# UNDERGROUND WATER TANK INSTALLATION

These guidelines are designed to cover the installation of Ecosure underground water tanks with a capacity up to 7,000 litres. Separate guidelines are available for larger tanks.

***Please note**: responsibility for the tank passes to the buyer once unloading commences; it is therefore important that the buyer accepts the condition of the tank on arrival before attempting to move it.*

Ecosure underground water tanks are designed to be lifted and manoeuvred only when empty. Under no circumstances should they be lifted or manoeuvred when containing water.

It is recommended that these tanks be unloaded, moved around site and lowered into position by attaching lifting chains and appropriately sized D-shackles to the lifting points provided, or by use of lifting straps around the whole tank. However, some initial swing should be anticipated. This must be stabilised before the tank is moved further. To stabilise the tank when moving around the site, guide-ropes should be attached to the chains, enabling operatives to control the load from a safe distance.

## IMPORTANT INFORMATION – ADDITIONAL PRECAUTIONS

Ecosure underground water tanks are designed to be installed in accordance with these guidelines, taking additional precautions in the special circumstances identified in the following table:

| SPECIAL CIRCUMSTANCES | ADDITIONAL PRECAUTIONS REQUIRED |
|---|---|
| Clay soil | Fill with water and completely encase in c220mm concrete |
| High water table | Fill with water and completely encase in c220mm concrete |
| Traffic bearing | Approved[1] arrangements |
| Adjacent foundations | Approved[1] arrangements |
| Non-standard install depth | Approved[1] arrangements |

[1] Designed and signed off by a structural engineer

If site personnel are faced with any of the conditions noted in the table above, they must seek supervisory advice before commencing tank installation.

**Please note:**

- The tank is designed to take pedestrian traffic only.
- The top of the tank must not finish any more than 500mm below ground level.
- The tank must not be located where root matter can disturb the concrete surround.
- Pipe-falls should be a minimum of 2:100 in the direction of water-flow, i.e. rainwater pipe and service duct towards the tank and the overflow away from the tank.

## BEFORE DELIVERY

Please ensure that

- suitable access and parking arrangements have been made for the delivery vehicle
- plant is available to unload the tank
- a clear route has been designated between the delivery vehicle and the installation site
- a risk assessment and method statement for unloading and manoeuvring have been prepared and signed off
- the installation site is level and clear of obstacles and site debris

Ideally:

- the water ingress pipework should be complete and ready for connection

- the water overflow pipework should be complete, ready for connection and itself connected to the surface water management system (soak-away, storm drain or attenuation as appropriate)
- the service duct is ready for connection

Before starting the installation, confirm no added precautions (see table above) apply and there is no requirement to:

- Install in heavy clay (in which case it is necessary to encase the tank in approximately 220mm concrete)
- Install in a high water table (in which case, encase the tank in approximately 220mm concrete)
- Carry the weight of vehicular traffic (in which case, a structural engineer's design is required)
- Locate closer than 4 meters to adjacent foundations (in which case, a structural engineer's design is required)
- Install adjacent to an earth bank or raised patio (in which case, a structural engineer's design is required)

## INSTALLATION GUIDELINES

The following guidelines apply when no added precautions are required (see table above).

### EXTERNAL WORKS

The installation of the Ecosure rainwater storage tank and its connection to the water supply, water overflow and service duct pipes should be undertaken at the same time as the overall underground works for the project.

The tank should be sited to provide the straightest possible service duct run between the tank and the dwelling as other pipe-work and cabling etc. need to be fed through this duct at a later stage.

### Excavation

- Allow 100-150mm all-round the tank.
- The top of the tank must be no more than 500mm below ground level.
- Use suitable planking and strutting as necessary
- Dig out trenches for pipe work and inline filters.

Once installed, the position of the tank is to be clearly marked and driving vehicles within 2 meters of a tank edge is strictly forbidden.

### The Base

The following guidelines apply when no added precautions are required (see table above).

- The tank must be installed on a firm, smooth, level concrete base built in accordance with good building standards and engineering principles.
- **The depth of concrete used must be appropriate to the size of the tank and soil conditions.**

### Installing the Tank

- Once the concrete base has dried, lower the tank into the hole. Make sure that the tank is sitting flat and true before filling it with any water.
- If you have been supplied with a neck ring, this should be cut to length to finish flush with the ground. If the neck ring is loose, position it and apply a good bead of silicon seal around the joint. ***Please note that the tank lid is designed to withstand foot traffic only.***
- Backfill a minimum of 450-460mm deep around the base of the tank with concrete.
- Once the concrete has set, backfill any remaining space with pea shingle and surround materials, bringing connectors and pipework into final alignment.
- Under no circumstances
  - Tamp-down the infill with machinery

  - Tamp-down finished ground level with machinery
  - Drive vehicles over tanks installed as above
- Connect all pipework
- Mark out an exclusion zone 2 metres outside the original excavation footprint. Superimposed loads must NOT be allowed within the protection area. If this is not possible, a reinforced concrete slab must be designed and installed by a qualified civil or structural engineer so that no loads are transmitted directly on to the tank.

**WARNING**

## Exceptional Conditions/Added Precautions

When exceptional conditions are experienced (see table above), tanks are only to be installed in accordance with the design and instructions of a qualified structural engineer who takes responsibility for the integrity of the installed tank.

## Installation Tip

Installation of the tank and effecting connections with the inlet pipework, the outlet pipework, and the service duct, will normally be undertaken by ground-workers as part of the underground drainage works; this work should also include:

- Leaving in place a draw cord in the service duct for subsequent use by the plumber and or electrician
- Feeding the supply pipe through the service duct, section by section as the service duct is installed

## Aftercare

Most underground water tanks do not need aftercare immediately. If the water is undisturbed for a period of time, it may become stagnant. Over years of use the tank may require cleaning, which can be done using a mop.

## Filter Box Installation

- The filter box can be installed anywhere along the inlet pipe *between the tank and the down pipe*. Ensure you can gain access to the filter for cleaning. *Please note that the filter box lid is designed to withstand foot traffic only.*
- Run your pipe work, ensuring that the inlet from the filter has an adequate drop to ensure water flow. A fall of 2:100 is recommended.
- Ensure the inlet pipe from the down pipe, is fitted to the 4” connector on the filter box with the 90° elbow on it.
- Back fill the area around the filter box with pea shingle.
- More detailed instructions are available on a separate sheet.

## Fitting a Pipe to Underground Water Tanks – 1100 - 2800 litres

- Slip a 110 straight joiner over drilled spigot on tank.

## Fitting a 4” Pipe to Underground Water Tanks – 3500-7000 litres

- Drill out the hole for the pipe using a 108mm hole cutting saw.
- Cut the 110mm pipe square, using a fine tooth saw.
- Chamfer the end of the pipe, using a medium file or rasp.
- Remove dust and filings from the end of the pipe .
- Push the pipe into the hole drilled in the tank. The end of the pipe can be lubricated.

## For Information

The following example risk assessments are available at www.water-tanks.net in the technical information section:

| | | |
|---|---|---|
| Example risk assessment | – | tank unloading and on-site movements |
| Example method statement | – | tank unloading and on-site movements |
| Example risk assessment | – | tank installation |
| Example method statement | – | tank installation |

**WARNING**

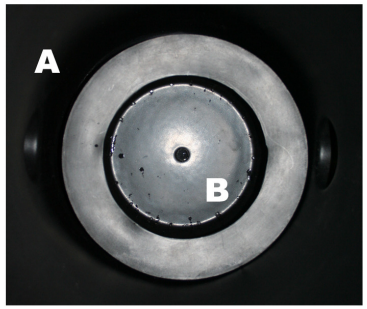
The risk assessments are examples only, and need to be adapted by a capable person to reflect actual site conditions

# UNDERGROUND FILTER - SET-UP

**1x A :** Filter chamber
**1x B :** Filter Basket
**1x C :** 90° elbow calmed inlet
**1x D :** Mini filter basket
**1x E :** Lid

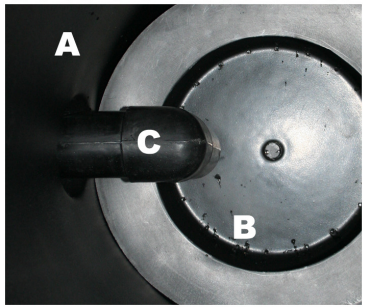

## Step 1

**Lower the basket filter into the chamber**



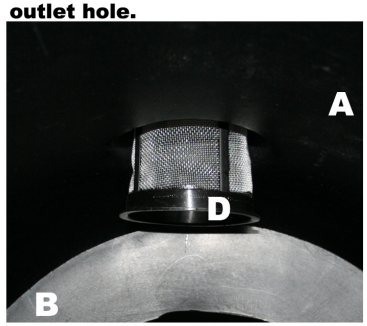

## Step 2

**Insert the calmed inlet elbow in to the smaller of the two holes.**



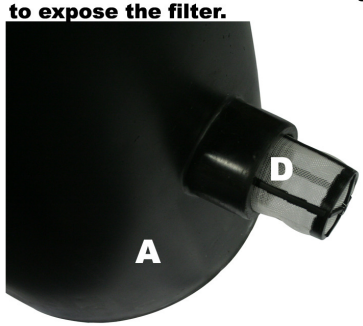

## Step 3

**Insert the mini basket filter into outlet hole.**




## Step 4

**Pull the mini basket filter through to expose the filter.**



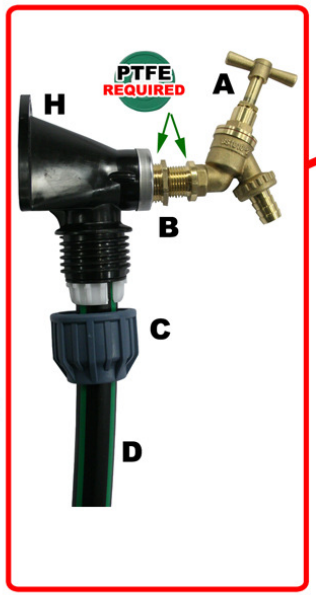

**Once all the steps above are complete, place the lid (E) on the filter chamber.**

ECOSURE

# EASY HYDRO PUMP KIT - SET-UP

**1x A :** Brass tap
**1x B :** Brass reducer
**2x C :** Pipe connector
**1x D :** Rainwater pipe
**2x E :** Submersible pump
**1x F :** Inline filter
**1x G :** 90°elbow connector & suction filter
**1x H :** Wall mountable hose/tap connector

PTFE REQUIRED PTFE Tape Required
(Please use PTFE Tape on Threads Shown)







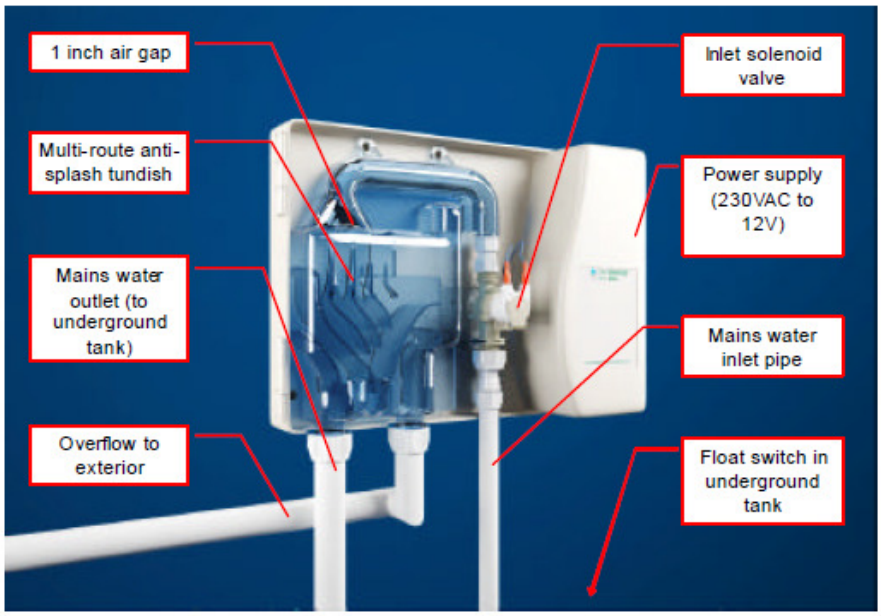
This must be plugged into the nearest electrical point

ECOSURE

new model 2012

RainBackup in a Box®

# Plug-and-play mains water backup
## for direct feed rainwater harvesting systems




Rainwater harvesting plays a large role in reducing the dependence of any building on expensive treated water from the mains. Toilet flushing, clothes washing and any outdoor use of water can be assured by rainwater pumped, in this case, by direct feed from the submersible pump in the rain storage tank. But what happens if stored rainwater runs out? Every system needs a means by which mains water is reintroduced into the system to keep the appliances going. The principle for a direct feed system is simple; a float switch detects when the rainwater storage tank is empty and opens an electrically-actuated solenoid valve so that mains water flows into the bottom of the tank. When the float switch floats off the bottom of the tank it closes the solenoid valve. The bulk of the storage tank remains empty ready to admit the water from the next rain shower.

U.K. Building Regulations require that rainwater cannot possibly flow back into the mains water supply. For this reason all mains backup devices must have an air gap where the mains water flows into the rainwater tank. The simplest way to do this is for the mains water to flow through open air into an inverted conical or inverted cup-shaped device called a tundish. The 2012 evolution of the Rain Backup in a Box (Product ID RWH-BUB01) features a multi-route anti-splash “tundish” and overflow incorporated into one transparent blue injection moulded. It is housed with the solenoid in an off-white injection-moulded cabinet 325 L x 260 H x 95 D millimetres. The injection-moulded components enable mass-production and even keener pricing of the Rain Backup in a Box. The float switch is provided with 15 metres of cable and is connected under the right hand panel.

The Rain Backup in a Box® is fitted inside the building where the occupiers can, when rainwater has run out, hear any mains water running from the solenoid valve. It replaces a higgle piggle of components with a single wall mounted unit, one electric plug to a wall socket, mains water input and a pipe to the underground storage tank. Wall mounting is with screws through holes in the back of the cabinet.

Rain Backup in a Box® is optimised for a direct feed system in which the appliances are kept under pressure. The alternative is a gravity feed system: enquire about the Rain Director® which uses less electricity, reduces wear and tear on the pump and appliances, and which ensures water supply during power cuts.

## Installation instructions

These instructions assume the separate installation of a rainwater system in the building with rainwater flowing off the roofs through a filter into an underground storage tank and a pump to take the rainwater through a separate pipe network for toilets, washing machine and outdoor use.

1. Locate the best position for the Rain Backup in a Box® unit.
    a. Inside the building where the occupiers can see and hear it,
    b. Within a metre of a 220v AC wall socket into which to connect the plug,
    c. Accessible to a mains water pipe, and
    d. Above the top of the underground storage tank so that the backup mains water flows by gravity.

2. Mount the unit securely to the wall and pipe the mains water to the inlet at the bottom left of the unit.

3. Pipe the outlet of the tundish using 21.5mm waste pipe from the bottom right of the unit to the rainwater storage tank. **The first 300mm must be straight**; any angle close to the unit risks the water backing up and flowing back out of the tundish. In most installations this outlet can be channelled to the closest possible rainwater downpipe from the roof. This backup water supply does not have to be piped separately to the storage tank.

4. The overflow pipe at the bottom right of the Rain Backup in a Box should flow to the exterior through a pipe which offers no constriction. It is designed to avoid flooding of the house if the pipe from the tundish to the underground tank is blocked up, and to provide a visual alert to the building occupants. Run the overflow to the exterior of the building to discharge over the ground or gully or connect to an adjacent rainwater down pipe.

5. Channel the float switch cable to the underground storage tank. Typically this is through a service pipe made of 4 inch (110 mm) plastic which also carries (i) the mains electricity supply to the submerged pump (if so fitted) and (ii) the return pipe carrying rainwater from the storage tank back to the appliances in the house.

6. Attach the wire of the float switch, at a point about 1 inch (25 mm) away from the float switch, with a nylon tie wrap to a suitable point near the base of the storage tank.

7. The float switch should be positioned so that, at its lowest level, hanging down, the water level is not below the pump inlet. So, ensure that the water level at which the mains backup cuts in is above the level from which the pump draws water; this then avoids the pump sucking air and stopping.

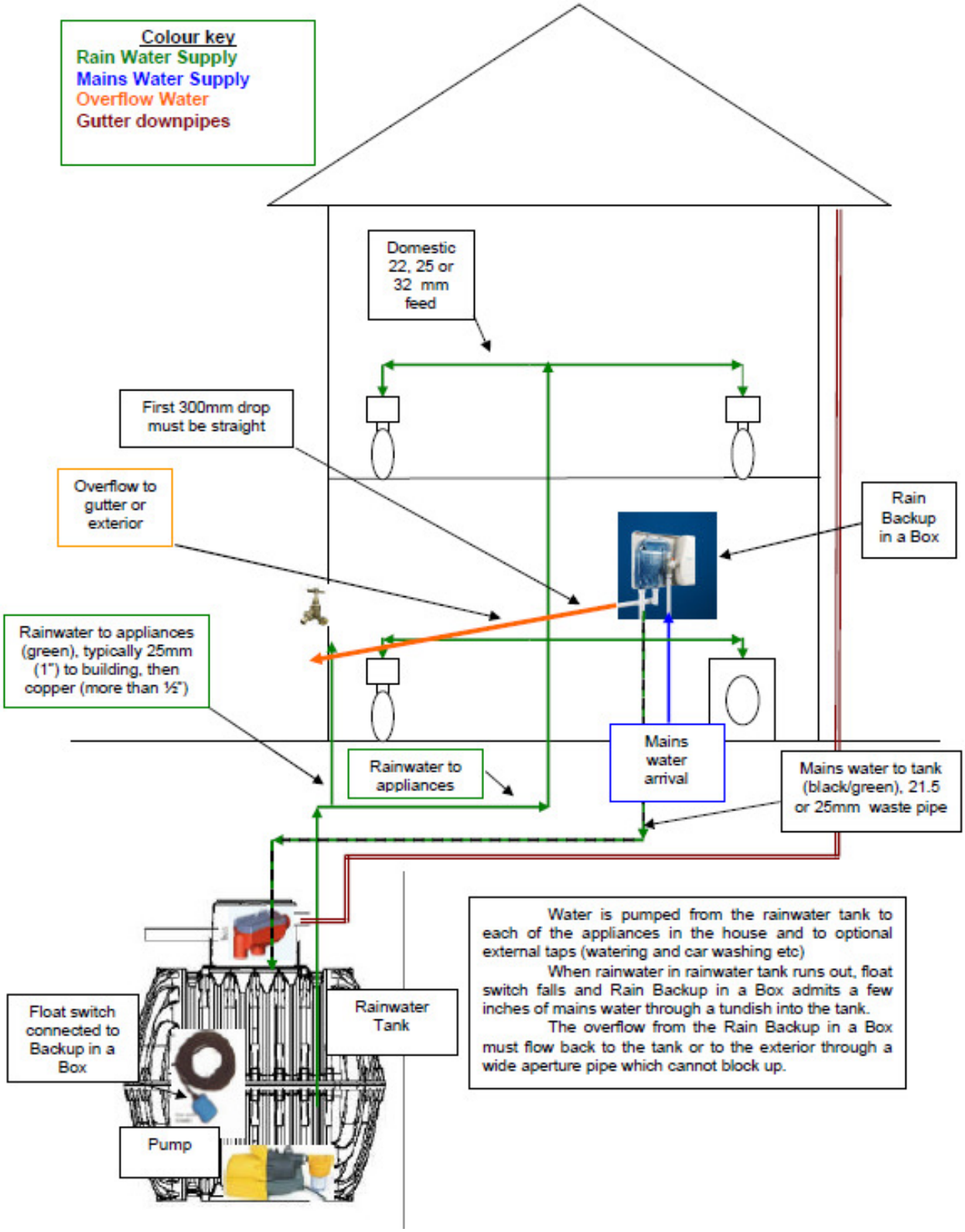
8. Connect the unit's 12 volt DC adapter to a 220V AC mains socket. Power should be maintained to the unit at all times.

9. The installation is finished. Some mains water will continue to flow into the storage tank until the float switch rises.

10. Note that the rate of refill of the rainwater tank with mains water by this product is typically slower than the water flow out of the submersible pump. If you are watering the garden and the rainwater tank runs low it is possible that the pump will shut down due to absence of water, even if the backup mains is flowing. Some pumps need a mains electricity reset (turn switch on and then off).

Consult the schematic diagram on the next page.

# Plumbing Schematic: Rain Backup in a Box®



# Wiring of the solenoid: Rain Backup in a Box®

## 12 volt charger and float switch

In the event any wire has to be detached from the Rain Backup in a Box, for example when pulling the float switch wire through a service pipe, we show here the wiring for the 4 pole connector strip inside the box under the coloured logo.

**Notes:**
The polarity of the solenoid (green) and charger (black) connections is not critical.
The brown from the float switch is not used in this application

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| From float switch | Brown | Blue | - | Black |
| From solenoid | - | Green | Green | - |
| From 12V wall charger | - | - | Black | Black |