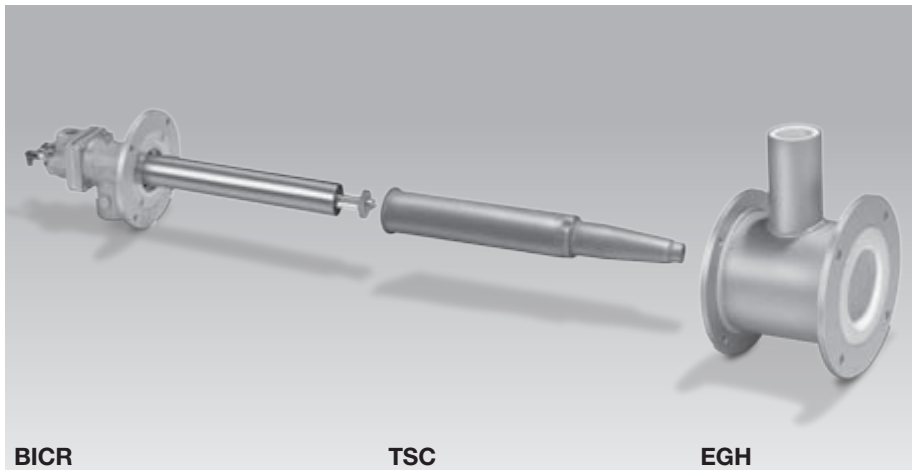
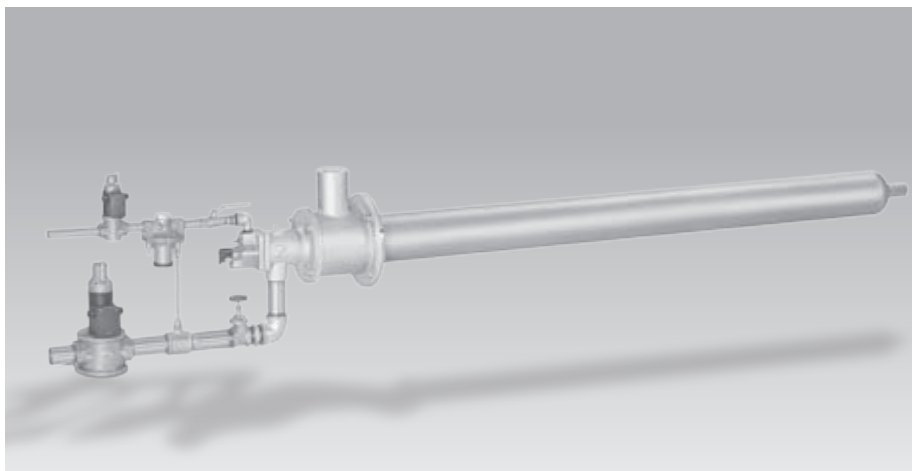


## **Burner with integrated recuperator BICR**

- // For direct and indirect heating equipment
- // Economical, energy-saving operation by virtue of internal air preheating
- // Great flexibility due to its maintenance-friendly modular design
- // Light-weight construction for minimum weight
- // High flue gas outlet velocity ensures homogeneous temperature distribution
- // Low pollution combustion
- // Direct ignition and monitoring
- // Low cost gas/air control is possible
- // High availability due to a ceramic pipe heat exchanger
- // Low gas and air connection pressures
- // As a result of its compact design it is ideal for replacing electric heating elements in radiant tubes which were originally electrically heated



*Modular construction consisting of the burner BICR, the ceramic pipe heat exchanger module TSC and the exhaust-gas housing EGH with integral insulation.*



*BICR in a single-ended radiant tube.*

**Application**

The burners with integrated recuperator BICR are for use on heating either direct or indirect furnace systems.

**Indirect heating**

BICR recuperative burners in conjunction with radiant tubes are used as indirect heating equipment where the combustion gases must be separated from the product or a certain furnace atmosphere must be achieved.

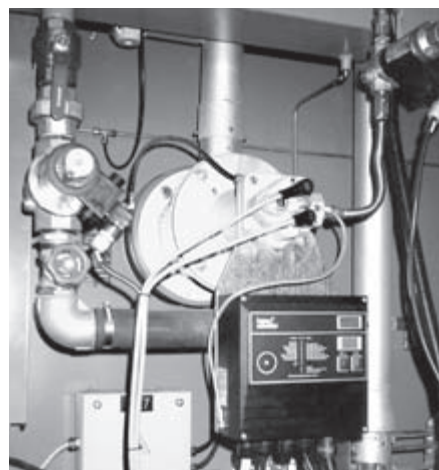
**Direct heating**

In conjunction with an inductor to return the flue gas, the burner is used to save energy in a direct heating system.

Applications include industrial furnaces and firing systems in the iron and steel industry and in the non-ferrous metals industry.

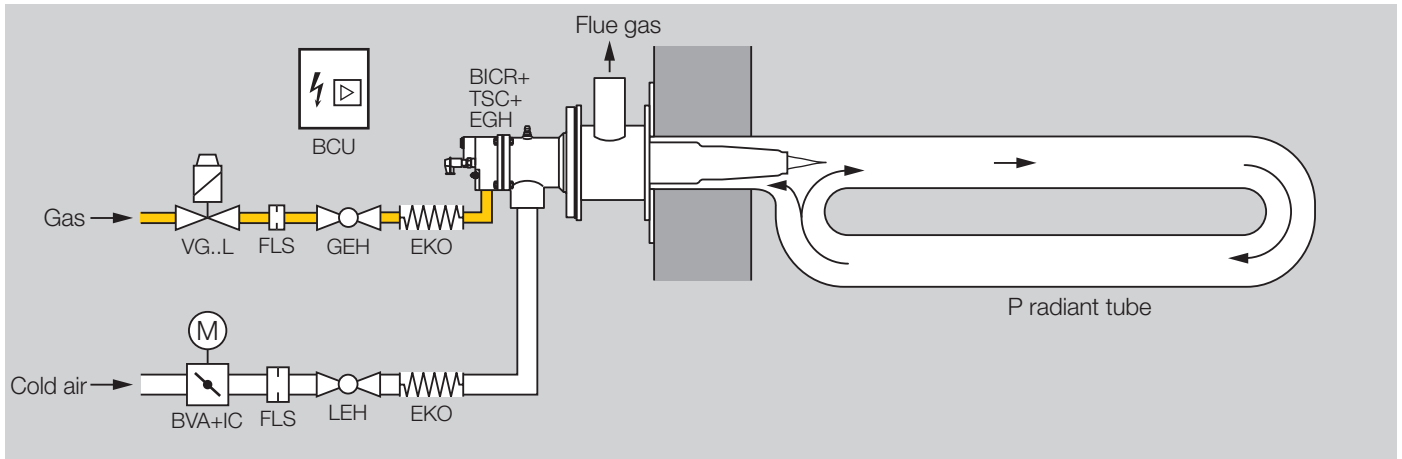


*Direct heating of an annealing bell. Flue gases are recycled via the inductor.*



*Indirect heating of a roller hearth furnace.*

## Application examples



### BICR in a P radiant tube

Example application for indirect heating.

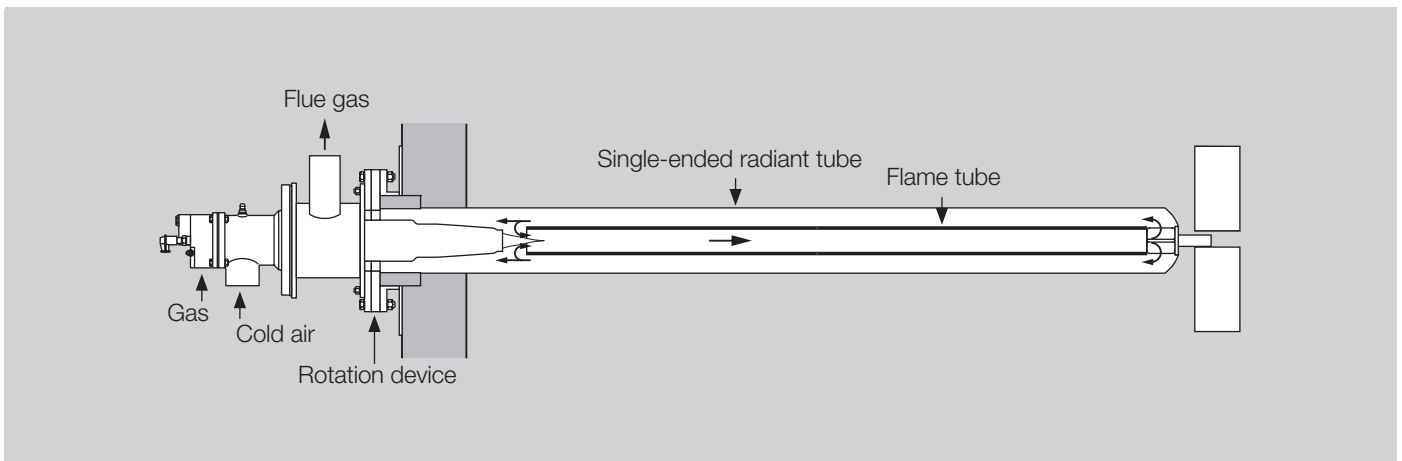
The high outlet velocity of the combustion gases generates a pressure at the outlet of the ceramic burner tube, resulting in the recirculation of the flue gases. This leads to the following:

- A reduction in NO<sub>x</sub> emissions,
- A uniform radiant tube temperature.

The hot flue gases are fed through the ceramic heat exchanger, heating the additional cold combustion air supply. The maximum achievable air preheat temperature is approx. 400°C.

### Legend

- VG..L = Solenoid valve for gas, slow-opening  
 GEH = Flow adjusting cock for gas  
 EKO = Stainless steel bellows unit  
 FLS\* = Measuring orifice  
 BICR = Burner with integrated recuperator  
 TSC = Ceramic tube  
 EGH = Exhaust-gas housing  
 BVA = Butterfly valve for air  
 IC = Actuator  
 LEH = Flow adjusting cock for air  
 BCU = Burner control unit  
 \* Required in the gas circuit on BICR 65/50 only



### BICR in a single-ended radiant tube

Example application for indirect heating.

The high outlet velocity of the combustion gases generates a pressure at the outlet from the ceramic burner tube resulting in the recirculation of the flue gases. This leads to the following:

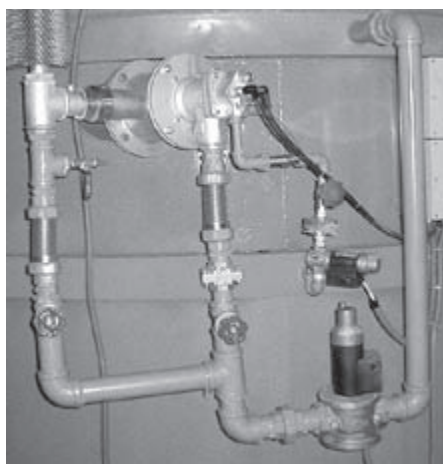
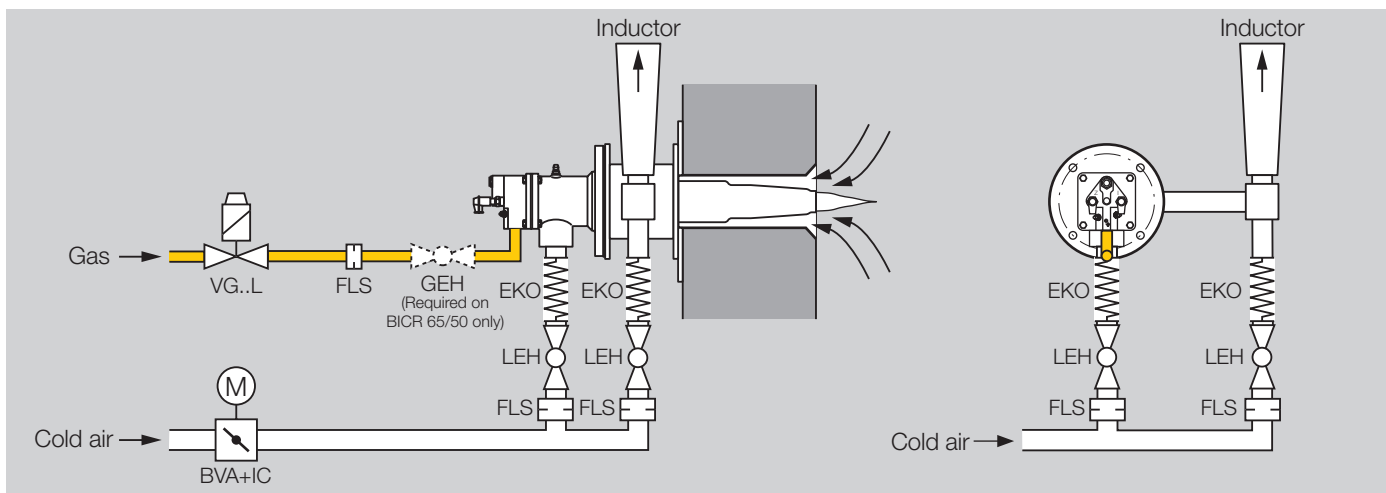
- A reduction in NO<sub>x</sub> emissions,
- A uniform radiant tube temperature.

The hot flue gases are fed through the ceramic heat exchanger, heating the additional cold combustion air supply. The maximum achievable air preheat temperature is approx. 400°C.

An internal flame tube must be fitted in the single-ended radiant tube to guide the hot flue gases.

If metal single-ended radiant tubes are fitted horizontally then provision must be made for rotating the tube 180 degrees periodically to extend its working life.

As the BICR burner is slim and compact, it can also be used in radiant tubes that were formerly electrically heated.



**BICR for direct heating systems**

BICR recuperative burner in a direct heating system with optional inductor at the outlet from the exhaust-gas housing (EGH) to evacuate the flue gases from the furnace. The inductor generates a vacuum with a centrally positioned nozzle and thus draws the flue gases out of the furnace chamber through the burner's heat exchanger. The maximum achievable air preheat temperature is approx. 400 °C.

- Low air connection pressure at the inductor is required.
- 100% flue gas return through the burner is possible. No other flue gas channelling required.

**Technical data**

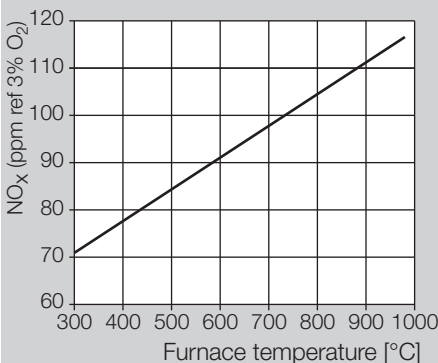
Types of gas: Natural gas or LPG (gaseous); other gases on request.  
 Heating: Direct with inductor or indirect in radiant tube.  
 Control type: On/Off.  
 Flame velocity: High.  
 Most of the burner components are made of corrosion-resistant stainless steel.  
 Flame control: Direct ionisation control (UV control as an option).  
 Ignition: Direct, electrical.  
 Maximum furnace temperature: Approx. 1000 °C.  
 Burner length increments: 100 mm.  
 Burner output and required connection pressure at a furnace temperature of 900 °C for indirect heating with natural gas in a radiant tube:

Burner	Output kW	Gas mbar	Air mbar
BICR 65/50	20	27	35
BICR 80/65	40	25	30
BICR 80/65	60	51	55
BICR 100/80	80	26	32
BICR 100/80	100	41	48

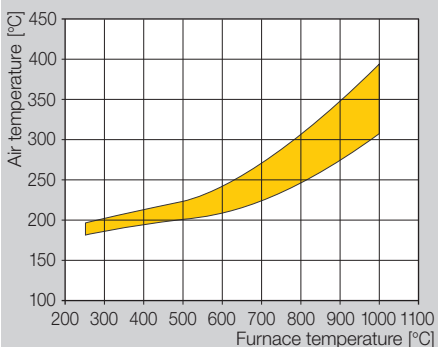
Burner output and required connection pressure for other furnace chamber temperatures, heating modes or gas types: On request.

Inductor connection pressure: On request.

**NOx emissions on BICR 80/65, natural gas**



**Air temperature**



**Maintenance cycles**

Twice per year, but if the media are highly contaminated, this interval should be reduced.

**Selection  
Burners BICR**

	/50	/65	/80	H	B	G	-0	/335	/385	/435	/485	/535	/585	/635	/685	/735	/785	-(1)–-(99)	A–Z
BICR 65	●			●	●	●	●		●		●		●		●		●	●	●
BICR 80		●		●	●	●	●	●		●		●		●		●		●	●
BICR 100			●	●	●	●	●	●		●		●		●		●		●	●
Type = BICR + housing size																			
Burner size = /50, /65, /80																			
Flame shape Long flame = H																			
Type of gas Natural gas = B LPG = G																			
Length of burner extension 0 mm = -0																			
Position of burner head [mm] = /335, /385, /435, /485...																			
Burner head identifier = -(1), -(2), -(3), -(4), -(5)...																			
Construction stage = A, B, C, D, E...																			

● = standard, ○ = available

**Order example:** BICR 80/65HB-0/435-(51)E

**Exhaust-gas housing EGH**

	/50	/65	/80	-190*	-240	-290	-340	-390	
EGH 65	●			●	●	●	●	●	●
EGH 80		●		●	●	●	●	●	●
EGH 100			●	●	●	●	●	●	●
Type = EGH + housing size									
Burner size = /50, /65, /80									
Length of exhaust-gas housing [mm] = -190*, -240, -290, -340, -390									
To be combined with BICR 65 BICR 80 BICR 100									

\* Standard length: 190 mm

● = standard, ○ = available

**Order example:** EGH 80/65-190

**Ceramic tube set TSC**

	/50	/65	/80	B	022	030	040	-500--900	-550--950	/385--/785	/335--/735	-Si	-1350
TSC 65	●			●	●			●		●		●	●
TSC 80		●		●		●		●			●	●	●
TSC 100			●	●			●		●		●	●	●
Type = TSC + housing size													
Burner size = /50, /65, /80													
Tapered shape = B													
Outlet diameter [mm] = 022, 030, 040													
Tube length [mm]													
-500, -600, -700, -800, -900													
-550, -650, -750, -850, -950													
Position of burner head [mm]													
/385, /485, /585, /685, /785													
/335, /435, /535, /635, /735													
Ceramic tube made of silicon-infiltrated SiC = -Si													
Up to 1350 °C = -1350													
To be combined with													
BICR 65													
BICR 80													
BICR 100													

● = standard, ○ = available

**Order example:** TSC 80/65B030-500/335-Si-1350

**Detailed information on this product**

[www.kromschroeder.com](http://www.kromschroeder.com)

**Contact** [www.kromschroeder.com](http://www.kromschroeder.com) → information → contacts

We reserve the right to make technical modifications in the interests of progress.

Kromschroder uses environment-friendly production methods. Please send away for our Environment Report.

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