

Sump

by Dr_DBW

An almost total DIY project, with the glass tank being brought from a tank builder after providing them with the design of what was required. If was done again would build it from scratch, works out cheaper, are more handy with construction of things like this now and you can get exactly what you want.

For more information on sumps, see this Article: [Sumps](#).

Parts list:

180lt Custom Built Glass Tank
Two internal chambers are included to allow the use of activated carbon and ion exchange resins, if the need arises. The inlets and outlets are through the tank wall using bulk heads. The return chamber will contain the heaters and provide the point of evaporation water replacement, see the above diagram.
2 x 120mm x 120mm x 5mm Glass And 23mm Center Hole
This was to reduce the incorrect hole size down, see below.
1 x 13mm Plastic Float Valve
Installed on the return side of the sump to maintain a constant water volume/level in the system using water top up.
1 x 100mm Plastic Float Ball
To operate the float valve, height adjustment possible by changing the length of the string/cord.
1 x 13mm Threaded Couple
To join the float valve to the barb.
1 x 13mm Threaded Barb
To allow joining of a length of flexible piping to the water top up reservoir.
1 x Plastic Jerry Can Tap
Allows joining of pipe to reservoir and ability to isolate if need arises.
1 x 25lt Plastic Jerry Can
Top up water reservoir.
2.5m x 12.5mm Clear Plastic Tubing
To connect the reservoir to the float valve.
2 x 9mm Hose Clamp
To ensure a water tight fitting of the tubing to barb joints.

The sump tank was sized such that it fitted neatly into the left hand side of the tank stand (through the spacing of the doors), give as larger water volume as possible and provide a reservoir for the water in circulation that will drain when the power/pump is off. The dimensions are 600mm wide, 600mm high and 500mm deep. This gives a total water volume of 180 litre, 40 gallons, and the baffles are such that when the return pump is in operation it will be approximately half filled. The tank was a custom built unit, with the internal baffles and drilled for the inlet, outlet and float valve. Configuration and dimensions are as shown in the following diagram and photo.

Diagram of the sump, with top and side views.

Photograph of the sump just after installation and before it was filled with water.

Sump on the right hand side, containing protein skimmer feed pump, two heaters and the protein skimmer water outlet.

Prefilter fitting on the return pump inlet, covered in sponges and vemitid snails.

The guy that made the tank stuffed up a by making the hole the size for 25mm fittings where the water top up is located. Then he fitted it with a 25mm piping were where just a hole of 12mm fittings should be. This wasn't too much of a drama, as the silicon was still drying and simply pulled it out. The two pieces of glass were purchased with the correct hole size and then stuck on either side of the larger hole using a silicon sealant.

Here are some older images of the internals of the stand which show how it all goes together with the other equipment around it.

Right hand section of the stand, showing sump, powerboards, protein skimmer and metal halide ballasts. Taken in 2003.

Left hand section of the stand, showing return pump, evaporation top up, ventilation fan and sump. Taken in 2003.

The original plan was to use the two central baffle regions to place chemical filtration media, which was how it was done for a year or so. However, now that is the location for the heaters, as can be seen in some of the above images. And the chemical filtration is now performed by passing water through a separate column which contains the media.

The float valve also works very well for the evaporation top up. It has no failed once in over 6 years of operation. The only thing that had to be done as the base of the arm had holes that captured air bubbles, enough to hold it close when the float lowered and should have allowed it to open. That problem was solved by filling the base of it with silicone and it hasn't caused any problems at all since.