



# Purifilter™ Plus

Combining technologies to reach the next level!



Urban Buses

School Buses

Highway Trucks

Off-road Vehicles



The ECS Purifilter™ Plus Hybrid is a combination of the Combifilter™ and the Purifilter™ DPF, which takes the Purifilter™ to the next level.

## The ECS Purifier™ Plus Hybrid More Than Just a Passive Filter

Passively regenerating diesel particulate filters (DPF's) have been widely and successfully used on newer lower emitting diesel engines. These passive DPF's, such as the ECS Purifier™, incorporate an exhaust heat activated catalyst on the surface of the DPF to combust the collected soot. If the heat required by the catalyst is not provided and/or the emitted soot is higher than normal, soot can slowly accumulate in the DPF, increasing back-pressure and eventually requiring that the DPF be removed for cleaning. This cleaning process requires the vehicle be taken out of service and can be expensive.

DPF's can also combust soot by applying supplemental heat generated by electric elements or fuel burners. These active DPF's, such as the ECS Combifilter™, can be more broadly applied than passive DPF's but they are more expensive and can require daily action on the part of the operator to initiate regeneration.

The ECS Purifier™ Plus Hybrid incorporates electric elements with a passively regenerating Purifier™ DPF. The result is a DPF with an extended application range for higher emitting highway and non-road diesel engines as well as an enhanced ability to operate under variable or colder duty cycles.

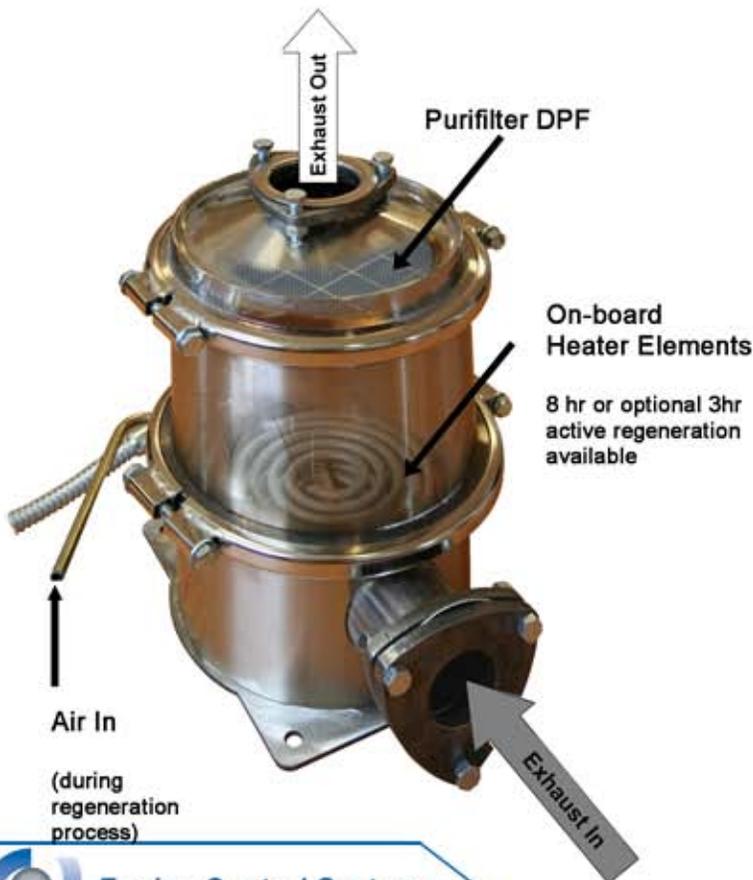
This broader application range is possible because the Purifier™ Plus can combust the accumulated soot through two methods instead of one.

The primary method of soot oxidation is accomplished passively by using the exhaust to heat the catalyzed Purifier™ DPF. The secondary method is active regeneration which is initiated by the use of the electric elements. Depending upon the particulate emissions level of the engine and its duty cycle, the electric elements can be employed when needed to initiate a controlled regeneration to safely clean the DPF of any accumulated soot. A clean filter reduces exhaust backpressure and insures peak fuel economy and performance of the engine.



Purifier Plus is ideal for off-road fleets

## Electric heating element incorporation into the passive Purifier DPF



- Extends application range of passive DPF's without applying more highly active NO<sub>2</sub> generating catalysts
- Incorporates a service tool on-board which minimizes equipment down-time and labor eliminating DPF removal for cleaning
- Off-board panel can be used to service numerous pieces of equipment which reduces infrastructure of traditional active regeneration system
- Is great for rental equipment fleets who need to deal with variable duty cycles of multiple customers and need to know the DPF is serviced for next customer
- Can reduce filter size employed on smaller non-road engines over traditional un-catalyzed active systems.



## **Purifilter Plus Hybrid can be used proactively or reactively to maximize equipment up-time**

### **Proactive Use**

The Purifilter Plus Hybrid incorporates the ECS Backpressure Monitor Logger which can record engine data and determine backpressure characteristics. Using this data, a proactive regeneration schedule can be determined. This interval may be weekly, biweekly, monthly or at every preventative maintenance interval.

### **Reactive Use**

If the ECS Backpressure Monitor Logger illuminates a Yellow Alarm Condition (Higher than normal backpressure: Schedule Filter Service), the Purifilter Plus system would be scheduled for plug in at the next available time.

If the ECS Backpressure Monitor Logger illuminates a Red Alarm Condition (Service DPF now) the Purifilter Plus would be plugged in as soon as possible.

The Yellow and Red alarm conditions are preventative in nature and their illumination is proactive to indicate that a plug-in of the system is required to maintain the Purifilter in optimal condition.

### **On-board elements reduces labor and saves time**

When excessive soot accumulates in a passive DPF, the vehicle is taken out of service and the DPF must be removed by qualified service technicians for inspection and cleaning. To minimize downtime for cleaning, most fleets using passive DPF's will maintain an inventory of spare filters that are used as replacement when filters are removed for service.

By incorporating electric elements into Purifilter Plus Hybrid, the Purifilter can be serviced in place on the vehicle quickly and conveniently reducing cost and maximizing uptime. Additionally, the common off-board regeneration panel can be used by multiple vehicles within a fleet.

### **On-board Purifilter with electric heating elements**

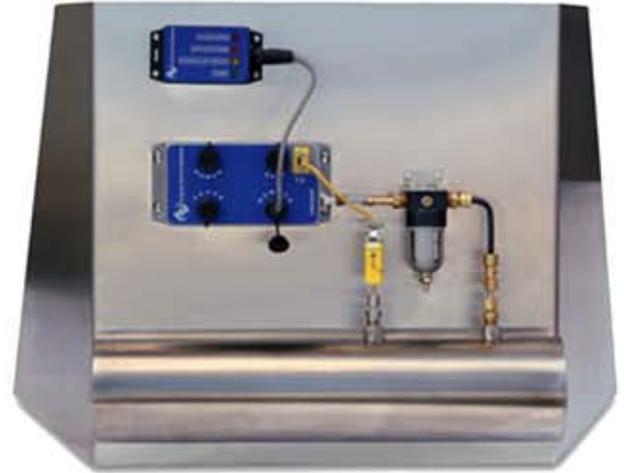
- Installs like a passive filter
- Can be maintained in optimal condition without removal
- Requires off-board de-ashing once every 2000 engine hours



## **ECS Backpressure Monitor and Logger**

Particulate filters are widely used on diesel powered applications in order to reduce the emitted particulate matter. By design, the DPF accumulates emitted particulate matter (soot) and combusts it employing a passive, active or combined strategy.

The ECS Backpressure Monitor Logger is a useful tool not only to indicate the condition of the diesel particulate filter but it can also be utilized as a general engine maintenance tool.



ECS Backpressure Monitor and Logger stores operational data for up to two years

By monitoring and logging the backpressure exhaust temperature and alarm illuminations over time, the operator or fleet manager can predict fuel injector or turbocharger problems before they become serious. The data is also useful to determine how the equipment is being used and whether normal or severe duty maintenance schedules should be employed.

Engine Control Systems is pleased to offer the Backpressure Monitor Logger for DPF users to help protect both your engine and your diesel particulate filter.

### **Off-board Regeneration Control Panel**

- Available in 240 single phase, and 480 three phase voltages
- Standard 8 hour or 3 hour regeneration times available
- Can be used with multiple vehicles/pieces of equipment



## CUSTOMER SERVICE LINES North America

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## CombiClean™ - DPF Cleaning Station

The CombiClean is designed with health and safety in mind. The cleaning process is designed to safely and effectively clean the filter while minimizing exposure to harmful diesel particulate. The system allows the debris collected from the CombiClean to be disposed of following both municipal and environmental guidelines.



## Purifilter is a Verified Emissions Reduction Technology

- ✓ *Verified by the California Air Resources Board for 1994-2003 on-road diesel engines using ULSD*
- ✓ *Verified by the US EPA Voluntary Retrofit program for 1994-2003 on-road diesel vehicles*
- ✓ *Certified by the Swedish Environmental Zones: Off-road Engines program*
- ✓ *Tested and Approved under the Swiss VERT Program*
- ✓ *Approved by the Vehicle Certification Agency of the United Kingdom for on-road vehicles*