



FOX ENVIRONMENTAL SYSTEMS

**FX10000SS**

Maintenance and Operation Manual  
Oil/water Separator

This Manual is the property of the owner operator.  
Please ensure you pass this to the relative person.

This Manual is to be read by all staff producing Tradewaste on the site.





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## 1. The Fox Oil/Water Separator

The Fox Series FX separators are enhanced gravity separators and incorporate a Bio-Tube® filtration media pack to promote coalescing of oil droplets and enhance floatation separation from the water in accordance with Stokes Laws. The design of the tube pack offers a large surface area for the interruption of flow through the unit with the spiral construction of the tube promoting an upward flow of oil particles.

The units will be supplied with a low voltage pump motor control station. There are several options available:

Model X1 – Allows Auto/Manual Pump Control

Model X1IS - Intrinsically Safe Control Station

Model X2 - Provides for a High Level Alarm in the Holding Tank.

Model X2IS - Intrinsically Safe Control Station

Model X3 – Provides a Non-Resetable Run Meter (required by some councils)

Model X3IS - Intrinsically Safe Control Station

All units are manufactured from 304 Stainless Steel as standard and are fully seal welded. A removable lid ensures that rain or hose water cannot enter the tank in normal circumstances. The lid is vented and has provision for locking. An option is available for the unit to be manufactured from grade 316 Stainless Steel when they are to be used for extremely aggressive waste or salt water applications.

The basic design philosophy for each model is typical however the physical size, retention time and tube pack mass for each model increases with the treatment rate of the unit.

The Models are designated as follows:

▪ Model FX1000SS .....	0.28 l/sec	(1000 l/hr)
▪ Model FX1500SS .....	0.42 l/sec	(1500 l/hr)
▪ Model FX3000SS .....	0.85 l/sec	(3000 l/hr)
▪ Model FX6000SS .....	1.7 l/sec	(6000 l/hr)
▪ Model FX10000SS.....	2.8 l/sec	(10000 l/hr)
▪ Model FX15000SS.....	4.2 l/sec	(15000 l/hr)

Each Model will be supplied with a Fox Diaphragm Pump, ASM Diaphragm Pump, or a Mono Helical Rotor Pump (where allowable by Local Authorities). Dual diaphragm pumps may also be supplied where suitable.

## 2. Model Compatibility

The Fox Series FX Separator is ideally suited to applications that have the potential to generate waste water containing free floating hydrocarbons in suspension.

Typical applications for the separator include but are not limited to the following:

- Vehicle Washdown Areas
- De-greasing Bays
- Mechanical Workshops
- Oil Storage Areas
- Vehicle Hardstand Areas

Correct sizing of the Separator, Pump and Holding Tank and the use of “Quick Break” detergents will provide a system that will treat oily water to a standard that is suitable for discharge into Local Government Tradewaste Disposal Systems.

### 3. Installation Instructions

It is important to ascertain the requirements of the Local Authority responsible for the installation of pre-treatment systems to ensure that the proposed installation will fulfil their individual requirements.

It is the Installers responsibility to ensure when installing any Intrinsically Safe Equipment, it must be installed to the relevant and current Australian Standards for Hazardous Zones. For Information on Hazardous Zones, Placement of Systems and Control Panels etc, contact the Design Engineer on the project drawings.

At this stage it is assumed that the Holding Tank has been installed and a bunded concrete pad has been provided for the Separator Installation. Provision should be made for this area to drain back to the Holding Tank.

Please refer to the drawings relevant to the Fox Oil/Water Separator and pump being used.

Model FX 1000 SS .....	A4-INST-1020
Model FX 1500 SS .....	A4-INST-1021
Model FX 3000 SS .....	A4-INST-1022
Model FX 6000 SS .....	A4-INST-1023
Model FX 10000 SS .....	A4-INST-1025
Model FX 15000 SS .....	A4-INST-1026

Refer to the relevant drawings for the Control Box connection details.

Model X1 .....	A4-INST-X1
Model X2 .....	A4-INST-X2
Model X3 .....	A4-INST-X3
Model X1IS .....	A4-INST-X1IS
Model X2IS .....	A4-INST-X2IS

Following is a step by step procedure for the installation of the Separator, Pump and Control Box. Careful attention should be paid to the items marked ' \* ' as they will affect either the operation of the unit or the safety of personnel.

1. Install the pump suction line in the holding tank with a barrel union to enable dismantling via the manhole for service. Install a foot valve if a Mono pump is being used. No foot valve is required for the diaphragm pumps as they are self priming.
2. Remove the Separator lid; this is done by releasing the over-centre lock, lifting and sliding the cover away from the locking end. When the lip of the cover clears the lip of the tank the lid can be removed. Supplied loose inside the unit are the legs for the stand, waste oil extension pipe, gate valve(s) for the separator tank and the Holding Tank float switch(es).
3. Lift the tank out of the stand. Fit the legs onto the stand, finger tightening the locking bolts.
4. Place the stand in position. To ensure correct operation of the Separator, the unit must be installed in a level plane in all directions.  
 \* Using a builder's level, adjust the legs so that the stand is level in both planes then tighten the locking screws.
5. Using Dynabolts, Chemical Anchors or other suitable corrosive-resistant fixings, anchor the stand utilising the pre-drilled 10 mm dia. holes in the feet. Re-check the levels and adjust if necessary.
6. Fit the tank into the stand.

7. Fit the gate valve to the tank drain using Teflon tape or suitable thread sealant. Make sure that the valve is closed.
8. Install the waste oil extension pipe to the skimmer outlet. The pipe should not be glued to the adaptor to facilitate removal of the waste oil collection vessel.
9. Place the pump in position and fix to the concrete pad using corrosive-resistant fixings.  
★Electrical regulations require that the pump motor is to have a 500mm clearance from the separator unit and holding tanks.
10. Install interconnecting pipework between the pump and the separator inlet. Barrel unions should be installed on either side of the pump to facilitate easy removal for servicing. Install sample points as required by the Local Authority.
11. Connect the outlet pipe of the separator to the trade-waste (sewer) system. Install sample points as required by the Local Authority.  
★Connections to sewer system must be made by a licensed plumbing contractor and with the approval of Local Authorities.
12. Supply and install a waste oil collection vessel. The waste oil collection vessel must be clear and have provision for a screw cap to be fitted.
13. Mount the Control Box adjacent to the pump and near a 240V 10Amp GPO.  
★Any electrical work required must be carried out by a licensed electrician.
14. Install Activation Float Switch in the Holding Tank. Attach to the suction line using heavy duty cable ties and ensure that sufficient lead is left to enable removal of the suction line for servicing. Position to ensure clearance from bottom of tank as per installation drawing. Draw cable through 32mm conduit to Control Box location. The float operates on low voltage and is connected to the terminal strip in the Control Box via the gland in the bottom of the unit. Refer to the Control Box installation drawing for connection details. For Model X2 & X3 Control Boxes, repeat procedure for High Level Float Switch.
15. Plug the Control Box into the GPO and the pump power lead into the Control Box outlet.
16. Fill the Separator to the level of the discharge weir. Ensure that the level in the Holding Tank is well above the pump pick up point before testing. If a Mono pump is being installed it must be primed with water.
17. Select the manual run position on the Control Box and turn the power on at the GPO. The pump will start and transfer water into the Separator. Ensure that the Oil Skimmer is above the water level. The top section of the skimmer pipe slides out from the main pipe. ★When the water flow through the Separator has stabilised the Oil Skimmer should be adjusted to 3 mm above the water level with the pump running.
18. The Separator is now ready for work. Turn the Control Box Selector Switch to the Auto position.

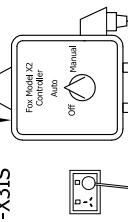
# Schematic Detail of FX10000SS Separator

Scale 1:125

Fox Control Box (Supplied Separately) GPO by others

For Connection Details refer to drawings below:-

- Model X1 A4-INST-X1
- Model X2 A4-INST-X2
- Model X3 A4-INST-X3
- Model X1IIS A4-INST-X1IIS
- Model X2IIS A4-INST-X2IIS
- Model X3IIS A4-INST-X3IIS



Float Control Cable.

Protect with 32mm Conduit. All joints to be glued. Use only long radius bends.

D550 Diaphragm Pump 2" BSP Ports (Supplied Separately)

Provide Bundled Area for Separator.

Securely fix Pump and Separator with corrosive resistant fixings. 500mm clearance required from Separator and Holding Tank.

Position gate valves and sample points as required by Local Authority.

2330

500

Min. clearance to pump

Dual 50mm BSP Female Inlets

Provision for padlock

Discharge Weir

See Detail A

Outlets 2 x 100mm BSP

Discharge To Sewer

Tundish

Trade Waste Sampling Point

To Property Sewer

1027

ϕ

Extension Pipe

To Waste Oil Container (supplied on request)

Gate Valve 40mm BSP Female

Insall Separator on leveled slab Use packing under feet to level separator if required

Drain to be supplied to bundled area (by others)

To Holding Tank

From Holding Tank

80mm pipe from pump (by others)

To Holding Tank

To Holding Tank

To Holding Tank

To Holding Tank

To Holding Tank

To Holding Tank

To Holding Tank

To Holding Tank

To Holding Tank

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To Holding Tank

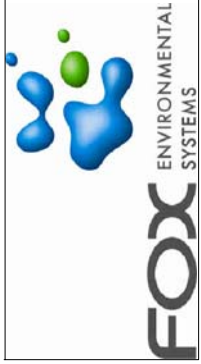
To Holding Tank

To Holding Tank

To Holding Tank

Note:

This is a schematic representation only. Slab size and gradient to engineers details as arranged by customer. All plumbing and electrical connections to be installed by certified tradesmen in accordance with relative authorities requirements. Tradesmen to be engaged by the purchaser. System to be approved by relative Local Authorities before Installation.



This Drawing and design is the Property of Fox Environmental Systems Pty Ltd. It must not be used for any other purpose than that for which it was issued. This drawing must not be shown or lent to anyone without the written permission of Fox Environmental Systems Pty Ltd.

Project: Installation Instructions  
Drawing Title: FX10000SS Separator

Drawn by:	R.O'B.
Date:	28/08/2007
Scale:	1:25
Drawing No:	A4 - INST-1025/1

NOTES:

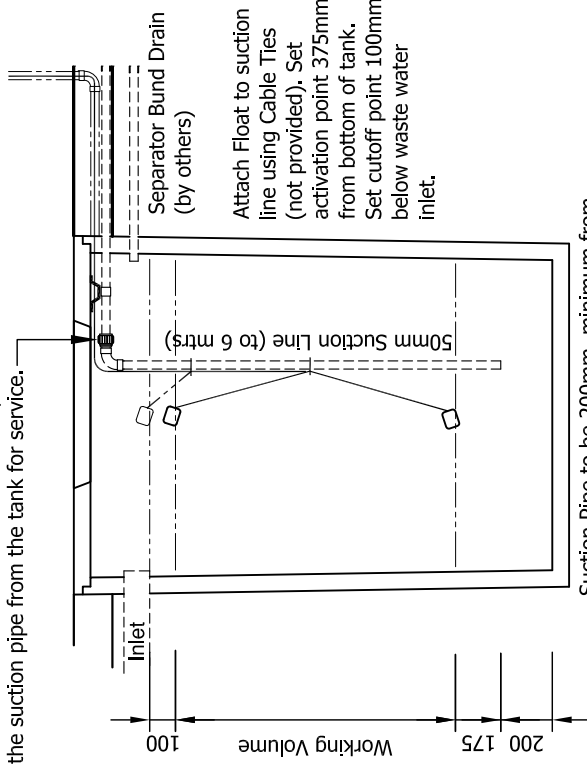
Locate Separator in a well ventilated area away from building entry.  
Ensure vehicle access and clearance around Separator for maintenance.  
All electrical and plumbing connections to be installed by certified tradesmen in accordance with relative authorities requirements. Tradesman to be engaged by the purchaser. Local Authority requirements to be confirmed before installation.  
These drawings are to be read in conjunction with the Installation Instructions provided in the Separator Users Manual. Refer to manual for maintenance requirements.

# Installation Details of FX1000SS Separator

## Holding Tank Detail

Note: The capacity of the holding tank is to be twice the capacity or greater than the oil separator

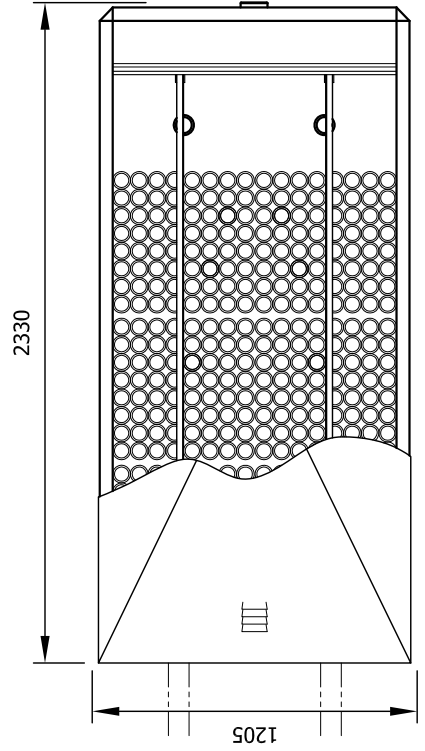
Install suction line with a barrel union in suitable location to enable dismantling via the manhole without entering holding tank. Ensure that sufficient float cable is provided to remove the suction pipe from the tank for service.



Suction Pipe to be 200mm minimum from bottom of tank. No foot valve required. Increase for applications where significant quantities of silt may be encountered.

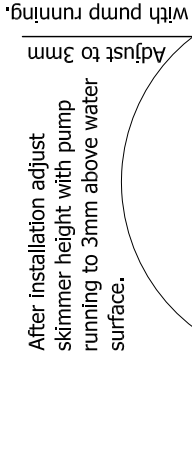
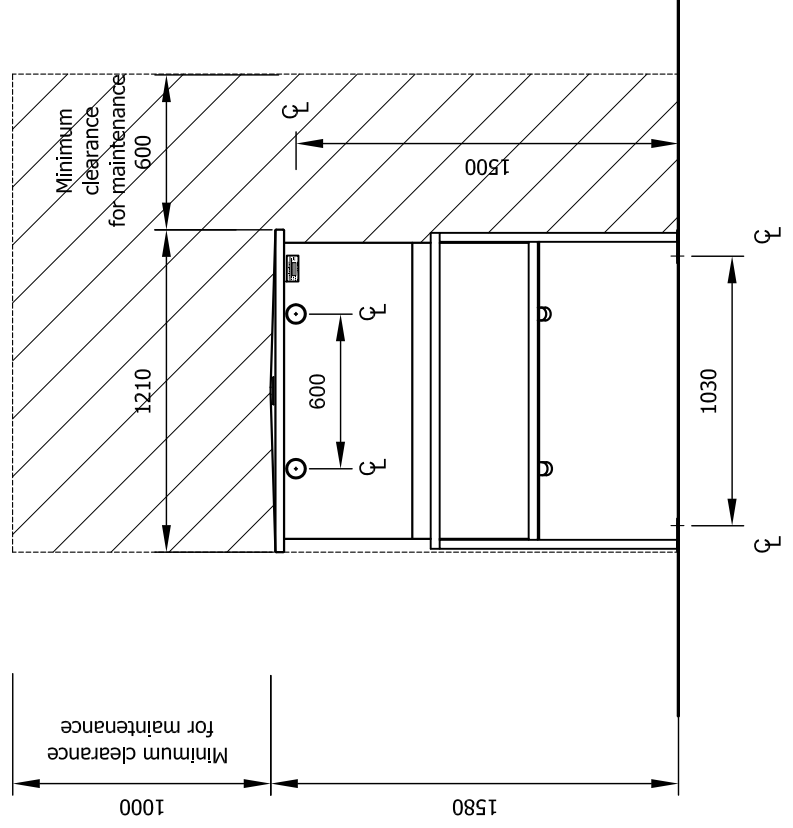
## Plan View

Scale 1:30



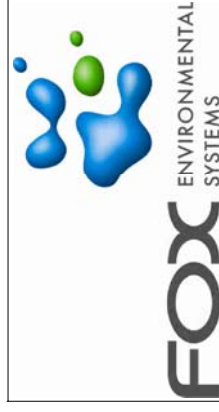
## End View

Scale 1:20



## Detail A

Oil Skimmer Adjustment Detail



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<b>Project:</b>	Installation Instructions
<b>Drawing Title:</b>	FX1000SS Separator

<b>Drawn by:</b>	R.O'B.
<b>Date:</b>	28/08/2007
<b>Scale:</b>	As Specified
<b>Drawing No:</b>	A4 - INST-1025/2



## 4. Operation & Maintenance

Proper maintenance of the Oil/water Separator and associated equipment will ensure that the unit continues to perform the function for which it has been installed.

The Separator will provide effluent of a quality acceptable for release to sewer at the approved flowrate. Increasing the flowrate beyond this will affect the efficiency of the system. 'Quick Break' detergents must be used for the System to operate efficiently. Solvent based detergents may affect the warranty.

Documentation of all pre-treatment facility operations, including products and residues removed should be kept in accordance with Australian Standards.

Maintenance of the unit should be undertaken at the following regular intervals:-

- Weekly
- Quarterly

Note: These are the recommended maintenance intervals for typical site requirements. The period should be reduced in accordance with the volumes and pollutant loadings of the effluent being treated.

### 4.1 Recommended Weekly Maintenance.

1. Remove the Separator lid; this is done by releasing the over-centre lock, lifting and sliding the cover away from the locking end. When the lip of the cover clears the lip of the tank the lid can be removed.
2. Inspect the Separator and ensure that there is no floating debris that can create a blockage.
3. Check the level in the waste oil collection vessel. If full, remove the extension pipe from the adaptor and place a screw cap on the oil container. Arrange for proper disposal of the waste.
4. Inspect and clean all collection points and silt baskets as required.
5. Turn the Separator Controller selector switch to manual and ensure that the pump starts, that the effluent flow through the unit is steady and that the Oil Skimmer pipe is approximately 3 mm above water level.
6. Check the flow through the final filter bags.
7. Return the selector switch to Auto.
8. Inspect the unit and all pipe connections for leaks or physical damage that could affect the operation.
9. Replace the Separator lid and lock if required.

## 4.2 Quarterly Service.

**Fox Environmental Systems recommend that the quarterly service to the unit is performed by a qualified service technician. All Fox recommended Service agents are able to provide a Fox Service Authorisation Number.**

1. Perform steps 1-4 & 8 above.
2. Isolate the Separator Controller at the GPO and remove the plug.
3. Adjust the Oil Skimmer to a point just below the water level to remove any build up of oil on the water surface.
4. Drain the sludge from the hopper via the gate valve into a suitable container and dispose of in a proper method.
5. Drain any remaining effluent from the Tank back to the Holding Tank.
6. Remove the Tube Pack from the unit and clean thoroughly. Ensure that any run-off is returned to the Holding Tank.
7. Thoroughly clean the Separator internally.
8. Refit the tube pack. Ensure that the sludge hopper is fully covered to stop bypass occurring.
9. Inspect the final filter bags and replace as necessary.
10. Lift the Oil Skimmer pipe to a point above the water level and fill the unit with clean water.
11. Check the level of sludge in the Holding Tank. If necessary arrange for the tank to be pumped out and the contents disposed of.
12. Check operation of the pump float switch. Be sure that the float is free to move with the water level and that the contacts change over when the float is lifted.

**Note: The Holding Tank of a trade-waste system is a confined space and must not be entered without proper precautions being observed. In a properly installed system all regular maintenance activities should be able to be carried out through the access hole in the tank.**

1. Prime the Pump (if required) and check that the water level in the Holding Tank is sufficient to run the unit.
2. Plug the Separator Controller into the GPO and turn on. If the pump does not start automatically, lift the float in the Holding Tank (use a wire hook or similar) and the pump should run. Let the float down; the pump will shut off automatically when the low level is reached.
3. When the effluent flow through the unit becomes steady adjust the Oil Skimmer to 3 mm above the water level.
4. Replace the Separator Lid and lock if required.

## 5. Trouble Shooting and Fault Finding

**Note: Electrical fault finding must be done by a licensed electrical contractor.**

Symptom	Cause	Remedy
No flow to Separator.	<ul style="list-style-type: none"> <li>• Mono pump not primed</li> <li>• Pump diaphragm damaged.</li> <li>• Pump check valve faulty.</li> <li>• Suction pipe below sludge level.</li> <li>• Suction pipe blocked.</li> <li>• Foot valve blocked.</li> </ul>	<ul style="list-style-type: none"> <li>• Prime pump</li> <li>• Service pump.</li> <li>• Service check valves.</li> <li>• Pump holding tank out.</li> <li>• Remove obstructions.</li> <li>• Service foot valve.</li> </ul>
Pump not running.	<ul style="list-style-type: none"> <li>• Low level in Holding Tank</li> <li>• Float switch jammed.</li> <li>• Controller switched Off.</li> <li>• Motor overload tripped.</li> </ul>	<ul style="list-style-type: none"> <li>• Pump runs with rising float. Lift float.</li> <li>• Ensure switch is free to lift with water level.</li> <li>• Check power is on, &amp; selector switch is on Auto or Manual. Return to Auto for running.</li> <li>• Reset overload.</li> </ul>
System will not switch on.	<ul style="list-style-type: none"> <li>• Float switch jammed.</li> <li>• No power to Controller.</li> <li>• No power to pump.</li> <li>• Pump running but not pumping.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure float switch is free to lift with water level.</li> <li>• Check power is on, &amp; selector switch is on Auto or Manual</li> <li>• Check electrical connections and ensure power is available at pump.</li> <li>• Refer "No flow to Separator" above.</li> </ul>
System will not switch off.	<ul style="list-style-type: none"> <li>• Float switch jammed.</li> <li>• Pump not pumping.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure switch is free to fall with water level.</li> <li>• Refer "No flow to Separator" above.</li> </ul>
Water in Waste oil vessel.	<ul style="list-style-type: none"> <li>• Oil skimmer set too low.</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust skimmer with pump running to 3mm above water level.</li> </ul>
Oil in discharge stream.	<ul style="list-style-type: none"> <li>• Oil skimmer set too high.</li> <li>• Incorrect detergent or degreaser used.</li> <li>• Excessive heavy oil loads introduced into waste stream.</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust skimmer with pump running to 3mm above water level.</li> <li>• Use only quick break detergents.</li> <li>• Pure oil should not be run through the unit.</li> </ul>
Pump Motor overload trips continuously.	<ul style="list-style-type: none"> <li>• Motor starts/stops too frequently</li> <li>• Power supply voltage too low or too high.</li> </ul>	<ul style="list-style-type: none"> <li>• Holding Tank too small.</li> <li>• Floats set incorrectly.</li> <li>• Check voltage.</li> </ul>

## 6. Product Warranty

All products that are supplied by Fox Environmental Systems Pty Ltd (Fox) are warranted to the original owner (not necessarily the purchaser) of the equipment in accordance with the following Limited Warranty. The warranty is only valid when the system is operated and maintained in accordance with the manufacturer's instructions. If service of the system is not carried out on a regular basis the warranty of your system will be affected.

The warranty offered is for the repair or replacement of any part or component manufactured by Fox or their subcontractors that fails due to defects in materials or workmanship for a period of 12 months. To obtain service under this warranty the owner should contact Fox Environmental Systems and advise the nature of their concern, the model and serial number of the unit and the date of purchase. If required the component must be returned at the senders' expense. A replacement item, which at the discretion of Fox, may be the original component following repair, a reconditioned or new item, will be returned at our expense. Should it be determined that the part is not covered by warranty the owner will be responsible for the payment of any costs involved in the supply of replacement parts, including shipping and handling.

All components supplied under this warranty will be covered by a further warranty equal to the remainder of the original limited warranty or 90 days, whichever is the longer. All components replaced under warranty become the property of Fox Environmental Systems Pty Ltd and may be used for whatever purpose they deem suitable.

The warranty will be void if the equipment is not installed as per manufacturer's instructions. Warranty will also be void if water pressure exceeds 1400 kPa. The warranty is only valid when the system is operated and maintained in accordance with the manufacturer's instructions, and service of the system is carried out on a regular basis. The Commissioning-in report must be completed, signed & returned to Fox Environmental Systems

Note: The use of pipes smaller than the port size of the pumps will void the suppliers' warranty.

This warranty does not cover consumables or any damage arising from improper selection of materials, faulty installation or misuse.

➤ What are Consumables?

1. The final filter bags.

To obtain service under this warranty the owner should contact Fox Environmental Systems Pty Ltd on (07) 5437 8455 or Fax (07) 5437 8488 and advise the nature of their concern, the model and serial number of the unit and date of purchase. If required, the component must be returned to Fox at the senders' expense. A replacement item which at the discretion of Fox may be the original component following repair, a reconditioned or new item will be returned at our expense. Should it be determined that the part is not covered by warranty the owner will be responsible for the payment of any costs involved for the supply of replacement parts, shipping and handling costs.

All components replaced under warranty become the property of Fox Environmental Systems Pty Ltd and may be used for what ever purpose they deem suitable. All components supplied under this warranty will be covered by a further warranty equal to the remainder of the original limited warranty or 90 days, which ever is the longer. Should it be found that the equipment is not being maintained in accordance with the maintenance recommendations provided by Fox Environmental Systems Pty Ltd then the warranty may become void.