

# Regenerative System for Aluminum Melting Furnace with Common Air, Exhaust and Gas Manifolds



B019846; B022272; B022458; B023046; B023226

## Application: Aluminum Melting Furnace

In order to accommodate **very tight physical space** restrictions on an aluminum melting furnace, Bloom engineered a system with common manifolds for air, gas, and exhaust both to simplify piping and to save space. Bloom also installed the most **up to date control system** on the furnace.

### Purpose/Drivers

- Emissions
- Limited Space
- Reliability

### Scope

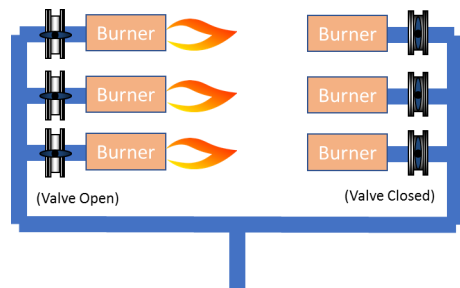
- Complete Regenerative Package
- Advanced Controls Package
- Start-up & Commissioning
- Pre-piped/pre-wired gas train

### Achievements

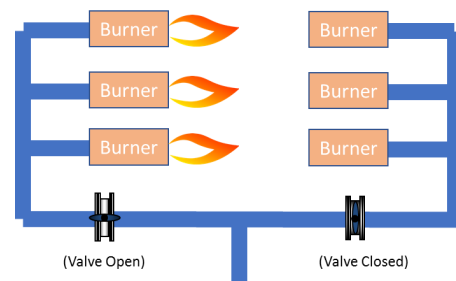
- Innovative space saving features
- Lower capital expense
- Low Emissions (<120ppm@3%O<sub>2</sub>)
- Melt Rate (70,000 #/hr)

#### Key Points:

- 1) A **common manifold** shared by three (3) burners reduced components and **minimized space requirements**.
- 2) This system used **advanced controls** to optimize combustion. **Pressure control** is also easier to accomplish.
- 3) **Engineered actuators** and **special flow control elements** optimized system performance.



Traditional arrangement  
(Six cycle valves)



Unique arrangement  
(Two cycle valves)

Note: Only air cycle valves shown here

Physical space was extremely limited for new installation of a round top aluminum melting furnace. Typically, each regenerative burner in a pair requires its own air, exhaust, and fuel cycle valves. Because of these space restrictions, Bloom decided to gang together several burner units. Using this strategy, instead of six (6) independent cycle valves for each fluid flow, only two (2) were required. Furthermore, the system required unique flow control elements (again because of the space considerations) and valve actuators. With the most advanced controls system, as well, this system easily accomplished all performance metrics.

**Keywords:** Aluminum, NOx, melting furnace, Advanced Controls, manifold

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