



Keeping The Lights On

Optimal Fuel Quality • Reliable Power Supply

Filtration

Separation

Fuel Conditioning



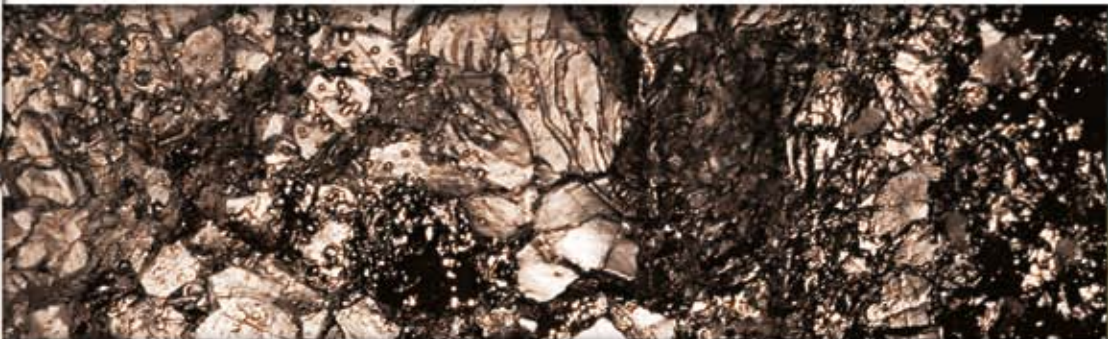
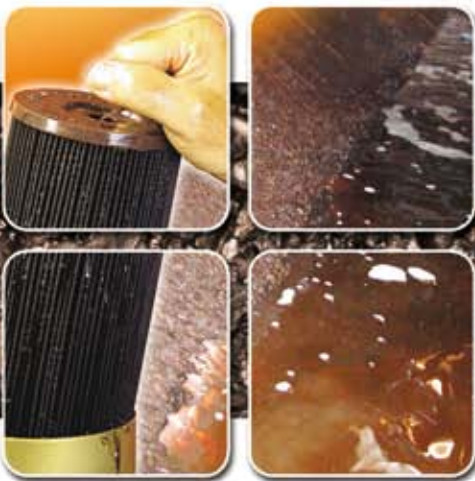
When the Lights Go Out it is Too Late to Clean Your Tanks

It is the condition of the fuel in your tanks that determines Engine Performance and Emergency Power Reliability

Today's diesel injection systems with pressures of 30,000 psi or more require that the particle size of your fuel does not exceed the tolerances of your engines. Primary filter water-separators dramatically improve engine protection. However, they can only do so much.

Non-fuel contaminants (in-organic debris) can easily be filtered out and removed. However, the most adequate filtration has no effect on the natural tendency of fuel constituents to agglomerate and form **organic contaminants that are beyond filtration**.

In the industry, terms like algae, gum, wax, resin, varnish, tar, asphaltene, etc. are often used to describe the organic contaminant that clogs filters and is responsible for carbon deposits, corrosion, failing injection systems, loss of power, incomplete combustion, and excessive emissions.

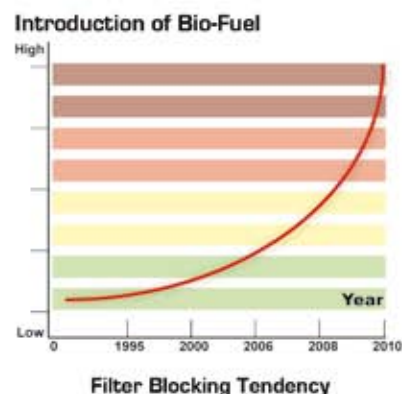


Most Engine Performance Problems Start In The Fuel Tank . . .

Over the last number of years we have seen a sudden, dramatic and worldwide increase in **Filter Plugging Tendencies**. What has changed? Oil supply and environmental concerns have resulted in important **changes in fuel production**, such as cracking, blending, ultra low sulfur, and the introduction of bio-fuels.

These changes have negatively impacted the inherent instability of our fuel and significantly shortened its **shelf life**. Additives, storage and transportation challenges further accelerate fuel degradation.

Reliable Power requires the implementation of AXI's unique and innovative Fuel Optimization and Maintenance Technology to adequately protect engines and preserve the integrity of stored fuel beyond filtration and separation.



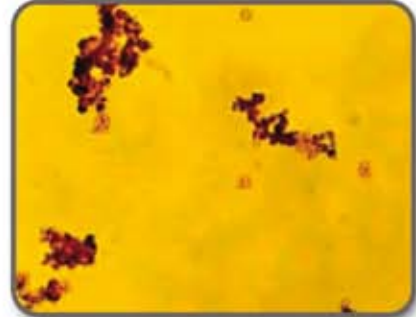
Fuel Degradation

Fuel degradation is an inevitable, natural process. And unless an adequate fuel sampling, testing, monitoring and maintenance program is implemented, fuel breakdown will continue to be a potentially expensive liability and a major contributor to your overall operating costs.

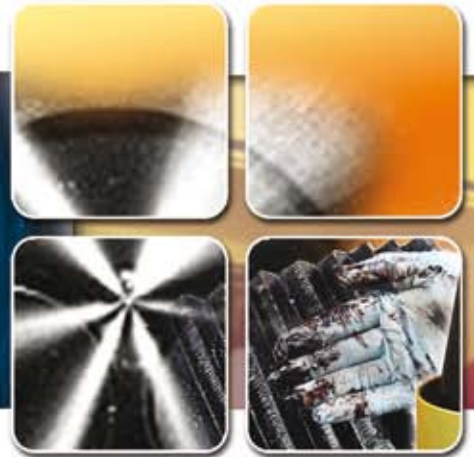
Diesel is a very complex fluid...

It is not homogenous and no two batches will ever be identical. Fuel deterioration, filterability and shelf life depend on a variety of factors including good housekeeping.

Fuel breakdown is also dramatically accelerated by changes in temperature, water, microbial contamination, and exposure to heat and pressure from engine injection systems.

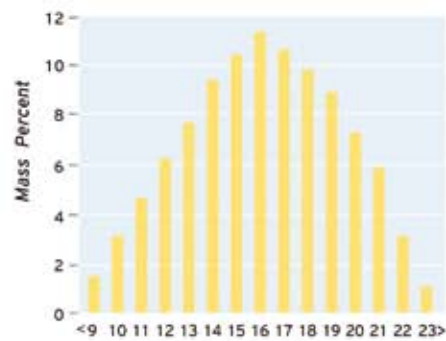


Fuel Is Not Homogenous



Fuel shelf life and filter clogging tendencies depend on a series of factors such as: transportation and storage, natural oxidation and breakdown, the source of the crude oil, use of production additives, and the addition of biofuel.

Fuel breakdown is also accelerated by hot fuel that engines return to the day-tank. Hot return fuel and condensation are important contributors to bad fuel in emergency generator tanks, resulting from exercising the engines without implementing adequate fuel testing and maintenance programs.



Typical Carbon Number Distribution - No. 2-D Diesel Fuel

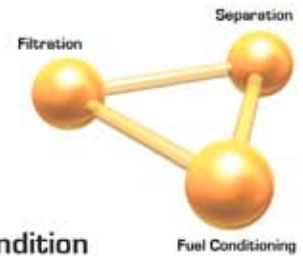
Primary filter water-separators dramatically improve engine protection. However, they can only do so much.



Fuel Optimization & Maintenance

AXI provides a “green”, unique and innovative approach to fuel conditioning. Our equipment, methods and programs protect your engines and preserve the integrity of **stored fuel**. They are an **insurance policy** guaranteeing permanent reliable power to:

- Increase Up-Time, Lower Emissions & Operating Costs
- Optimize & Preserve The Integrity Of Stored Diesel & Biofuel
- Protect Engines, Insuring Peak Performance & Reliability
- Clean Tanks, Restoring Fuel To Its “Clear & Bright” Pristine Condition



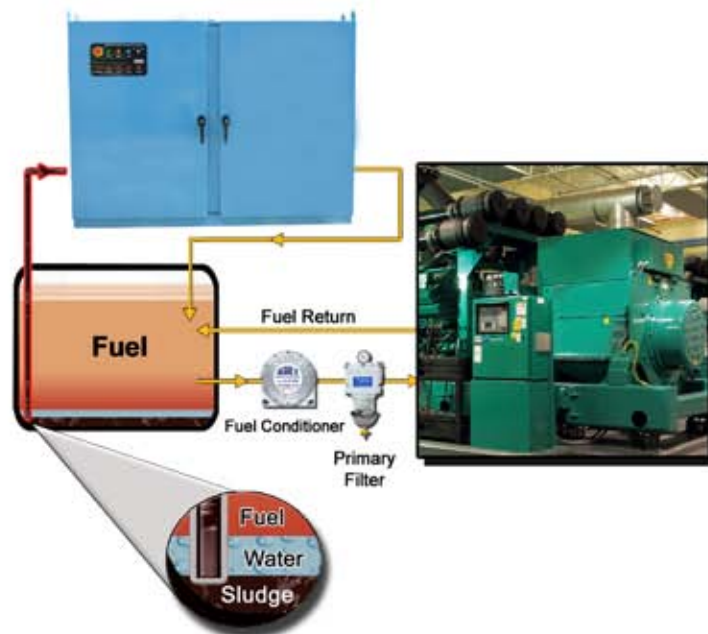
STS-6000-30gpm

AXI's STS and Smart FPS Series are programmable, fully automated filtration and fuel optimization systems.

They remove water and sludge from tanks, keep your diesel and biofuel dry to eliminate microbial contamination, and stabilize your fuel.

STS and SMART FPS Series of systems are equipped with remote ready, programmable SMART Filtration Controllers to seamlessly integrate with building management systems or in marine applications with vessel monitoring systems.

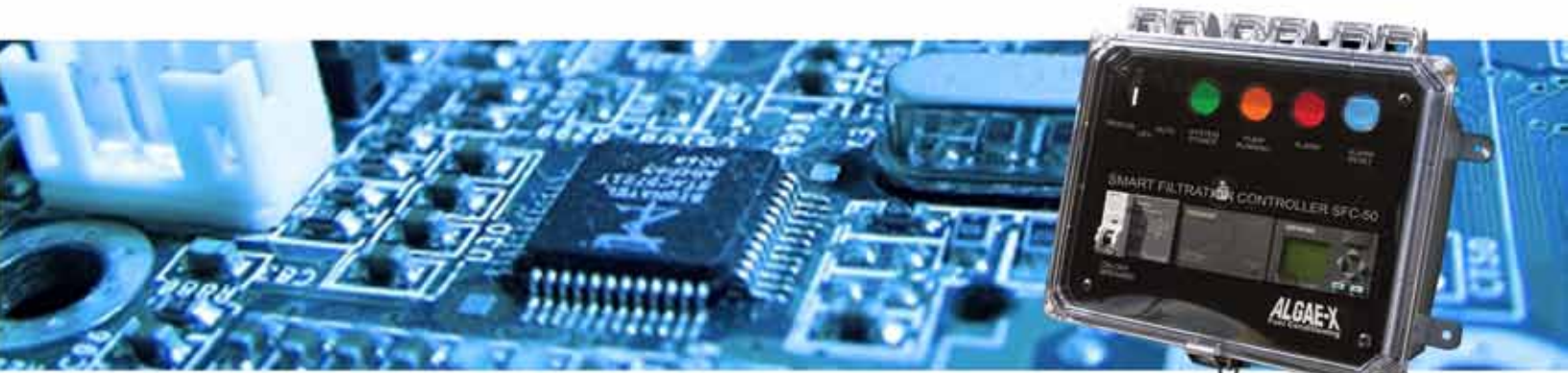
AXI engineers and manufactures higher capacity and flow-rate fuel filtration and transfer equipment designed for A&E, OEM and client specifications.



Automated Fuel Filtration Systems

The controller's alarm and operating functions are triggered when filter elements require service, a leak is detected, high vacuum or pressure occurs, fuel flow changes to outside it's set range, or when there is water in the separator. The controller will shut down the system and communicate the alarm status to the control room. STS and SMART FPS Systems feature:

- Programmable Smart Filtration Controller (UL508a)
- Remote-Ready Connection To BMS
- Powder Coated Or Stainless Enclosures (NEMA)
- Continuous Duty Cycle Pumps With Viton Seals
- Stainless Steel Plumbing
- Stand Alone, Turn-Key Plug & Play Equipment



SFC-50



One of Seven STS Systems At Beau Rivage Resort & Casino

STS programmable automated filtration systems with remote monitoring and control capabilities simplify the implementation of fuel optimization and maintenance programs to stabilize stored fuel and ensure safe, reliable power for mission-critical equipment.



Fuel Polishing & Transfer

AXI's Smart FPS Series and the STS Series are functionally similar. They are unique in combining fully automated remote monitoring and control, with conditioning and preserving the integrity of stored fuel. Both series simplify the implementation of diesel and biofuel optimization and maintenance programs.

SMART FPS Systems were originally designed for the marine industry. However, their small footprint has proven to make them a perfect fit for installation inside generator enclosures to ensure **Reliable Emergency Power**.

- Remote-Ready Controller (UL508a)
 - Modular Plug & Play
 - Unique Safety & Alarm Features
 - Continuous Duty Cycle Pump
 - Compact, Lightweight, Small Footprint



SMART FPS WITH SFC-50

Generators and pumps operating in remote locations are ideal applications for our SMART FPS Systems to guarantee continuous, uninterrupted service.

SMART FPS systems fit perfectly inside standard emergency generator enclosures and have proven to significantly reduce cost and service technicians' travel time for generator rental companies.



SMART FPS-DX In Generator Enclosure



Marine Applications

SMART FPS systems are installed in a fuel dialysis mode parallel to all tanks. In vessels with multiple tanks, the systems connect to all storage and day tanks on the vessel. The SMART FPS optimizes and conditions all fuel taken onboard, transfers fuel between all tanks and fills the day tanks.

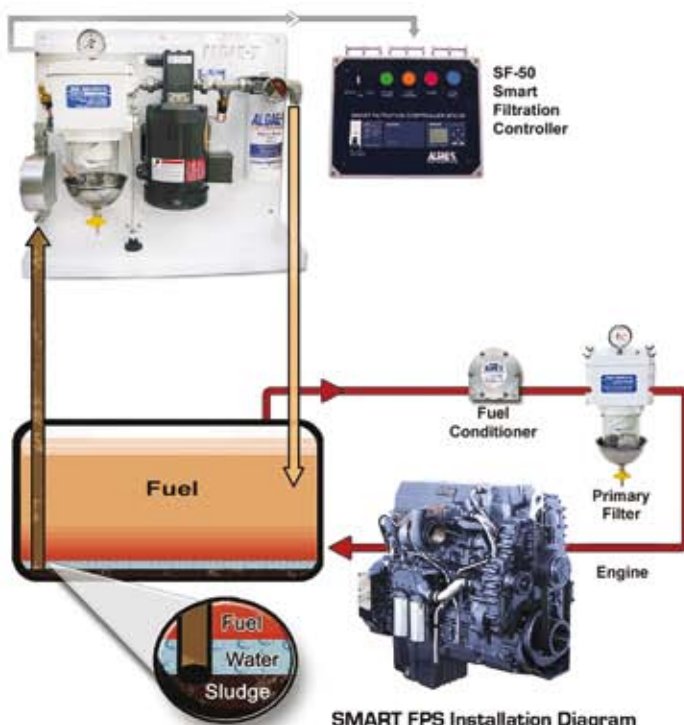
When vessels are laid up for any length of time, the SMART FPS will automatically keep your tanks clean and preserve the integrity of all the fuel you have onboard.

SMART FPS Systems are compact, lightweight, and easy to install. The plug and play SMART Filtration Controller (SFC) can be mounted away from the system to accommodate the available space in your engine room.

- Remove Water & Sediments
- Transfer Fuel To Tanks & Day Tanks
- Optimize Fuel When Bunkering



SMART FPS-MX WITH SFC-50



In comparison to traditional equipment such as centrifuges, SMART FPS Systems are more effective and require minimal maintenance.

SMART FPS Systems combine programmable, fully automated, high flow rate fuel conditioning with a compact plug and play design, and a small footprint.

AXI works with and supports naval architects, boat builders and owners with custom engineering for fuel system design and layout.



Fuel Restoration & Tank Cleaning Service Equipment

Mobile Tank Cleaning Systems (MTC) recondition, stabilize and decontaminate diesel, biofuels, light oils and hydraulic fluid. They remove water, sediment, and sludge that naturally accumulate in tanks. MTC's are compact, heavy-duty, multi-stage industrial systems, for long-term reliable service. They clean tanks and restore fuel to its "Clear & Bright" pristine condition without entering the tank.

- Compact Industrial Design
- Multi-Stage Tank Cleaning
 - Fuel Restoration With Minimal Waste & Negligible Fuel Loss
 - Low Operating Cost
 - No Tank Entry Needed



Before & After Samples



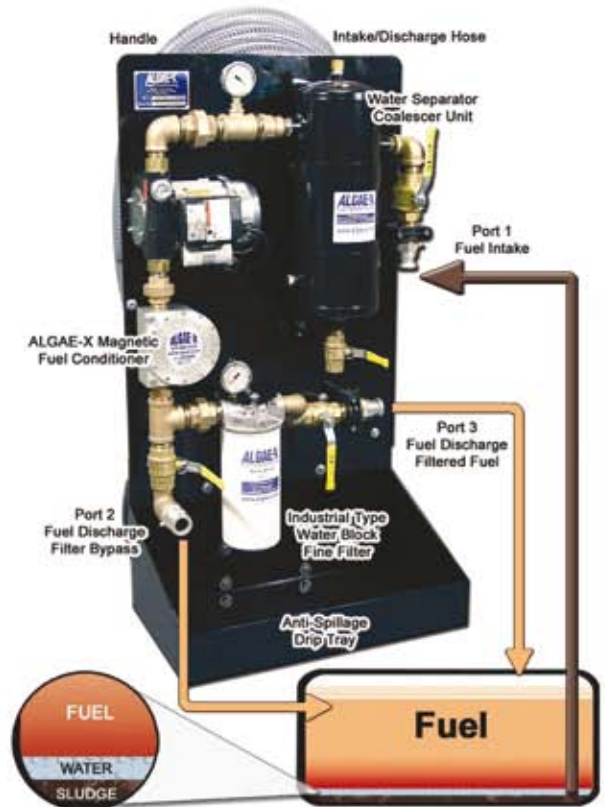
MTC-HC-50



AXI's standard MTC systems cover a wide range of flow-rates for a variety of tank sizes. In the initial stages of the tank cleaning process, while removing free water and sludge from the tank, MTCs do not use any consumables. Only in the last stage will the MTC use fine filter or water-blocking filter elements to dry the fuel and remove emulsified water.

MTCs are used in many applications around the world e.g.: vehicle and heavy-equipment service centers, generator storage tanks, gas stations, oil rigs, fuel docks, marinas, tank and equipment rental companies, etc.

AFC-705 Fuel Catalyst is an essential part of every tank cleaning procedure.



Fuel Catalyst

AFC-705 Fuel Catalyst is a unique and powerful, broad-spectrum fuel additive concentrate. Its active ingredients accelerate tank cleaning, stabilize fuel, enhance combustion, improve lubricity, and inhibit corrosion. It is designed for use in Diesel, Biofuels, Gasoline, Kerosene, Jet fuel and HFO. Implementing AFC as part of your preventative fuel maintenance program, in combination with good housekeeping, will stabilize your fuel, prevent sludge build-up and eliminate the need for expensive and toxic biocides.

Using AFC accelerates tank cleaning and fuel restoration processes. It enhances the breakdown and removal of sludge, slime and bio-fouling from tank walls and baffles that are difficult to access. AFC efficiently decontaminates and cleans the entire fuel and injection system. It continues to work in the tank, cleaning and stabilizing your fuel after we have all gone home.



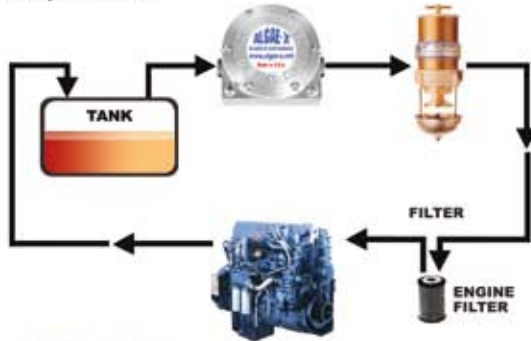
AFC's unique combustion catalyst removes and prevents the formation of hard carbon deposits, improves combustion, and reduces harmful emissions. It provides superior fuel quality, improves uptime, and lowers maintenance and operating costs.

- **Cleans Fuel, Storage Tanks & Injection Systems**
- **Improves Combustion, Lowers Emissions & Fuel Consumption**
- **Removes & Prevents Carbon Build-Up & Corrosion**
- **Adds Lubricity & Extends Lube Oil & Equipment Life**
- **Optimizes Engine, Generator & Boiler Efficiencies**
- **Reduces Harmful Emissions, Soot & Particulates:**
CO - HC's - NOX - SOX - VOC's - Carbonyls - PAH



In-Line Fuel Conditioners

Most engine failures start in the tank. Diesel engines take more fuel out of tank than they use for combustion. They continuously cycle the fuel from the tank through filtration and separation to the engine, returning most of it right back to the tank. In 24/7 applications, with that continuous fuel filtration loop working for us, we would expect our day tanks to always be spotless, but we know they are not.



Diesel, biofuels, jet fuel, gasoline, hydraulic fluid and oil are organic hydrocarbon fluids that naturally break down. The resulting sediments, acid, and tank sludge clog filter elements, and corrode injection systems.

Anaerobic, sulphate reducing bacteria produce sulphide causing pit corrosion



LG-X 3000



Fuel filters should last thousands of hours.

However, frequent filter changes and tank cleaning have become acceptable periodic maintenance instead of serious warning signals for potentially expensive downtime, power failures, and liabilities.

Fuel conditioners immediately extend filter life and clean your total fuel system by simply running your engines. They protect your injection system and extend engine life.



MODEL	200	400 500	1000 1500	3000	4000 / 5000
Port Size	1/4"	3/8" / 1/2"	1/2" / 3/4"	1"	1-1/2" / 2"
Max Flow Rate	1 - 25	20 - 110	50 - 350	200 - 800	1500 / 2500
Weight (lbs)	1	2	3.5	7.5	27 / 35
HP Range	200	500	1500	3000	3000 (and up)

Lifetime Warranty

AXI fuel conditioners stabilize and condition your fuel, reducing the size and mass of clusters of fuel molecules. In combination with primary filter water-separators, fuel conditioners prevent fuel degradation and microbial contamination. **They optimize fuel quality, keep your tanks clean, and protect your engines.**



Fuel Sampling & Testing

Monitoring fuel integrity is an essential part of all fuel maintenance programs.

According to NFPA-110: *"...Fuel maintenance and testing should begin the day of installation..."* Not adequately taking care of the condition of the fuel we use and store is costing billions of dollars and deserves our attention.

Fuel's inherent instability, bio-fuel components and microbial contamination cause fuel to breakdown and polymerize. This process causes the formation of tank sludge and the build-up of emulsified fuel and slime in the water fuel interface. Even a few millimeters of fuel breakdown products in large storage tanks represent a significant and costly loss of product.

To guarantee reliable, critical power supply, a fuel optimization and maintenance program should always start with protecting our engines and day-tanks first. Monitoring and protecting the condition of our bulk fuel supply is important, but secondary to engine protection.



Keeping our storage tanks clean and implementing automated fuel maintenance systems is important, but does not stop fuel degradation in downstream equipment tanks. We hardly ever use all the fuel in our tanks and continue topping them off. And, since each tank is its own biosphere, each tank will develop its own bad fuel components that are beyond filtration.

Our fuel suppliers provide us with the best possible fuel, but from there on, we are on our own. Implementing fuel quality monitoring programs and installing fuel optimization and maintenance systems are our responsibility. It is our job to keep the lights on in a data center, hospital, or any other mission-critical application. **When disaster strikes, it's too late to clean your tanks or install fuel conditioners.**

Fuel sampling is key to fuel maintenance and tank cleaning. Before and after bottom samples tell the story of the condition of the fuel in the tank and enable us to measure and demonstrate results. AXI provides a variety of fuel sampling and testing equipment and works with established fuel testing and research labs. We support clients to develop fuel maintenance programs and engineer equipment for specific applications to ensure Optimal Fuel Quality at All Times.



Redundant Prime-Power Filtration

AXI's RMS line of programmable Smart Filtration Controllers are designed to monitor and manage Primary Power Filtration Systems. They seamlessly interface with your BMS to remotely monitor operating and alarm functions to provide early warning when filters need to be serviced or elements replaced.

The RMS alarm is triggered at an operator-determined delta "P" or when there is water in the separator. Automated, motorized, dual filters can be switched over at a programmed pressure drop.

- Programmable - Fully Automated – Early Warning System
- Vacuum & Water Alarm With Reset & Text Display
- Remote Ready BMS/BAS Interface



RMS-60 Redundant Filtration Controller



Water Sensor Alarm Module

WATECT 550 proprietary technology is based on a programmable micro-controller with a unique measuring method. It eliminates electrolytic probe corrosion and works with most standard water probes and sensors. The module is protected against reverse polarity, over-voltage, over-current and has safe recovery from power interruption.

Watect 550's potential-free, versatile SPDT relay output controls N.O. and N.C. contacts up to 250V/3A. The compact, flanged housing is environmentally sealed and can be used in harsh environments for a variety of applications.

- Zero Water Probe Corrosion
- Potential Free Output Signal
- Power & Alarm Status LEDs
- Safe Sensing Circuit



Watect 550 Module

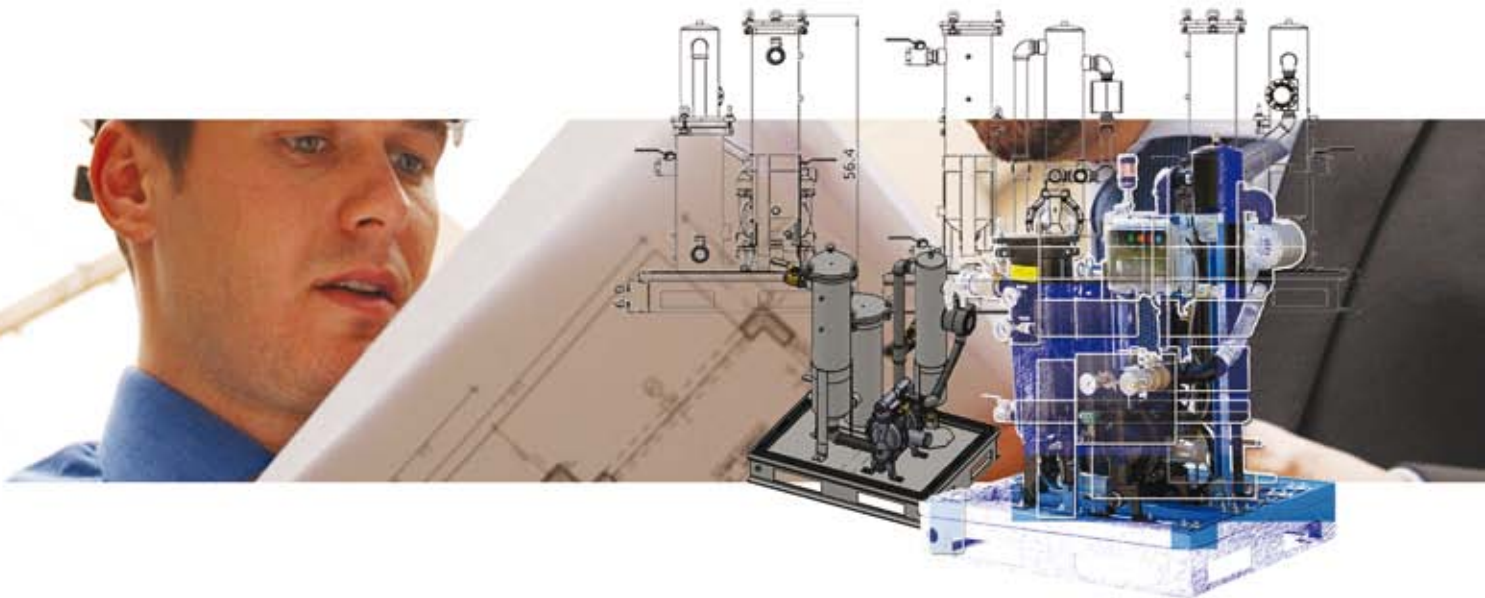


Engineering

AXI's first priority is providing clients with innovative methods and equipment to remediate and **permanently** prevent the costly consequences of otherwise unavoidable fuel deterioration processes.

In addition to our standard off the shelf equipment, AXI designs and manufactures high capacity and high flow-rate custom engineered systems for the conditioning, filtration, separation and transfer of diesel, biofuels, jet fuel, lube-oil, hydraulic fluids, and the reduction of sludge and slop-oil in HFO applications.

AXI works with and supports clients, architects and engineering firms, boat builders, and facility management companies to design innovative, fully automated fuel optimization, maintenance and transfer systems for their specific applications.



AXI Service Centers

AXI works with partners and resellers around the world. We are happy to see a rapidly growing network of AXI Fuel Service Centers employing trained technicians to sample and test your fuel, clean your tanks, and restore fuel quality.

AXI Fuel Service Centers are often established as independent tank cleaning companies and distributors for major engine manufacturers such as Cummins, Detroit Diesel, and Caterpillar. In addition, more truck service depots and engine/generator distributors are providing **Fuel Optimization & Maintenance Programs** for their fleets and emergency generator customers.

Selling AXI equipment and providing tank cleaning services has created new and additional income streams for an increasing number of domestic and international clients and engine and generator supply companies.







MTC HC-50 Mobile Tank Cleaning System



AXI Equipment Specs



Series	Model	In-Line Fuel Conditioner	On-board Tank Cleaning ¹	Mobile Tank Cleaning ²	Automated Stored Fuel Filtration	AXI Fuel Conditioning	Water Separator/Coalescer	Particulate Filtration	Flow Rate (gph)	Port Size	Power Source	Max AMP Draw	HP Range (up to)
 STS	6000-SX				•	•	•	•	150	3/4" in 1/2" out	AC	6A	
	6000-4GPM				•	•	•	•	240	3/4"	AC	6A	
	6000-4GPM S				•	•	•	•	240	3/4"	AC	6A	
	6000-10				•	•	•	•	600	1"	AC	13A	
	6000-10 2T				•	•	•	•	600	1"	AC	13A	
	6000-30GPM				•	•	•	•	1800	2" in 1.5" out	AC	9.2A	
 FPS	Smart-DX		•						80	1/2"	DC	5A	
	Smart-DX-D		•						80	1/2"	DC	5A	
	Smart-DX-LD		•	•					80	1/2"	DC	5A	
	SMART FX		•	•	•	•	•		150	1/2"	DC	10A	
	SMART FX-R		•	•	•	•	•		150	1/2"	DC	10A	
	Smart SX		•	•	•	•	•		150	3/4" x 1/2"	AC	6A	
	Smart SX-R		•	•	•	•	•		150	3/4" x 1/2"	AC	6A	
	Smart MX		•	•	•	•	•		250	3/4"	AC	6A	
	Smart MX-F		•	•	•	•	•		250	3/4"	AC	6A	
	Smart LX		•	•	•	•	•		600	1"	AC	13A	
	Smart LX-F		•	•	•	•	•		600	1"	AC	13A	
	 MTC	TK 180-XT		•						180	1/2"	DC	10A
500			•		•	•	•		480	1" x 3/4"	AC	10A	
500-AFR			•		•	•	•		180-480	3/4"	AC	10A	
1000			•		•	•	•		900	1"	AC	8A	
1000-LX			•		•	•	•		900	1"	AC	8A	
3000			•		•	•	•		1500	1.5" x 1.25"	AC	10A	
HC-50			•		•	•	•		4500	2"	Air	N/A	
 LG-X	200	•							1-25	1/4"			200
	500	•							20-110	1/2"			500
	1500	•							50-350	3/4"			1500
	3000	•							200-800	1"			3000
	4000	•							1500	1.5"			3000+
	5000	•							2500	2"			3000+

PLEASE NOTE: The above recommendations are general sizing guidelines, valid for most environments. However, there are many conditional and application variations that can alter the appropriate solution. AXI Sales Engineers are experts at assisting you in proper selection and custom adaptations. Contact us for free engineering support & consultation.

Full product specifications and CSI specs are available at www.AXIFuelConditioning.com

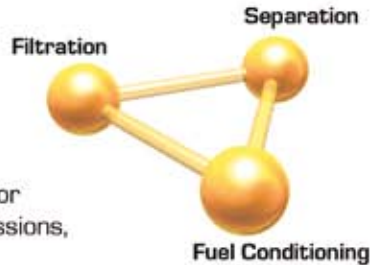


AXI Company Profile

ALGAE-X International (AXI) provides a green, unique, and innovative approach to fuel conditioning technology.

Our equipment, methods, and programs protect your engines and preserve fuel integrity. Implementing AXI equipment and programs will remediate and permanently prevent the costly consequences of otherwise unavoidable fuel deterioration processes.

AXI's unique approach to fuel quality optimization, maintenance and tank cleaning technology and equipment always incorporates fuel conditioning, filtration and separation. It is the basis for improving uptime, extending equipment life, reducing emissions, saving fuel, and lowering operating costs.



Traditionally, combustion improvement efforts have focused on hardware and exhaust treatment without much consideration for the condition of the fuel. Modern engines and injection systems are much better than ever before. They are more fuel quality sensitive while fuel stability has suffered in recent years. The resulting challenges of performance, reliability, failing injection equipment and downtime can only be resolved by improving the condition of the fuel that is beyond filtration and separation.

AXI's Fuel Quality Optimization Systems for stored fuel have become an integral part of mission-critical and emergency power supply for data and communication centers, banks, hospitals, government and military facilities demanding reliable power.

AXI designs and manufactures standardized and custom engineered Automated Fuel Conditioning, Fuel Polishing and Transfer Systems, Tank Cleaning Equipment, Fuel Additives, and In-line Fuel Conditioners to ensure optimal fuel quality at all times. Our scope of expertise covers fuel storage and supply systems from single engine installations to unloading stations and power plants. AXI is your single source for all fuel conditioning related equipment and support around the world.

Key Industries

AXI Fuel Optimization and Maintenance is about the condition of the fuel to improve fuel stability, filterability, engine performance and reliability. Implementation of our equipment and methods applies to all tanks and engines in all industries where hydrocarbon fuel is being used.

- Prime & Emergency Power Generation
- Commercial, Military & Recreation Marine
- Mining, Construction, Agriculture & Heavy Equipment
- Transportation, Rail & Automotive

Company Designations

DUNS: 957070386

CAGE: 1L607

NAICS: 325199, 325998, 333298,
333911, 339999

Notable Clients

Allegheny Power
Toronto Children's Hospital
General Dynamics
Union Pacific
Nobel Energy
U.S. Embassies
U.S. Dept of Transportation
D.O.D.
Alaska Power & Telephone
Miami-Dade Transit
SNC Lavalin
HH Angus
Jones Lang LaSalle
Cable Bahamas
Verizon
Amway
Office Depot

Dealers & Distributors of Major Engine Manufacturers:

Detroit Diesel-MTU
Cummins
Caterpillar

Memberships:



**American Institute
of Architects**



GLOBALSPEC
The Engineering Search Engine

**Environmental
Expert.com**
Since 1999
The Environmental Industry Online



CONNECTING INDUSTRY
ThomasNet

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Our scope of expertise covers fuel storage and supply systems from single engine installations to power plants. AXI is your single source for all fuel conditioning related equipment and support available around the world.

- **Peak Engine Performance**
- **Reliable Power Supply**
- **Lower Exhaust Emissions**



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