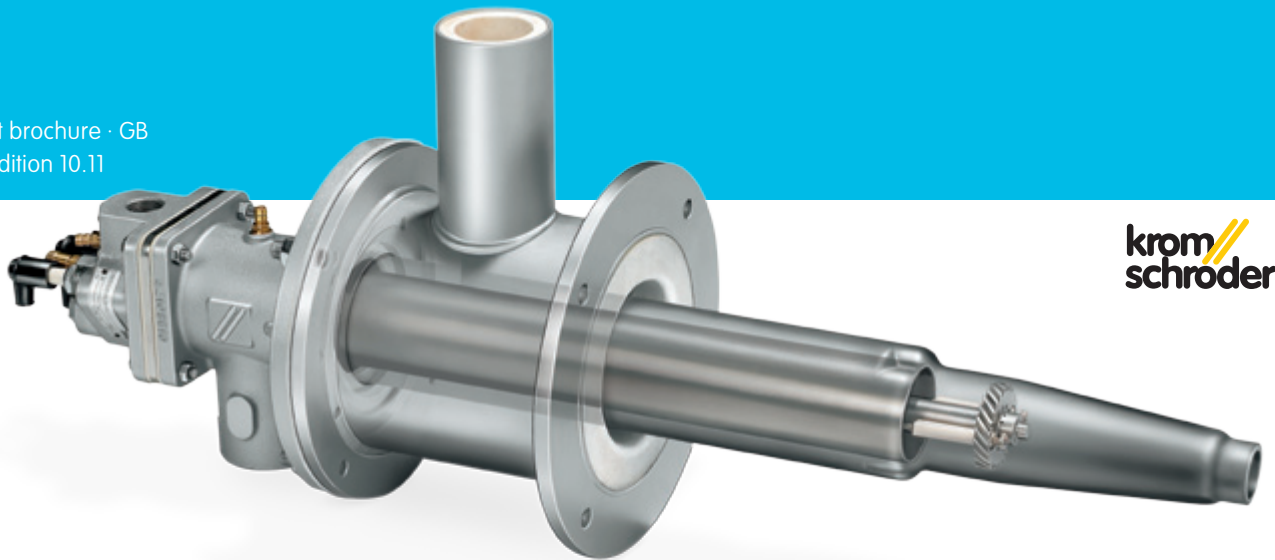


Burner with integrated recuperator BICR

Product brochure · GB
7.2.4 Edition 10.11

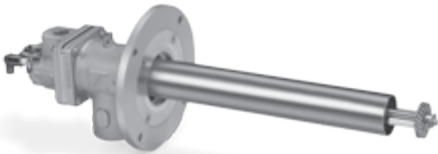
krom
schroder



- 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
- Lightweight construction for minimum weight
- High flue gas outlet velocity ensures uniform temperature distribution
- Low pollution combustion
- Direct ignition and monitoring
- Low cost gas/air control is possible
- High usage 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 the heating elements in radiant tubes which were originally electrically heated



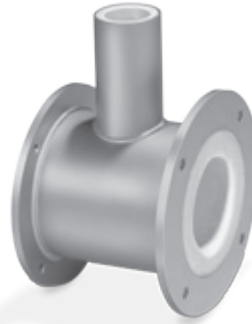

elster
Kromschroder



BICR



TSC



EGH

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



Indirect heating in a single-ended radiant tube

Application

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

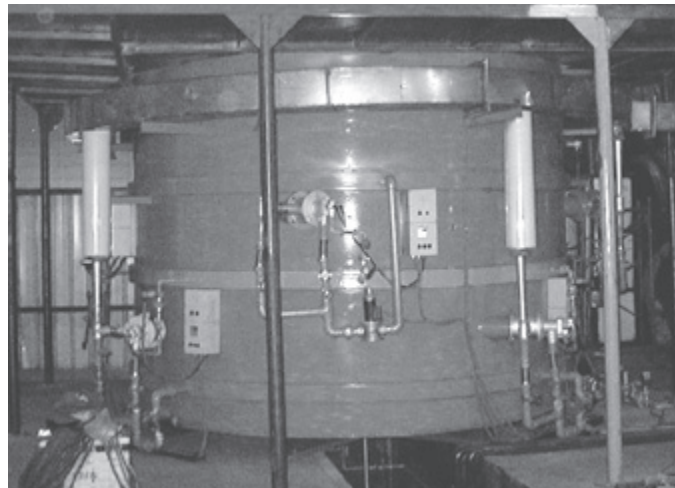
Indirect heating

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

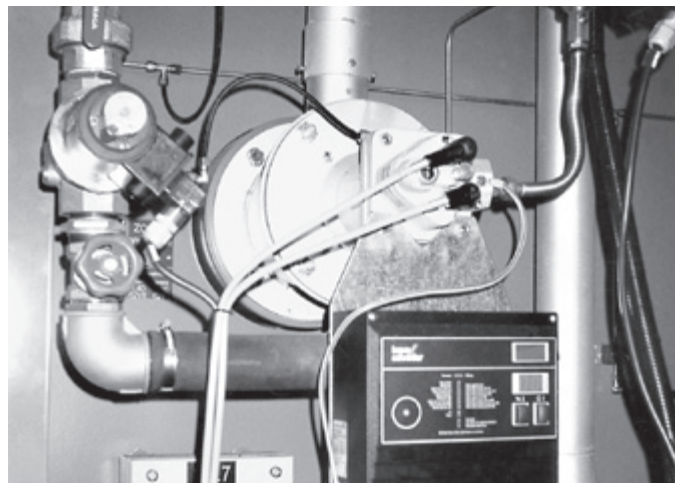
In conjunction with an inductor to return the flue gas, the burner is used to save energy in a direct heating system.

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



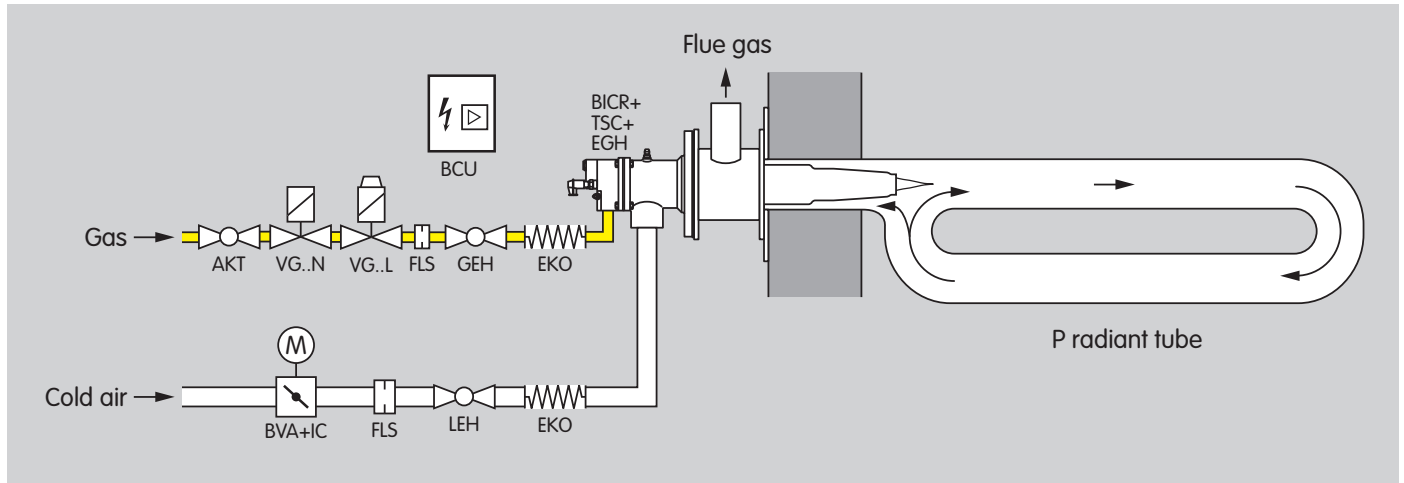
Direct heating of a bell furnace for annealing

Flue gases are recycled via the inductor



Direct heating of a roller hearth furnace

Example applications



BICR in a P radiant tube

Example application for indirect heating.

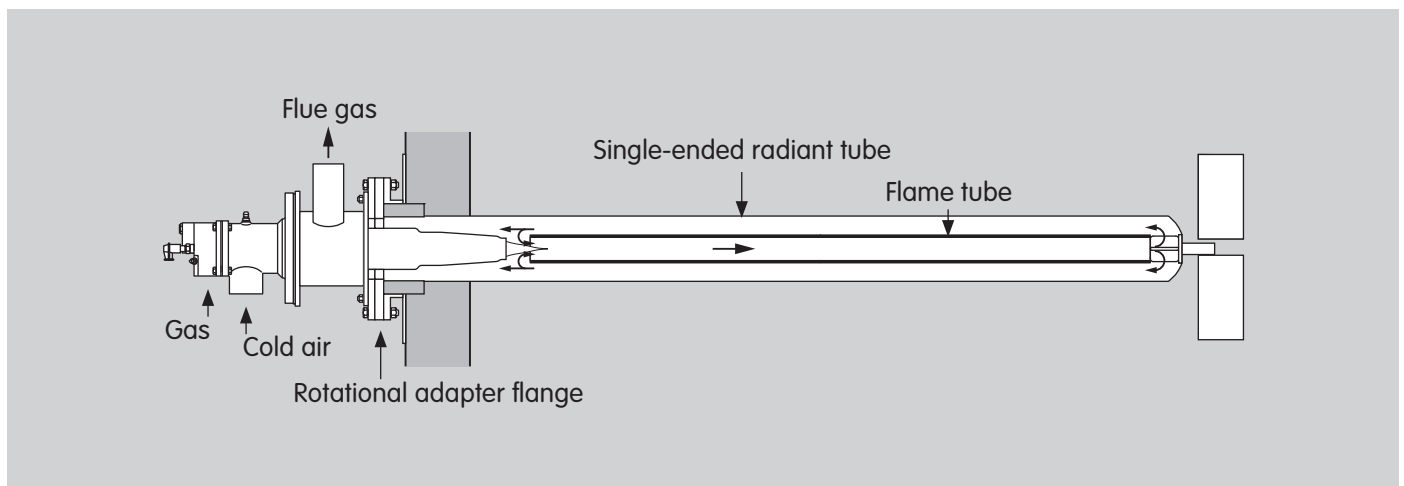
The high outlet velocity of the combustion gases generates a pressure at the outlet of the ceramic burner tube, resulting in the recirculation of the flue gases. This leads to the following:

- A reduction in NO_x 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

- BCU = Burner control unit
- 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
- * 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:

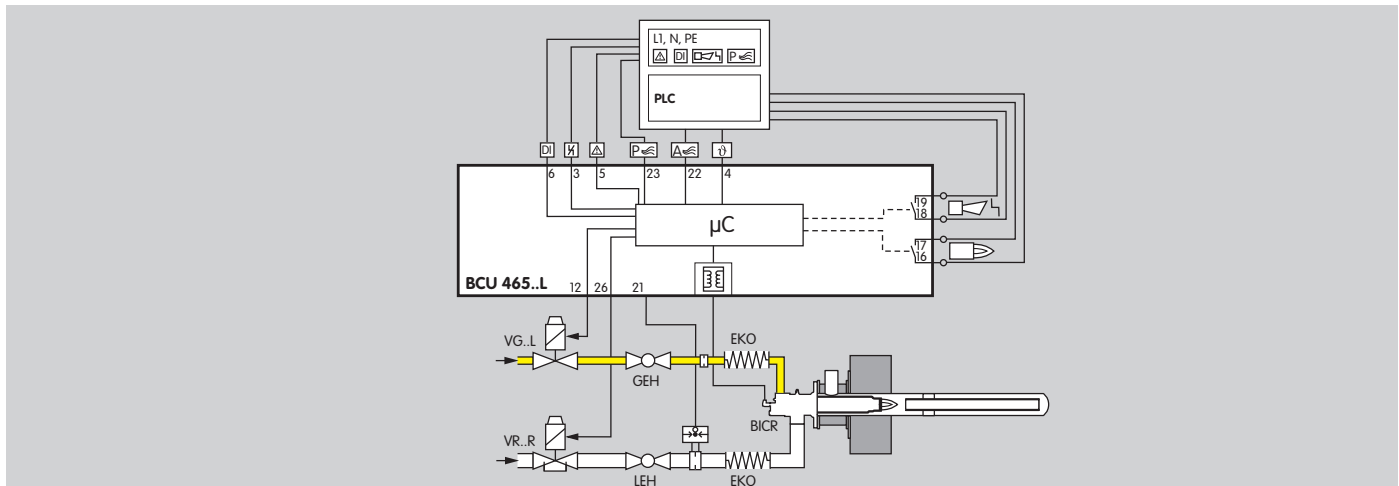
- A reduction in NO_x emissions,
- A uniform radiant tube temperature.

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.

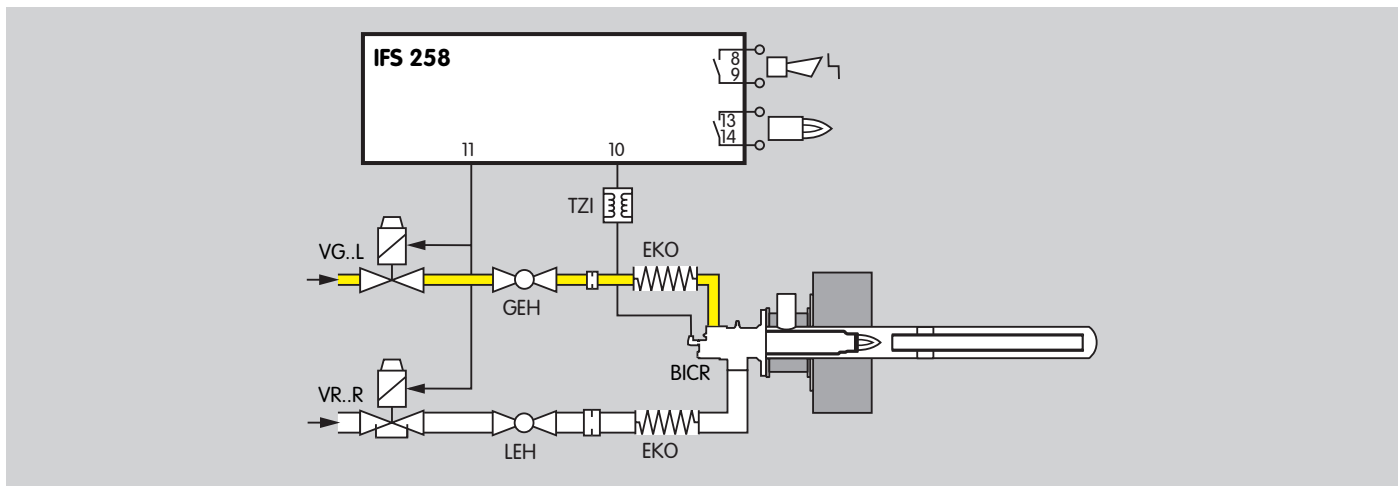


BICR in a single-ended radiant tube with burner control unit

Control example application: ON/OFF with burner control unit BCU 465..L.

The gas/air mixture is adjusted to the requirements of the applications using the differing parameters of air supply and air post ventilation.

The pressure switch monitors the air flow in the air supply line or in the flue gas exhaust.

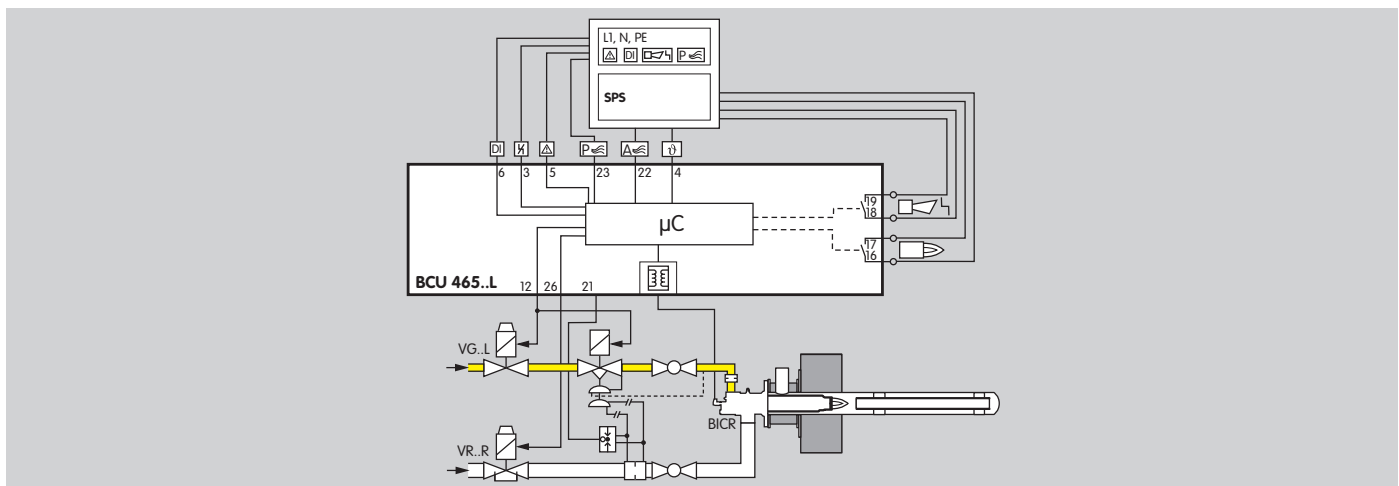


BICR in a single-ended radiant tube with automatic burner control units

Control example application: ON/OFF with automatic burner control units

IFS 258 and ignition transformer TZI, external air fan control and central pre-purge. Gas valve and air valve are activated simultaneously.

The burner is ignited and monitored by a single electrode. There is an immediate fault lock-out following flame failure.

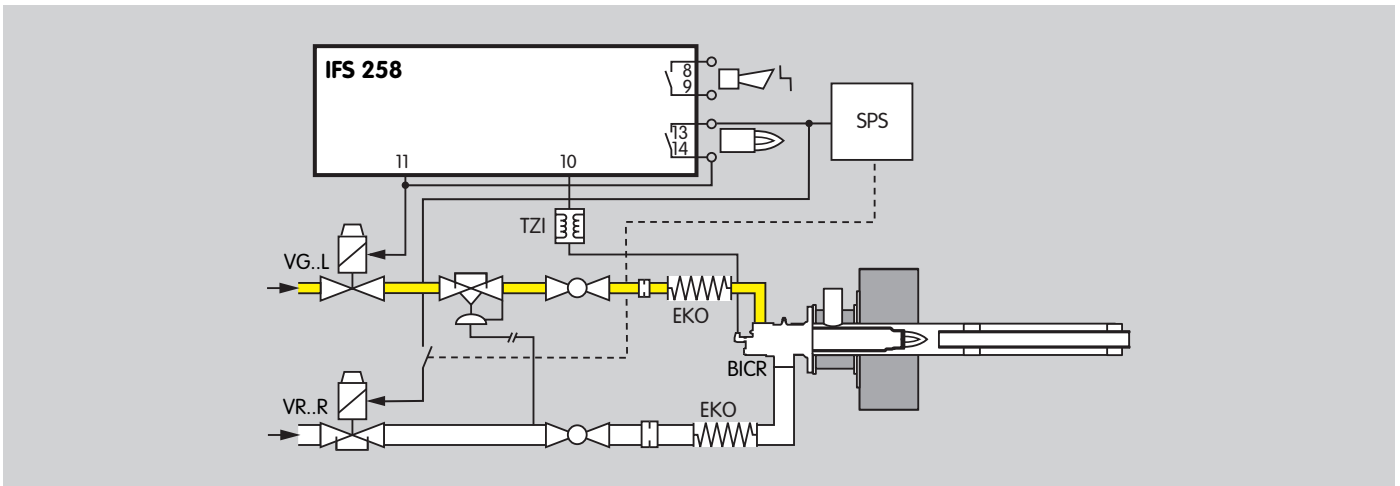


Single-stage-controlled BICR in a single-ended radiant tube with pneumatic link to the burner control unit

Control example application: ON/OFF with burner control unit BCU 465..L.

The BCU provides the cooling and purging processes. The variable air/gas ratio control compensates for gas/air pressure fluctuations. The pressure switch monitors the air volume during pre-purge and operation.

The gas/air mixture is adjusted to the requirements of the applications using the differing parameters of air supply and air post ventilation.

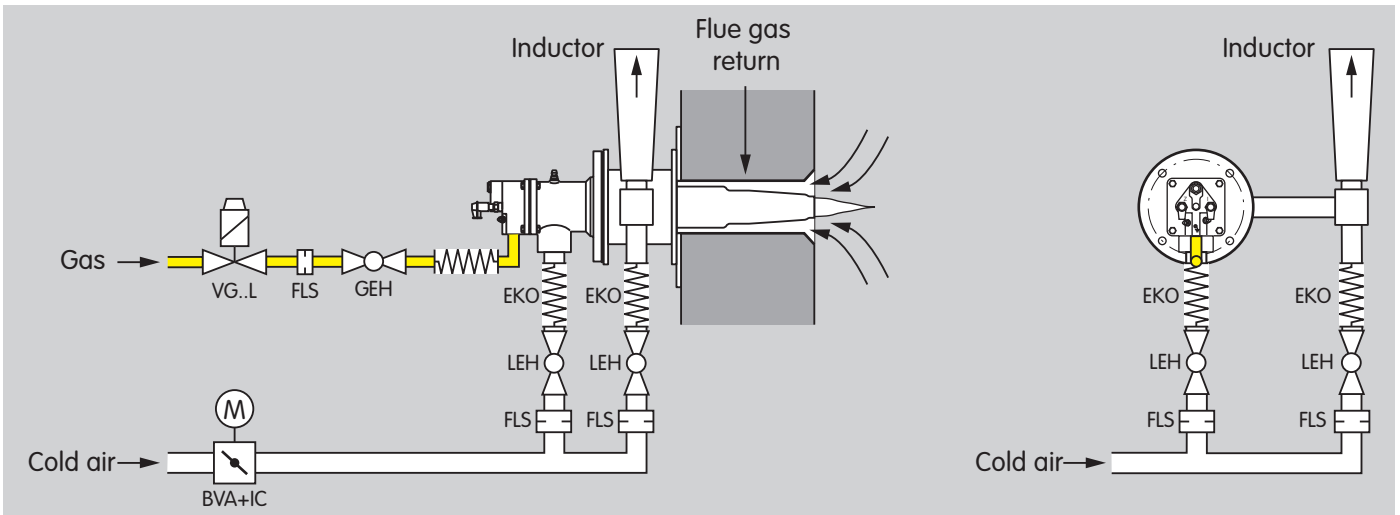


Single-stage-controlled BICR in a single-ended radiant tube with pneumatic link to the automatic burner control unit

Control example application: START/HIGH/OFF with automatic burner control units IFS 258.

The burner starts at low-fire rate, and a PLC opens the air valve after the operat-

ing state has been signalled and thereby switches the burner to high-fire rate. In the event of a flame failure, there is an immediate fault lock-out or a restart.



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.



Technical data

Burner length increments: 100 mm.

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.

Exhaust-gas housing EGH with internal ceramic fibre insulation (RCF).

Flame control: Direct ionisation control.

Ignition: Direct, electrical.

Maximum furnace temperature: approx. 950°C for indirect heating, approx. 1050°C for direct heating.

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

The reverse flow pressure via the radiant tube is to be taken into consideration.

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

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 (L2) [mm] = /335, /385, /435, /485...								
Burner head identifier = -(1A), -(2A), -(3A), -(4A), -(5A)...								
Construction stage = A, B, C, D, E...								

Order example: **BICR 80/65HB-0/435-(34A)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 (L8) [mm] = -190*, -240, -290, -340, -390							
To be combined with BICR 65/50 BICR 80/65 BICR 100/80							

* 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 (L7) [mm] -500, -600, -700, -800, -900 -550, -650, -750, -850, -950								
Position of burner head (L2) [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 65/50 BICR 80/65 BICR 100/80								

● = standard, ○ = available

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

Detailed information on this product

www.docuthek.com

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