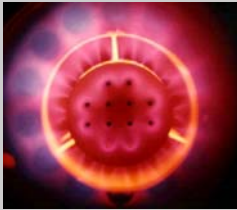


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FIR BURNER

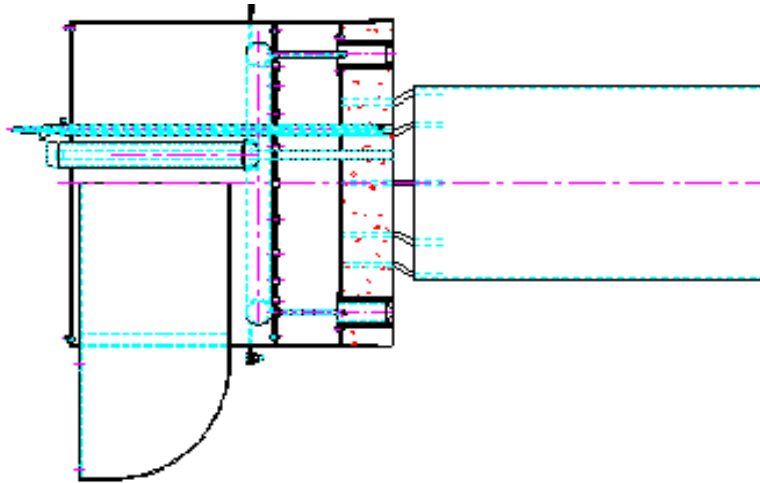
FORCED INTERNAL RECIRCULATION BURNER



JOHNSTON BURNER COMPANY
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300 Pine Street
P.O. Box 300
Ferrysburg, MI 49409-0300

Ph: 616-842-5050
Fax: 616-842-1854
www.johnstonboiler.com



Ultra Low NO_x without external FGR! The Johnston FIR burner reduces emissions of NO_x and CO from natural gas combustion. The burner can reach levels of less than 10 PPMv NO_x and <50 PPMv CO at design turn-down with no decrease in efficiency. To maintain the burner/boiler thermal efficiency, the burner is setup to operate at between 3 to 4% O₂ over the complete operating range. This minimizes dry gas losses and maximizes burner performance.

The patented FIR Burner through Gas Technology Institute, Chicago, IL, combines staged, premixed combustion with forced internal flue gas recirculation to minimize the formation of both thermal and prompt NO_x. The unique burner design provides excellent flame retention for stable combustion at the sub 9 PPM NO_x levels. The low levels of NO_x and CO will meet the stringent emission requirements found in California, Houston and other non-attainment zones.

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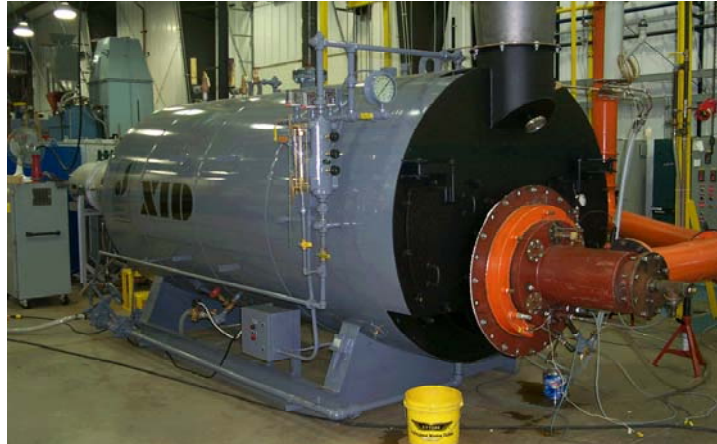


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Testing & Operating



An Ohio Special boiler installed at GTI's Lab running at 250 BHP.

Using the FIR burner, boilers can operate at low excess air levels without external FGR, resulting in higher thermal efficiencies than are achievable with competing technologies. The burners use non-proprietary, single point positioning controls to reduce cost and downtime.

The burners also meet CSD-1, FM, IRI and NFPA-85 approval codes.



Fullerton College, Fullerton, CA
Two - 250 BHP