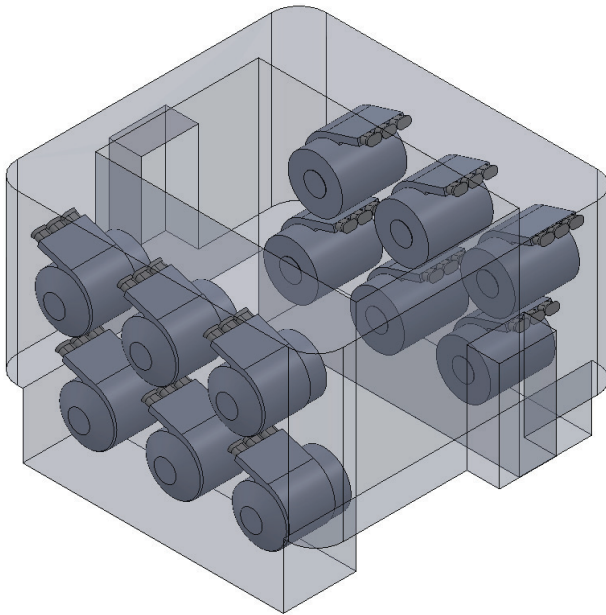
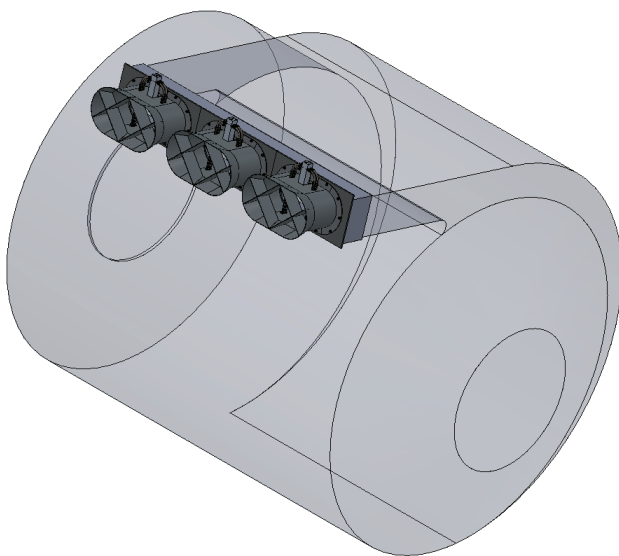


# Cyclone Burner Optimization: Using Oval High Betas from Eastern Instruments



**Cyclone Boiler Windbox with Burners**

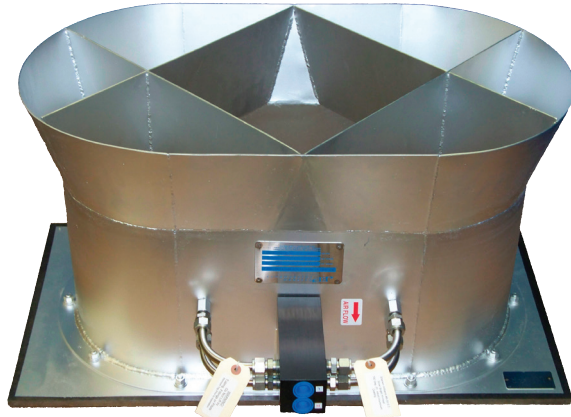


**Cyclone Burner with  
Oval High Beta Array**

The trend towards improved efficiency in today's power plants, in conjunction with a climate of more stringent environmental regulation, has propagated an interest in optimizing the combustion cycle of the power generation process. That means accurately measuring both components of the combustion phase, or in the case of coal fired power generation, both the coal and the air. Measuring the air, especially in cyclone burners can be a challenge, however. Typically, a cyclone burner windbox has many obstructions and very few straight duct runs, which makes accurate flow measurement very difficult. Moreover, in an effort to reduce NOx emissions, many cyclone boilers have overfired air systems installed. In many cases, air is redirected to the overfired air system from the secondary air across the cyclone barrel. In such cases the already difficult flow measurement and control becomes nearly impossible as the control system becomes severely oversized and the control range of the velocity dampers is compromised.

A much more accurate secondary air flow measurement in cyclone burners would allow for tighter control of the fuel-to-air ratio which in turn, reduces the NOx and CO emissions that are produced. Moreover, a more stringent control of the fuel-to-air ratio will reduce the amount of slag buildup created during combustion. The oval High Beta from Eastern Instruments is specifically designed to accurately measure the secondary airflow in cyclone boilers and employing them on the cyclone burners will dramatically improve airflow control and thus, the combustion cycle of your power generation.

# Oval High Beta



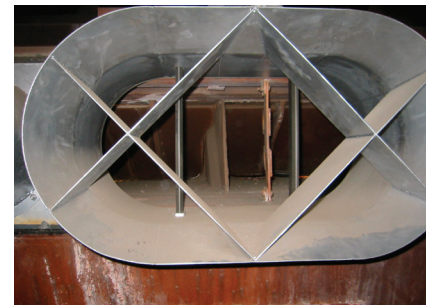
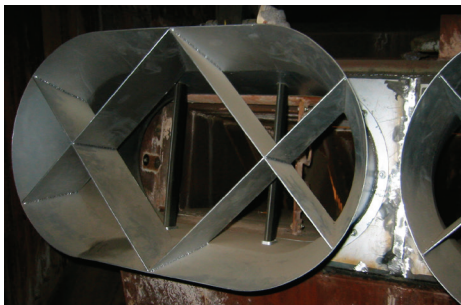
Single Oval High Beta

## FEATURES AND BENEFITS

- Improves cyclone burner performance
- Offers control of the combustion cycle
- Profiles the airflow entering cyclone burner
- Easy, bolt on installation
- Plug resistant pitots resist fly ash plugging
- Can reduce overall systemic static pressure
- Results are independent of cyclone burner's position within the wind box
- Can reduce slag buildup

The proper flow measurement of air entering a cyclone burner is extremely important to the optimization of the combustion cycle. Using patented High Beta® technology, Eastern Instruments has developed an oval High Beta® Flow Conditioner which has been optimized

to accurately measure air flow across the inlet of cyclone burners. High Beta® installation will improve the performance of the cyclone burner regardless of its position within a wind box and can actually reduce the system's overall static pressure.



## APPLICATION INFORMATION

The above images depict an installation at the Leland Olds Power Station. This station's Unit 2 is a 450 MW cyclone fired boiler which has been equipped with a first generation overfire air system. A combustion system upgrade undertaken in 2012 included replacement secondary air flow measurement. Each cyclone

was fitted with an array of three oval High Betas from Eastern Instruments. The results of the upgrade included a vastly improved secondary airflow measurement and control, improved slagging and an optimized fuel-to-air ratio which dramatically improved the combustion phase at their power station.