

BioSieve™



Installation and User Guide

Please read these instructions before assembling your BioSieve

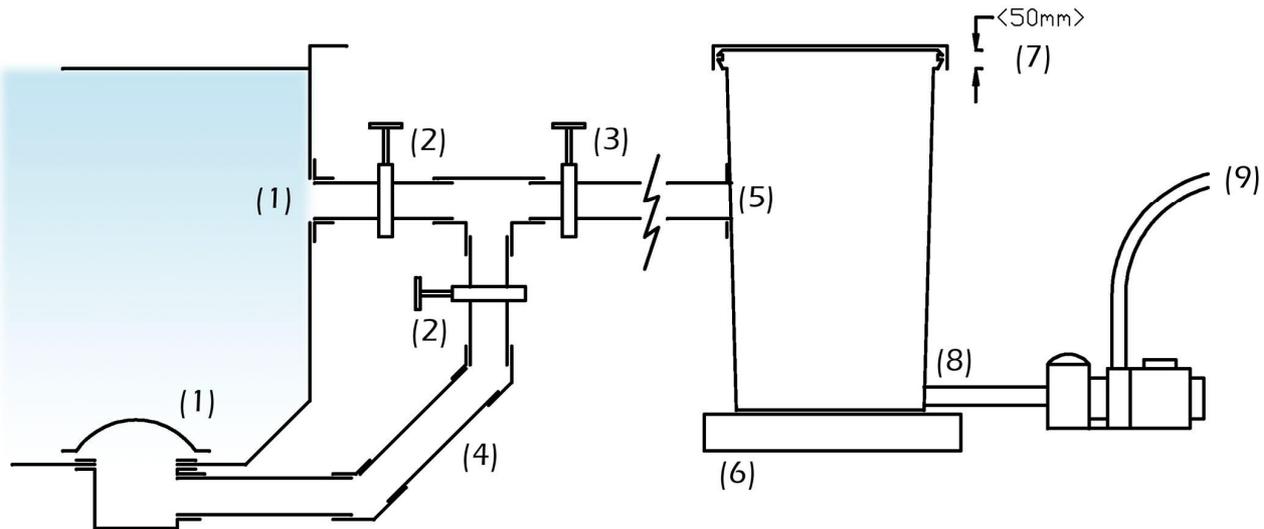
- * This unit is heavy and should be moved by two people
- * To remove the BioSieve from its box, lay the box on its side and slide the unit out.
- * This unit has been fitted with an outlet strainer of: Coarse grade / Fine grade
See Note 1 to ensure that this is the correct strainer for your situation

Section A - Siting your BioSieve:

Typically the BioSieve is gravity-fed (See **Section B** for pump-fed operation)

It can be sited in a chamber external to the pond, leaving room for an external pump and leaving sufficient access to all side fittings for routine maintenance and for removal of the outlet strainer.

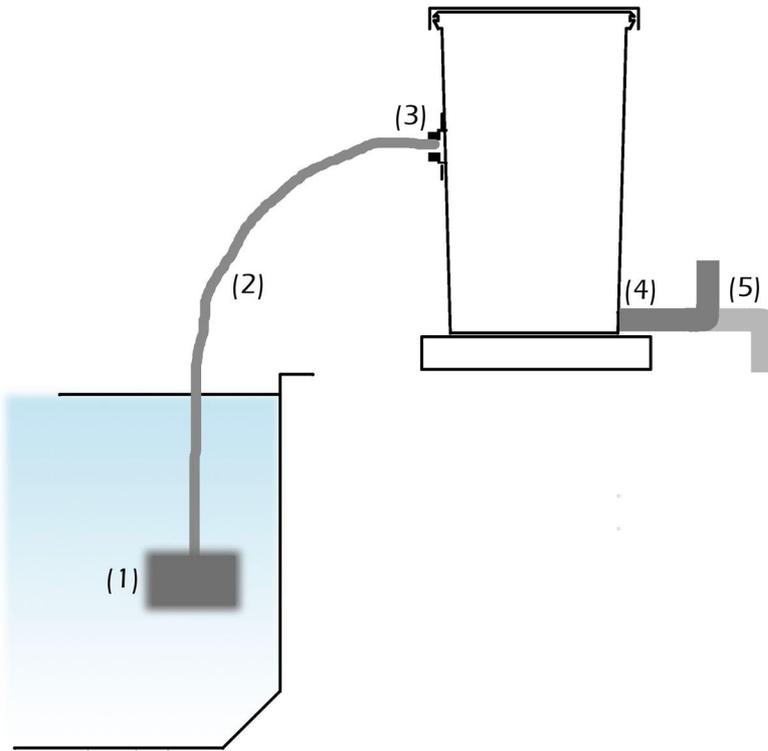
See Note 2 if you intend to bury the unit in soil.



- 1) Midwater and/or bottom drain feed** Ensure these are designed to prevent escape of fish
- 2) Flow control valves** Optional, for use with multiple inlets
- 3) Isolation valve** Recommended for maintenance
- 4) Feed pipe.** To reduce friction-loss and maintain maximum flows, keep pipes to the shortest lengths possible with the minimum number of bends using swept or 45 degree bends in preference to knuckle bends.
- 5) BioSieve inlet socket** for 110mm solvent weld pipe.
110mm inlet (pipework typically 100mm internal diameter) handles gravity flows of up to 16,000 litres per hour (3,500 gph) in ideal conditions. If the system flows are less than 7,000 litres per hour (1,500 gph) you may wish to adapt down to 90mm or 3" pipework (80mm internal) to reduce the risk of sediment building up in the inlet pipework.
See Note 3 for details on how to adapt fittings to alternative metric or imperial sizes.
See Note 4 regarding the optional additional inlet.
See Note 7 regarding solvent weld fittings
- 6) Firm level base.** We recommend tamped ground with a hardcore footing and a 120mm concrete foundation. As with deep ponds, it is important that the water table is kept below the water level in the unit to prevent buoyancy and movement of the unit.
- 7) 50mm lip.** Typically the top of the main body of the unit should be 50mm above the maximum water level in the adjacent pool. (The weir can cope with drops in pool level of around 100mm.)
- 8) Main outlet.** 3" thread fitted with a 75mm internal/90mm external sleeve and an internal strainer. Usually this is linked to an external pump using solvent weld solid or flexible pipe.
See Note 5 regarding what type of external pump to use.
See Note 3 regarding adapting to alternative pipe fittings.
See Note 6 regarding use of submersible pumps inside the BioSieve.
- 9) Non-Return Valve.**

A non-return valve prevents backflow into the BioSieve when the pump is turned off and should be fitted wherever significant backflow is likely to take place. Flap-valves give less friction loss than spring and ball type valves (Note: Automatic BubbleBead filters have a built-in non-return valve on their inlet).

Section B - Using the BioSieve as a pump-fed unit.



1) Pump

External or submersible pumps can be used. High efficiency solids-handling (to 8mm) pumps are ideal.

2) Feed Pipe.

3) Adaptor. Ask your supplier about how to adapt from your feed pipe to the 110mm socket on the unit.

4) Main outlet. Water leaves the BioSieve by gravity, returning to the pool or to further biofiltration. The 3" thread is fitted with an internal strainer and a 75mm internal and 90mm external sleeve. Extend this with pipework as required, using larger bore pipework where high flows are required.

The water level inside the unit should not rise higher than the base of the waste trough. Therefore, ensure that the end of the outlet pipe is not positioned too high.

If the unit is being used with 'Buoyant Biomedia', a sufficient level of water must be maintained within the unit to keep the media submerged and free moving. If necessary, fit a push-fit elbow and extension **(5)** to the outlet pipe that can be adjusted to obtain the correct level of water inside the unit.

Section C - Before Assembly

Items that you may require when installing your BioSieve

Spirit level and tape measure

PTFE plumbers tape

Cross-headed screwdriver

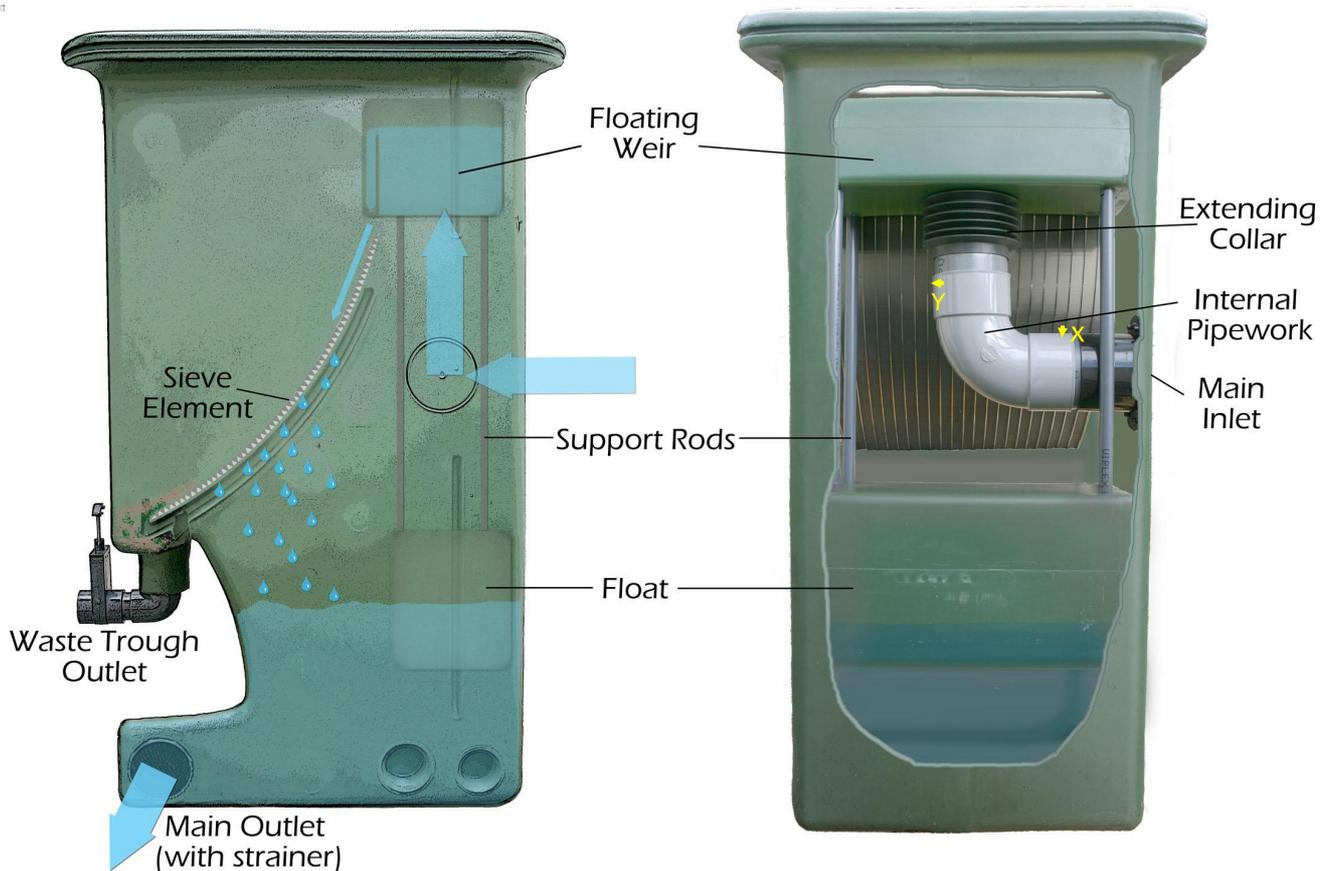
Toughened gloves

Aquarium silicone sealant

Solvent-weld cleaner and glue

Drill (or gimlet) and stainless screws (optional)

Section C - Assembly



Open the end of the box and slide/pull the unit from the box whilst it is on its side.

Remove the (optional) *lid* if fitted

Remove any loose fittings or (optional) packaged media from the unit

Slide the *floating weir* up towards you to allow the *sieve element* to be removed.

Note that the lower end of the sieve element is slightly narrower than the upper end - the sieve will need to be put back the same way up when reinserting it.



Take care. The Sieve element has very sharp edges.
Use toughened/leather gloves when handling.

After the sieve element has been removed, the *internal pipework*, *extending collar* and *support rods* between the *floating weir* and the *float* can be checked to ensure that they are in place and have not come displaced in transit.



For closer access to the *internal pipework*, it is possible to remove the *floating weir* by removing the *retention screw(s)* (see picture) and pulling the *support rods* from the sockets in the underside of the *floating weir*.

The *internal pipework* and the *extending collar* are supplied push-fitted and not glued. This allows the pieces to be easily removed to allow access for cleaning and maintenance and also makes it easy to adapt to a twin inlet if this option is desired (See Note 4).

On ponds where there is a larger than average variation in pool level, or where the pump is regularly turned off for longer periods, it may be desirable to fix the *internal pipework* more permanently. It is recommended that the unit is run in-situ first to ensure that all pipework is at the appropriate angles before fixing any pipes more permanently.

This optional fixing can be achieved by fitting a couple of small stainless retaining screws (not supplied) to hold the pipes in place (**x** and **y** on the assembly diagram). Make pilot holes first, using a gimlet or drill. Remove the *sieve element* to allow screw 'x' to be fitted from the outside>in. Screw 'y' can be fitted from the inside>out using a short handled screwdriver. Alternatively, seal the fittings by cleaning and drying them before gluing them with aquarium silicone sealant. (See Note 7)

The *extending collar* is located at its lower end, by the flange on the pvc pipe extending into the lowest corrugation. At its upper end, the top corrugation is pulled through the opening into the *floating weir*.

The Outlet Strainer



Unscrew the *outlet strainer* to check that the grade fitted is the one suited to your situation (See Note 1). Wrap the threads with PTFE tape to improve watertightness and ease future removal, and screw it back in taking care to avoid cross-threading. If the sealing ring is gently compressed this will give a further watertight seal. The outlet strainer may need to be removed for future maintenance, so ensure that any

pipework connected to it can be disassembled if required.

See Note 3 regarding adapting fittings to alternative sizes of pipework

See Note 7 regarding solvent weld fittings

The outlet on the opposite side of the BioSieve can be used instead by cutting out the blanked-off centre and inserting the strainer there. Seal off the original threaded outlet with a 3" BSP blanking plug wrapped with ample amounts of PTFE sealant tape. This outlet will also need sealed off if a submersible pump is being used inside the BioSieve, rather than an external pump

See Note 6 if using with a submersible pump

The Waste Outlet



The *waste trough outlet* is fitted with an elbow. To ensure a leak-free joint, remove this threaded elbow and wrap the threads with PTFE plumbing tape. Reinsert the elbow taking care to avoid cross threading. The elbow can be turned to the most convenient angle for connection of waste pipe and the waste *slide-valve*. Your dealer may be able to supply an extension tool to simplify control of the valve.

If a longer extension is required than the pipe stub included, this should be in 50mm metric pipe. Access should be maintained to allow the slide valve to be controlled, even if the unit is buried in soil. If the valve is fitted to an extension pipe it must be adequately supported to prevent flexion of the pipework.



The valve can be opened and waste directed into a bucket. Alternatively the outlet of the valve can be extended to a sewer or remote sump capable of handling the volume and concentration of wastes. The waste pipe must be free draining and without an excessive number of bends, as the waste material is likely to include large amounts of solids.

See note 7 regarding solvent weld fittings

See note 3 regarding adapting fittings to alternative sizes of pipework

The Main Inlet



The main inlet has a 110mm solvent-weld socket

See note 7 regarding solvent weld fittings

See note 3 regarding adapting fittings to alternative sizes of pipework

It is essential that some form of valve be fitted in the feed from the pond to allow the BioSieve to be isolated for maintenance.

Notes:

Note 1 - Using the correct outlet strainer



The unit is supplied with either a *coarse* (7mm) or *fine* (1.5mm) slotted *outlet strainer*. Either is suited to use with the optional 'Buoyant Biomedia'.

The *fine strainer* provides protection against solids clogging impellers on pumps, or clogging further strainers in equipment such as the BubbleBead filter. Over time, this strainer will start to clog with biological slime and with any strands of blanketweed that may have dropped off the sieve when it was removed for maintenance. If the unit is mounted in an area with good access, the strainer can be removed for cleaning when required.

If there is less access to this outlet (e.g. if the unit is buried in soil), then the *coarse strainer* should be fitted. In these cases, any external pump should be fitted with a suitable strainer pot to prevent any stray solids clogging the impeller. This strainer pot will also provide some protection against solids entering BubbleBead filters.

Note 2 - Burying the unit

It is possible to bury the unit in soil. In these cases, when running with an external pump, ensure that the coarse outlet strainer is used in the base. External pumps need to be in a ventilated chamber, mounted low enough to be self-priming, and fitted with a strainer pot.

Before backfilling:

- Insert the two bracing bars supplied. One is mounted below the *sieve element*, and the other above the *sieve element*. These prevent the unit from being overly compressed by the surrounding soil, and make it easier to remove the sieve element in future. Mount the complete end of the bar over one of the moulded protrusions in the unit, and push the semi-cut end of the bar down onto the matching protrusion on the opposite side of the unit.
- Test run the BioSieve to ensure that all pipe joints are watertight.
- Avoid using a backfill with sharp stones as these might damage the unit.



Note 3 - Adapting pipe connections to alternative fittings

Main inlet:

The 110mm socket can be adapted to 4" Imperial pressure pipe if required by using a short stub of 110mm pipe, an adaptor bushing and a 4" pressure socket. Use appropriate adaptor bushings to connect to smaller bore pipe - these are available from specialist plumbing suppliers.

Main outlet:

The 3" BSP thread is fitted with an adaptor to a solvent sleeve 75mm internal and 90mm external. The 90mm spigot can be adapted to 3" pipe using an inch/metric socket. The 75mm socket can be adapted to imperial pipe using a bushing, or adapted to a thread using an appropriate adaptor (e.g. to 2", 2½" or 3" female or male BSP).

As the strainer might need removed for maintenance, or access obtained to brush out the inside of the strainer, we strongly recommend that a dismantable union be fitted close to this point.



Waste outlet:

The waste outlet has a 2" female thread which is supplied with a 90degree bend leading to a 50mm pipe stub and a 50mm slide valve. Use 50mm pipe if a longer stub is required. The 50mm outlet on the slide valve can be adapted to 1½" pipe using an appropriate bushing.

Additional outlets:

The unit is supplied in the base with 2" and 2½" moulded female threads that can be cut out as required. These can be used for e.g.

- fitting pipe from a submersible pump used inside the unit
- fitting a UV or heater, in a pipe loop
- fitting an ozone dosing device



Note 4 - Fitting an additional inlet



A kit is available to fit an additional 110mm inlet socket on the opposite side of the BioSieve unit. The cutting guides are pre-marked in the moulding.

The kit has the necessary socket and flange plate, and an internal tee to link the two inlets into the same extending collar. This allows the unit to connect to e.g. two separate bottom drains, or separate midwater and bottom drain feeds. Both feeds should be fitted with valves to control flow between the two and to allow the BioSieve to be isolated for maintenance. With both feeds running, the BioSieve can handle flows in excess of 20,000 lph (4,400 gph).

Early models of the BioSieve supplied with three (rather than four) support rods, have insufficient rod spacing to allow the fitting of this tee piece. When fitting the additional inlet kit, contact your supplier to arrange a swap-over of the float and weir assembly to one fitted with four rods of wider spacing.

Note 5 - Choice of external pump for use with the BioSieve

An external pump can be used to move water from the BioSieve on to further filtration, or back to the main pond. The design of the BioSieve outlet is such that airbubbles (entrained in the waterflow cascading through the sieve element) are less likely to be drawn into the outflowing water.

The maximum flow from the pump should not exceed the maximum flow into the BioSieve unit, or the pump may run dry. In ideal circumstances, the BioSieve can handle up to 16,000 lph (3,500 gph) through the single inlet, and in excess of 20,000 lph (4,400 gph) with twin inlets, though the precise flow is determined by friction loss in the pipework, obstructions within the pipework or pond, and the level of the water in the pond. The exact flow in any particular circumstance cannot be determined until the unit is up and running. For this reason it is important that larger capacity pumps are fitted with a flow control valve on their outlet, to enable the flow rate to be matched to the BioSieve capacity.

Pumps that are not self-priming, should be mounted low enough (in relation to the BioSieve water level) that the pump chamber is constantly flooded. Self-priming pumps should be fitted as directed by the manufacturer, along with any non-return valves recommended. Take care to follow any manufacturer's recommendations about ventilation and frost protection.

If the pump has no strainer pot fitted, it is essential to fit one or to use the BioSieve outlet fitted with the fine-grade strainer option.

Note 6 - Using a submersible pump in the BioSieve

See Note 5 regarding pump sizing. A submersible pump can be used inside the base of the filter, either to draw strained water from the unit, or to push water through a loop for UV or ozone treatment. The pump outlet hose can be fitted to an adaptor fixed in the 2" additional outlet moulded into the base of the BioSieve, or a tank connector can be fixed through the wall of the BioSieve. Leave enough spare hose and cable to allow the pump to be accessed for maintenance. The pump should have a strainer fine enough to prevent 'Buoyant Biomedica' from being drawn into the pump, and preferably should draw from close to the base to avoid air being sucked in. N.B. Make sure that the pump does not get in the way of the float assembly.

A thin cable may fit between the wall of the BioSieve and the floating weir, and can be fed out through the top of the unit. Ensure that float and weir movement is not obstructed and that the cable is not

abraded. Hold the cable in place with a few adhesive patches or small blobs of silicone or similar sealant ('Adheseal'). Alternatively, and for thick cables, fit a waterproof cable grommet in the side of the unit.

Note 7 - Solvent Weld Fittings

Before attempting to glue any of these fittings:

- Attempt a dry run
- Make sure that surfaces are clean and dry. Solvent-weld cleaner removes surface grime and grease

If any fittings might need to be removed at a later date we recommend using aquarium silicone sealant. Although pipe movement may break the seal, at least the seal can be pulled away from the plastic fittings if changes are required at a later date. For permanent fixing, use a quality PVC pipe adhesive and allow sufficient time for this to set.

Maintenance:

At regular intervals: Drain waste from the waste trough by opening the valve. Push down the floating weir temporarily to increase flow, flush loose debris into the trough, and flush out the pipework. Check that pump strainers/strainer pots and pond outlets/bottom drains are all free from obstruction.

Less frequently: Isolate the BioSieve. Lift the weir to allow the sieve element to be temporarily removed for more thorough cleaning e.g. in a dishwasher (Caution! Sharp edges!). Check that float and weir movement remains free from obstruction and remove blanketweed from inlet pipework. Use a long handled brush to loosen dirt from the outlet strainer. If fitted, the fine strainer may need to be removed for cleaning from time to time.

Accessories Available:

Heavy duty lid.

Kit for fitting an additional 110mm inlet.

'Buoyant Biomedia'. A 25-litre pack of 'Buoyant Biomedia' can cope with the waste from 125 grams of typical koi food per day, once matured. Only add media after a full trial run of the BioSieve.

Seal pack. When using ozone this sealing ring fixes in the outer rim between the unit and the lid.

Alternative sieves. 150 and 300-micron sieves are available to special order.

Troubleshooting:

The floating weir does not move up and down smoothly??

- Check that there is no obstruction inside the unit, or between the float/weir and side wall.
- Check that the sieve element fits neatly into the slot under the weir lip. If the sieve element has bent out of shape, remove it and gently bend it back into a curve that will fit into the slot under the weir lip.



The BioSieve unit fills too full with water when running??

If the unit fills too full, the waste trough may be constantly submerged, and collected dirt will be disturbed, increasing risk of contamination of the strained water. This may be due to the weir not rising high enough to stop water flowing into the unit.

- Insert a longer section of pipe between the elbow and the extending collar to reduce tension on the float, and/or use slightly longer support rods between the float and the floating weir.
- Double-check that the unit lip is at least 50mm above pond level. If it is less than this, and the unit cannot be easily moved, carry out both steps noted above.

The BioSieve unit fills full with water when pump is turned off, causing the floating weir to rise up out of the unit and dislodging the extending collar??

This may be due to pondwater slowly seeping through unsealed joints in the internal pipework. Try to avoid turning the pump off for long periods, and seal the internal pipework with aquarium silicone sealant. Ensure that the pump outlet has a non-return valve fitted as directed in Section A (9).

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