

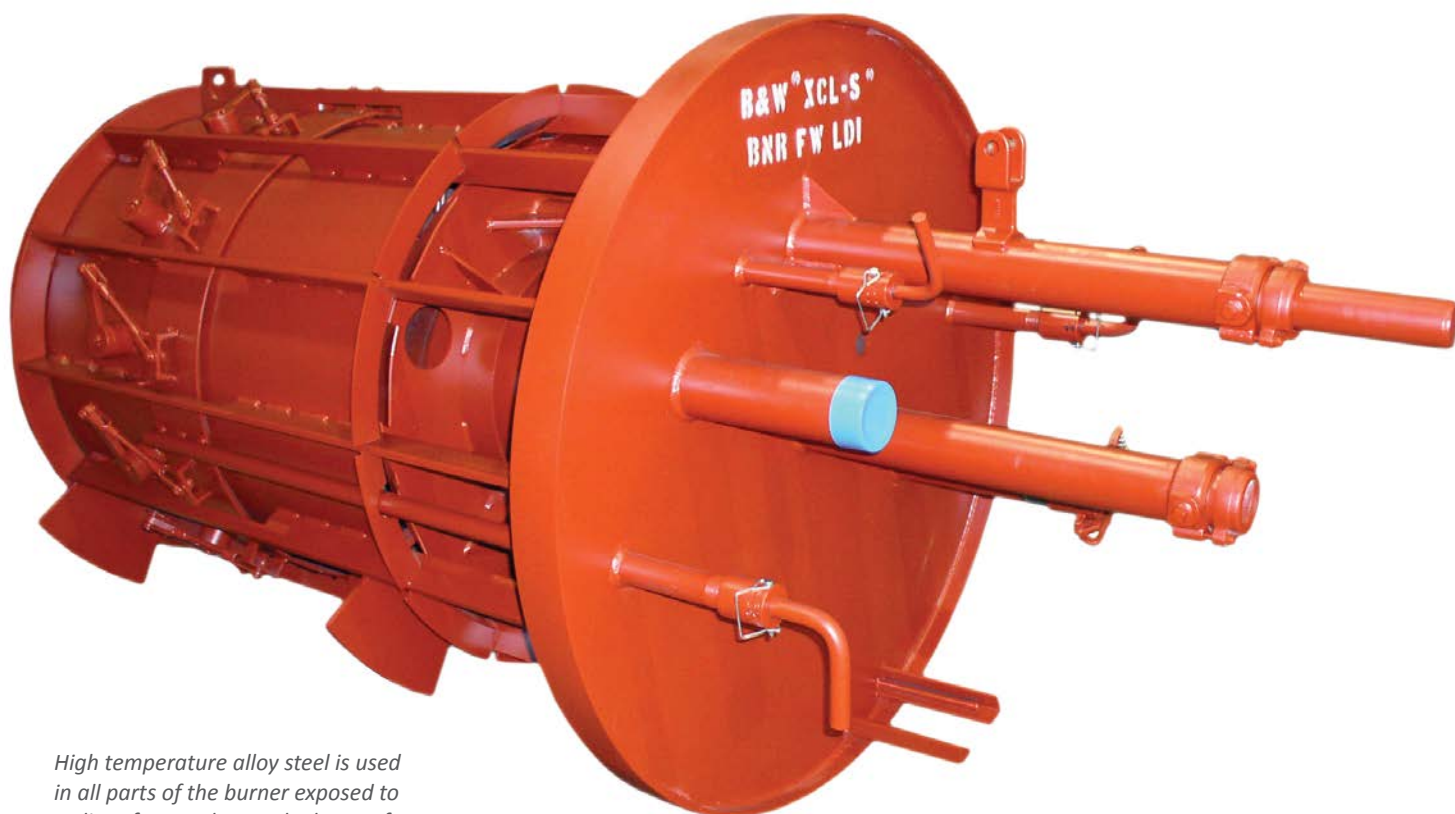
Low NO_x XCL-S® Burner for Oil- and Gas-Fired Boilers

Babcock & Wilcox (B&W) has successfully used the low NO_x XCL-S® burner in low NO_x oil and gas applications since 1988. This advanced low NO_x burner was developed to achieve superior NO_x performance in burner-only applications and in applications using overfire air (OFA) and/or flue gas recirculation (FGR). Proven performance with more than 5,400 megawatts of experience gives us confidence in achieving the results our customers need.

Each oil and gas low NO_x XCL-S burner is completely shop assembled and mechanically tested before shipment. The XCL-S burner is designed as a simple plug-in, with little or no modifications needed to the rest of the boiler. B&W's system approach provides the engineering know-how needed to meet your boiler's NO_x reduction requirements, without adversely affecting boiler performance.

B&W's low NO_x XCL-S burner offers:

- Proven performance
- Demonstrated NO_x reductions in excess of 90 percent
- Demonstrated low NO_x emissions with and without the use of FGR
- Superior flame stability and burner turndown
- Lower CO emissions
- Improved excess air control
- On-line adjustability to optimize performance
- Low-cost plug-in design
- Proven mechanical reliability and operation
- Complete shop assembly – ready for installation

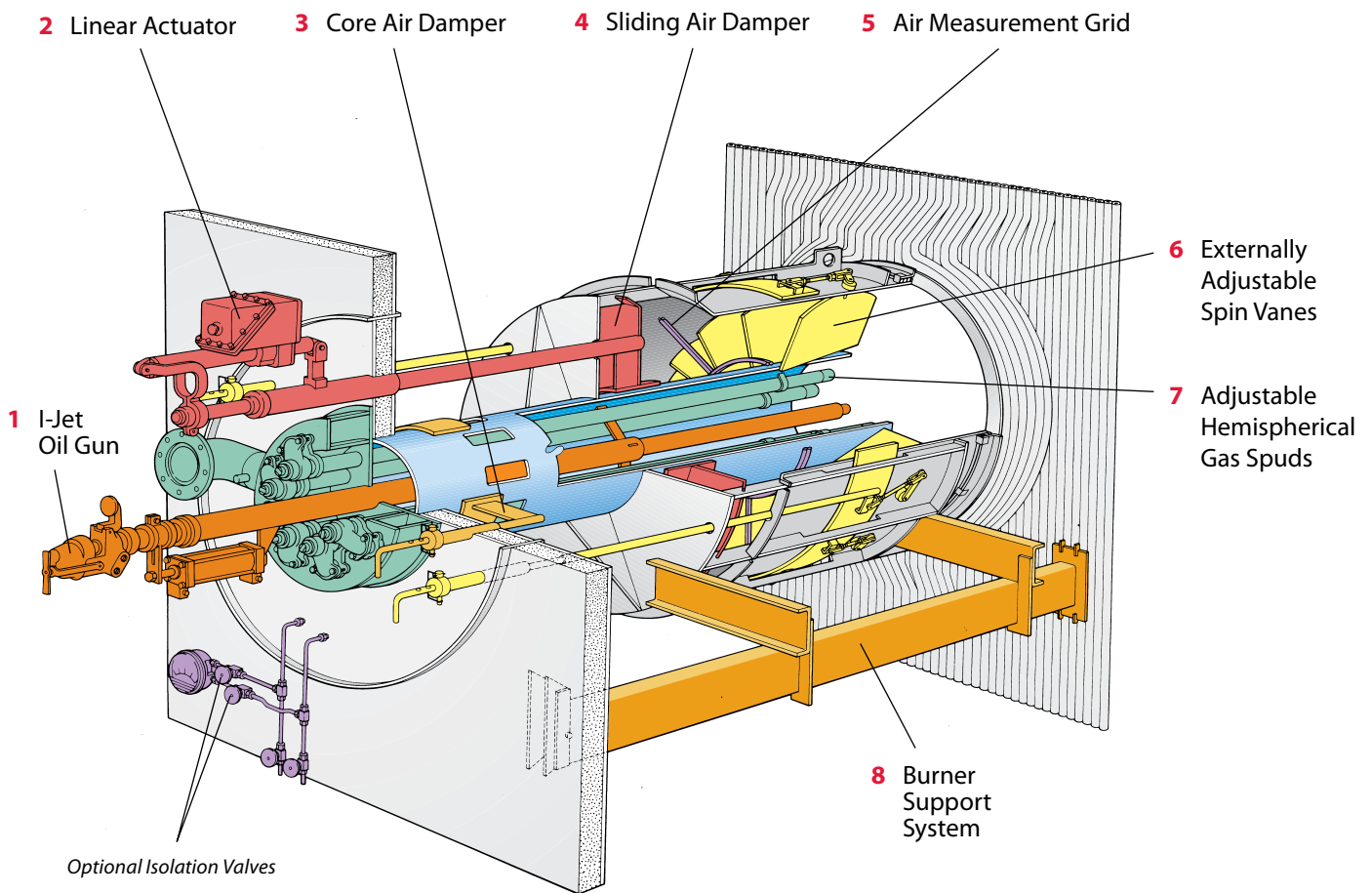


High temperature alloy steel is used in all parts of the burner exposed to radiant furnace heat. The burner for this retrofit is rated at 130 million Btu/hr (38 MW_t) on gas and 118 million Btu/hr (35 MW_t) on heavy fuel oil. The burner shown here weighs approximately 3,500 pounds (1,590 kg) and is equipped with shop-attached lifting lugs for easy one-piece installation.



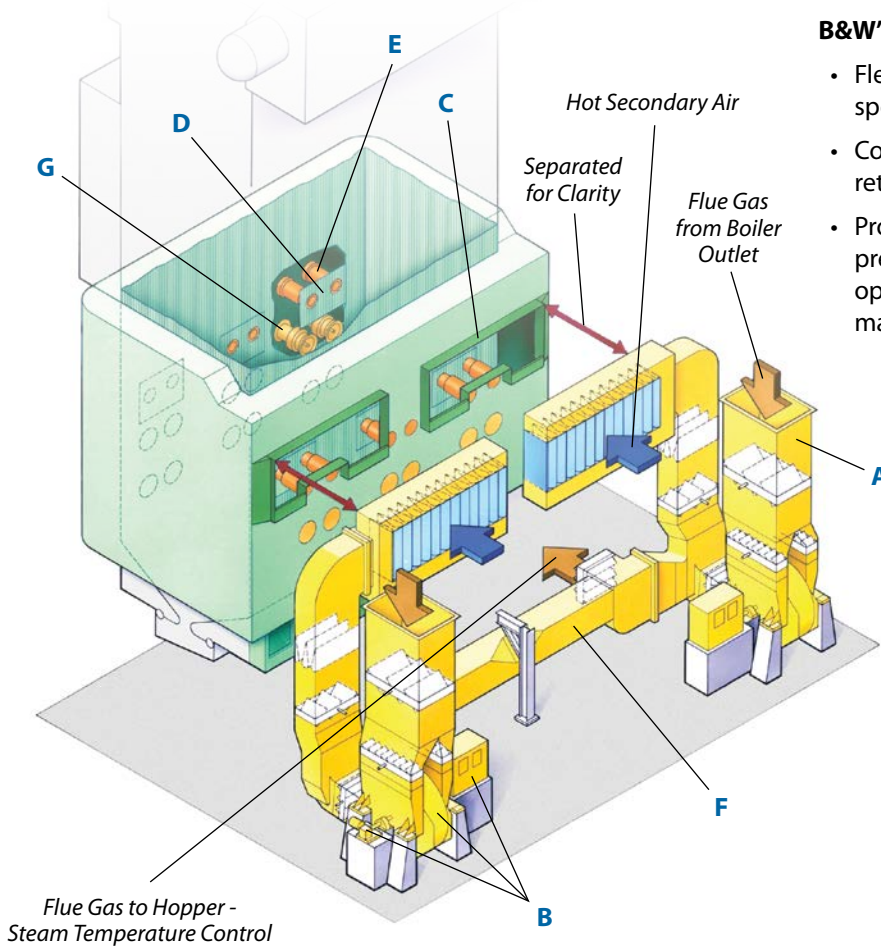
Low NO_x XCL-S burner mechanical design features

Components	Features/Functions
1 I-Jet oil gun	Produces a finer oil spray, reduces particulate and opacity emissions, minimizes atomizer plugging
2 Linear actuator	Easily adjusts the main air sliding damper position for light-off, full-load and out-of-service cooling
3 Core air damper	Adjusts core air flow to the oil gun or gas spuds for optimizing combustion
4 Sliding air damper	Adjusts the majority of secondary air flow to the outer air zone, independent of swirl, to balance air flow among burners during commissioning
5 Air measurement grid	Ensures an accurate indication of relative air flow with a multi-point impact/suction device
6 Externally adjustable spin vanes	Provide proper mixing of the secondary air and fuel (to the end of the flame) – vane position is optimized and fixed during commissioning
7 Adjustable hemispherical gas spuds	Can be rotated to optimize NO _x reduction and are removable while the boiler is in service
8 Burner support system	Supports the burner and allows for differential expansion



Each design feature incorporated in the low NO_x XCL-S burner has been refined to allow maximum NO_x reduction with optimum combustion efficiency.

System approach reduces NO_x emissions



Using plug-in low NO_x XCL-S burners, flue gas recirculation and a staged combustion system, NO_x was reduced by ninety percent on this 350 megawatt boiler.







B&W's NO_x reduction system approach offers:

- Flexible application of technologies to meet specific NO_x emission limits
- Comprehensive analysis of the impact of a low NO_x retrofit on boiler capacity and performance
- Proven technological capabilities to modify boiler pressure parts, reconfigure heating surfaces, and optimize material selection and auxiliary systems to maximize boiler performance

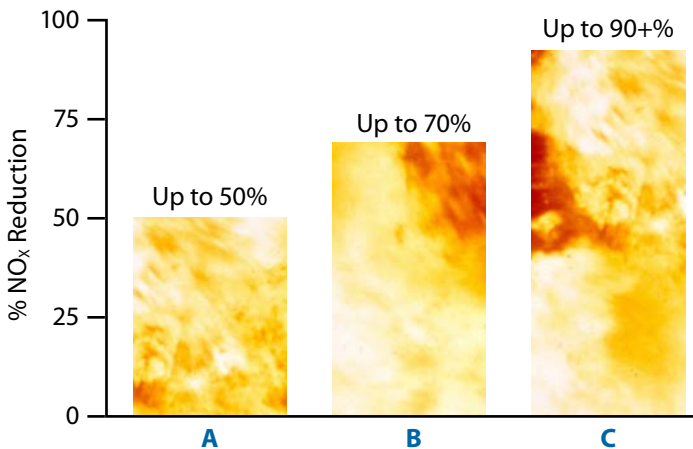
Equipment description:

- A.** Gas recirculation flue
- B.** FGR fan, motor and turning gear
- C.** Connecting ductwork
- D.** NO_x port pressure part panel
- E.** Dual zone OFA port
- F.** FGR crossover flue
- G.** Low NO_x XCL-S burner
- H.** Controls and instrumentation

Retrofit equipment:

-  Flue gas recirculation
-  Mixing air foils
-  Overfire air ports
-  Connecting ductwork (FGR/air mixture)
-  Low NO_x oil and gas XCL-S burners
-  Open windbox (existing)

Low NO_x oil/gas XCL-S burner performance

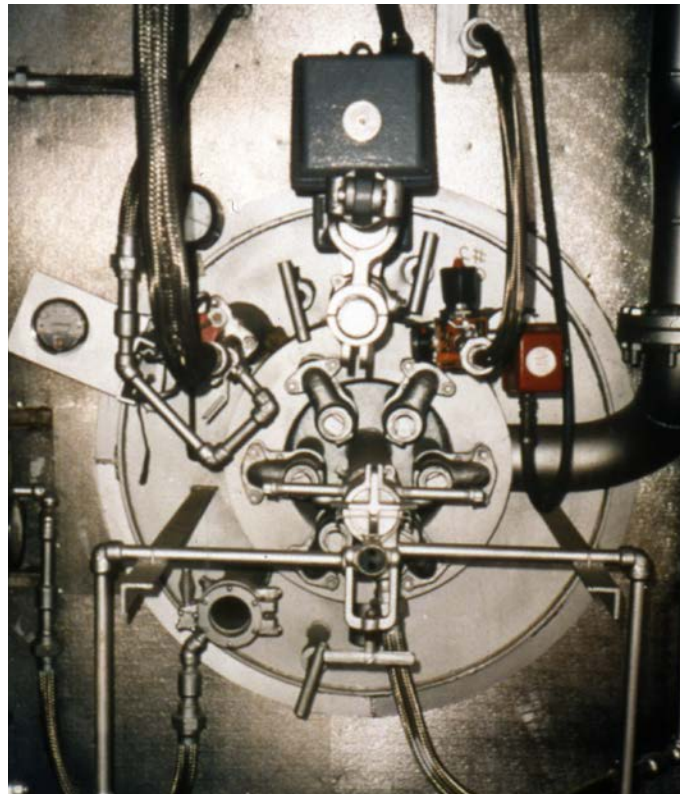


- A** XCL-S burner only
- B** XCL-S burner with OFA
- C** XCL-S burner with OFA and FGR

The value of proven experience

The low NO_x XCL-S burner system approach offers significant NO_x reduction capabilities across the full range of wall-fired boiler configurations and combustion firing patterns.

B&W's leadership in the field of low NO_x reduction technology began in 1962 with the first patented OFA port system design. That leadership continues with unparalleled experience, proven equipment and innovative technology. Our systems are designed to be cost-effective, dependable and adaptable to the full range of fuels and boiler arrangements in new or retrofit applications. Count on us for all your NO_x emission control technology needs. For 24-hour emergency assistance, call 1-800-354-4400.



A typical low NO_x oil- and gas-fire XCL-S burner. The linear actuator (at the top of the burner) moves the sliding air damper, which controls the majority of the secondary air flow to the burner. The hemispherical gas spuds can be rotated to minimize NO_x emissions or removed for inspection while the boiler is in service.

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