

## COOLstar® Burner

### Ultra-Low NOx Performance

## Proven Worldwide, With Thousands In Service

The COOLstar burner from John Zink Hamworthy Combustion is an advanced solution for ultra-low NOx gas firing applications. Thousands of COOLstar burners are in service today because of its proven performance and reliability.

The key to the COOLstar burner's impressive service record is that it applies JZHC's proprietary flue-gas entrainment and mixing strategy using the energy of incoming fuel and air streams. This breakthrough design results in stable flames and NOx emissions as low as 15 ppmvd.

JZHC engineers developed the COOLstar burner from the customer's point of view. Leveraging insights gained from our experience as global leaders in burner design and manufacturing, they designed the COOLstar burner with a focus on safety, easy operation and optimum performance. Its compact design makes it well suited for both new builds and retrofit applications. In addition, the COOLstar burner requires minimal maintenance and operates with a wide range of fuels, setting a high standard for economical, ultra-low NOx combustion.

### Typical Applications

The COOLstar burner is ideal for a variety of applications including:

- + Coker heaters
- + Horizontally fired platformers
- + Crude and vacuum heaters
- + Downfired methanol, ammonia and hydrogen reformers
- + Ethylene cracking furnaces
- + Hot oil heaters, charge heaters, reboilers, etc.



*The COOLstar provides stable flames and  
NOx emissions as low as 15 ppmvd.  
**That's smart. That's JZHC.***



## Design

### Heat Release

- + Natural draft heat release from 1.7 to 20 MMBTU/hr (0.5 to 6.0 MW)
- + Higher heat release available with forced draft

### Compact Version Available

- + Fits furnace cutouts of many conventional burners with little to no modifications required
- + Accommodates tight burner-to-burner spacing

### Fitted with ARIA™ Register

- + Compact radial air inlet replaces conventional side entry to minimize interference with furnace structures
- + Optimized air distribution improves flame shape and combustion emission performance
- + Excess air control from design to minimum firing rates allows predictable emission performance
- + Minimizes wind effects on burner performance

### Ease of Operation

- + Single point air control
- + Jackshaft controllable
- + Proportional heat release based air control operation available

### Low Maintenance

- + Robust tile for increased longevity
- + Individually removable high alloy gas tips with stainless steel risers
- + Coanda surfaces eliminate metal flame holders

### Adaptable Design Platform

- + Natural or forced draft
- + Up-fired, down-fired and horizontal
- + Common plenum, individual plenum

## Performance

### Emissions

- + NOx levels as low as 15 ppmvd
- + Design options can reduce NOx emissions further for certain applications
- + Optional low CO design available for cooler furnace operations

### Reliability and Efficiency

- + Compact flames minimize potential for impingement and maximum thermal efficiency
- + No metal in the throat
- + Stable over a wide range of fuels and furnace operating conditions
- + Pilot not required for burner stability

### Wide range of fuels

- + Natural gas
- + Refinery fuel gas
- + PSA purge gas
- + Specialty fuels like vaporized naphtha or 100% hydrogen
- + Optional waste gas firing
- + Tested under oxy-firing conditions

### High turndown

- + 5:1 turndown and higher based on application

