ARIS® Airless Return Flow Injector

- Patented system features airless return flow single-fluid injection solenoid-actuated injector

- Unique return flow design with integral cooling allows airless injection of reagents in challenging high-temperature environments such as exhaust streams

- Compact design with precise injection control and good atomization

- Single-fluid, return flow design eliminates injector clogging common with non-return flow systems

- Airless nature minimizes system complexity, installation issues and cost of compressed air for traditional air-assisted injection

- Applicable for mobile (on-road and off-road) and stationary applications

- Compatible with industry-standard urea sources, including diesel emission fluid (DEF) and Adblue

Typical Applications

- Selective Catalytic Reduction (SCR): Urea injection system for NOx reduction meets Euro 6 and US 2010 NOx requirements

- Lean NOx: Hydrocarbon injection for lean NOx

- Active DPF: Hydrocarbon injection to initiate active regeneration
**SCR NOx Emissions Reduction**

- Suitable for all lean-burning engines, including diesel and alternative fuel options of liquefied natural gas (LNG) and compressed natural gas (CNG)
- Clean Diesel's patented return flow design cools the injector head to avoid injector clogging and subsequent system failure, common with non-return flow systems
- Proper implementation of return flow makes it suitable for the complete range of engine applications, from passenger cars to heavy-duty systems
- Airless injector system is cost-effective for any SCR application, especially in the transportation sector where air compressors are not available or practical
- Avoids the parasitic power requirement of air compressors
- The cost-effective nature of ARIS makes SCR possible across a wide range of engine applications, allowing engines to operate at maximum fuel economy, providing a 5-9% increase in fuel-efficiency over EGR-equipped diesel engines
- Applicable for new or retrofit installations for on-road, off-road and stationary applications

**Hydrocarbon Injection for Active Regeneration Systems**

- Broad range of after-treatment systems, such as hydrocarbon-based lean NOx traps and diesel particulate filter (DPF) active regeneration systems
- Airless single-fluid injection with controlled precision return flow provides a cost-effective, compact solution without delivery of ultra fine droplets of hydrocarbon to the exhaust stream

**Availability**

ARIS is available to the industry as follows:

- **Product**: As EPA- and European-certified systems from Tier 1 providers who have licensed ARIS, including Bosch, Tenneco and Hilite
- **License**: Through a non-exclusive license program with Clean Diesel Technologies