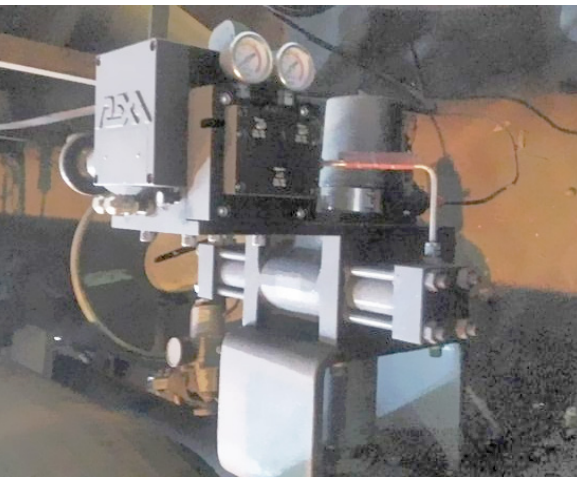




## FURNACE FUEL GAS PRESSURE CONTROL



Before - Poor Control with Pneumatic

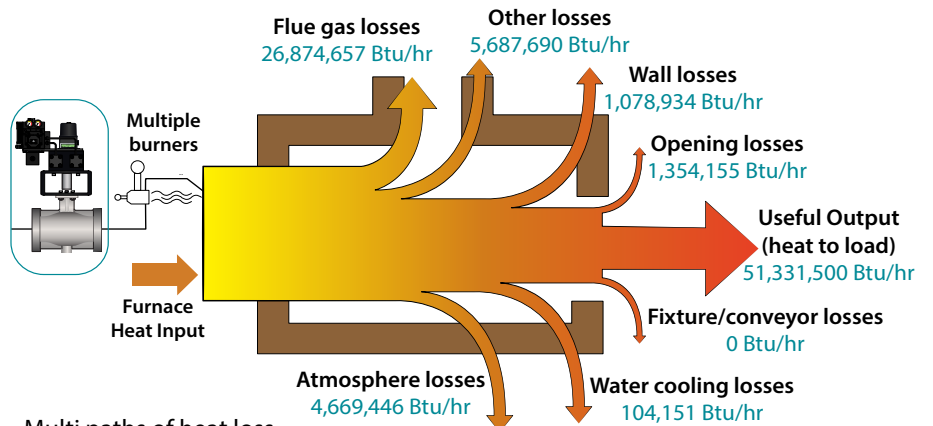


After - Improved Control with REXA

**BACKGROUND:** Producing steel is an energy intensive process. Utilizing byproduct gases as a fuel source is vital to the plant's operational efficiency. These byproduct gases, which are recovered from blast furnaces and coke ovens, are commonly used as a mixed gas fuel source throughout the plant. Reheat furnaces can use mixed gas as the primary fuel source. Mixed gas feed lines can have variable incoming pressure and constantly changing gas demand due to heating cycles and exit door losses. This creates challenges in regulating air/fuel mixture and temperature within the reheat furnace. Reheat furnace operation directly impacts steel properties. Austenite grain structure, which is sensitive to time and temperature, directly effects the strength and mechanical properties of steel.

### Fuel Gas Demand Changes Due To Reheat Furnace Energy Losses

Legend:  
Current



- Multi paths of heat loss
- Opening losses and load heat requires fuel gas flow changes

# ELECTRAULIC™ ACTUATION

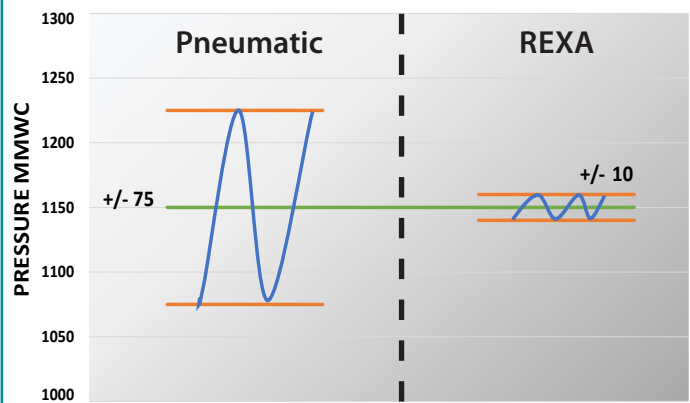
**KEY TO SUCCESS:** Minimal variation of incoming mixed gas pressure feeding the reheat furnace is critical to producing high quality steel. Accurate and responsive mixed gas pressure control enables efficient combustion for a controllable temperature profile within the furnace. Efficient combustion will reduce SOx emissions and gas consumption. This leads to stable slab heat up and soak, resulting in a more efficient furnace producing a higher quality finished product with fewer slab defects.

**PROBLEM:** Mixed gas fuel pressure to the reheat furnace is commonly controlled with a large butterfly valve and pneumatic actuator, an inherently poor controlling device. Though widely used, pneumatic actuators lack the repeatable control needed to maintain the fuel pressure necessary to stabilize furnace temperatures. Although smart positioners can reduce overshoot they introduce process deadtime. With pneumatic actuation air compressibility is unavoidable. Poor control leads to large pressure variations causing inefficient combustion within the reheat furnace.

**SOLUTION:** REXA's Electraulic Actuation™ is the ideal replacement for old and unstable pneumatic actuators. Through zero overshoot with minimal deadtime REXA actuators deliver greater process control with accurate and repeatable positioning. Electraulic Actuation™ combines simple electric operation with hydraulic performance. The system uses minimal oil volume; it has no filters or oil maintenance requirements. Pressure is generated within the power module, through an internal positive displacement gear pump, driven by a 100% duty cycle motor, with no limitations on starts, stops, or reverse cycles. The self-contained Electraulic™ actuator is sealed and maintains a positive internal pressure to prevent ingress.

REXA Electraulic™ actuators are engineered for use in critical applications requiring high modulating duty cycle with accurate and repeatable positioning in harsh environments. REXA's user-friendly control interface allows the customer to calibrate the actuator and customize its operation to suit the application requirements. Sophisticated control software allows for system diagnostics to enhance the operation and service life of the valve. The system supports both HART (Highway Addressable Remote Transducer) and Foundation Fieldbus communication protocols.

## Reduce Pressure Variation and Improve Productivity with REXA



## RESULT

REXA Electraulic™ Actuation significantly improves reheat furnace fuel pressure control. With the reduction in mixed gas fuel pressure fluctuation, the reheat furnace evenly heats the slab. This enables more efficient furnace operation and a decrease in slab defects. The resulting product is of higher quality, cleanly finished and requires less rework.

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