Cube X - DHW User Guide

V02

mixergy®

Contents

1. An overview of your Mixergy Cube X - DHW

1.1. The technology in your system and what it does

Thanks for buying a Mixergy Cube X DHW system!

The Mixergy Cube X - DHW is an intelligent thermal store that uses a combination of technologies to deliver the highest possible system efficiency whilst making the best possible use of low-cost renewable energy when it is available. Key features of this innovative system include:

1.1.1. High speed boost mode delivering hot water faster

To ensure maximum comfort, the Cube X - DHW exploits the physics of thermal stratification to provide a rapid, high efficiency boost capability. This is illustrated by the following figure:

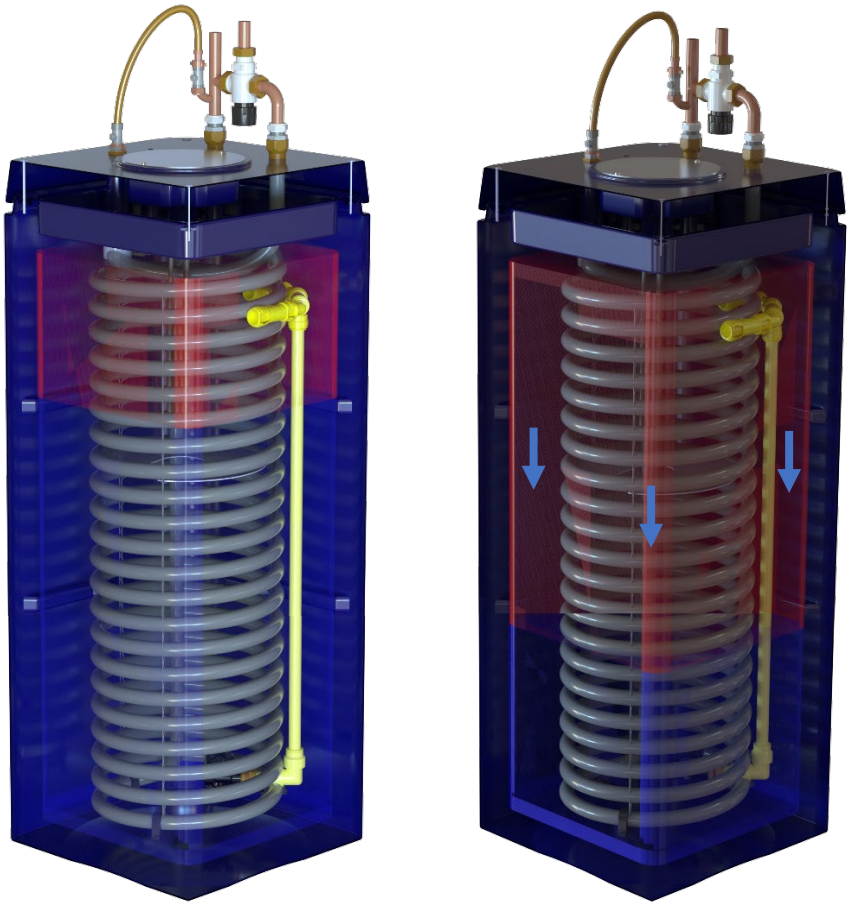


Figure 1 An illustration of the internal temperature distribution within the Mixergy Cube X - DHW during boost mode

Boosting your Cube X - DHW is achieved by a simple press of a button on the Mixergy Gauge or upwards swipe on the app (see Sections 2.1 and 2.2 respectively).

1.2. State of charge measurement for convenient control

State Of Charge (SOC) represents the amount of useful hot water inside your Mixergy Cube X – DHW. This is represented in the app or on the gauge provided (see section 2.1)

1.3. How your Mixergy system works with both traditional and renewable energy sources through smart tariffs

By connecting your Mixergy system to the internet and setting up a Mixergy account through your phone, it is possible to link your Mixergy Cube X - DHW to a variety of time of use (or Smart) tariffs now available on the market. Time of use and Smart tariffs offer lower cost (or even negatively priced!) electricity whenever there is surplus renewable energy. Surplus renewable energy arises when there is more generation from sources like wind and/or solar than demand from homes, commercial premises and factories. You can find out more information around tariffs available from specific suppliers on Mixergy's website through the following link:

https://www.mixergy.co.uk/solutions/smart-tariffs/

By signing up to a Smart tariff, your Mixergy Cube X - DHW is helping the grid to decarbonize by storing energy from excess wind and/or solar. Not only are you saving money, but you are helping to save the planet!

2. How to control your Mixergy system

2.1. Local control with the Mixergy Gauge

Your Mixergy Cube X - DHW comes equipped with a simple gauge to allow for easy and fast control of your hot water:

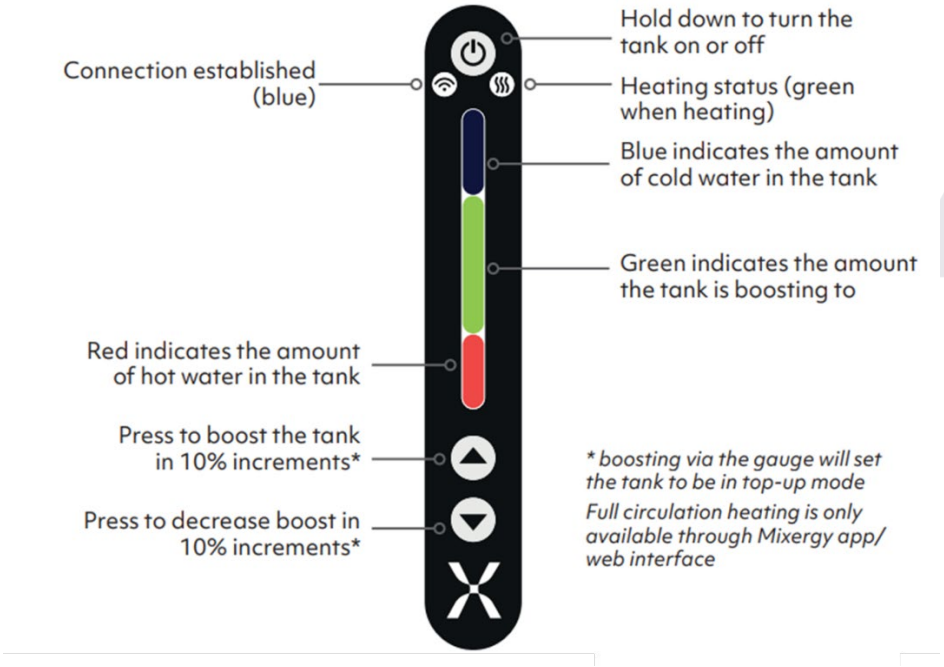


Figure 2 The Mixergy control gauge

Pressing the up arrow allows you to incrementally boost the amount of desired energy within the Cube X - DHW. You can cancel a boost by pressing the down arrow until the green bar disappears. (annotated in green in Figure 4).

2.2. Setting up a Mixergy account to control with your Mixergy App

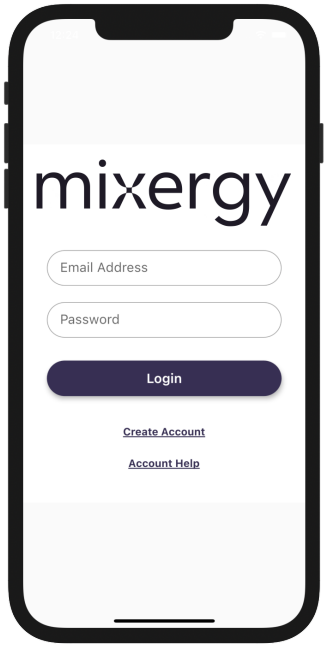
A. Download the Mixergy App by searching for Mixergy on the App Store or Google Play.

Google Play

Download on the App Store

B. Create a Mixergy account

Upon opening the App, you will be presented with a Login screen. Click **Create Account** and then set your credentials.



After entering all the required details, you will receive an email from noreply@mixergy.co.uk. Click through this link to validate your account, and then go back to the Mixergy App to login with your set credentials.

Mixergy's terms and conditions are available during sign up and are also available at www.mixergy.co.uk/terms-of-use

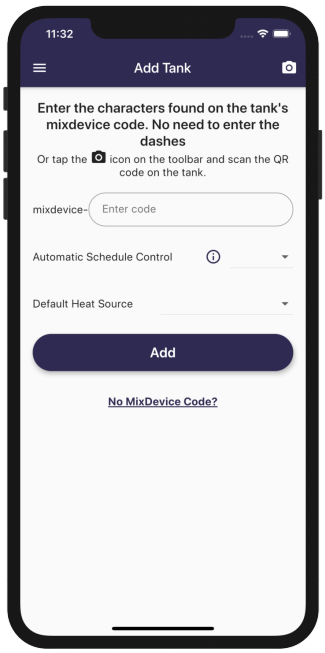
Our privacy notice is available at www.mixergy.co.uk/privacy

C. Register your Mixergy Cube X - DHW to your account

After logging in for the first time, you will be asked to register your Cube X - DHW to your account.

On your Cube X - DHW, there will be a label containing a mixdevice code which is a 25-character identifier unique to your Cube X - DHW (please note: this is not the MX number shown on the same label!).

Enter this code into the App. Alternatively, scan the QR Code (only available in iOS) on the label on your Cube X - DHW to save typing in this code.



On this screen, you may choose whether you'd like to manually schedule your Cube X - DHW (you choose when it heats, and how much), or you can select the option for **Automatic Schedule Control** (our machine learning algorithm will optimise your schedule to save on energy and money).

- If set to Off, your schedule will not be adjusted (i.e. you must manually schedule your Cube X - DHW).
- If set to Standard, your Cube X - DHW will be conservative in its scheduling, aiming to save some money whilst minimising the chance that you'll run out of hot water.
- If set to Economy, your Cube X - DHW will optimise its schedule to maximise savings. This comes with an increased risk that you may run out of hot water if your household uses more than estimated.

2.3. Remote monitoring and control through the Mixergy app

The Mixergy App allows you to view your hot water level, quickly boost your Cube X - DHW, set a schedule or simply delegate all control to our Automatic Schedule Control setting. Automatic Schedule Control uses machine learning to determine how much to heat and when against your particular hot water consumption habits and energy tariff. The Mixergy App can be downloaded from the Apple App Store, or Google Play Store, for more details around how to download and use the App, please visit the following link:

https://support.mixergy.co.uk/how-do-i-access-and-use-the-mixergy-app

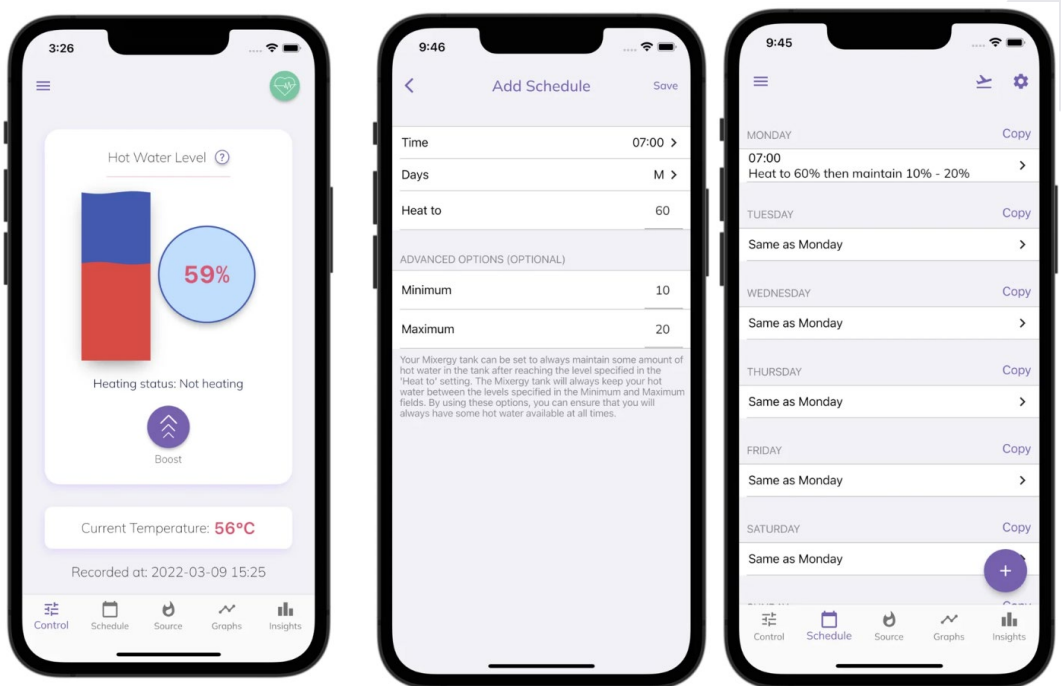


Figure 3 Using the Mixergy app to see how much hot water you have, set a schedule or simply let Automatic Schedule Control take care of things whilst saving energy

2.3.1. View your hot water level

The home screen shows the current heating status of your Cube X - DHW, and how much water is available.

The Hot Water Level is the percentage of the water in the Cube X - DHW that is usable hot water.

In this example, 59% of the water in the Cube X - DHW is usable hot water (the red portion of the graph) and the remaining 41% is considered cold (the blue portion of the graph).

The Heating Status tells you if the Cube X - DHW is currently heating or not. If it is heating, it will state where the instruction has come from. For example, whether it's in response to a boost (from the internet or gauge), or due to a user defined heating schedule, demand side response, or a water sterilisation cycle.

Underneath the Heating Status it will say what time the water measurements were last received by Mixergy servers. This information can be useful when diagnosing internet connection issues in the home.

2.3.2. Boosting your Cube X - DHW

To boost your Cube X - DHW, drag the slider on the right up with your finger to the desired level and let go. The green portion of the graph represents the level your Cube X - DHW is heating to, and the heating status below will change. As the Cube X - DHW heats up, the red portion will climb until the target hot water level is reached.

To cancel a boost made from the App, click **Cancel Boost.**

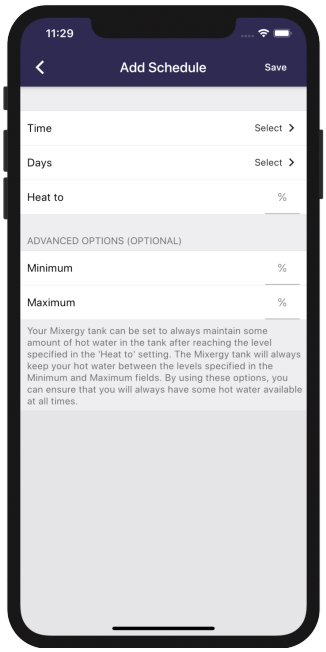
2.3.3. Setting a manual schedule

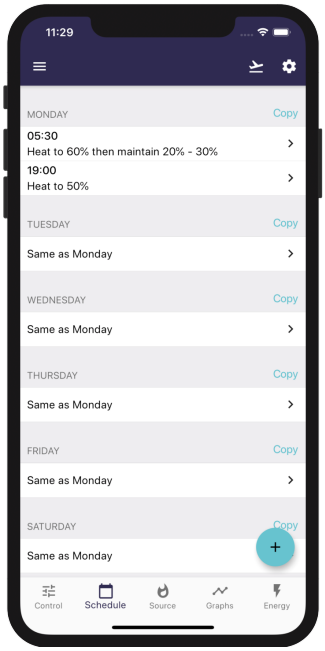
Click on the **Schedule** tab at the bottom of the page and press the + button to set when and how much you want your Cube X - DHW to heat. Click **Save** to view your new schedule.

You can set a different schedule for each day or copy the same schedule over to several days. You can also set the Cube X - DHW to re-heat back to 100% when it falls below a certain level. This means that if the hot water level falls below the minimum hot water level, the Cube X - DHW will automatically turn back on again until the maximum level is reached. If no maintain parameter is set, the usable hot water will naturally cool off, unless it is first used by a draw event.

For example, a schedule can be set every weekday to heat in the morning at 06:00 up to 100%, and then again at 18:00 back to 100%.

On the weekends, it could be that everyone is expected to be in the house all day and likely to be using hot water at different times. For example, a schedule can be set to heat at 08:00 to 100%, and then a maintain parameter to re-heat back to 100% it falls below 50%.





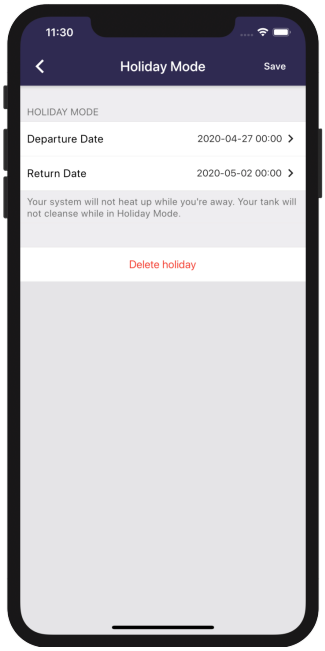
If you do not set a schedule yourself, your Cube X - DHW will automatically run on a ‘default schedule’ until you do. This setting will heat your Cube X - DHW to 100% every day at 3am. This may be useful to begin with if you are unsure of how much hot water your household requires, but please note that this may not be the most efficient setting to optimise energy/cost!

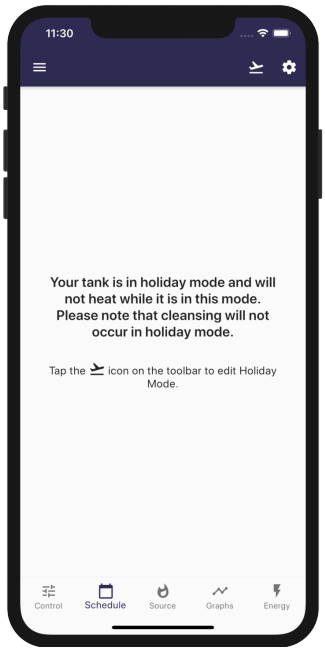
Please note, the minimum hot water level your Cube X - DHW can heat to will be approximately 20% for Cube X - DHWs (this will be slightly different depending on Cube X - DHW size). After this initial heat, you will be able to heat in 1% increments.

2.3.4. Vacation mode

Vacation mode will stop your Cube X - DHW heating when you are away, and any schedule currently set will be ignored until your return day.

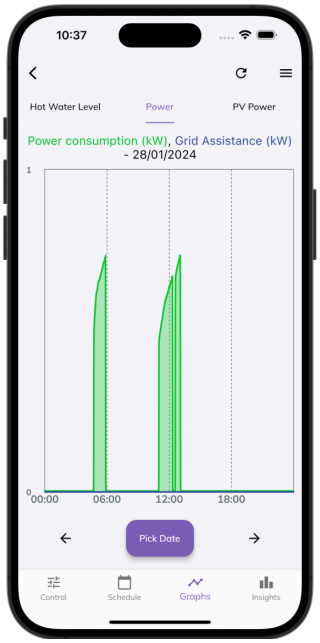
To enter vacation dates, click the **aeroplane icon** on the tool bar.





2.3.5. Viewing your hot water and energy consumption data

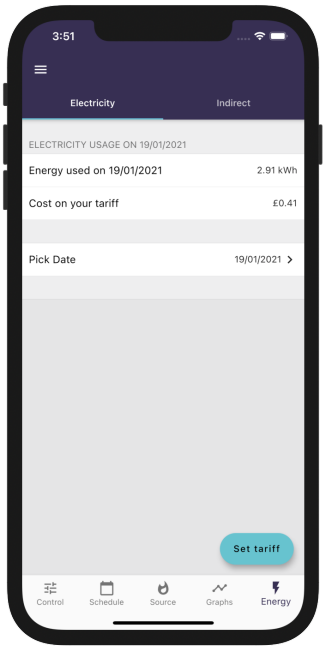
Click the Measurements tab to view graphs visualising your hot water usage and electricity consumption. You can see graphs of previous days by clicking Pick Date underneath the graph.



You can see how these graphs are consistent with the set heating schedule and

reflect water usage and natural cooling of the water throughout the day.

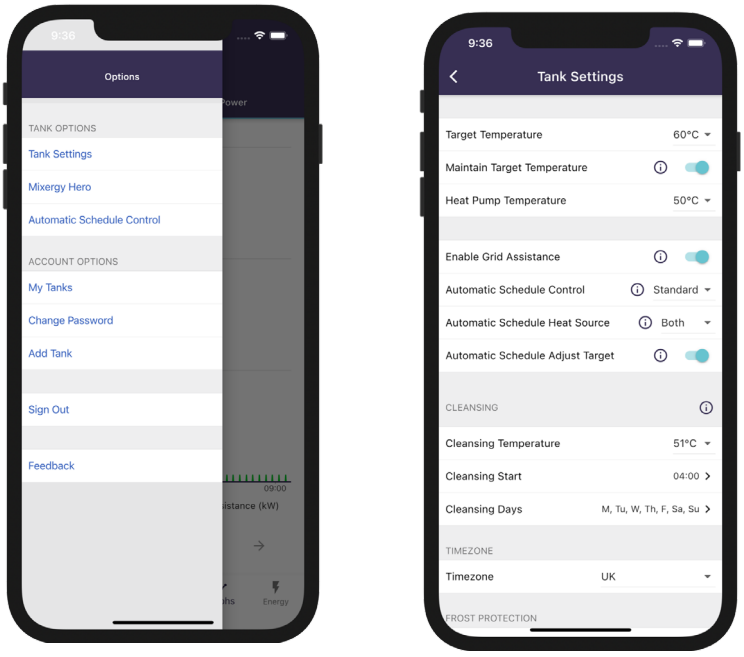
The Mixergy App can calculate how much energy you've used to heat your water, and provide an estimate of how much this has cost. Click the **Insights** tab, then click **Set Tariff**. Enter your peak/off-peak electricity prices for an estimation.



2.3.6. Admin options

To log out, change your password, or add a new Cube X - DHW to your account, return to the homepage **Tank Info** and click **More**.

Click **System Settings** to change the target temperature of your hot water, change your automatic schedule control setting.



2.4. Controlling Mixergy through 3rd party controls in the home

Your Mixergy system can work from third party control devices. The simplest means of integration is to have your installer set your ‘switched live’ signal into your third party controller. Whenever the third party controller calls for heating of hot water, a live mains signal is sent to the Mixergy system, instructing it to start heating hot water. Your system will stop heating until either the third party controller stops calling for heat, or the Cube X - DHW is full of hot water. You can disable the switched live control mode in favour of the Mixergy App by going to the app settings (see previous section for a link to more information).

2.5. Voice control through smart speakers

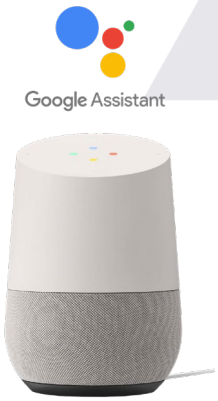
Your Mixergy Cube X - DHW can be controlled with voice control via Google Assistant or Amazon Alexa.

You can use commands to set your hot water temperature, check how much hot water you currently have or give the Cube X - DHW a boost. Plus many more!

A full list of commands are shown below, and we are working to add more commands to this list.

Google Assistant commands

Your request	Google's response	Notes
OK Google, turn on <device name> heating	Sure, turning on heating on <device name>	Heats Cube X - DHW to 20% above current charge
K Google, turn off heating in <device name>	Alright, turning off heating on <device name>	Turns off the immersion (if it's on)
OK Google, fill <device name> <amount>	OK, filling to <amount>	
OK Google, fill <device name> to X%	Got it, filling to X%	
OK Google, how full is <device name>?	<device name> is filled to X%	
OK Google, is <device name> <heating> on	<device name> heating is on/off	
OK Google, what is the temperature in <device name>	<device name> is set to X degrees	X is the target temperature, not the actual water temperature
OK Google, set <device name> to X degrees	Sure, setting <device name> to X degrees	Sets the target water temperature



Amazon Alexa commands

Your request	Alexa's response
Alexa, boost Mixergy tank charge to XX% (e.g. 50%)	OK
Alexa, increase Mixergy tank charge by XX% (e.g. 20%)	OK
Alexa, what is the hot water level in the Mixergy tank?	You have XX%
Alexa, what is the hot water level in my <device name>	You have XX%
Alexa, what is the amount of hot water in my <device name>	You have XX%
Alexa, what is the charge in Mixergy tank?	Mixergy tank charge is XX%
Alexa, what is the charge in my <device name>	<device name> charge is XX%
Alexa, what is the state of charge in my <device name>	<device name> charge is XX%
Alexa, is Mixergy tank boost on?	Mixergy tank boost is ON/OFF
Alexa, turn off Mixergy boost	OK
Alexa, set Mixergy tank temperature to XX°C (e.g. 52°C)	OK
Alexa, what is the temperature in Mixergy tank?	Mixergy tank temperature is XX°C

3. How to achieve the most from your Mixergy system

3.1. Mixergy terminology key

• Hot water level: the % of usable hot water available, or state of charge.

• Draw event: any amount of hot water discharged from the tank.

• Heating event: a scheduled heating instruction set in the Mixergy App (e.g. heat to 50% at 7am on Monday).

• Maintain levels: You can set your tank to maintain a state of charge between a minimum and maximum level. If the level of hot water drops below the minimum level, your tank will automatically heat until the maximum level is reached. We recommend a level of 15% (min) to 20% (max) (electric/gas)to cover any small draw event (e.g. washing dishes). For heat pump cylinders it is recommended to set the max. to 100%.

Fuel type	Best time to heat	How much to heat
Flexible tariffs with price volatility (e.g. Octopus Agile, Economy 7 or Economy 10)	You'll want all of your heating schedules to run when electricity is cheapest, during the set off peak hours.	If possible, you'll want to heat enough water to cover your expected usage for the entire day in one heating event.
Flat tariffs with no price variability (e.g. electric flat rate, indirect sources such as gas boiler)	The time you heat won't affect how much you pay for the energy. To minimize heat losses, we suggest setting your tank to heat to the required amount just before the first expected draw event.	Set your tank to heat enough water at the times you need it. Be sure to put your tank in "indirect mode" through the App to ensure gas is used if it is cheaper than your electricity tariff!

3.2. Automatic schedule control

It can be tricky to know exactly how much hot water you'll require on a daily basis, and that's why we've produced an intelligent machine learning algorithm, which will select the best possible heating schedule for you. This algorithm will optimise your energy use, so you're always saving as much money on hot water bills as you can. It's a win-win situation for you, and our planet!

Automatic control can be set to one of two modes:

1. Standard: your tank will heat conservatively, aiming to save some money whilst minimising the chance that you'll run out of hot water.
2. Economy: your tank will heat to maximise savings. This comes with an increased risk that you may run out of hot water if your household uses more than estimated.

Before the machine learning kicks in, your actual hot water usage will be monitored over a short period. You should either set a manual schedule yourself to begin with, or your tank will run a default schedule – heating to 100% at 3am.

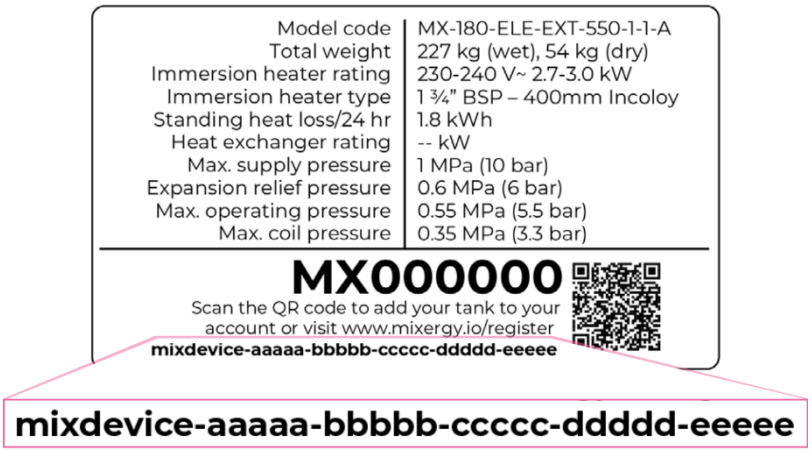
* Friendly disclaimer – scheduling is trying to predict water usage happening in the future. Therefore no manual or automated schedule will ever perfectly predict the exact amount of hot water you'll actually need, though we hope our suggestions and automatic heating control setting will do a pretty good job!

4. FAQs and troubleshooting

1. The Mixergy App won't let me register my Cube X - DHW, what should I do?

a. Before you will be able to register your Cube X - DHW with your Mixergy account, the Cube X - DHW must first be installed and connected to the internet. If you are unable to establish internet connection, please see the answers to question 2 below.

b. Ensure you are entering the 25-character mixdevice number, and not the MX number. This is printed on a white sticker on the side of your Cube X - DHW.



2. What should I do if my Cube X - DHW is not connecting to the internet?

A powerline adapter (included with your Cube X - DHW) should be plugged into a mains socket and connected to your internet router via the included ethernet cable. Check this set-up has been correctly followed by your installer. If you still do not have internet connection, check each of the following steps:

If you already have a homeplug AV network installed in your home, it is recommended that you pair the Cube X - DHW with an existing homeplug adaptor to avoid interference

ii. Ensure that the adapter is not plugged into an extension lead.

iii. If the bottom ethernet LED on the adapter [4] is not lit, the ethernet cable may have come loose and will need to be plugged in again (you should hear it click into place).

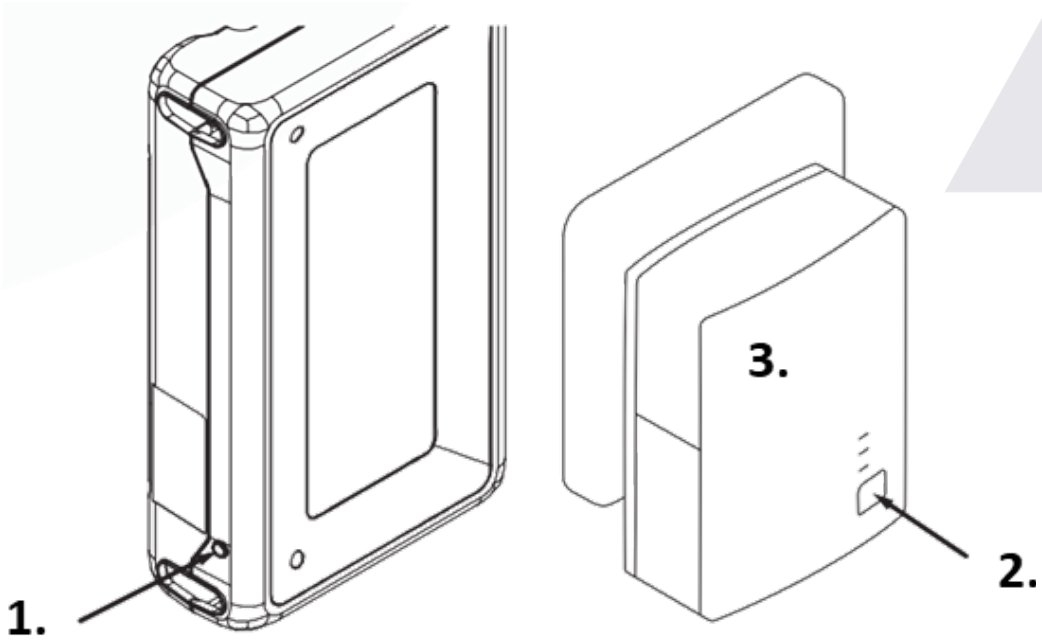
iv. If the middle powerline LED on the adapter [4] is not lit, then your Cube X - DHW may have become unpaired from the powerline adapter connected to your router.

In the case that the cylinder does not automatically pair to the powerline adapter or connection to an existing homeplug AV network is desired, please follow the steps below to pair the cylinder to the network.

i. Use a thin tool to depress and hold the pair button for 1 - 2 seconds.

ii. Depress the pair button on the powerline adapter for 1-2 seconds within 2 minutes of step

iii. Observe all 3 LEDs as solid green on the powerline adapter



3. What will happen to my heating schedule if the Cube X - DHW loses internet connection?

a. Your Cube X - DHW will continue to heat according to the last schedule set when there was internet connection.

I. However, if you power the Cube X - DHW off at the mains it will need to re-connect to the internet in order to begin running the schedule again with the correct time. If no internet connection is available, the Cube X - DHW will enter an ‘offline’ mode where it will constantly maintain between 40-50% charge using your primary heat source.

b. You can continue to boost your Cube X - DHW via the gauge without an internet connection.

4. Why is my Cube X - DHW heating when the schedule is not set to heat?

a. The Cube X - DHW may have been boosted from the gauge or the App.

b. If you have set ‘maintain levels’ within the App, then your Cube X - DHW will automatically begin to heat when the water level drops below the minimum parameter.

c. If you have solar PV, your Cube X - DHW will automatically heat when surplus energy becomes available.

d. A sterilisation cycle occurs every two weeks. This will heat the Cube X - DHW entirely to 100% in order to prevent legionella growth.

e. If you have opted for automatic heating control, your heating schedule will be automatically optimised and may be altered to assist with balancing of the National Grid energy system.

5. Why is my Cube X - DHW not following the schedule?

a. If you have a ‘sense’ cable connected, your Cube X - DHW will ignore its schedule and will heat up when the sense cable becomes live and will stop heating when the cable is no longer live. To disable the sense cable in the app, click on the Schedule tab, click on the cog icon on the top tool bar, click “Ignore automatic off-peak sense and follow schedule”.

b. If you do not have sense cable connected, it is still worth checking the above step, as it could be that the system has wrongly identified a sense cable to be present.

c. If the Cube X - DHW has lost internet connection and been powered off and on, it will have entered offline mode and will maintain between 40-50%.

d. If the Cube X - DHW is in vacation mode, the Cube X - DHW will not follow its schedule until the return date set on in the App.

e. If the power button on the gauge has been pressed and held, the Cube X - DHW will enter a standby mode and will not heat. Press and hold the button again to continue heating according to the set schedule.

If you continue to have to have any problems with internet connection or how to operate your tank, please call Mixergy on **01865 884 343** and we’ll be happy to help!

5. Mixergy warranty statement

Please Note: To validate your warranty, you must first register your Cube X - DHW. You can do this either using the Mixergy App (downloadable from the App Store or Google Play), or by going online at www.mixergy.io.

Once registered and connected online, the Mixergy Cube X - DHW comes with a **25 year warranty** on the Cube X - DHW and a **5 year warranty** on the heat pump head unit, against faulty materials or manufacture subject to the following terms:

1. It has been correctly installed as per the accompanying manual and all the relevant standards, regulations and codes of practice in force at the time, and the commissioning checklist within the manual has been completed.
2. The Cube X - DHW has been commissioned correctly and is connected to the Mixergy platform (via App) – this facilitates remote condition monitoring. Failure to connect the Cube X - DHW to the App will limit warranty period to 2 years.
3. Labour costs to cover any software or hardware faults is included within the scope of this warranty whereby an approved Mixergy installation partner has been used. This period last for 12months, before labour costs become chargeable. A list of current approved installers found on our website.
4. It has not been modified in any way, other than by the manufacturer.
5. It has not been misused, tampered with or subjected to neglect.
6. It has only been used for the storage of potable water.
7. It has not been subjected to frost damage.
8. The unit has been serviced annually.
9. A benchmark service record has been filled in after each annual service by the installer or the unit has been connected to the online analytics platform through the app and monitored each year.
10. The guarantee period starts from the date of purchase and no registration is required.
11. The extended guarantee is not transferable, and rests with the original householder.
12. The system is fed from a public mains water supply.
13. Store temperatures do not exceed 65°C.
14. Installations are made only in the UK & Republic of Ireland.
15. The water supply does not have a Chloride content greater than 300ppm.

16. Where a plate heat exchanger is supplied with the Cube X - DHW (for use with heat-pumps) the water must be in a soft area or plumbing system deployed with a water softener.

17. Units are not installed with uncontrollable heat sources (e.g. Wood Burning Stoves).

18. For commercial / heavy duty installations where constant usage / reheat is required Titanium immersion heaters must be fitted to comply with the warranty.

19. All peripheral components (for instance heating elements, T&P valve, expansion vessel and electronic parts) are subject to a 3-year guarantee.

Exclusions:
The effects of scale build-up, any labour charges associated with replacement of the unit or parts, or consequential losses associated with the failure of the unit.

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For more information on our hot water tanks,

visit us at **mixergy.co.uk**

email us at **enquiries@mixergy.co.uk**

or call us on **01865 884 343**

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