitted with a 1.5m cable, designed for water tanks kept within the greenhouse.

Pump extension cables are available.

1. Place a larger jubilee clip over the garden hose and then attach the hose to the barb on the pump.
2. Tighten the jubilee clip once the hose has been fully pushed onto the mini pump barb end.
3. Drop the pump into your water tank.
4. Route the hose from your pump to your inline water filter. Cut the hose in a suitable place to fit the inline water filter.
5. Place the larger jubilee clips over the hose and then secure the hose ends to the filter ensuring the correct orientation of the filter. There are arrows on the filter to show the flow of water.
6. Route the hose from the filter to the input side of the water valves.
7. Cut the hose to the correct length.
8. Fit a snap-on female garden hose attachment.
9. Connect to the water valves.

The pump will supply enough flow rate and pressure for up to 6 sprayers per zone (12 in total, i.e. 12m² coverage). Alternatively, up to 40 drippers (20 per zone).

We recommend no more than 4m of inlet hose between the pump and the water valves. Ensure you have no kinks in the hose (also consider that on a hot day the hose will get soft, and any weight on a bent hose may cause a blockage).

Installing sprayers, emitters, drippers etc

Sprayers



Sprayers are best for covering a large area of plants. One 360 degree sprayer nozzle can cover approximately 1m² from a position of 1m high. Sprayers are available in a range of flow rates and a range of spray angles from 90 degrees to 360 degrees. Various sprayers are available online; we've provided a selection to get you started.

Up to 20 spray nozzles per zone are supported by the WaterMate Pro pump.

Fit spray nozzles either directly to the distribution pipe or on sections of 4mm hose. We find that they work well when inserted into the top half of the LDPE distribution pipe. This helps prevent dripping, and ensures the pipe is filled before the sprayers start, giving better water distribution.

Drippers

Drippers are good for injecting water to the roots of larger plants, such as tomatoes, peppers, beans and so on. The supplied 4 litre per hour pressure compensated drippers provide a good flow for most uses. You can also get 2 litre per hour and 8 litre per hour from our website - all can be used in the same system.

We recommend you have rings of drippers, each ring connected to the distribution pipe with a take-off. This helps distribute water around the whole greenhouse more effectively, especially with short pumping times.

Up to 60 drippers per zone are supported using the WaterMate Pro pump.

1. Punch a hole in the LDPE distribution pipe where you want the dripper ring take-off.
2. Insert a 4mm take-off connector.
3. Add 4mm irrigation hose to the barbed connector.
4. Connect drippers to the 4mm line in groups of no more than 10 per take-off.

Soak hose / porous hose (not supplied)

Soak hose is good for distributing water along rows of plants, and for keeping soil moist over a larger area than drippers. WaterMate Pro supports up to 20m of soak hose per zone.

Soak hose and tank level sensing

Soak hose does not let much water through, which leads to a high pressure inside the hose. The WaterMate Pro pump is designed to cut-out at a certain pressure (approx 35psi). When the pressure drops again due to water leaking through the hose, the pump will turn on again. This on/off cycling is normal. However it does mean that the automatic low-water sensing does not work, since the pump is off for part of the pumping time.

If you are using a soak hose on one of your irrigation zones, turn off tank level sensing for that zone, using the watering settings for the relevant zone on the device control panel (not the web app).

Misters / foggers (not supplied)



The WaterMate Pro pump is powerful enough to provide water for hanging misters in the roof of your greenhouse or polytunnel. Misters are good for keeping the temperature down, and humidity levels up, but not as good for providing water to the roots of your plants.

To fit a soak hose to the WaterMate valves, you will need to use a section of garden hose and jubilee clips to prevent leaks due to the higher pressure.

Combinations of sprayers / drippers / misters

It's possible to use a mix of emitters in a single zone; if you have a row of tomatoes and salad along the same side of the greenhouse, you can use both pressure compensated drippers and sprayers.

Misters or foggers are best used by themselves (without any other type of emitter in the same zone), as they require a higher pressure to work properly.

Soak hose is best used by itself on a zone, as it also requires a higher pressure to work properly.

Mount the control box

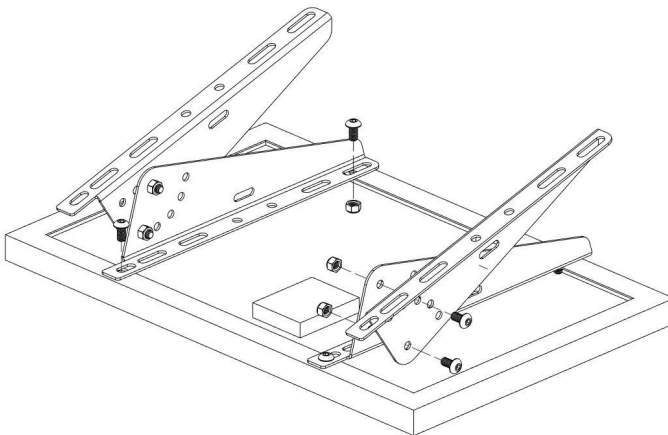
The control box should be mounted within 1m of the water valves. If your greenhouse has slots for 6mm bolts, use two to fix the control box firmly to the frame. Greenhouse mounting kits are available. The control box is waterproof.

Mount the solar panel

Mounting the solar panel correctly will ensure your system keeps watering throughout the year. Place it outside, where it gets the most sun. You may need to change the angle and position as the seasons change. Solar panel extension cables are available at **harvst.co.uk**

The solar panel comes complete with two brackets, each made up from two parts.

1. Attach two brackets to the solar panel using the nuts and bolts provided. This is easiest using an 8mm open spanner with some tape to hold the nut in place on the spanner while you thread the bolt in from the top, through the bracket.
2. Fix the other part of the brackets to a wall, fence, or other surface, a suitable distance apart to match the brackets that are attached to the solar panel.
3. Offer the solar panel up to the fixed brackets and secure it all together using two bolts in each bracket, as shown in the illustration. Adjust the solar panel to the best angle for maximum sun.



Pipe installation in a polytunnel

Every polytunnel is different, so you will need to adapt the guide for your own situation. Water is distributed around the perimeter of the polytunnel using a 13mm LDPE (semi rigid) pipe which is fixed to straining wires around 1m above the ground. Into this pipe, you can connect sprayers directly, or 4mm take-off hoses for drippers or other 4mm emitters.

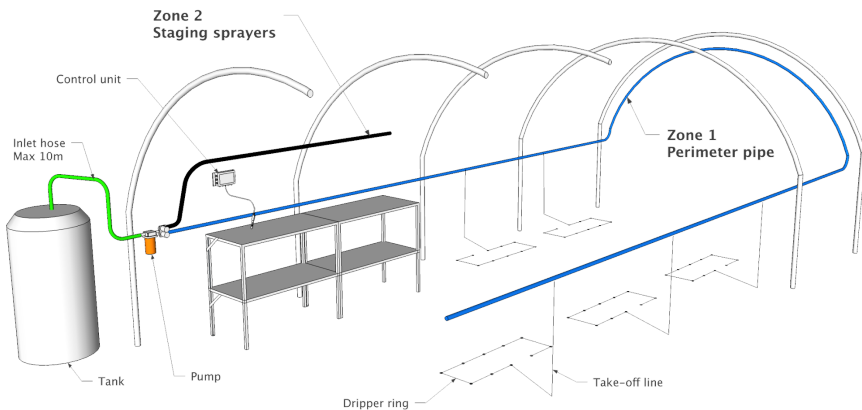
Tools needed

- Secateurs for cutting pipe
- Pozidrive screwdriver and a selection of screws
- Pliers to cut 2mm rubber coated straining wire
- Small adjustable spanner
- Kettle to warm water for softening pipe ends

WARNING The ends of the galvanised wire are sharp, and the wire will be under tension. Wear safety goggles and gloves, do not over tension the wire and take care not to pierce the plastic of your polytunnel.

Example One perimeter pipe & one staging sprayer

Zone 1 as a perimeter pipe around the polytunnel with drippers or sprayers for a soaking of the larger plants, and zone 2 spraying or misting your seed trays and pots on the staging / shelves on a more regular basis, perhaps controlled by a soil moisture sensor.



Polytunnel installation process

TIP	To prevent the support wire causing heat damage where it comes into contact with your polytunnel skin, thread the wire through 4mm micro irrigation pipe first, or use a foam barrier between the wire and the polytunnel.
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Using pliers or wire cutters, cut a short (30cm) section of wire and thread it through the small hole in the flat end of the wire tensioner. Using the wire, fix the tensioner to something strong at one end of the polytunnel, at least 1m above the ground.

Uncoil the wire, and secure one end at the same height at the other end of the polytunnel. A loop around a hoop with a good twist will do.

Straighten out the wire so that it reaches the tensioner, and cut it a little longer than needed. Don't let the wire spring away and cut your polytunnel.

Thread the free end of the wire through the hole in the wire tensioner frame, and then through the hole in the tensioner barrel. See how the barrel spins just one way (against the ratchet mechanism), and feed the wire through appropriately.

Turn the tensioner barrel to tighten the wire. Not too tight.

Fix your LDPE perimeter pipe to the wire using cable ties every 30cm, making a full loop around the polytunnel.

Close the loop with a tee joint, and from the centre of the tee joint, take a length of flexible braided hose to one of the outlets on the water valves. The one with the yellow wire is zone 1, and the one with the black wire is zone 2. Secure it with a jubilee clip over the raised part of the barb.

Punch holes in the LDPE pipe and insert your emitters or take-off lines. We suggest about 40 cm apart for sprayers.

Pipe installation in a greenhouse

Every greenhouse is different, so you will need to adapt the guide for your own situation.

Water is distributed around the perimeter of the greenhouse using a 13mm LDPE (semi rigid) pipe which is fixed to the frame around 1m above the ground. Into this pipe, you can connect sprayers directly, or 4mm take-off hoses for drippers or other 4mm emitters.

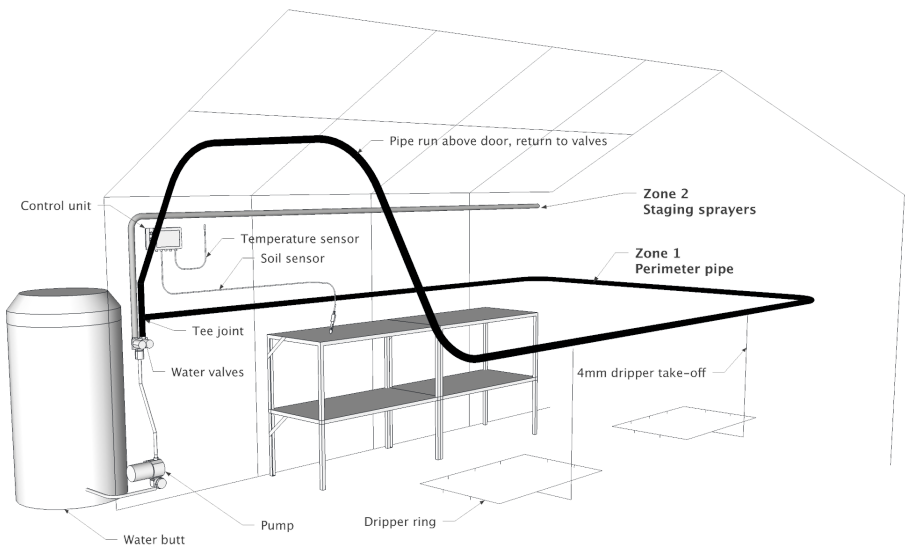
The guide assumes you have an aluminium framed greenhouse with slotted channel, to take M6 cropped head bolts.

Tools needed

- Secateurs for cutting pipe
- 10mm spanner
- Kettle to warm water for softening pipe ends

Example

One perimeter pipe & one staging sprayer



Greenhouse installation process

- Start by choosing where you will feed the inlet pipe into the greenhouse or polytunnel. You may need to drill a hole in the aluminium at the ridge, or through the base.
- For the WaterMate Pro, mount the pump securely near where the inlet pipe comes into the greenhouse, somewhere it will not get wet. The WaterMate Mini pump is placed *into* the water tank which should be within 3m of the water valves (extension cables are available)
- Plan where you will run your perimeter pipe(s), and mark on your greenhouse frame where you will need pipe clips. Approximately 1m above the ground is a good start. A full ring around the greenhouse is best, coming back to a tee joint to connect to the water valves. A ring helps get water to all emitters sooner.
- Mount the water valves in a suitable location, so that at least one of the outlets can feed into your perimeter pipe. The angle bracket on the valves bolts to the inside of the greenhouse frame using an M6 cropped head bolt and nut. The head of the bolt is in the greenhouse frame.



Fix a cropped head bolt with a nut into the slot of the greenhouse frame at each mark, leaving the bolt thread exposed; you'll fix the P-clips to these. Some greenhouses have slightly larger slots, which do not lock the cropped head bolt, but you will still be able to tighten the nut up with care.



Place the 13mm semi-rigid pipe around the greenhouse and secure it to the bolts with the P-clips. It's intentionally a tight fit. If you're struggling to close the clips, you can remove the rubber lining - it's not strictly necessary but prevents the pipe from moving and flexing.

- Link the two ends of the perimeter pipe with a tee joint.
- Attach a length of black braided hose to the centre of the tee piece, and then to the water valves. Secure it with a jubilee clip over the raised part of the barb.
- Run a second pipe in a similar fashion for zone 2, or get creative and use it another way!
- Punch holes in the LDPE pipe and insert your emitters or take-off lines. We suggest about 40cm apart for sprayers.

Regular maintenance

To keep your WaterMate running smoothly, you'll need to do some regular maintenance. We recommend every week you:

- Clean the inlet filter on the pump.
- Ensure drippers and spray nozzles are clear of debris.
- Wipe the solar panel clean with a dry cloth, and position it for the best sun (which changes throughout the year)

Specifications

Maximum water source to water valves (Pro)	Pro: 10m	Mini: 4m
Maximum 13mm diameter irrigation pipe per zone	Pro: 10m	Mini: 10m
Maximum sprayers per zone	Pro: 20	Mini: 6
Maximum drippers per zone	Pro: 60	Mini: 20
Pump flow rate	10 lpm	Mini: 10 lpm
Pump pressure	35 psi	Mini: 10 psi
System voltage	12-16V	
Charging range	5°C - 45°C	

Visit www.harvst.co.uk/setup for more information, videos and photos

WARNING : Do not open the control unit case as this will void your warranty