

HOTWORK

COMBUSTION TECHNOLOGY

E-Jet Ultra Low NO_x Hot/Cold Air Burner (EJ_HA/CA)



Following its initial and very successful application to regenerative burners, the E-JET technology has been adapted to the less arduous, but nevertheless demanding, environments of hot and cold air firing. Continuous and reliable operation using high temperature regenerative preheated air on a variety of thermal process plants such as steel reheat and heat treatment furnaces and aluminium melting furnaces has proven its suitability for constant firing and pulse firing applications.



EJ03-07HA connected to a HCR20 Compact Recuperator

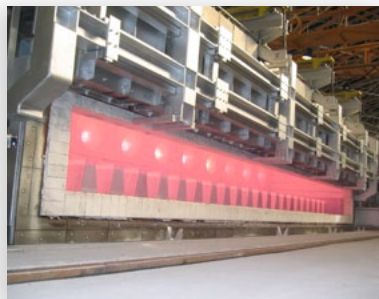


Plate heat treatment furnace fitted with 10 x EJ03-07HA and 5 x HCR25 Compact Recuperators

Benefits:

- Compliance with all international NO_x legislation
- Rapid and uniform heat distribution
- Robust refractory burner with high turndown and high excess air capabilities
- Stable at all temperatures
- Fuel savings with hot air version

Features:

- Internally Induced Fuel Dilution System (Patented Technology)
- Integral flue gas recirculation for enhanced temperature uniformity
- Staged combustion
- Flameless combustion
- Discharge velocities provided to suit process requirements
- Reduced noise operation compared with high velocity burners
- Sizes from 150 kW to 9000 kW
- Suitable for natural gas, LPG, coke oven gas, fuel oils and dual fuel
- Over 10/1 turndown on ratio on natural gas
- Ignition by premix interrupted or permanent pilot
- UV flame detection
- Maximum furnace temperature: 1500°C
- Hot air version available for preheat temperatures up to 600°C

Typical Applications:

- Heat treatment
- Forging
- Reheating
- Ladle heating
- Tundish heating
- Torpedo heating
- Stress relieving
- Aluminium melting
- Refractory drying units
- Air heating
- Process heating
- Ceramic kilns

A unique combination of NO_x reducing features

Ultra low NO_x levels are achieved by combining a range of NO_x reducing techniques which include, in particular, an innovative feature developed by Hotwork, the Internally Induced Fuel Dilution System (Patented Technology). The Hotwork E-Jet Burner can also operate with internal Flue Gas Recirculation (FGR) without the need for hot gas fans and associated refractory lined ducting. The addition of a local FGR duct and the flexibility of installing it in a strategic location around the burner have actually proven to improve temperature uniformity, a major benefit for applications such as heat-treatment and forging.

Controlled Velocity

The EJ_HA/CA burner is a robust refractory and very stable burner with high excess air capabilities which can deliver local air velocities up to 150 m/s. This results in controlled and uniform heat circulation inside a furnace as well as improved and controlled heat transfer to the load. High velocity, in conjunction with Internally Induced Fuel Dilution System (Patented Technology), provides the optimum in uniform heat release and minimised NO_x formation. These features make the EJ_HA/CA Burner ideal for applications such as heat-treatment, where the load has to be heated in a controlled manner to comply with stringent quality assurance standards like Rolls Royce RPS953, or ladle heating where the refractory linings have to be dried slowly with high levels of excess air and preheated quickly on stoichiometric ratio.

High Turndown and Excess Air Capability

The maximum turndown in excess of 10/1 for this burner is achieved by the staging of air for combustion, resulting in extremely high excess air operation with minimised formation of unburned hydrocarbons and aldehydes.

Fuels

The EJ_HA/CA Burner is suitable to fire on natural gas, LPG, coke oven gas and other low CV by-product gases on request. It can also be used with fuel oils or with a dual fuel arrangement.

Ignition and Flame Supervision

The EJ_HA/CA Burner is ignited by means of a premix interrupted or permanent pilot. The option of a permanent pilot is process dependant, the main flame being fully stable without a pilot. The burner is fitted with a sight glass and two ports are provided for a UV scanner and a pilot burner to be installed.

Hot Air Version

In order to maximise fuel efficiency, a Hot Air EJ_HA Burner accepting preheated air up to 600°C is also available. EJ_HA Burners are ideal on applications fitted with central recuperators, such as forging and reheating furnaces, and can also be used in conjunction with individual recuperators such as the Hotwork Compact Recuperator (HCR).

Burner air and gas pressures

Air is subject to specific burner selection and velocity requirements, usually between 20 and 60 mb. Gas pressures are subject to required fuel input but are normally around 30 mb.

Burner selection, relative to required thermal input and air preheat

Air °C	150 kW	200 kW	300 kW	400 kW	500 kW	600 kW	800 kW	1000 kW	1200 kW
20	x	015-04	015-04	03-07	03-07	03-07	03-07	06-12	06-12
100	x	015-04	015-04	03-07	03-07	03-07	06-12	06-12	06-12
200	015-04	015-04	015-04	03-07	03-07	03-07	06-12	06-12	06-12
300	015-04	015-04	03-07	03-07	03-07	06-12	06-12	06-12	09-21
400	015-04	015-04	03-07	03-07	03-07	06-12	06-12	06-12	09-21
500	015-04	015-04	03-07	03-07	03-07	06-12	06-12	09-21	09-21
600	015-04	015-04	03-07	03-07	03-07	06-12	06-12	09-21	09-21
Air °C	1500 kW	2000 kW	2500 kW	3000 kW	4000 kW	5000 kW	6000 kW	8000 kW	9000 kW
20	09-21	12-25	12-25	18-41	18-41	18-41	30-60	40-75	40-75
100	09-21	12-25	12-25	18-41	18-41	30-60	30-60	40-75	50-90
200	09-21	12-25	18-41	18-41	30-60	30-60	30-60	50-90	50-90
300	09-21	12-25	18-41	18-41	30-60	30-60	40-75	50-90	50-90
400	12-25	12-25	18-41	18-41	30-60	30-60	40-75	50-90	50-90
500	12-25	18-41	18-41	30-60	30-60	40-75	40-75	50-90	x
600	12-25	18-41	18-41	30-60	30-60	40-75	40-75	50-90	x

Note: greyed references can be either the size indicated or the one above, subject to process requirements.

Further Information

Further details on this burner such as dimensional drawings, typical schematic diagram, spares drawings, procedures for installation, commissioning and maintenance, etc. are available on request.

The data provided in this leaflet is for information only and does not form part of any contract. Due to our continued commitment to research and development, we reserve the right to modify specifications or dimensions without notice. The improper use of combustion equipment can result in a condition hazardous to people and property. Users are urged to comply with national and local standards.

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