CleanAIR ASSURE™ TWC

Diesel Three-Way Catalysts for Electric Power, Industrial, and Petroleum

The ASSURE™ TWC Advantage:

- Flow Through Ceramic Catalyst Design
- Works with Most Spark-Ignited Engines (Natural Gas, Propane)
- Reduces Carbon Monoxide (CO) and Hydrocarbons (HC) by up to 99%
- Reduces Nitrogen Oxides (NOx) by Up to 99%
- Available as Industrial, Critical and Super-Critical Silencer Designs
- Available in Multiple Custom Configurations

Applications:

- Electric Power
- Industrial
- Petroleum

The CleanAIR™ Difference:

- Custom Engineering and Design
- Integrated Manufacturing
- Product Optimization for Space Availability
- 304 Stainless-Steel Housing, Corrosion-Resistant
- Double-walled, Fully Insulated Construction
- Durable Product Manufacturing for Operation Under Extreme Conditions

For a price quote call

WILL RING

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EMPIRE CAT POWER SYSTEMS

The CleanAIR ASSURE™ TWC – Three-Way Catalytic Converter

The ASSURE™ TWC (three-way converter) for spark-ignited (stoichiometric) engines is designed to reduce carbon monoxide (CO) and hydrocarbons (HC) by up to 95% while reducing nitrogen oxides (NOx) by up to 99%. The high-performance, durable catalyst is housed within a 304 stainless steel, corrosion resistant package. This unique catalyst technology is available as a standard ASSURE™ TWC unit or packaged as Industrial, Critical or Super-Critical silencer designs. Available with multiple custom configurations, the ASSURE™ TWC/Silencer can be retrofitted as a direct muffler or silencer replacement.

Each unit is individually sized to meet engine specifications. This is necessary to keep engine backpressure at a low level. Every effort is made to design the ASSURE™ TWC to fit in the smallest possible package while maintaining engine performance.

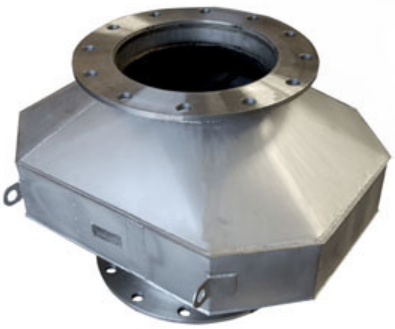
The ASSURE™ TWC/Silencer Unit, Critical Grade, utilizing an innovative light-weight design made with corrosion-resistant stainless steel.

The ASSURE™ TWC/Silencer Unit – Industrial Grade with 2 diesel oxidation catalysts

How the ASSURE™ TWC Works

For stoichiometric spark-ignited engines using natural gas or propane, the emissions of concern are CO, HC and NOx. The reduction process of these emissions is called “three-way” conversion. For the three-way conversion to work properly, an air/fuel/ratio controller must be used. The controller maintains the correct oxygen concentration in the exhaust for maximum catalyst performance. The CleanAIR ASSURE™ TWC catalyst performs two different functions during three-way conversion: oxidation and reduction.

In the oxidation process, the catalyst transforms pollutants into harmless gases through oxidizing (or burning), by combining them with free oxygen in the exhaust. Carbon monoxide and hydrocarbons are oxidized into carbon dioxide and water vapor.



Custom designed ASSURE™ TWC Unit for marine application

Unlike oxidation, reduction is a process of removing oxygen from compounds, in this case from nitrogen. Nitrogen oxides (NOx) formed in the combustion process, are reduced to nitrogen and carbon dioxide (CO_2) through reduction, which is promoted by the catalyst.

The chemical principles for simultaneous conversion of the three emission categories are as follows:

$$NOx + HC \longrightarrow N_2 + CO_2 + H_2O$$
$$NOx + CO \longrightarrow N_2 + CO_2$$

Over the proper catalyst formulation and in an oxygen-lean environment, these reactions will occur at temperatures as low as 250°C.

CleanAIR ASSURE™ TWC

Diesel Oxidation Catalysts for Electric Power, Industrial, and Petroleum

Emissions Reduction Summary

Control Technology	NOx Reduction	CO Reduction	HC Reduction
ASSURE™ TWC for natural gas and propane	Up to 99%	Up to 99%	Up to 99%

Results are fuel dependent and may vary with application.

Silencer Type	Typical Attenuation
Industrial Grade	22 – 29 dBA
Critical Grade	27 – 35 dBA
Super Critical Grade	30 – 38 dBA

Air/Fuel Ratio Controller

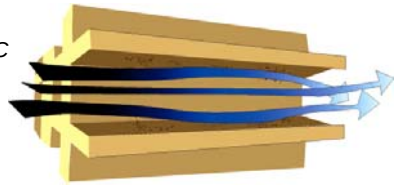
An advanced, closed-loop A/F Controller, utilizing a microprocessor technology, provides a stoichiometric air/fuel ratio (lambda .990 - 1.005) for maximum performance of the ASSURE™ TWC on carbureted gas engines.

Monitoring inputs from the oxygen sensor and thermocouple, the controller continuously and precisely adjusts the fuel valve to maintain the optimal oxygen content in the exhaust for high NOx reductions over the ASSURE™ TWC.

The A/F Controller system comes complete with Controller, Oxygen Sensor, Thermocouples, Fuel Control Valve and wiring harness.

Power requirement is 10 -30 vdc, 1 amp at 24 vdc.

ASSURE™ TWC Exhaust Flow



The ASSURE™ TWC/Silencer Unit – Industrial Grade with single three-way catalyst

The ASSURE™ TWC Unit

Custom designed ASSURE™ TWC/Silencer Unit – Industrial Grade with two three-way catalysts