Harlequin® HydroStore

RAINWATER HARVESTING

HOME HARVEST DIRECT

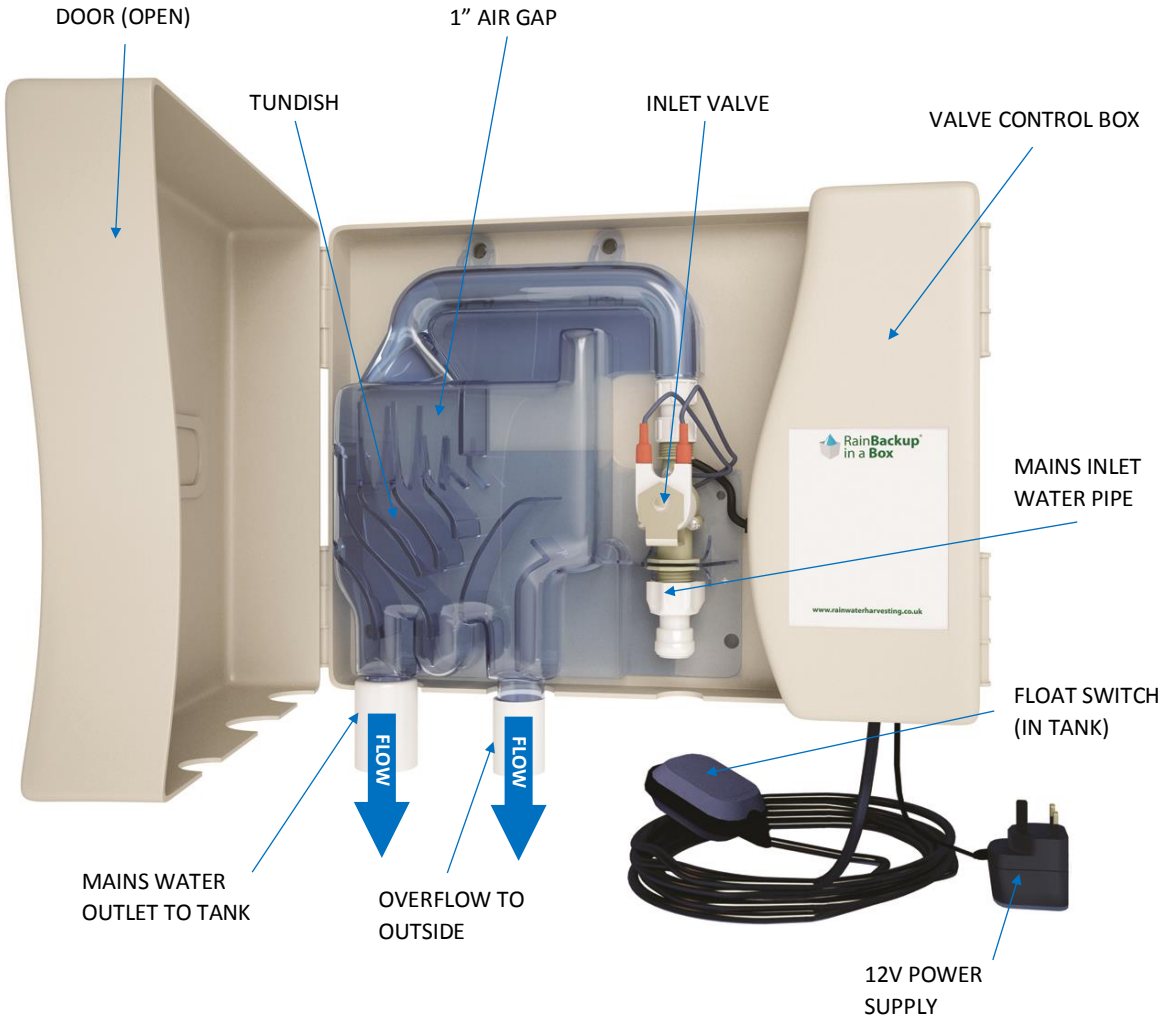
SUPPLEMENTRY INSTALLATION AND OPERATING MANUAL


Backup in a Box replaces a variety of components with a single wall mounted unit, one electric plug to a wall socket, mains water input, overflow pipe and a pipe to the Harlequin HydroStore tank.
Rainwater to appliances
Mains water arrival
Mains water to tank
Down pipe water flows to Harlequin HydroStore tank
Harlequin HydroStore tank

What happens if stored rainwater runs out?

In a direct feed system, the pump in the storage tank sends rainwater directly to where it is needed in the house or garden. If this rainwater runs out, mains water must automatically be brought into the system to keep the appliances going.
The float switch detects when the rainwater storage tank is empty and opens the electrically-actuated solenoid valve so that mains water flows into the tank. When the float switch rises off the bottom of the tank it turns the solenoid valve off.
The bulk of the storage tank remains empty ready to take the water from the next rain shower.

U.K. Building Regulations require that rainwater is not allowed to 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.
Within the Backup in a Box, mains water flows through open air into an inverted conical or inverted cup-shaped device called a tundish. House occupants will know if rainwater has run out because mains water will be heard flowing through the unit. In the unlikely event of the mains downpipe into the tank blocking, water will be seen flowing through the overflow pipe.




1 Rainwater flow into HydroStore tank
2 Rainwater supply to household appliances
25mm to building then standard copper pipe
3 Mains water supply to Backup in a Box
4 Backup mains water supply to Harlequin HydroStore tank
5 Power supply to pump (220v)
Fed through service duct to pump
Rainwater Distribution Unit
2
4
3
1
5
Inlet
Harlequin Hydrostore
Outlet

Installation instructions

Locate the best position for the Backup in a Box unit.

1 Inside the building where the occupiers can see and hear it
2 Within a metre of a 220v AC wall socket for the plug
3 Accessible to a mains water pipe
4 Above the top of the Harlequin HydroStore tank so that the backup mains water flows by gravity into the tank

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

• Mount the unit securely to the wall and connect the mains water supply through an isolation valve to the connection at the bottom right of the unit

• Pipe the outlet of the tundish from the bottom left of the unit to the Harlequin HydroStore tank. This does not have to be piped separately to the tank and in most installations can be channelled to the closest possible rainwater downpipe from the roof. The pipe must drop vertically downwards at least 300mm before the first curve or joint

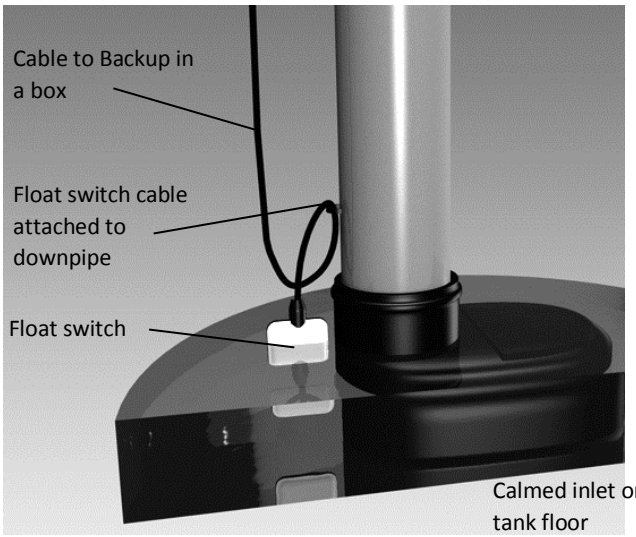
• The overflow pipe at the bottom centre of the Backup in a Box should flow to a drain through a pipe which offers no constriction. It is designed to avoid flooding of the house if the pipe from the tundish to the tank gets blocked. The pipe must drop vertically downwards at least 300mm before the first curve or joint

• Feed the float switch to the Harlequin HydroStore tank through the Ø110mm service pipe. This also carries (i) the mains electricity supply to the pump and (ii) the return pipe carrying rainwater from the tank back to the appliances in the house

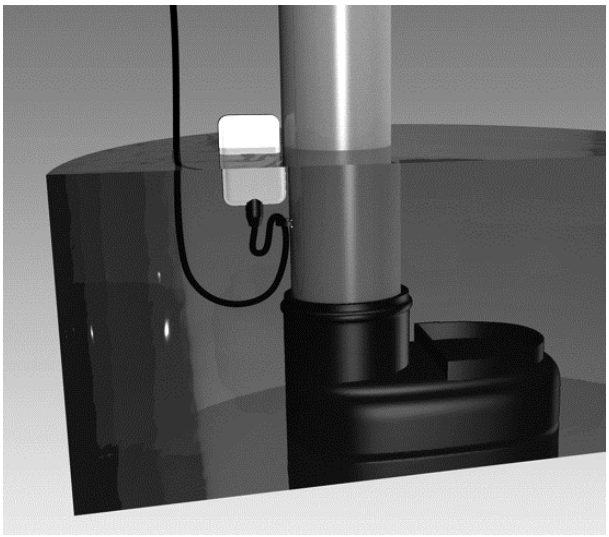
• Attach the wire of the float switch, at a point 10cm away from the float switch, with a nylon tie wrap to a suitable point near the base of the tank. Typically, the Ø110mm downpipe from the filter to the calmed inlet on the floor of the tank is the best securing point. The downpipe can be drilled and a screw used to anchor the float switch cable. The float switch should be positioned so that, at its lowest level, hanging down, it is not below the pump inlet. This corresponds to the lowest level of water before the mains supply is activated

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

• The installation is finished. When initially powered up, some mains water will flow into the tank until the float switch rises



Tank empty: Float switch hangs down, mains water flows in



As mains water flows in, float switch rises, mains water turns off

Wiring of the solenoid

12 Volt charger and float switch

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

If the float switch wire needs to be extended it must be connected through a suitable IP rated junction box (not supplied) and mounted within the turret of the tank or appropriately located externally.

Note: 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

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, eg, the Rain Director which uses less electricity, reduces wear and tear on the pump and appliances, and ensures water supply during power cuts.

Backup in a Box does not fill the tank to the top, but only a few inches deep. The bulk of the tank remains empty ready to receive water from the next rain shower.

In the case of delivering water to a garden appliance like a sprinkler, this may occur at a much higher flowrate than the Backup in a Box can achieve.

When the rainwater in the tank is depleted, delivery to the appliance will stop, even if mains water is being admitted.

Provision of water to internal appliances is less critical because

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