JOHN ZINK
A KOCH INDUSTRIES COMPANY

DYNASWIRL-LN

Low NOx Gas/Oil Burner for Multi-Burner and Utility Boilers

TODD Combustion

Lower Emissions. Higher Performance.

Improve your overall boiler performance while lowering NOx emissions with the high-efficiency, gas/oil-fired burner that's built to last. The TODD Combustion™ DYNASWIRL-LN.

Trusted in demanding utility applications throughout the world, the DYNASWIRL-LN provides *up to 50 percent NOx reductions and up to 90 percent reduction with FGR and OFA* over competitors' previous low excess air burners. Its proven design goes beyond meeting strict emissions requirements to delivering cost-saving benefits that work hard for your bottom line. And every DYNASWIRL-LN burner system includes TODD's™ unique **COOL*flow***™ physical modeling process which guarantees equal distribution of combustion air and FGR to every burner resulting in unparalleled combustion performance. And there's more.

- Excess O_2 levels of 0.5 percent or less
- Minimized boiler vibration
- Stable flames with FGR rates as high as 45 percent
- Increased operating flexibility, from 30-300 million BTUs/hr/burner
- High turndowns of 8:1 on oil and up to 20:1 on gas
- Low CO, particulates and opacity
- Reduced downtime, maintenance, fuel and operating costs
- Simultaneous gas and oil firing capable of firing refinery gas, hydrogen and NCGs, LPG and orimulsion
- Additional NOx reductions through BOOS, OFA and FGR

Precise Control Throughout The Entire Combustion Process.

Venturi Register–Eliminating The Guesswork.

The DYNASWIRL-LN venturi register eliminates operator adjustments and guesswork by providing an even, turbulence-free axial air flow. The venturi shape also minimizes pressure loss through the burner and maximizes velocity. This not only allows the use of existing forced-draft fans, but also reduces fan horsepower requirements. An optional piezometer ring in the venturi facilitates measurement of combustion air flow over a wide range of operation.

Swirler–Fixing The Ignition Point.

Primary air exits the venturi register through the DYNASWIRL-LN's swirler which provides the rotational vortex necessary for flame stability and thorough mixing. The swirler creates a tightly controlled, substoichiometric primary combustion zone with a fixed ignition point that never varies–regardless of load. The low-pressure zone formed by the swirler also recirculates hot gases within the flame pattern. This "internal FGR" is another key reason behind the DYNASWIRL-LN's impressive NOx reductions.

Secondary air exits the venturi register around the swirler. The remaining air flow exits through a separate sleeve as tertiary air, completing combustion downstream.

Oil Burner–Controlling Precise Flame Geometry.

The DYNASWIRL-LN's steam or mechanical atomizer achieves a precisely controlled flame geometry that creates substantial NOx reductions over conventional oil-fired burners.

The low-energy-consuming steam atomizer provides a turndown ratio as high as 8:1, with steam consumption of just 0.05 pounds per pound of oil burned. The atomizer eliminates the need for a more complex constant differential system and operates at a constant pressure of 100 psig.

With the high-pressure mechanical atomizer, the DYNASWIRL-LN provides substantial NOx and excess O_2 reductions through unique machining arrangements–TODD's patented, multi-jet sprayer plate.

Gas Burner–Setting New Standards In Staging.

The DYNASWIRL-LN effectively controls NOx by staging fuel and air. Using both a multi-poker injector and center-fired gas burner, fuel-rich and fuel-lean zones are created within the flame envelope. The ratio of center-fired gas to poker gas, together with poker orientation and machining, is carefully optimized for each application.

Quarl Extension–Creating Exceptional Stability.

To further ensure an aerodynamically stabilized flame, the DYNASWIRL-LN employs a unique, air-cooled, stainless steel quarl extension. The throat-exit shape is meticulously matched with the register and swirler designs to optimize combustion performance.

Pneumatic Air Slide–Providing Reliable "On/Off" Control.

Combined with TODD's **COOL*flow*** modeling, the pneumatic airslide allows for simplified "on/off" air flow control eliminating the need for complex modulating devices. The heavy-duty slide closes the air inlet to burners out of service, allowing control of furnace excess oxygen levels through the remaining burners. When closed, cooling air flows through the register to prevent front-end components from overheating. The result? Proven reliability, reduced maintenance and lower cost.

When Performance Counts, Count on TODD.

DYNASWIRL-LN's safe, reliable performance has resulted in over 8,000 MW of successful low NOx utility retrofits.

Demand Flexibility.

- **Achieve high-turndown ratios** even with such options as running substoichiometric or with high FGR rates.
- **Fire Oil and Gas** in the same burner; or gas in some, oil in others.
- **Switch fuels at various loads** without affecting boiler operation.

TODD Reliability.

- **Automatic purge-valve complex** (optional).
- **Assured flame stability** puts an end to metal fatigue, damage and forced outages from boiler vibration.
- **Heavier gauge construction** using only high-quality carbon and stainless steels.
- **310 stainless steel** front-end components.
- **Stress-relieved (as required).**

No other low NOx, gas/oil burner will do more for your utility's performance. And no other company will work harder to be your source for innovative combustion solutions. TODD Combustion. The most advanced burner products and technology in the world.

TODD Combustion

Developing Clean Air Solutions for Planet Earth

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