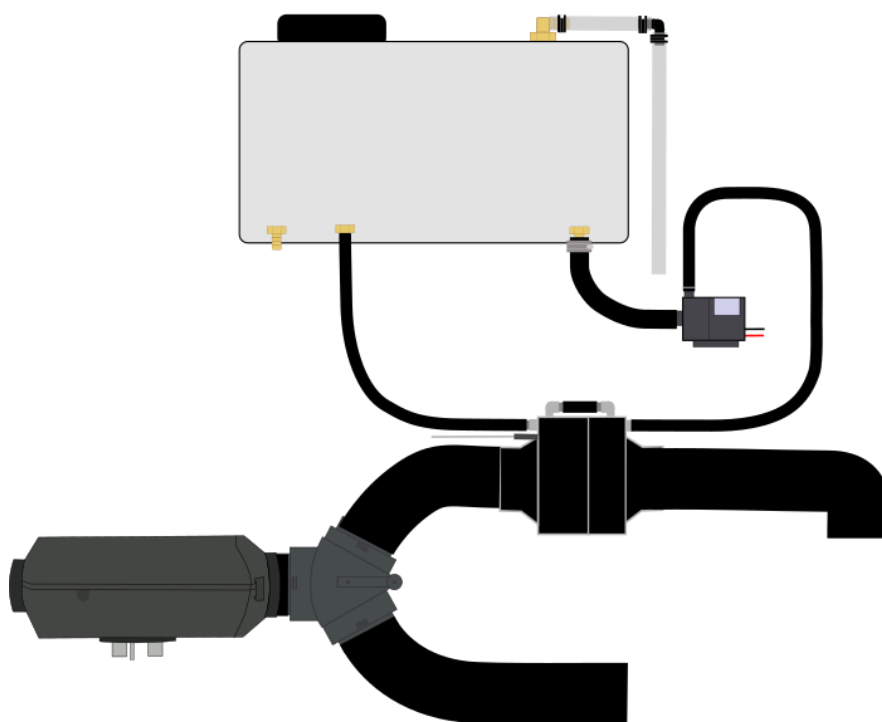




BOBIL VANS AIR XCHANGE WATER HEATER WITH SMART CONTROLLER

INSTALLATION INSTRUCTIONS





Important Safety Instructions! Please save these instructions!

This manual contains important safety, installation, and operating instructions for the Bobil Xchange Kit.

Bobil Vans accepts no liability for damage by:

- Incorrect assembly.
- Damage resulting from mechanical influences or excess voltage.
- Modification or tampering with the unit/system without expressed permission from the manufacturer.
- Used for purposes other than described in this manual.

General safety

- Firmly secure all cables and hoses.
- In the event of product failure, do not attempt to repair the water heater. Inadequate repairs may cause serious injury.
- Electrical devices are not toys - keep away from children.
- Disconnect the product from the battery power each time before draining, cleaning or maintaining the heater.
- This product is for 12V battery banks only. Make sure your voltage specification is within the input voltage range expressed.
- Do not use the product if physically damaged or with visibly perished hoses.

Installation

- Ensure secure location where it cannot tip or fall.
- If necessary, verify installation with a qualified electrician or installer.
- Lay cables so they cannot be damaged or be a tripping hazard.
- Do not operate in salty, wet, or damp environments; in the vicinity of corrosive fumes; in the vicinity of combustible material; in areas with risks of explosions.
- Ensure proper cable sizing for currents generated, with appropriate fuses.

Due to the nature of ways the Bobil Xchange systems can be fitted, we cannot account for all install variations and eventualities in this instruction manual. If you install your system in a way which deviates from these instructions without contacting us beforehand, then we cannot accept fault for any issues that might occur due to incorrect assembly or use, and as such, broken parts would not be covered under warranty.

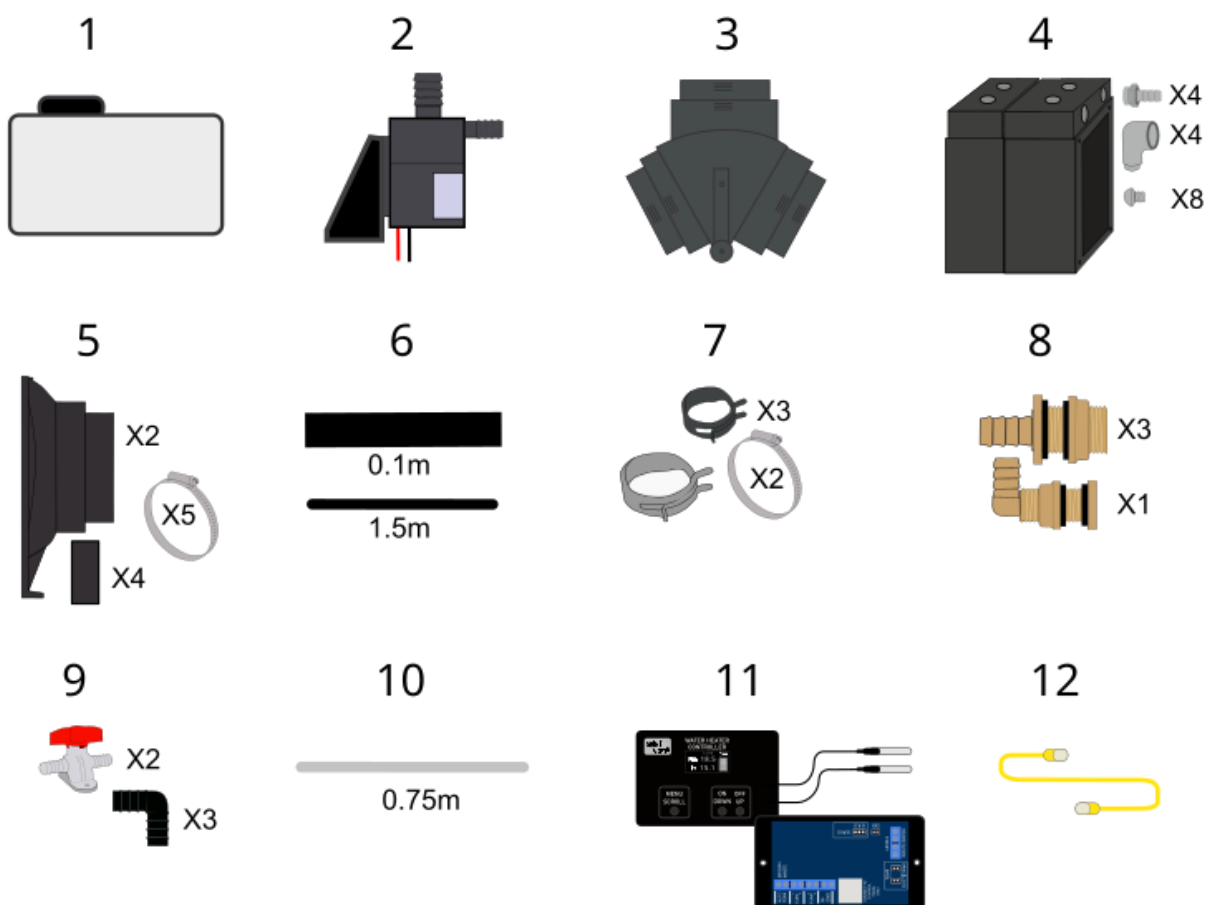
If you have any questions about your installation,

please email us at info@bobilvans.co.uk



What comes in the box?

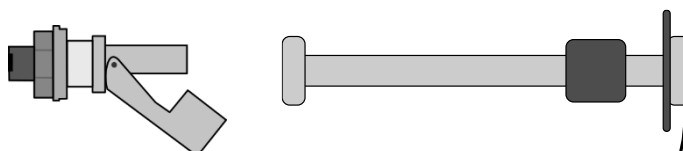
Please unpack all bags/boxes to ensure you have everything before starting installation.



1. 12/18L Water Tank (if ordered)	8. Silver Spring Clip
2. Circulation Pump with bracket	9. Hose Clips; 2 sizes
3. Diverter + Tri-Colour Servo Cable	10. Bulkhead Fittings + PTFE Tape
4. Heat Exchanger & Fittings	11. Drain Valve (x2) & Elbow (x3)
5. Ducting Adaptors + Gaskets (x2); Clips (x5); Spacer Blocks (x4)	12. Clear PVC Overflow Pipe (0.75m)
6. Silicone Hose; 2 sizes	13. Smart Controller
7. One Way Valve	14. Controller cable + accessories*

* For the Xchange kit, there will be 2 temperature sensors that connect to the slave board which will also be included.

If ordered, you will also receive two level sensors.





Preparing your installation area

The tank should be installed in a cupboard or locker which is clean, dry, ventilated, accessible and free of explosive gases or vapour such as those given off by charging batteries.

The heat exchanger can be installed remotely from the tank, even under the vehicle. If mounted under the vehicle, the unit should be protected from road debris and hoses should be secured where they won't be damaged by being passed through the floor of the van.

To install the kit, you will also need:

- Pliers
- Spanner
- Drill with 4mm, 5mm & 10mm drill bits & 26mm hole saw or spade bit
- Scissors to cut silicone hose
- Screwdriver

Thank you for buying our products!

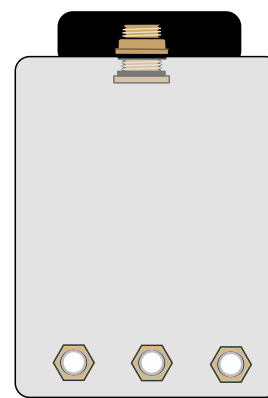
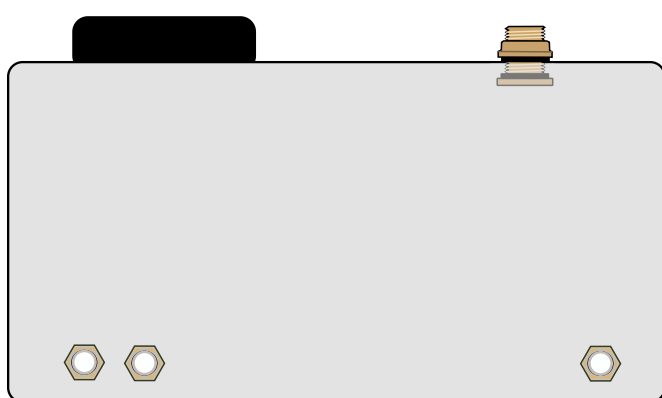
Small businesses like ours only exist because of the support of our customers. We appreciate you purchasing from us, and hope that you have a great experience.

If you have any installation questions or queries then just get in touch, we're here to help. Contact us at info@bobilvans.co.uk or on the phone at +44 1275 261074



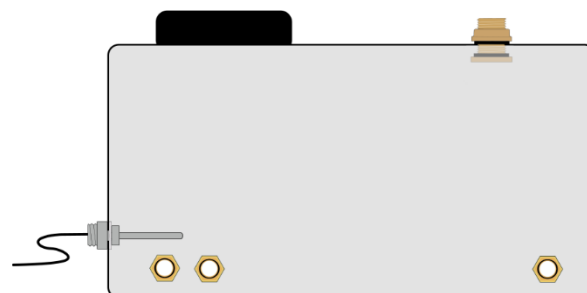
Installation

1. **PREPARE THE TANK:** Drill 3 x 10mm holes in the sides of the tank for the water, and 1 x 26mm hole in the top of the tank for the overflow. Fit the large bulkhead fitting (right angled fitting) to the top of the tank. Two layouts are shown below, but feel free to modify whichever layout suits your van. The centre of the holes should be at least 30mm from the bottom and sides of the tank.

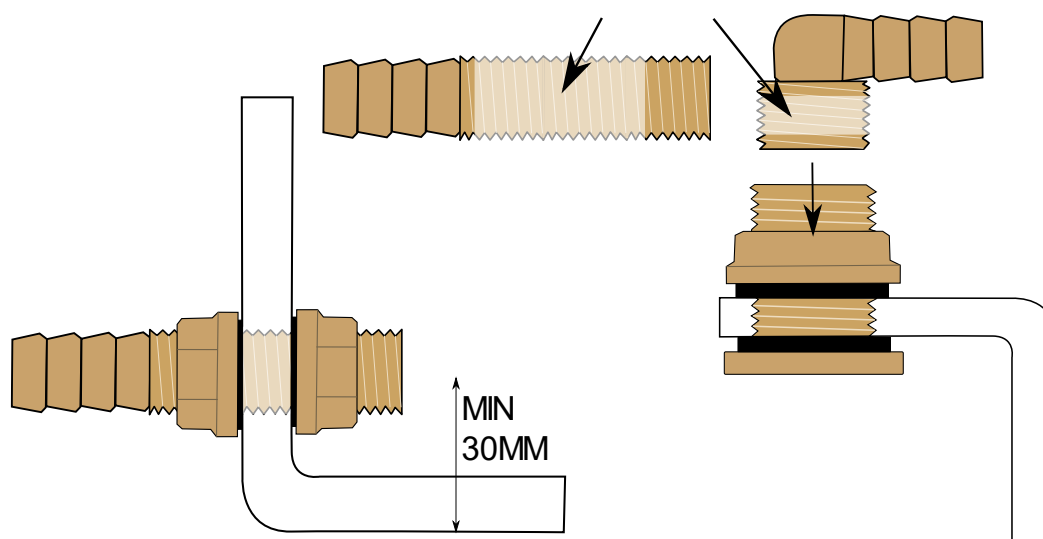


Drill another 10mm hole for the temperature sensor. This should be quite low in the tank, and near the outlets.

Fit using the nut provided, with the washer fitted on the inside of the tank.

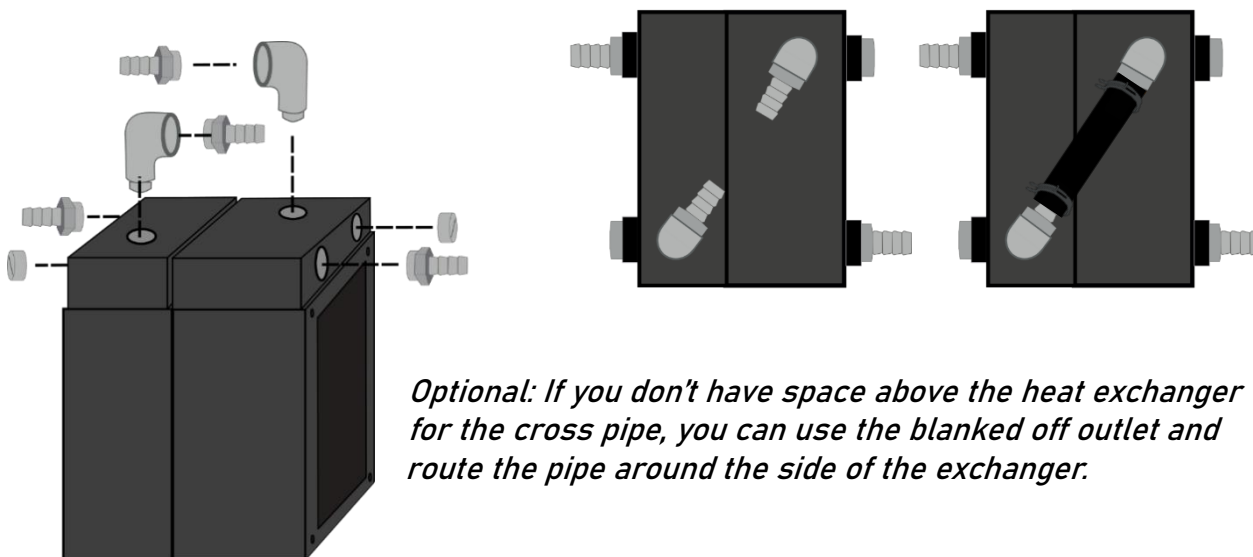


2. **BULKHEAD FITTINGS:** 4 bulkhead fittings are supplied; the angled outlet is for the overflow and the other three are for the water circulation. Remove the nuts from the smaller brass fittings, apply PTFE tape to the threads and fit as shown





3. **HEAT EXCHANGER ASSEMBLY:** Remove the 4 red plastic blanking plugs and 2 metal blanking plugs. Assemble heat exchangers as shown, adding the **metal blanking plug** into the spare port on the exchanger. **Do not overtighten the fittings. Hand tighten only.** Add a small piece of the 8mm ID silicone hose to connect the 2 top ports together.

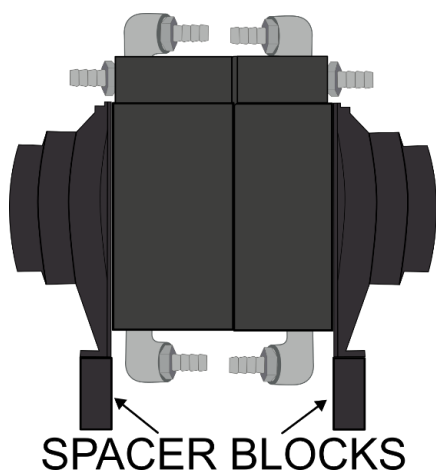
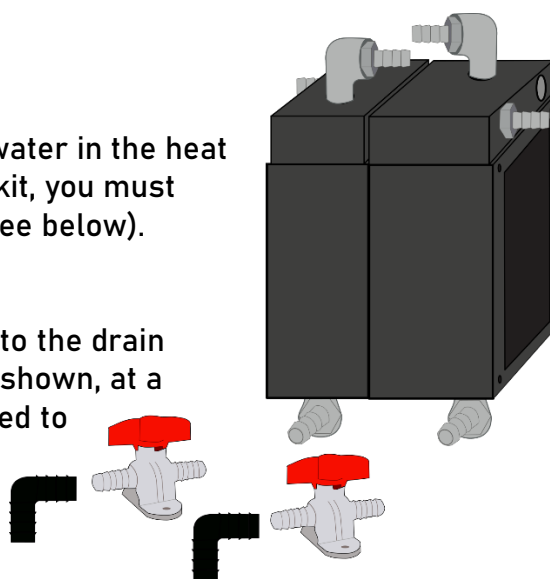


Optional: If you don't have space above the heat exchanger for the cross pipe, you can use the blanked off outlet and route the pipe around the side of the exchanger.

- 3a. **DRAIN KIT (optional):** Install the drain kit.

This is required for use in cold climates when the water in the heat exchanger is likely to freeze. If you do fit the drain kit, you must mount the exchangers on provided space blocks (see below).

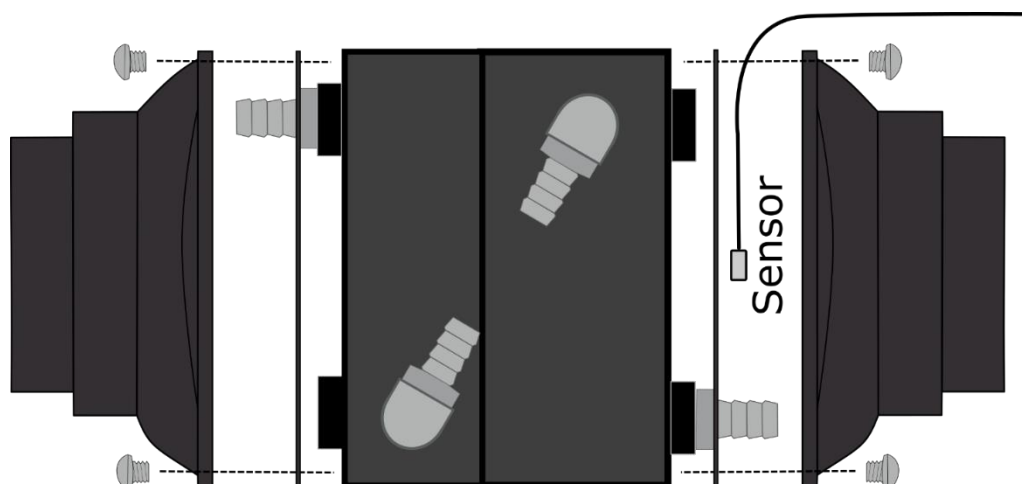
Screw in the remaining elbows and barbed fittings to the drain ports. Add drain valves and black elbow fittings as shown, at a convenient place to drain the tank. You will then need to add silicone hose and hose clamps (not shown in this image for clarity).



The spacer blocks click into the adaptors and allow a long screw to be fitted down through the block.

4. **HEAT EXCHANGER ADAPTORS:** The duct temperature sensor gets clamped between the rubber gasket and the plastic adaptor and is positioned as shown.

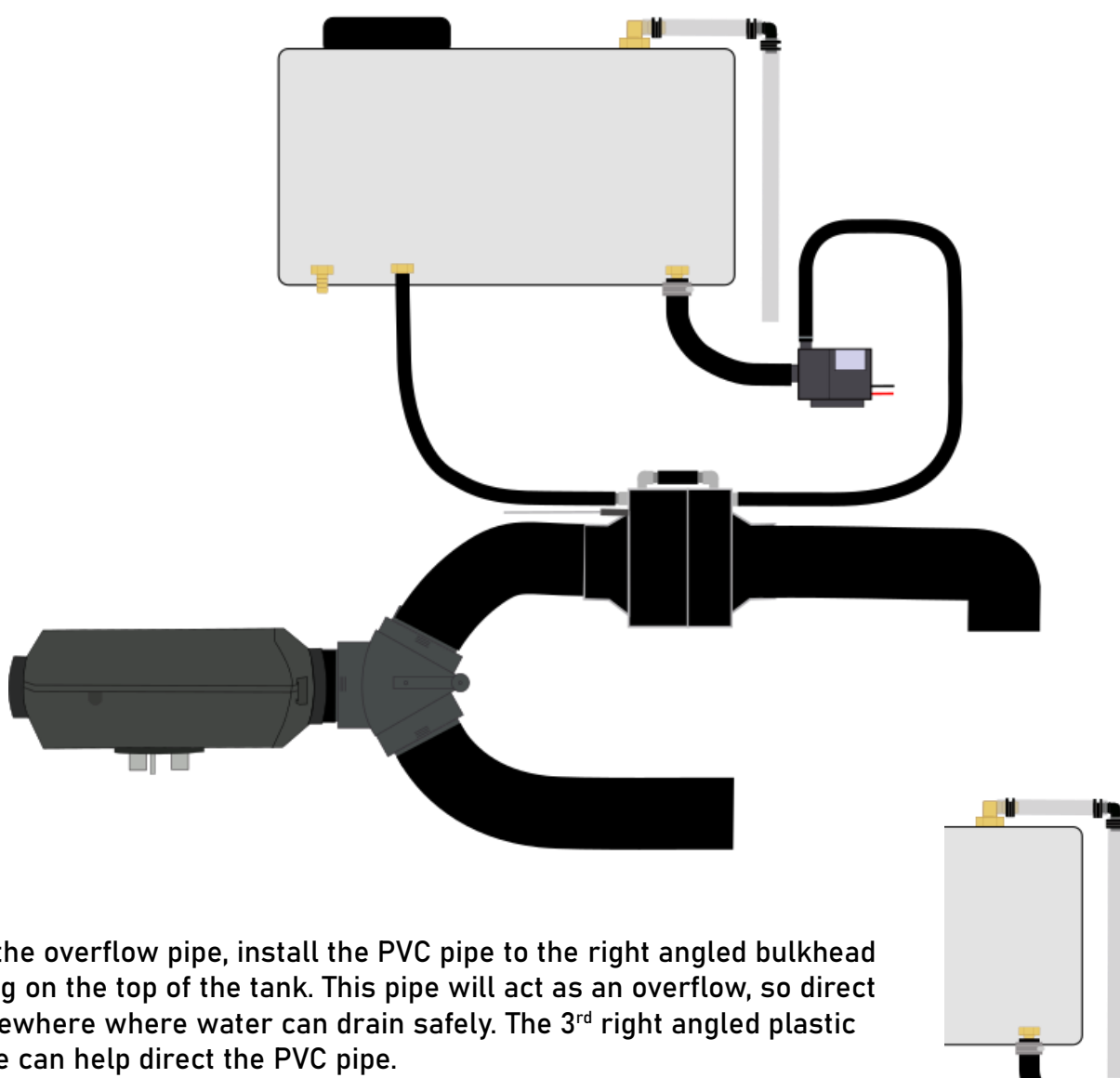
Add the rubber gaskets between the exchanger (orientation doesn't matter) and the adaptors. Fitting the screws through the adaptor and gasket before fitting to the exchanger makes this task much easier. The side with the temperature sensor will face towards the heater in final assembly.



5. **DIVERTER ASSEMBLY:** Assemble the diverter by clipping together the two halves of the units with the flap in between. Ensure the servo for the diverter flap motor is on the top. The 3 coloured wire connects the servo to the slave board – if required, you can use the included servo extension to lengthen this connection.

Final Assembly

- Assemble the heater kit as shown.
- Ensure that the silver wire clip is fitted on the pump outlet, and the jubilee clips are fitted to the large hose going to the pump.
- The open barb is for you to connect the Xchange tank to a pump, then onto your hot water outlet. This is unpressurised so providing your own pump is needed.
- To fill the tank we recommend a manual fill; fittings with on/off valves are available in most plumbing sizes.
- The pump should be lower than the water level as it is not self-priming and so that any air from the tank is allowed to escape.



For the overflow pipe, install the PVC pipe to the right angled bulkhead fitting on the top of the tank. This pipe will act as an overflow, so direct somewhere where water can drain safely. The 3rd right angled plastic piece can help direct the PVC pipe.

The ducting should be secured with the supplied jubilee clips, and the exhaust from the heat exchangers can be used to either heat a shower room, garage or vented straight outside through the floor of the van.



Element Upgrade Kit fitting (optional)

The element upgrade kit (if ordered) contains a level sensor, element and activation relay.

1. Drill and deburr a 34mm hole in the side of the tank to fit the element. This hole should be around 60mm from the bottom of the tank and be centrally positioned.
2. Fit the element to the tank, fitting the seal on the outside of the tank. Ensure that the thermocouple cannot come into contact with the element.
3. Drill and deburr a 12mm hole towards the top of the tank. This is for the level sensor. The heater element will therefore only come on if the level sensor is activated. This means the element cannot be run dry.



Water level sensor wiring (optional)

If you ordered level sensors, these go in your fresh and waste water tanks. Before starting, add crimped spade connectors to the wires for easy connections. There is no polarity on the level sensors.

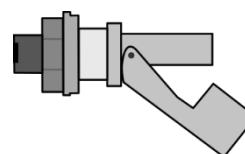
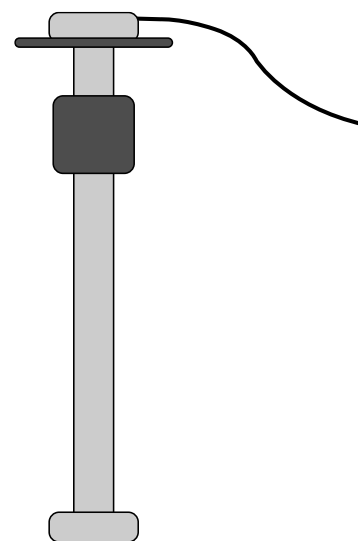
To fit the fresh level sensor:

- Drill a 35mm-38mm hole in the top of the tank.
- Drop the sensor in and centre it in the hole.
- Drill a 3.5mm hole underneath one of the holes in the sensor.
- Drive one screw into the hole to form a thread.
- With the sensor in position, drill the other four pilot holes.
- Remove the first screw. Remove any swarf from the sensor and the underside of the hole.
- Replace the sensor and gasket, refitting the first screw.
- Drive the other 4 screws into the holes to secure the sensor.

An optional spacer is included if the wall of your tank doesn't allow the sensor to sit correctly.

To fit the waste sensor:

- Drill a 22mm hole in the side of the tank at a level which corresponds to a level of around 80% of the tank volume.
- Once the sensor fits through the hole, tighten the collar on the outside to lock the sensor in place. You should ensure that the sensor is fitted in the orientation shown here.

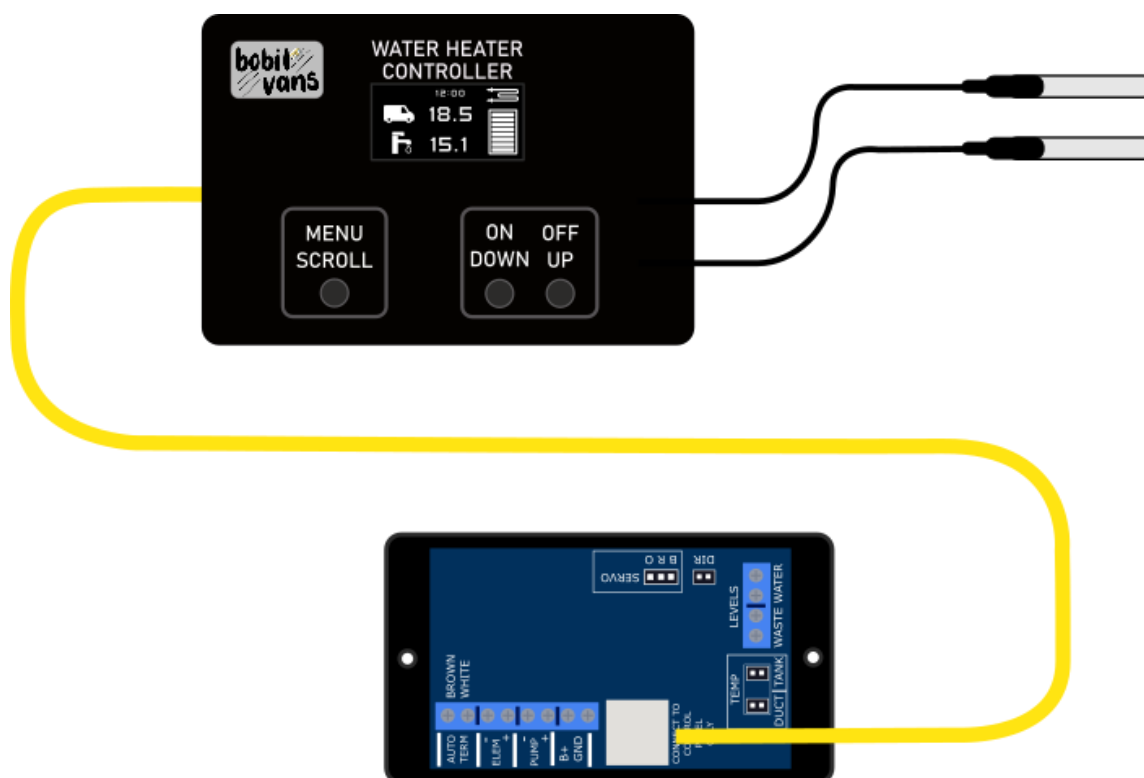




Controller Wiring

The Bobit Smart Controller is made up of two boxes, one which can be mounted in the living area (master controller), and one which is situated near the heater itself (slave unit). All connections are made from the slave unit except for the air temperature sensors which come from the cabin box.

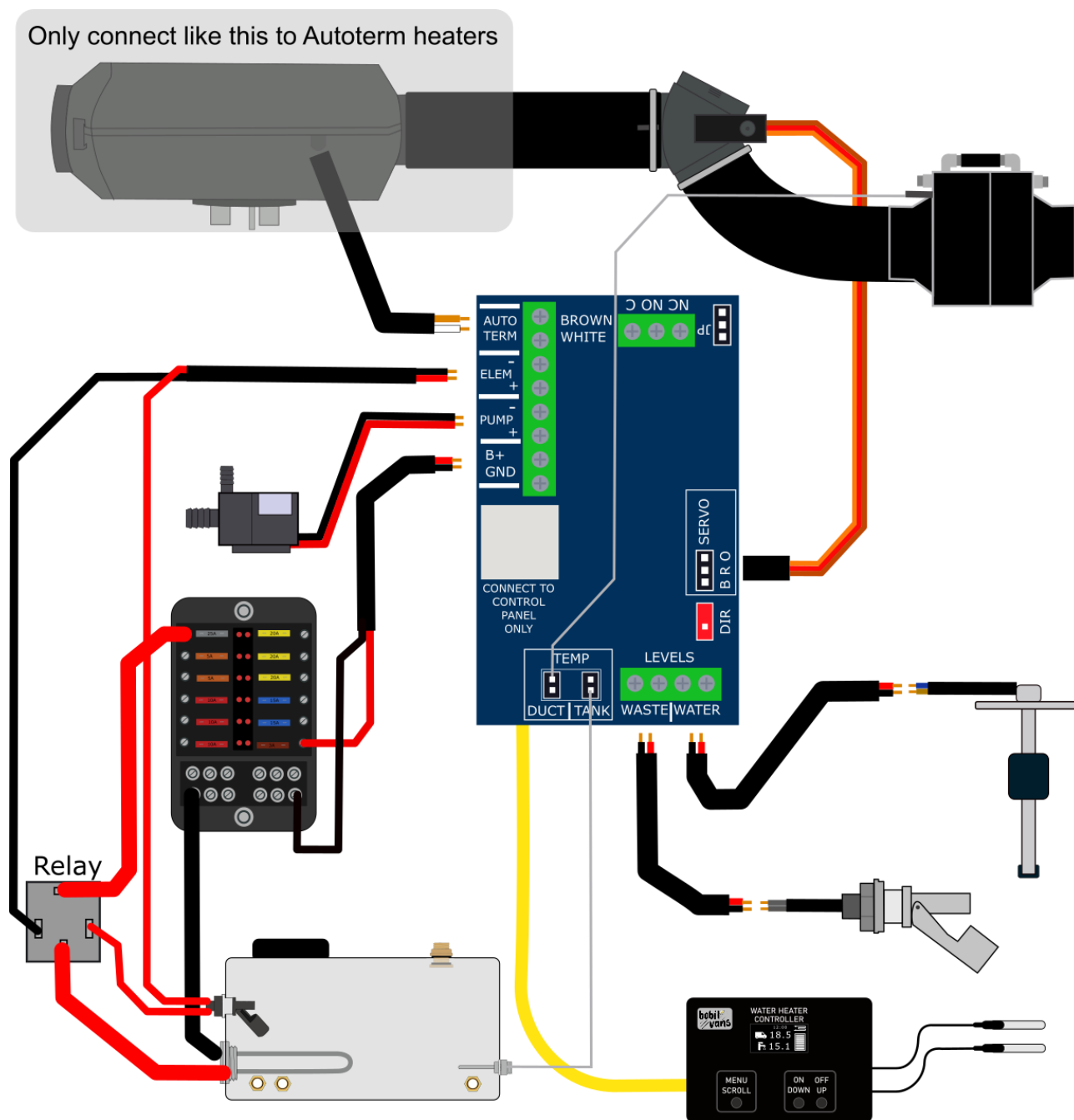
The yellow cable connects the 2 boxes together – this cable is 5m long, we don't recommend extending it as this can cause issues.



The two sensors from the master controller are for measuring the internal and external temperatures. The internal sensor should be mounted high up in the main living space, away from any direct flow from the heater outlet duct.

The external sensor can be mounted anywhere outside the vehicle but must be protected from moisture. We would suggest attaching it to the underside of the van, or alternatively you can drill a 6mm hole through the floor and poke it through there.

Please see the wiring of the slave board on the next page.



When the connections have been made to the slave board, either drill holes or remove some of the tabs on the lid of the box to allow the wires to come back through.

If you went with the optional 12V element for your Xchange tank, then connect the element and relay as in the diagram above. If you did not, leave the element port on the controller blank.

Only wire the Autoterm heaters directly to the slave board. Use the brown/white wires that are separate from any other wiring loom, covered with heat shrink on the end.

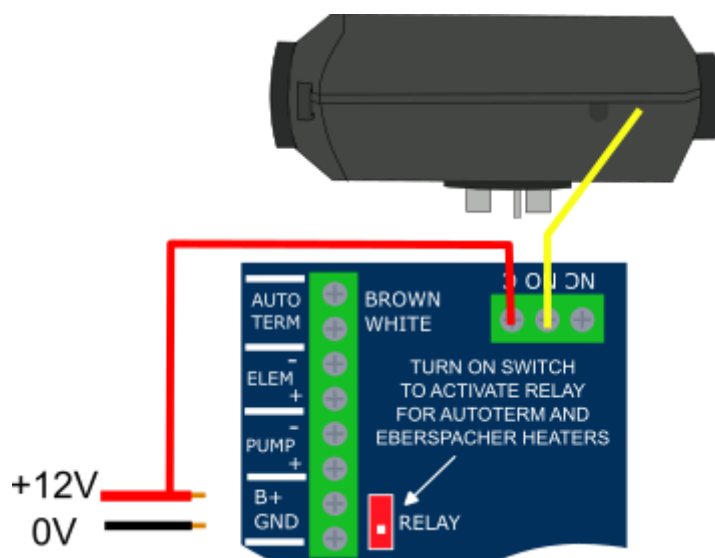


If your heater has a 'remote start' function which requires a 12v signal, you will need to wire the heater using the relay. Connect the activation voltage to the common pin 'C', and the heater to the normally open pin 'NO'. Please check the wiring diagram of your heater before wiring anything up.

Do not wire the slave board directly to a Chinese heater - it communicates using radio signals. Follow the instructions in the Smart Controller User Guide to pair your heater with the Smart Controller.

Eberspacher heaters have a yellow wire (called 'S+' or easystart in the documentation, normally pin 4 on the first connector out of the heater), marked 'ge' in the manual.

Some heaters can be made to run on full by interrupting one of the signal lines. If so, you can wire these through the 'C' and 'NC' pins.



The controller controls the DC element for "free" hot water when your batteries are full. If you have a tank with a DC element, then when your batteries reach 13.7V, it will switch the DC element on, and switch it off when voltage falls below 12.7V. Please see the Smart Controller instructions for more info on this.

Wire gauge

Use this table for suggested wiring sizes for the controller and the (optional) 12V element.

Distance	1-2M	2-3M	3-4M	4-6M	6-8M
Element (mm ²)	2.5mm	6mm	10mm	16mm	25mm
Element (AWG)	14 AWG	10 AWG	8 AWG	6 AWG	4 AWG
Controllers (mm ²)	1mm	1.5mm	2.5mm	2.5mm	2.5mm
Controllers (AWG)	17 AWG	16 AWG	14 AWG	14 AWG	14 AWG

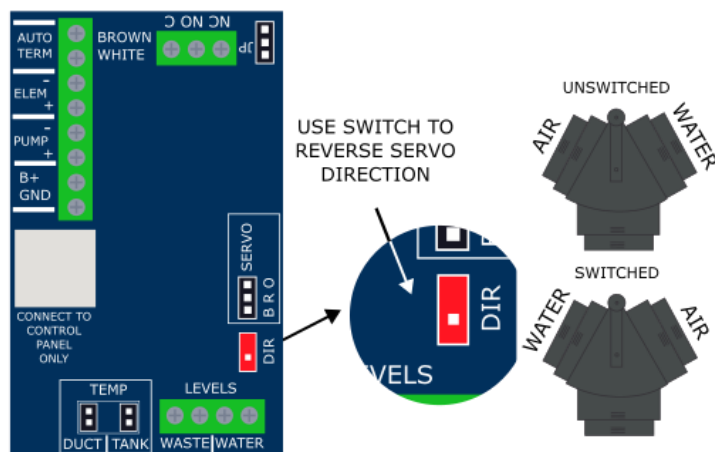
Use a 2A fuse for the controller and a 30A fuse for the element.

For the connections to the level sensors and the Autoterm, use the thinnest wire you have. We suggest 0.75mm regardless of the distance. The servo is supplied with an extension, if you need longer then extensions are available from our online shop.



Reversing the Diverter

Normally the servo will point to the left for water heating and to the right for air heating. However, you can reverse this by switching the 'DIR' switch.



Pressurising the Hot Water Line

As mentioned, the spare bulkhead fitting without any connections is the hot water outlet. This is a 12mm (1/2") barb.

The Xchange kit is unpressurised, meaning you need to connect this bulkhead fitting to a pump, before continuing the pipework onto your sink/shower outlet.

We recommend using 1/2" flexible pipe to connect this bulkhead fitting to a pump, to allow for expansion. We do sell this in our shop.



Commissioning the system

To commission your system for the first time, follow these steps.

1. Ensure your Xchange tank is full with water.
2. Ensure you have a working hot water pump that pumps water out the Xchange tank, and that this line is purged of air.
3. Turn on the controller. Verify that all of the sensors are working correctly, and that the diverter has directed the airflow into the van. If not, then switch the direction on the slave board.
4. Turn on the water heating routine. Check that the diverter fully closes off the airflow to the van.
5. After 2-3 minutes you should see the water temperature reading on the controller starting to rise. Stop the routine and ensure that the diesel heater switches off.
6. (element upgrade kit only): Switch on the element option on the controller screen. Raise the voltage of the leisure battery to at least 13.7v and ensure at least 300 watts will be available either from the engine of the vehicle, a mains charger or solar power. The controller should start to count down and switch on the element when it gets to 0. The red light on the front of the tank will come on and you should see the water temperature on the controllers start to rise.
7. Open the hot tap and enjoy the lovely warm water from your Bobil Xchange!



We would love to know what you think!

Please let us know by leaving a review through the link sent through when you made your purchase or email us at info@bobilvans.co.uk!

You can also share photos of your installation on the 'Bobil Water Heater Users', Facebook page, we'd love to see them!

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