

FPS-500 / FPS-750

Fuel Polishing System Eliminates Microbial Contamination

Installation and Operating Manual



- **Stabilizes Fuel**
- **Removes Water & Sludge**
- **Prevents Tank Sediments**
- **Improves Engine Reliability**
- **Optimizes Fuel Quality**

Optimal Fuel Quality Provides Peak Engine Performance

More Power • Less Smoke • Saves Fuel

INSTALLATION AND OPERATING MANUAL

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Fuel Polishing System FPS-500 / FPS-750



ALGAE-X[®] Fuel Polishing Systems keep diesel fuels in “pristine condition” while removing sludge and water from tanks.

The FPS is a **Three Stage Fuel Polishing System**:

Stage 1: The ALGAE-X[®] Fuel Conditioner reverses the process of fuel deterioration, buildup of tank sludge and stabilizes the fuel.

Stage 2: The centrifugal water separation system removes water.

Stage 3: The fine filter removes solid contaminants.

Ideal for use in: Tanks of vessels, vehicles, generators and heavy equipment.

	FPS-500	FPS-750
Flow rate	150 gph	210 gph
Tanks	< 1000 gal	< 1300 gal
Dimensions	17.25" H	20.0" H
	15.0" W	22.5" W
	5.25" D	8.0" D
Weight	23 lbs	45 lbs
Power	12V DC	110V/60Hz
	or 24V DC	or 230V/50Hz
Port Size	1/2" SAE	1/2" SAE
LG-X Model	500	1500

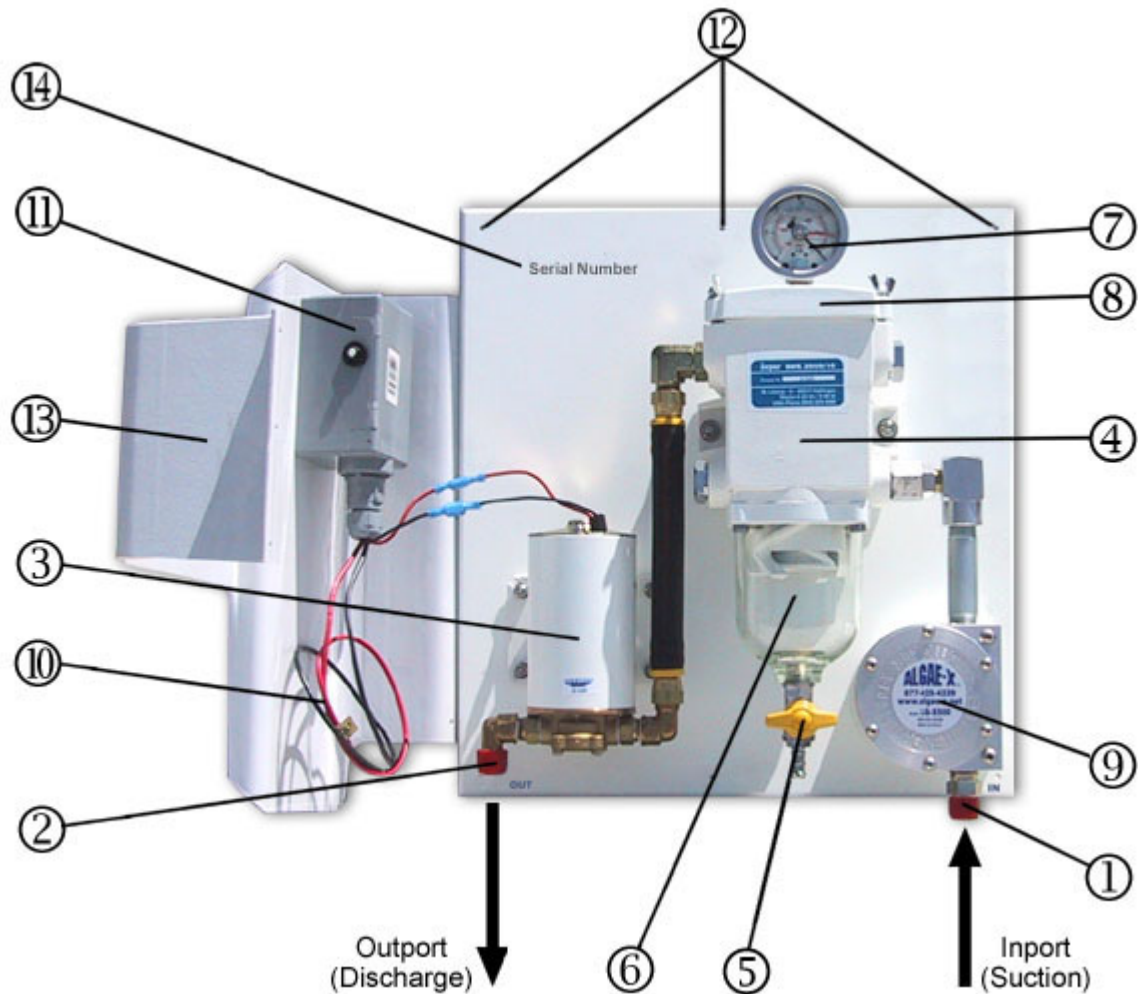
The **FPS-500 / FPS-750** is a wall mounted, fuel-polishing system providing **Optimal Fuel Quality for Peak Engine Performance**. Since fuel is inherently unstable, solids begin to form and the accumulating tank sludge will eventually clog your filters and damage your injectors. It will cause engines to smoke, lose power and ultimately break down.

The **FPS-500 / FPS-750** conditions and stabilizes the fuel, eliminates microbial contamination, removes water, tank sludge and contaminants from the tanks. The principal components of the system are an LG-X 500 (FPS-500) or LG-X 1500 (FPS-750) Fuel Conditioner, a continuous duty gear pump, a timer and a fuel filter water separator/coalescer with a vacuum gauge. The **LG-X Fuel Conditioner** decreases the size and mass of fuel droplets providing better filtration and water separation, clear and bright fuel, optimal combustion and clean tanks.

The system is compact, easy to install, operate and maintain. The **ALGAE-X[®] Fuel Conditioner** is self-cleaning, has no moving parts, no electrical hookup, and requires zero maintenance. The filter/water separator unit removes water and particulate from the fuel. It can be easily drained, by opening the valve on the bottom. The filter element can be back-flushed several times before replacing.

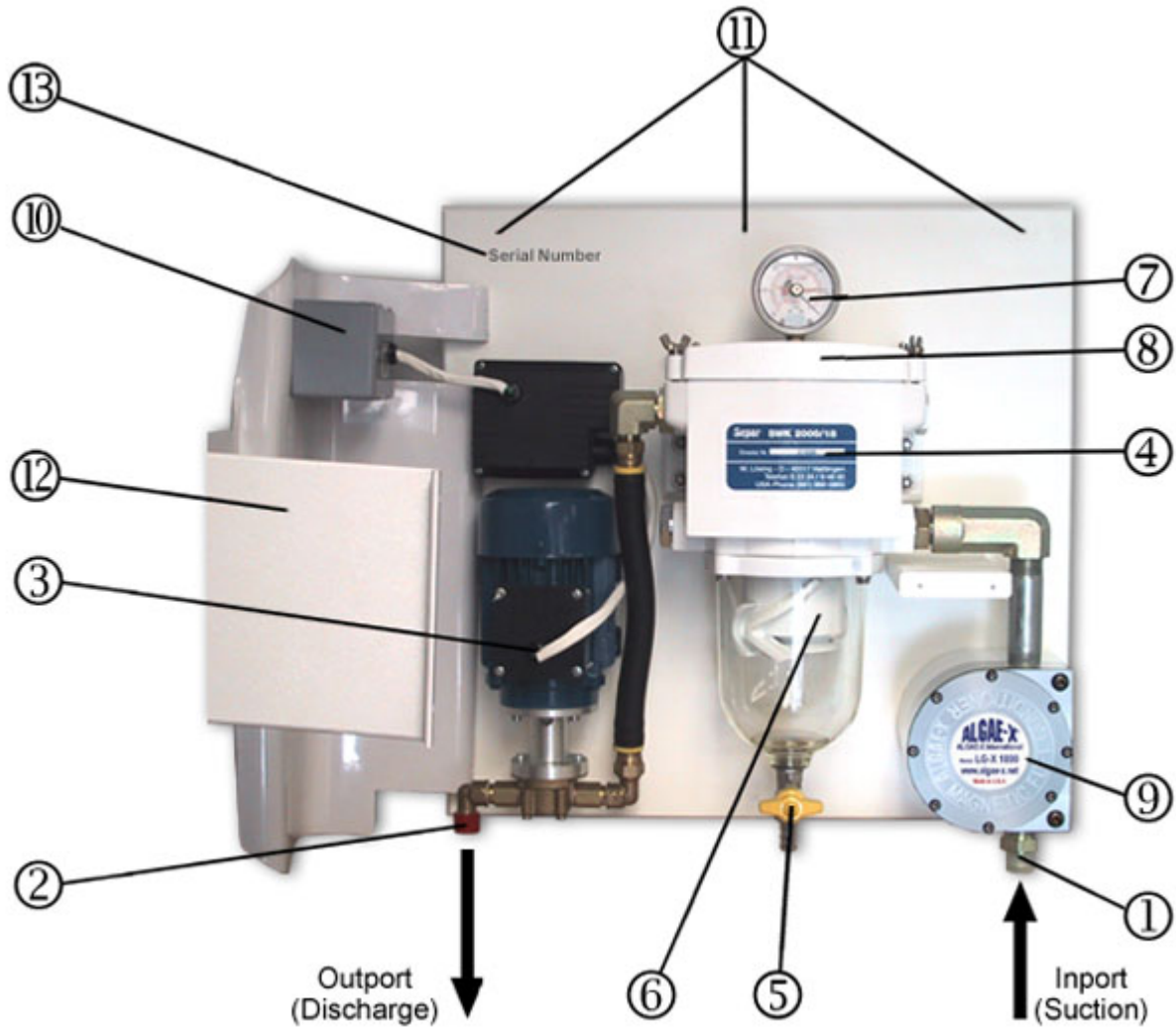
ALGAE-X[®] Total Fuel Management Systems

FPS-500 OVERVIEW – BASIC SYSTEM COMPONENTS



- | | |
|--|--|
| 1) Fuel Inlet | 8) Lid for filter replacement |
| 2) Fuel Outlet | 9) ALGAE-X [®] Magnetic Fuel Conditioner LG-X 500 |
| 3) Motor with coupled Gear Pump | 10) Lead wires for electrical hookup |
| 4) Water Separator and Filter | 11) Mechanical Timer / Circuit Breaker |
| 5) Drain valve (push and turn to open) | 12) Mounting Holes (6) |
| 6) Sight bowl | 13) Open Cover |
| 7) Vacuum gauge (black finger – actual value / red finger – highest value since reset) | 14) Serial Number |

FPS-750 OVERVIEW – BASIC SYSTEM COMPONENTS



- | | |
|--|---|
| 1) Fuel Inlet | 8) Lid for filter replacement |
| 2) Fuel Outlet | 9) ALGAE-X [®] Magnetic Fuel Conditioner LG-X 1500 |
| 3) Motor with coupled Gear Pump | 10) Mechanical Timer |
| 4) Water Separator and Filter | 11) Mounting Holes (6) |
| 5) Drain valve (push and turn to open) | 12) Open Cover |
| 6) Sight bowl | 13) Serial Number |
| 7) Vacuum gauge (black finger – actual value / red finger – highest value since reset) | |

GENERAL SPECIFICATIONS

FPS-500

Flow Rate	approx. 2.5 gpm / 150 gph
Outline Dimensions	17.25" x 15" x 5.25" (H x W x D)
System Weight	23 lbs
Operating Temperature	32 - 104° F; 0 - 40° C
Electrical	12 V DC, 15 A (standard) - 24 V DC / 7.5 A also available
Service Space	4" space on top and bottom, to facilitate changing filter elements and draining water and particulate from the bowl
Pump	Brass Gear Pump
Suction capability (primed)	15 ft vertical lift (lines >1/2")
Timer	Spring wound mechanical timer up to 6 hours
Inlet	1/2" SAE male flare fitting
Outlet	1/2" SAE male flare fitting
Max. Fluid Viscosity	29 cSt

Note: The FPS-500 is designed to meet environmental standards for safe operation
(NOT for use with fluids that have a flash point below 100°F (38°C), e.g.: gasoline, alcohol, ...)

FPS-750

Flow Rate	approx. 3.5 gpm / 210 gph
Outline Dimensions	20" x 22.5" x 8" (H x W x D)
System Weight	45 lbs
Operating Temperature	32 - 104° F; 0 - 40° C
Electrical	110 V / 60 Hz / single phase (standard) 230 V / 50 Hz / single phase also available
Service Space	4" space on top and bottom, to facilitate changing filter elements and draining water and particulate from the bowl
Pump	Brass Gear Pump
Suction capability (primed)	15 ft vertical lift (lines >1/2")
Timer	Spring wound mechanical timer up to 6 hours
Inlet	1/2" SAE male flare fitting
Outlet	1/2" SAE male flare fitting
Max. Fluid Viscosity	29 cSt

Note: The FPS-750 is designed to meet environmental standards for safe operation
(NOT for use with fluids that have a flash point below 100°F (38°C), e.g.: gasoline, alcohol, ...)

PRIMARY INSPECTION

Upon arrival, the FPS Fuel Polishing System and accessories must be visually inspected before installation. Shipping and handling may cause physical or electrical problems.

Checklist:

- If the packing crate shows signs of damage inspect the FPS-500 / FPS-750 cover and back plate for damages since that could indicate internal mechanical or electrical problems.
- Inspect filter for cracks or missing parts.
- Check vacuum gauge for spilled liquid.
- Check all plumbing joints. Tighten fittings and joints as necessary.
- Check all electrical terminals and connections for tightness.

INSTALLATION



! IMPORTANT ! It is recommended that only qualified, experienced personnel, familiar with this type of equipment, who have read and understood all the instructions in this manual should install, operate and maintain the system.

MOUNTING

The FPS-500 / FPS-750 should be wall mounted on a hard, level surface. This unit is designed for well-ventilated indoor use and should be located as close to the tank as possible. Allow about 4" of space on top of the unit to change the filter element comfortably and sufficient space on the bottom to drain the system. This space is also necessary to ensure sufficient ventilation of cooling air for the motor.

ELECTRICAL



! WARNING ! To avoid the risk of electric shock make sure that the power supply to the system is disconnected and ensure that the system is at zero volts, before working on any of the system's electrical parts.

Make sure that the motor has the same rated voltage as your electrical system. FPS-500 systems are available in 12V DC, 24V DC and FPS-750 systems in 110V AC and 230V AC.

FPS-500

The systems with either 12 V DC or 24 V DC motor connect to the positive lead from your battery with the red wire of the motor and to the negative lead with the black wire. After the initial wiring of the motor check system operation to insure that it is running in the correct direction. If the motor is running in the wrong direction or is not running at all, reverse the two electrical leads.

FPS-750

The FPS-750 may only be connected to properly grounded power sources for operator safety. Do not run over, crush or pull the power supply cable or extension lead otherwise it may be damaged. Protect the cable from oil, heat and sharp edges.



! WARNING ! The system must be properly grounded for operator safety.

Depending on length of run, use #12 AWG or larger copper wiring and connect system to a separate 20A breaker (not included in shipment).

PLUMBING

Use proper quality approved fuel line materials with at least 1/2" inner diameter. Smaller plumbing will place excessive load on the motor and shorten its life. A valve should be installed on the inlet and outlet port of the FPS system.

The pick-up tube/line(s) (suction) should originate from the lowest point of the tank and should be connected directly to the systems ALGAE-X[®] Magnetic Fuel Conditioner ("IN" port). For optimal performance, insure that the inlet (suction) line(s) are free and nothing is restricting their flow.

Note: It is recommended to install a foot valve to keep the system primed, especially if the system is located above the lowest possible fuel level in the tank.

If the FPS Fuel Polishing System is mounted below tank top level, a priming tee should be installed on the highest point of the suction line to be able to easily prime the systems delivery line.

The return line(s) (discharge) should be plumbed to the outlet of the pump ("OUT" port) and enter the tank as far as possible from the pick up tube of the FPS system close to the tank bottom. For optimal performance, insure that the outlet (discharge or return) line(s) are free and nothing is restricting their flow.

The system capabilities are 15 ft suction (vertical) lift, when connected to piping of 1/2" ID or more with no additional flow restrictions such as valves, 90-degree connectors or other plumbing accessories. For continuous optimal performance, make sure suction and discharge lines are free and that nothing is blocking the flow of fuel.



! WARNING ! The gear pump is capable of developing extremely high pressure. Care must be taken not to operate the pump with either the suction (inlet) or discharge (outlet) lines closed. Serious damage may occur.



! WARNING ! If the pump is allowed to run without fuel, pump damage will occur.

IMPORTANT INSTALLATION PRECAUTIONS

The suction line of the FPS system should be independent and separate from the suction line of the engine. If that is not possible, appropriate valves must be installed to completely separate the FPS from the engine fuel system to prevent any possible interference with safe engine operation.

The discharge should also be independent and separate of the engine's fuel return line back to the tank. If the return line from the engine and the discharge of the FPS Fuel Polishing System have to be combined in any way, adequate valves should be installed to prevent any possible interference with safe engine operation. (Many engines are already equipped with a check valve – check with engine manufacturer).

Note: If any of the FPS system's fuel lines are used in combination with the engine's fuel system, the FPS Fuel Polishing System should be disabled during engine operation.

OPERATION



! WARNING ! Do not fill with gasoline. This System is not meant for use with gasoline nor with other flammable liquids having a flash point less than 100°F. Use with gasoline or use with any flammable liquids at a temperature exceeding their flash point, presents an immediate explosion and fire hazard.



! WARNING ! Do not use the FPS at a temperature exceeding the flash point of its contents.



! WARNING ! Only run the system when you are able to supervise it. Operating the FPS-750 / FPS-500 on an unattended vehicle or vessel is NOT recommended.

It is necessary to prime the filter before initial use. Remove the top filter cover by removing the four wing nuts. Fill the bowl and filter body, as well as the suction line with diesel fuel and replace the cover. The timer can now be set to the desired run time. The pump will automatically shut off after this pre-set time. Set the tell-tale gauge pressure indicator (red pointer) to slightly above the black needle prior to operation. The gauge will indicate maximum vacuum pressure during system operation. When the indicator reaches 15" HG, it is time to back-flush or change the element. The same procedure is necessary if the water level reaches 30% of the clear bowl.

Servicing and Back-flushing the FPS filter:

1. Turn off the FPS-500 / FPS-750 pump motor
2. Open the brass colored bleed screw on the top of the filter cover
3. Place a fuel waste container below the yellow safety drain valve at the bottom of the filter bowl
4. Open the yellow safety drain valve (push & turn counter clockwise)
5. Close after approximately 2 seconds
6. After approximately 10 seconds reopen the drain valve
7. Close after visible sediment, particles and water are drained from the bowl
8. Prime the filter by removing the cover (4 wing bolts) and pouring clean diesel fuel into the filter body until the fuel level reaches the top of the filter body
9. Replace the lid. Note: evenly tighten the wing bolts to ensure a good seal
10. Close bleed screw on top of the lid
11. The FPS-500 / FPS-750 is ready for operation

Note: Elements can be back-flushed up to 5 times before replacement is required

Note: Disposal of fuel should be done in accordance with Federal, State and Local regulations.



! WARNING ! Some fuels may have been treated with biocides. Biocides are extremely toxic and may enter the body through the skin. It is recommended to use adequate protection and avoid skin contact with biocide-treated fuels.

STABILIZING AND OPTIMIZING FUEL QUALITY

We recommend treating the fuel with the **ALGAE-X® Fuel Catalyst (AFC-705)**. This will enhance and accelerate the tank cleaning process by breaking down and dissolving existing tank sludge. AFC-705 will decontaminate compartments of the tank that are out of reach of the suction line. Depending on the condition of the fuel and the amount of sludge build-up, it is recommended to initially use a double dose of one to twenty-five hundred (1:2500) instead of one to five thousand (1:5000) This has proven to be very helpful in accelerating the tank cleaning process. AFC-705 contains detergent, surfactant, dispersant, corrosion inhibitor, lubricity enhancer and combustion catalyst. It does not contain biocides. AFC-705 should always be used periodically in particular to stabilize fuel that is stored for longer periods of time.

Note: In cases of severe tank contaminant build-up and high water level in bottom, it is recommended to polish the fuel before initial use of an FPS system.

TROUBLESHOOTING

No fuel delivery

1. Pump does not run
2. Pump and filter are not primed
3. Fuel supply line blocked
4. Lift is too high
5. Air leak in fuel supply to pump
6. Pump rotation direction incorrect
7. Intake or outlet valve closed
8. Foot (check) valve installed backwards

Insufficient fuel delivered

1. Air leak at inlet
2. Lift too high
3. Pump worn
4. Inoperative foot valve
5. Piping improperly installed or dimensioned
6. Filter/water separator plugged

Rapid pump wear

1. Pump has been run dry or with insufficient fuel
2. Plumbing on inlet side not appropriately dimensioned

Pump requires too much power

1. Air in plumbing lines
2. Liquid too viscous

Noisy operation

1. Insufficient fuel supply
2. Air leaks in the inlet pipe
3. Air or gas on the suction side

Motor does not turn or turns intermittently

1. Control power not available
2. Circuit breaker on FPS-500 tripped
3. Pump failed and seized
4. Motor failure

Pump leaks fuel

1. Loose pump plumbing fittings
2. Worn pump shaft seal
3. Excessive head from overhead storage tank
4. Worn pump O-rings or seals

FUEL POLISHING SYSTEMS WARRANTY

LIMITED WARRANTY

ALGAE-X® International makes every effort to assure that its products meet high quality and durability standards and expressly warrants the products described herein, against defects in material and workmanship for a period of one (1) year from the date of purchase. This warranty is not intended to supplant normal inspection, care and service of the products covered by the user, and shall not obligate ALGAE-X® to provide free service during the warranty period to correct breakage, maladjustment or other difficulties arising out of abuse, misuse, or improper care and maintenance of such products. Our express warranty is subject to the following terms and conditions:

1. This warranty shall only extend to and is only for the benefit of original purchasers who use the products covered hereby
2. Any warranty claim received by ALGAE-X® after one (1) year from the date of purchase will not be honored even if it is claimed that the defect occurred prior to one (1) year from the date of purchase.
3. This warranty shall not apply to products (1) which have been tampered with, altered or repaired by anyone other than ALGAE-X® without the express prior written consent of ALGAE-X® (2) which have been installed improperly or subject to misuse, abuse, accident, negligence of others, improper operation or maintenance, neglect or modification, or (3) which have had the serial number altered, defaced or removed.
4. The liability of ALGAE-X® under this warranty is limited to the repair or replacement of the defective product. ALGAE-X® assumes NO LIABILITY for labor charges or other costs incurred by any purchaser incidental to the service, adjustment, repair, return, removal or replacement of products. ALGAE-X® ASSUMES NO LIABILITY FOR ANY GENERAL, SPECIAL, INCIDENTAL, CONSEQUENTIAL, CONTINGENT OR OTHER DAMAGES UNDER ANY WARRANTY, EXPRESS OR IMPLIED, AND ALL SUCH LIABILITY IS HEREBY EXPRESSLY EXCLUDED.
5. ALGAE-X® MAKES NO WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE, WITH RESPECT TO THE PRODUCTS COVERED BY THIS WARRANTY POLICY, EXCEPT AS EXPRESSLY PROVIDED FOR HEREIN. NO EMPLOYEE, AGENT, REPRESENTATIVE OR DISTRIBUTOR IS AUTHORIZED TO MAKE ANY WARRANTY ON BEHALF OF ALGAE-X® OTHER THAN THE EXPRESS WARRANTY PROVIDED FOR HEREIN.
6. ALGAE-X® reserves the right at any time to make changes in the design, material, function and specifications of its products. Any such changes shall not obligate ALGAE-X® to make similar changes in such products that were previously manufactured.

WARRANTY CLAIM PROCEDURE

To make a claim under this warranty, please call our ALGAE-X® at (239) 463 0607 or (877) 425-4239, and provide: Name and location where unit was purchased, the date and receipt of purchase, model number, serial number, and a detailed explanation of the problem you are experiencing. The Customer Service Representative may, at the discretion of ALGAE-X®, arrange for a Field Engineer to inspect your system. If the inspection discloses a defect covered by its limited warranty, ALGAE-X® will either repair or replace the defective parts or products. ALGAE-X® assumes no liability, if upon inspection, ALGAE-X® or its representative determines that there is no defect or that the damage to the system resulted from causes not within the scope of this limited warranty. For service and sales, please contact ALGAE-X®:

ALGAE-X® International
P.O. Box 4011 Fort Myers Beach, FL 33932 • 877-425-4239 • Fax: 239-463-7855
Internet: www.algae-x.net • Email: algae-x@algae-x.net

TECHNICAL ASSISTANCE AND ORDERING

Please write to, fax, email or call:

ALGAE-X® International
P.O. Box 4011, 1661 Estero Blvd. #18
Fort Myers Beach, FL 33932
Tel: 239-463-0607
Fax: 239-463-7855
Email: algae-x@algae-x.net
Internet: www.algae-x.net

Please provide the following information:

Serial Number of your FPS (located on the inside behind the timer) the required part numbers and quantity.

REPLACEMENT FILTER ELEMENTS

FPS-500:

01030 30 Micron filter element
01010 10 Micron filter element
01060S 60 Micron Stainless Steel re-usable filter elements

FPS-750:

01830 30 Micron filter element
01810 10 Micron filter element
01860S 60 Micron Stainless Steel re-usable filter elements

Also available:

- ALGAE-X® Fuel Polishing Systems in kit form
- Larger capacity, custom designed systems for higher flow rates and larger tanks
- Digital Flow Meter
- Rotor Sight Glass

FPS-500 / FPS-750 SYSTEM IDENTIFICATION

Serial Number: _____ (e.g. B 030010 – 5001)

FPS-500:

Voltage: 12 V DC
 24 V DC

Filter Element: 10 Micron
 30 Micron
 60 Micron Stainless Steel

FPS-750:

Voltage: 110 V AC / 60 Hz
 230 V AC / 50 Hz

Filter Element: 10 Micron
 30 Micron
 60 Micron Stainless Steel

Inspected by: _____ Date: _____