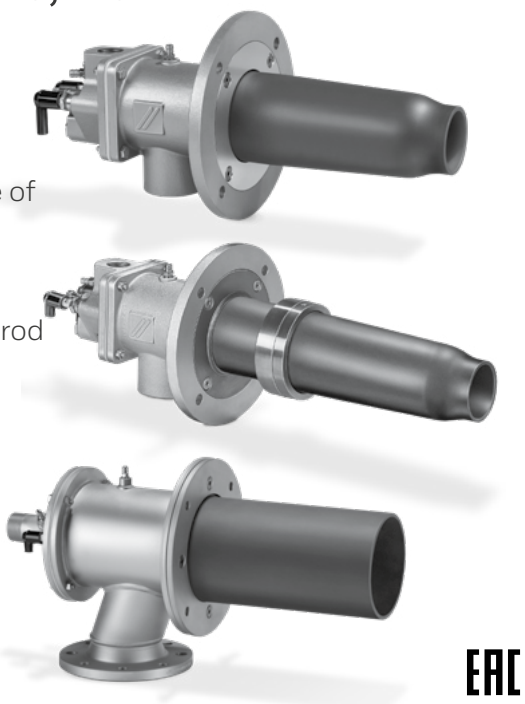
Honeywell

krom schröder

Burners with ceramic tube BIC, BICA, BICW, ZIC, ZICW

Technical Information · GB
7 Edition 11.17



- Ideal for fibre-lined furnaces with a ceramic burner tube made of SiSiC, no burner block required
- Suitable for ON/OFF intermittent operation
- Reliable electrical ignition and safe flame control using a flame rod
- Large capacity range up to 1000 kW (3782 x 10^3 BTU/h (natural gas H factor))
- Air preheating to 600°C (1112°F)
- Length increments enable individual adjustment to the wall thickness of the system

EAC

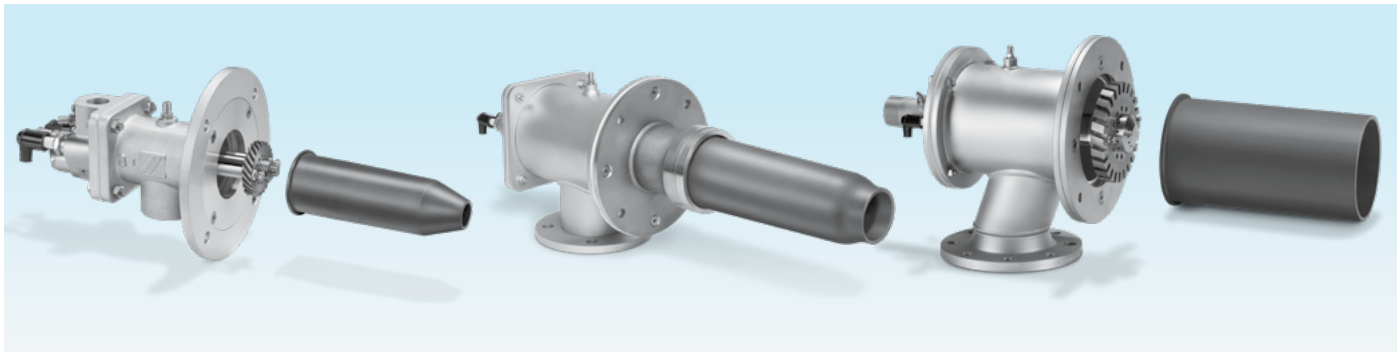
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= To be continued

1 Application



BIC and TSC BICW and TSC ZIC and TSC

Suitable for use in industrial furnaces and firing systems, e.g. in the iron and steel industries, in the heavy clay and fine ceramics industries and in the precious, non-ferrous and light metal sectors. Burners BIC, BICA or ZIC can also be used in thermal incineration installations, as well as in dryers and hot air generators.

The burners can be used with the ceramic tube set TSC in fibre-lined furnaces (also in furnaces with a brick lining) as an overhead or side heating system. No burner block is necessary.

The stainless steel extension allows for individual length adjustment to the most diverse furnace wall thicknesses.

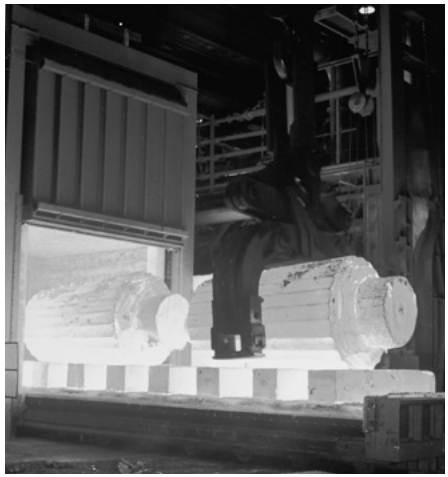
Thanks to their medium to high outlet velocity (65 to 155 m/s), burners BIC, BICA are ideal for industrial furnaces whose temperature is controlled by an impulse system.



Ceramics kiln with temperature control via impulse system



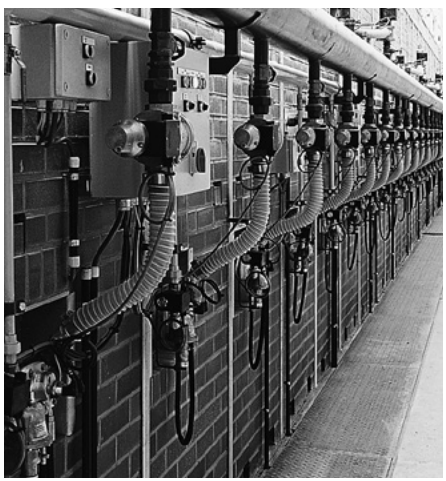
Overhead heating with burner BIC



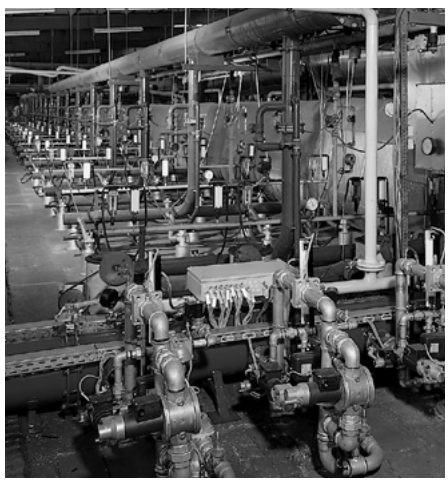
Steel forging furnace



Batch furnace



Tunnel kiln

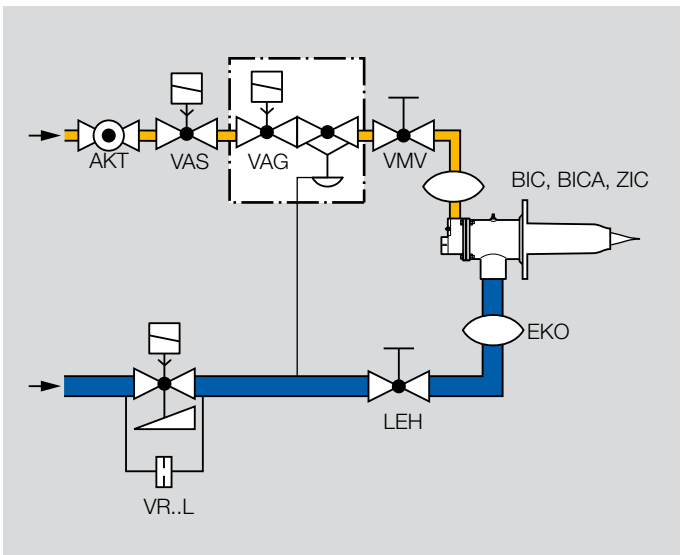


Tunnel kiln overhead heating

1.1 Application examples

Explanation of symbols, see page 52 (Legend).

1.1.1 ON/OFF cyclic control



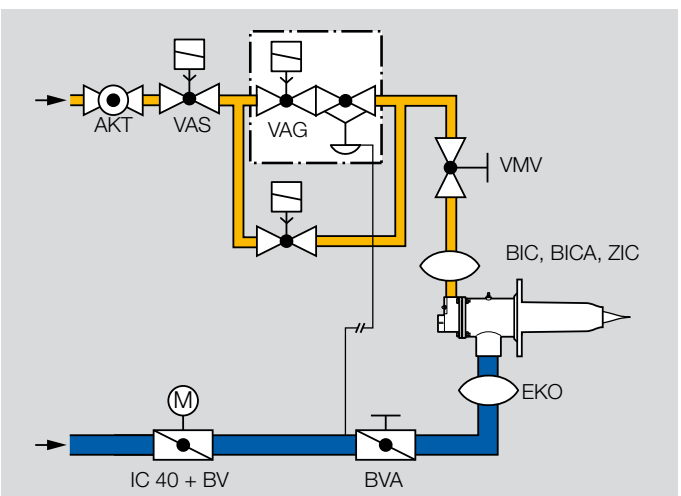
With ON/OFF cyclic control, the input into the process is controlled by means of a variable ratio of the operating time to the pause time.

The burner is ignited while the air valve is opening slowly. The pneumatic ratio control system controls the gas volume and ensures a constant mixture of gas and air in the burner. In accordance with EN 746-2, this type of control can only be used for ignition with burner capacities of up to 360 kW (1229 × 10^3 BTU/h).

Depending on the furnace temperature, there must be a certain air flow when the burner is switched off, see page 28 (Purge air/cooling air).

The high output pulse frequency at the burner produces a uniform temperature distribution and good circulation of the furnace or kiln atmosphere, e.g. in heat treatment furnaces in the iron and non-ferrous metal industries or kilns for heavy clay and fine ceramics.

1.1.2 ON/OFF cyclic control with a defined pilot rate

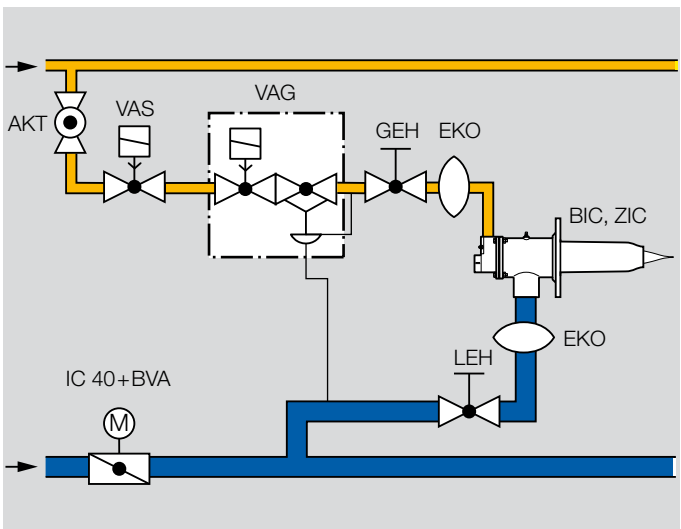


With this kind of cyclic control, the input into the process is controlled by means of a variable ratio of the operating time to the pause time (ON/OFF).

Here, the burner is ignited at a defined pilot rate via a bypass valve (PILOT RATE/HIGH/OFF burner control). This burner system can thus be used regardless of the burner capacity.

A 2-stage air control valve allows the volume of air infiltrating when the burners are switched off to be minimized. Alternatively, a single-stage air control valve with bypass for the pilot rate can be used if the volume of air infiltrating into the process is non-critical.

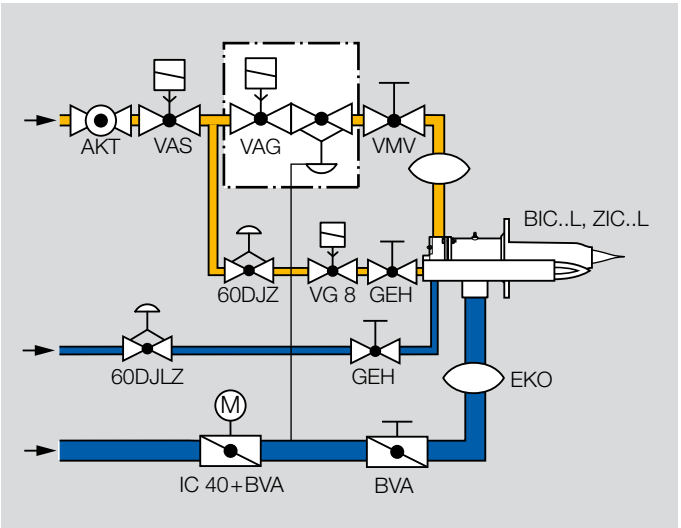
1.1.3 Modulating control with pneumatic ratio control system



This type of control produces high temperature accuracy where there is low circulation, e.g. in roller hearth kilns in the heavy clay ceramics industry.

The capacity of the burners of a zone/group is adjusted using a central air control valve.

1.1.4 Modulating control with pneumatic ratio control system and torch



The burner's flexibility is increased thanks to a torch. This type of control is used in heat treatment furnaces in the iron and non-ferrous metal industries and in heating furnaces in the steel industry, for example.

2 Certification

Eurasian Customs Union

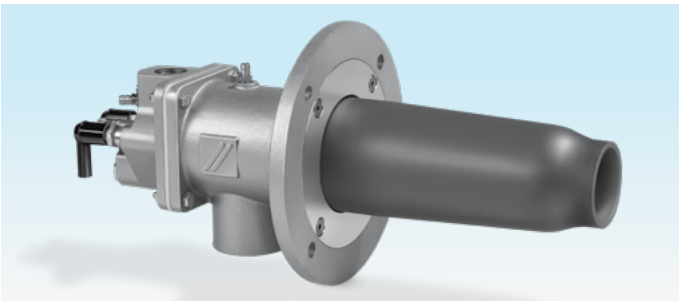


The product BIC/BICA/BICW/ZIC/ZICW meets the technical specifications of the Eurasian Customs Union.

Declaration of Incorporation pursuant to the Machinery Directive

Burners BIC, ZIC, BICW and ZICW comply with the requirements of EN 746-2 and the Machinery Directive 2006/42/EC. This is confirmed by the manufacturer's Declaration of Incorporation.

3 Mechanical construction



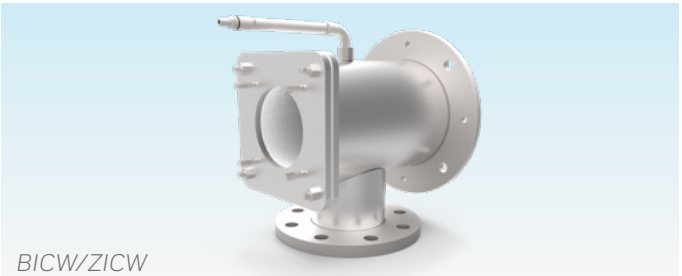
The burner is composed of the following modules: burner body, burner insert and ceramic tube. This structure enables easy adjustment to suit the respective process or integration into existing systems. Maintenance and repair times are reduced, and existing furnace installations can easily be converted.

3.1 Burner body (furnace flange)



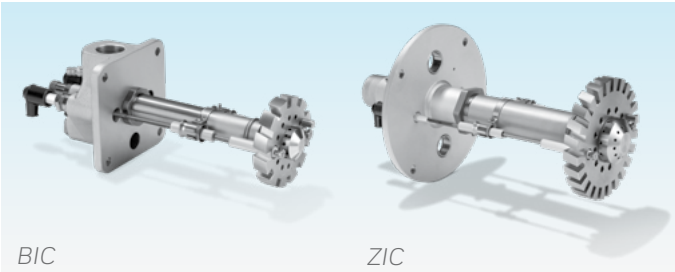
The burner is secured to the furnace by the burner body. The burner body accommodates the burner insert and the ceramic tube, and routes the combustion air. The combustion air pressure can be measured using an air pressure test nipple.

With internal insulation (high temperature version)



Burner bodies with insulation can be used for higher hot air temperatures of up to 600°C (1112°F). The insulation consists of vacuum-formed ceramic fibres (RCF = refractory ceramic fibre) with a specially hardened surface. Its purpose is to reduce the body surface temperature and protect the materials from overheating. To ensure that the air pressure test nipple remains cool, it is not installed directly on the body but at a distance from it.

3.2 Burner insert



BIC ZIC

The fuel gas is supplied to the burner head via the gas connection and the gas nozzle. The burners are nozzle-mixing burners. Gas and air are mixed only once they are in the burner head. This prevents explosive gases from being generated in the pipelines.

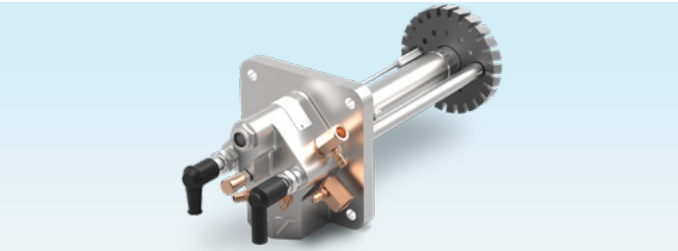
The gas connection flange assembly includes the sight glass, ground screw and spark plugs with right-angle terminal boots. For BIC 65 to 140, the connection flange is equipped with an integrated measuring orifice for easy measuring and flow adjustment for exact adjusting of the gas flow rate (BICA without measuring orifice and without flow adjustment).

Spark electrode and flame rod are screwed into the connection flange and can be replaced without removing the burner insert.

The length of the burner insert has been selected so that the burner head is always positioned in the ceramic tube TSC.

A wide selection of burner heads ensures excellent combustion for the most diverse types of gases and applications.

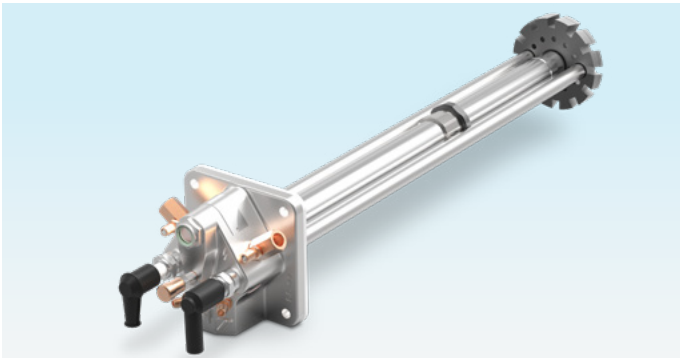
3.2.1 Burners with integrated torch



Burner insert BIC with integrated torch

A complete pilot burner with separate gas and air connection is fitted to burners with an integrated torch instead of the spark electrode.

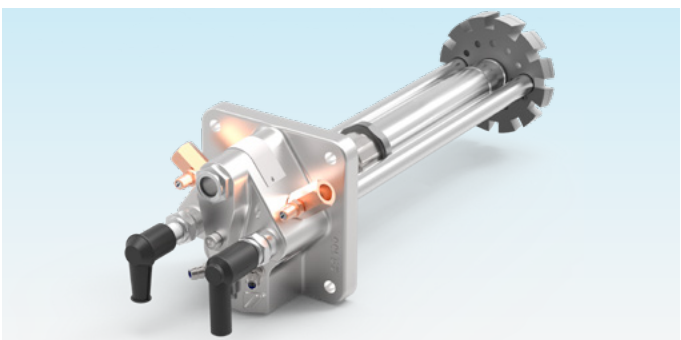
3.2.2 Heat-resistant, with purged electrodes



Burner insert BIC with purged electrodes

A heat-resistant version is available for burners with hot air up to 450°C, minimum cooling air and a maximum turndown. This version is characterized by a burner head made of heat-resistant steel, electrodes with an air connection and integrated flow adjustment

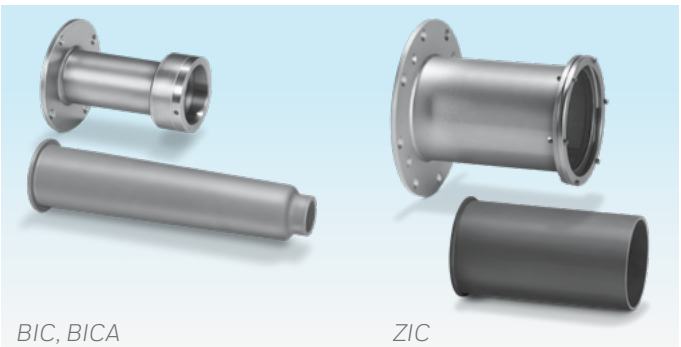
3.2.3 High temperature version



Burner insert BIC for high temperature version

A high temperature version (HT version) is available for burners with hot air up to 600°C. This version is also characterized by a burner head made of heat-resistant steel and electrodes with an air connection. Compared to the heat-resistant version, among other things, the HT version has no integrated flow adjustment.

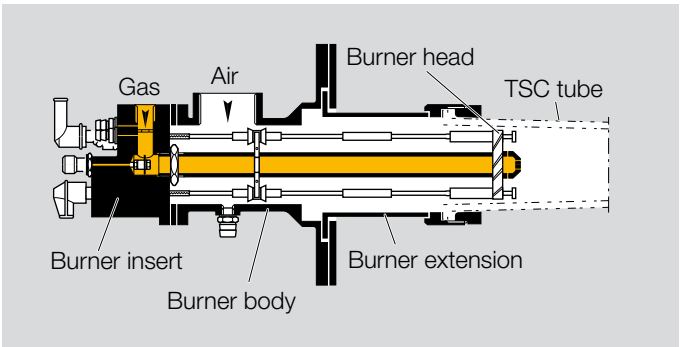
3.3 Ceramic tube set TSC and burner extension

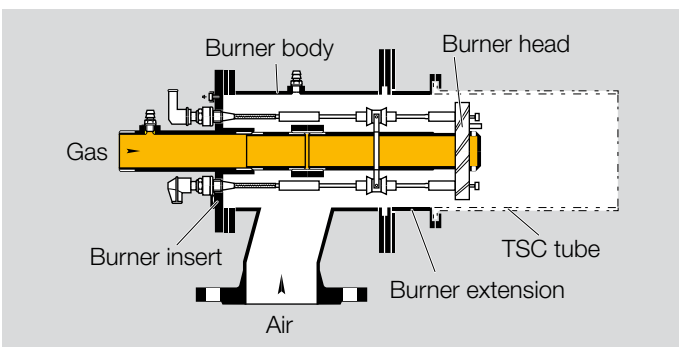


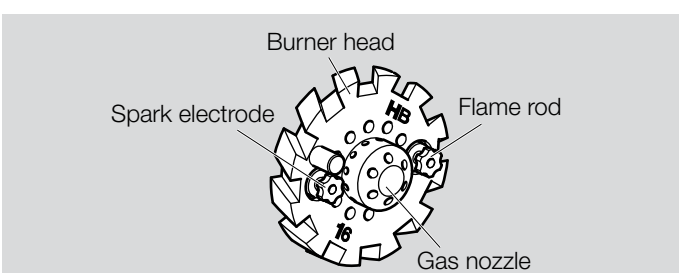
BIC, BICA *ZIC*

A SiC ceramic tube, lightweight in design, serves as combustion chamber. The ceramic tube ensures complete combustion so that no burner block is required. The ceramic tube is not supplied with the burner and must be ordered separately.

The burner length can be adjusted perfectly to the furnace wall thickness using the burner extension.







4 Function

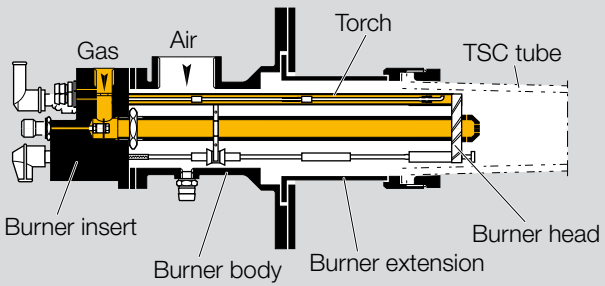
4.1 Burners with spark electrode

The burner control unit opens the gas and air control valves. Gas flows through the gas connection flange and air flows through the burner body as far as the nozzle-mixing burner head.

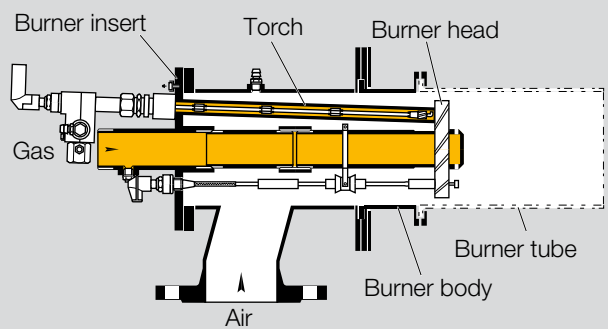
The combustible gas/air mixture is produced downstream of the burner head. Slots and holes in the air disc vary the angle of twist of the combustion air and determine the flame shape. Depending on the gas type, the geometry of the gas nozzle varies.

The gas/air mixture is electrically ignited directly by a spark electrode or a torch. A flame forms which is monitored using a flame rod or optionally using a UV sensor.

The required flame velocity and burner capacity are achieved by combining the burner with an appropriately shaped ceramic tube.



BIC



ZIC

4.2 Burners with integrated torch

In the case of ignition with a torch, the pilot burner is supplied with gas and air before the main burner starts. The gas/air mixture is electrically ignited directly by the torch electrode and is then monitored by this electrode using ionization control.

Once the torch has been successfully ignited, the main burner is ignited via the torch.

5 Selection

As far as the capacity data are concerned, it should be noted that the capacities in kW and the energy densities in kWh/m³ relate to the lower heating value H_u. Capacities quoted in BTU/h and energy densities in BTU/scf Relate to the higher heating value H_o.

Units	relative to
kW	Lower heating value H_u
kWh/m³	Lower heating value H_u
BTU/h	Higher heating value H_u
BTU/scf	Higher heating value H_u

5.1 Burner type

Type	Body material	Air temperature	
		°C	°F
BICA	AlSi	< 200	< 392
BIC	Cast steel	< 450	< 842
ZIC	St	< 450	< 842
BICW	St with internal insulation	< 600	< 1112
ZICW	St with internal insulation	< 600	< 1112

5.2 Burner size

Burner size	Available with capacity*	
	kW	10^3 BTU/h
50	15, 30, 35	57, 113, 132
65	15, 25, 50, 60, 70	38, 94, 189, 227, 265
80	90, 105, 120	340, 397, 454
100	130, 160, 180	492, 605, 680
125	200, 230, 260	756, 870, 983
140	270, 320, 360	1021, 1210, 1361
165	550, 630	2080, 2382
200	800, 1000	3026, 3782

* *The rated capacity of the burners depends on the geometry of the ceramic tube, see page 22 (Ceramic tube set TSC made of SiC).*

5.3 Burner head

The choice of burner head depends on the **use**, **gas type** and **variant**.

5.3.1 Use

Use	Burner head code letter	Air temperature		Furnace temperature	
		°C	°F	°C	°F
Cold air	R	< 150	< 302	<1100	<2012
Hot air/high furnace temperature	H	< 500	< 932	< 1450	< 2552
Heat-resistant, with purged electrodes	H(..E)	< 500	< 932	< 1450	< 2552
High temperature version	H(..E)..H	< 600	< 112	< 1450	< 2552

The choice of burner head depends, among other things, on the air temperature, the furnace chamber temperature and the resulting minimum low-fire rate, see page 27 (Minimum low-fire rate). The required purge/cooling air when switched off depends on the furnace chamber temperature and the burner head, see page 28 (Purge air/cooling air).

5.3.2 Gas type

For operation with changing gas types, see page 26 (Operation with changing gas types).

Gas type	Code letter	Heating value range		Density ρ	
		kWh/m³(n)	BTU/scf	kg/m³	lb/scf
Natural gas L and H quality	B	8 – 12	810 – 1215	0.7 – 0.9	0.041 – 0.053
Propane, propane/butane, butane	M	25 – 35	2480 – 3472	2.0 – 2.7	0.118 – 0.159
Propane, propane/butane, butane	G[1)]	25 – 35	2560 – 3474	2.0 – 2.7	0.118 – 0.159
Coke oven gas, town gas	D	4 – 5	413 – 517	0.4 – 0.6	0.024 – 0.035
Low calorific value gas	L[2)]	< 3	< 288	< 1.15	< 0.068
Biogas	F[3)]	4.5 – 6.5	456 – 660	1.4 – 1.16	0.083 – 0.069

1) *For λ < 0.9 or when using the BIC 50.*
2) *Heating value range < 1.7 on request.*
3) *Only with reduced capacity and with R burner head for composition of the fuel gas CH_4 = 45% – 65%, remaining component CO_2 or N_2.*
Suitable burner sizes on request.

Low calorific value gas

Low calorific value gases have a heating value of less than 3 kWh/m³ (less than 288 BTU/scf). The fuel gas composition must be checked in advance. Operation with low calorific value gas is only possible using H burner heads. The capacity of the burner heads for low calorific value gas is reduced.

The recommended maximum outlet velocity of the ceramic tubes TSC is 80 m/s. On versions with integrated torch, it should be noted that the torch cannot be operated with low calorific value gas.

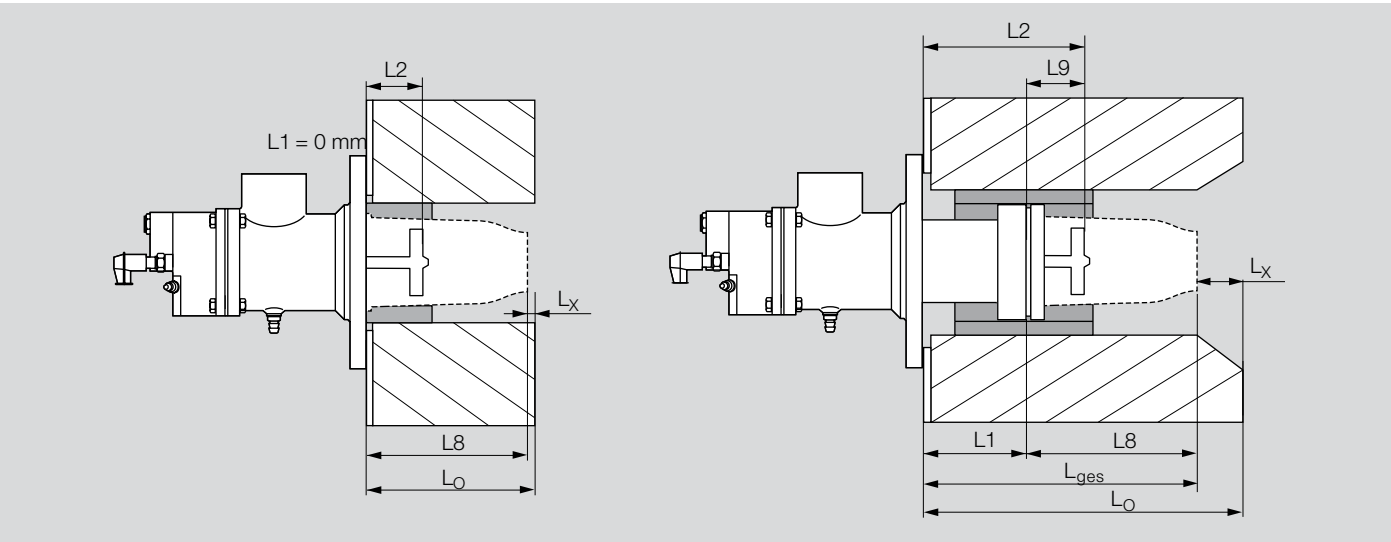
Burner*	Rated capacity		Ceramic tube
	kW[1)]	10³ BTU/h[2)]	
BIC 65HLR	45	170	TSC 65B033
BIC 80HLR	75	284	TSC 80B040
BIC 100HLR	115	435	TSC 100B050
BIC 125HLR	160	605	TSC 125B066
BIC 140HLR	225	851	TSC 140B070
ZIC 165HLR	315	1075	TSC 165A154

** Other sizes on request.*

5.3.3 Variant

Variant	Code letter	Feature
Integrated torch	L	Capacity of the torch approx. 1.5 kW (5670 BTU/h). The gas type for the torch is automatically defined by the selection of the gas type for the burner head (low calorific value gas and biogas not possible). Size BIC 50 cannot be fitted with an integrated torch.
Reduced capacity	R	In conjunction with low calorific value gas and biogas. Restricted choice of ceramic tubes and reduced rated capacities.

5.4 Burner length for horizontal installation



The burner length is to be selected so as to ensure that the opening of the TSC tube is flush with the interior furnace wall ($L_X = 0$). The opening may not be more than 50 mm (1.97 inch) back from the surface of the interior furnace wall ($L_X \leq 50$ mm (1.97 inch)). Provided that mechanical damage to the TSC tube can be excluded (due to moving parts in the furnace, for example), the TSC tube may also protrude into the furnace chamber. The burner head should always be surrounded by the furnace insulation. The shortest burner installation length is equal to the length of the ceramic tube. It can be extended with steel extensions in increments of 100 mm.

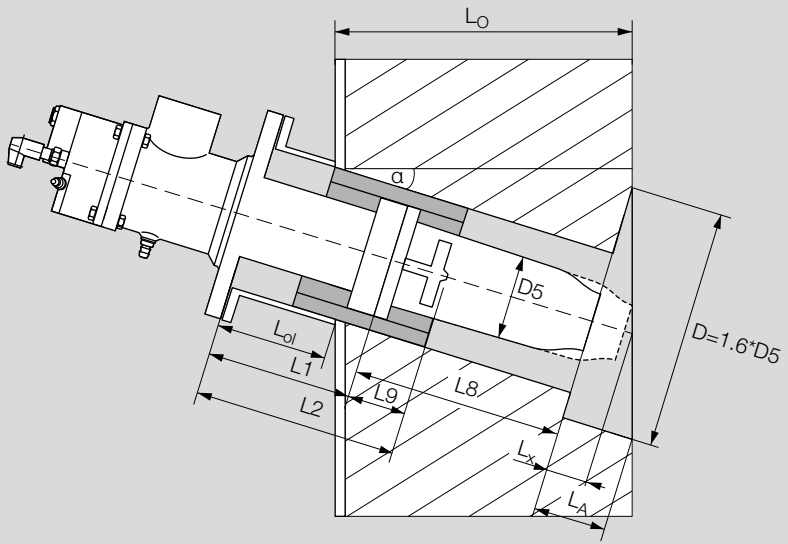
Legend

L1 = Length of steel extension
L2 = Position of burner head
L8 = Length of TSC tube,
see page 22 (Ceramic tube set TSC made of SiC)
L9 = Position of burner head in TSC tube
L_O = Furnace wall thickness
$L_X \leq 50$ mm
L_{ges} = Total length ($L_O - L_X$)

Calculating the steel extension

see Adlatus

5.5 Burner length for installation at an angle



Legend

L1 = Length of steel extension

L2 = Position of burner head

L8 = Length of TSC tube, see page 22 (Ceramic tube set TSC made of SiC)

D5 = Diameter of TSC tube

L9 = Position of burner head in TSC tube

L_o = Furnace wall thickness

L_{ol} = Length of furnace extension

L_x ≤ 50 mm

Ideally, the burner length is to be selected so as to ensure that the opening of the TSC tube is in the interior furnace wall.

The distance L_X between the opening and the interior furnace wall must be max. 50 mm (1.97 inch). If the distance is L_X = 0 mm, the opening of the TSC tube will extend into the furnace chamber. Provided that mechanical damage to the TSC tube can be excluded (due to moving parts in the furnace, for example), the TSC tube may also protrude into the furnace chamber. The burner head should always be surrounded by the furnace insulation.

The burner installation length can be extended with steel extensions in increments of 100 mm.

Calculating the steel extension

see Adlatus

5.6 High temperature version

Special burner bodies and burner inserts are available for high temperature applications for sizes 65 – 200, see page 9 (Mechanical construction). These versions are available for natural gas, LPG and coke oven gas.

The high temperature versions can be identified by the code letter “H” at the end of the burner type code.

5.7 Selection table

Burner

	W	Burner size	R	H	B	G	M	D	L	F	L	R*	-0 …	/35 – …	(1) – (199E)	D – F	HT
BIC		50	●	●	●	●		●	○	○		○	●	●	●	●	
BICA		65	●	●	●	○	●	●	○	○		○	●	●	●	●	
BIC	○	65	●	●	●	○	●	●	○	○	○	○	●	●	●	●	○
BIC	○	80	●	●	●	○	●	●	○	○	○	○	●	●	●	●	○
BIC	○	100	●	●	●	○	●	●	○	○	○	○	●	●	●	●	○
BIC	○	125	●	●	●	○	●	●	○	○	○	○	●	●	●	●	○
BIC	○	140	●	●	●	○	●	●	○	○	○	○	●	●	●	●	○
ZIC	○	165	●	●	●	○	●	●	○	○	○	○	●	●	●	●	○
ZIC	○	200	●	●	●	○	●	●	○	○	○	○	●	●	●	●	○

● = *standard*, ○ = *available*
* *For gas types L and F only*

Order example

BIC 80HB-0/35-(16)F

Burner type

Furnace temperature		< 1100°C	< 1100°C	< 1450°C	< 1450°C	< 1450°C
Combustion air temperature		< 150°C	< 200°C	< 450°C	< 500°C	< 600°C
Burner head code letter		R	H			
Type	Size					
BICA	65	◆	◆			
BIC	50 – 200	◆	◆	◆		
BIC..(..E)	65 – 200		◆	◆		
BICW	65 – 200		◆	◆	◆	
BICW..(..E)H	65 – 200		◆	◆	◆	◆

◆ = *Modulating control*, ◇ = *Limited turndown*
standard, *available*

5.7.1 Burner type code

Code	Description
BIC BICA BICW ZIC ZICW	Burner for gas Burner for gas with aluminium body Burner for gas with internal insulation Burner for gas Burner for gas with internal insulation
50 – 200	Burner size
R H	Use: cold air hot air/high furnace temperature
B G M D L F	Gas type: natural gas propane, propane/butane, butane propane, propane/butane, butane (with mixer) coke oven gas, town gas low calorific value gas biogas
L R	Versions: with torch with reduced maximum capacity (for gas types L and F only)
-0 -100 -200 ...	Length of burner extension (L1) [mm]
/35- /135- /235- ...	Position of burner head (L2) [mm]
-(1) – (199) -(1E) – (199E)	Burner head identifier Heat-resistant version
D – Z	Construction stage
H	High temperature version

5.8 Ceramic tube set TSC made of SiC

Burner size	Burner capacity	Shape	Outlet dia. D4*	D5	Length L8* [mm]				Position of burner head L9* [mm]	
	[kW]		[mm]	[mm]	200	250	300	350	/35-	/135-
50	15	B	20	55	–	–	●	–	–	●
50	30	B	28	55	–	–	●	–	●	○
50	35	A	35	55	–	–	●	–	●	–
65	50	B	33	68	●	–	●	–	●	–
65	60	B	40	68	●	–	●	–	●	–
65	70	A	48	68	●	–	●	–	●	–
80	90	B	40	87	–	○	●	–	●	–
80	105	B	50	87	–	○	●	–	●	–
80	105	L	50	87	–	–	●	–	●	–
80	120	A	64	87	–	○	●	–	●	–
100	130	B	50	104	–	○	●	–	●	–
100	160	B	65	104	–	○	●	–	●	–
100	180	A	82	104	–	○	●	–	●	–
125	200	B	66	127	–	–	●	–	●	–
125	230	B	75	127	–	–	●	–	●	–
125	230	L	75	127	–	–	–	●	●	–
125	260	A	100	127	–	–	●	–	●	–
140	270	B	70	142	–	–	●	–	●	–
140	320	B	85	142	–	–	●	–	●	–
140	360	A	120	142	–	–	●	–	●	–
165	550	B	120	168	–	–	●	–	●	–
165	630	A	154	168	–	–	●	–	●	–
200	800	B	145	197	–	–	●	–	●	–
200	1000	A	180	197	–	–	●	–	●	–

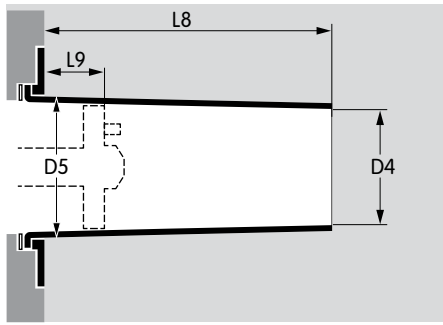
● = *standard*, ○ = *available*

* *Required length, see page 17 (Burner length for horizontal installation).*

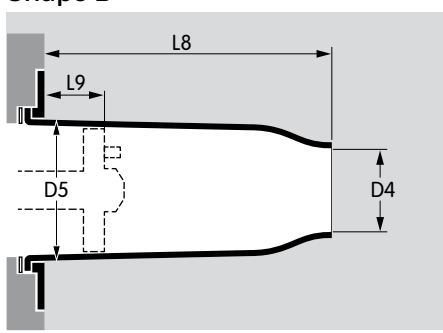
Example

TSC 65A048-300/35-Si-1500

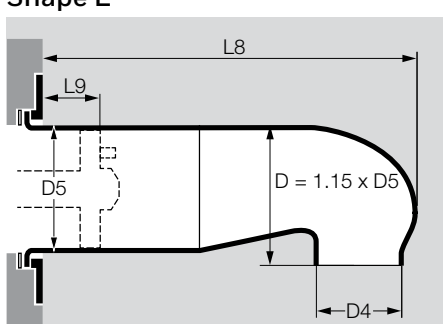
Shape A



Shape B



Shape L

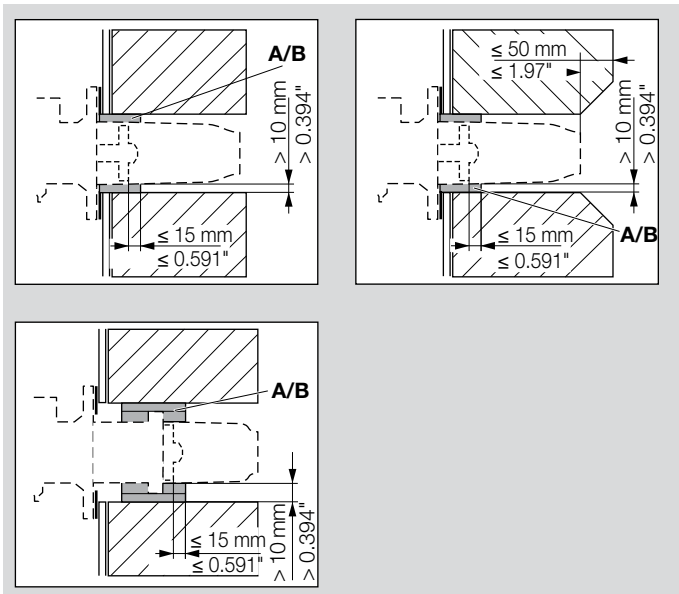


5.8.1 Ceramic tube set TSC type code

Code	Description
TSC	Ceramic tube set
50 – 200	Designed for burner size
A B L	Shape: cylindrical closed cone curved
020, 025, 028, 033, 035, 040, 048, 050, 064, 065, 066, 070, 075, 085, 100, 120, 154, 180	Outlet dia. [µµ]
–200, –250, –300, –350	Tube length (L8) [mm]
/35– /135–	Position of burner head (L9) [mm]
Si-1500	Ceramic tube material

6 Project planning information

6.1 Installation



Installation position as required.

Gas and air connection: can be rotated in 90° steps. Install flexible tubes or bellows units to prevent mechanical stress or vibrations.

Insulate the TSC tube and burner extension as shown. Use high temperature resistant shaped parts **A** or high temperature resistant ceramic fibrous material **B** for insulation. The TSC tube may be insulated to max. 15 mm (0.591 inch) downstream of the burner head – beyond this point, the insulating material must not come into contact with the TSC tube in the flame formation area. Allow a gap of at least 10 mm (0.394 inch) around the TSC tube.

6.2 Ignition

6.2.1 Ignition with reduced capacity

The burners can be ignited near-stoichiometrically within a range of 10% – 40% of the rated capacity. Exceptions are noted in the operating characteristic diagram, see www.docuthek.com (registration required).

6.2.2 Ignition with defined pilot rate

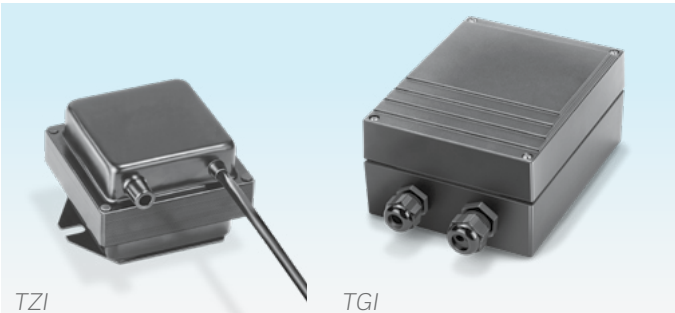
If a defined air volume is required for ignition, the burners can be ignited via the pneumatic ratio control system. As an alternative to the pneumatic ratio control system, the gas volume can be released by a bypass valve.

6.2.3 Ignition without defined pilot rate

(flying burner start/ignition against the opening valves)

The burner can be ignited in the interim period while the air control valve is opening fully. Either slow opening air and gas valves or a slow opening air valve in a pneumatic ratio control system must be used for this purpose.

6.3 Recommended ignition transformer



TZI TGI

We recommend ignition transformers TZI or TGI with a voltage of > 7.5 kV and an output current of > 12 mA for the burners.

An ignition voltage of 5 kV for the torch is recommended.

6.4 Non-return gas valve

Non-return gas valves are not required, since the burners are of the nozzle-mixing type.

6.5 Flame control

The burners BIC/ZIC are supplied as standard with a flame rod for flame control.

6.5.1 Burners with UV sensor

As an option, control is possible with a UV sensor (BIC 50 on request only). This replaces the flame rod and is fitted to the same connection on the burner. An installation set is required for this purpose, see page 32 (UV sensor). The burners of sizes 65 to 100 also require a viewing duct which is included in the installation set (for modification instructions, see www.docuthek.com/registration required). If the burners are ordered with an installed UV sensor, the various items must be ordered in a group.

6.5.2 Burners with torch

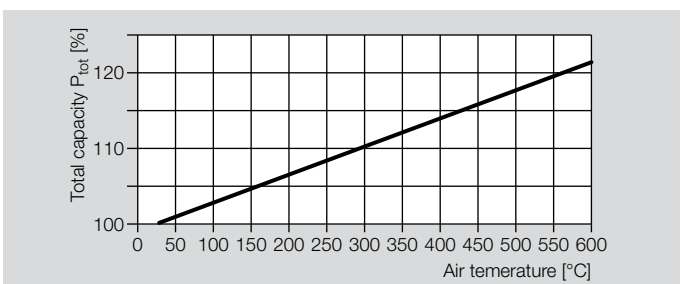
Burners with an integrated torch have two electrodes for flame control. One of them is used to ignite and monitor the pilot flame. The other electrode is designed for monitoring the main flame (UV control on request only).

6.6 Operation with changing gas types

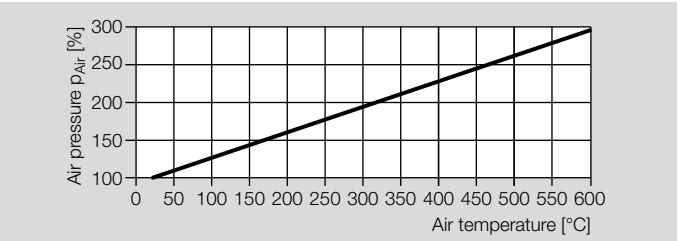
Burners for natural gas with an H burner head can also be operated with pure propane. The turndown of the burner is then around 1:3. Operation with a mixture of propane and air (the same Wobbe index as natural gas) is also possible. Turndown is around 1:5. The low-fire rate must be adjusted with excess air to prevent soot formation.

6.7 Hot air operating mode

The total input into the process in hot air operating mode is calculated from the total gas capacity and the energy content of the hot air. The diagram shows the relative total capacity as a function of the air temperature. Operating the burners at rated capacity is also possible using hot air.



For applications with air preheating via a central recuperator, hot air compensation is performed by changing the air pressure depending on the air temperature. The air pressure is increased as the air temperature rises in order to keep the air index λ constant.



As the air temperature increases in flame mode, the flame counterpressure in the ceramic tube TSC also increases. At a constant gas pressure on the burner, the gas volume decreases (reduction < 5%) as the air temperature increases. Accordingly, the air pressure must be increased less than at a constant gas volume.

6.8 Chemical resistance of the ceramic tube TSC

In atmospheres containing alkalis (e.g. sodium or potassium compounds), the ceramic tube is subject to increased wear. This means that ceramic material is eroded. Even low concentrations in the furnace atmosphere result in alkali accumulation on the ceramic material.

Ceramic materials should not be used when melting aluminium.

6.9 Household and sanitary ceramics (whiteware)

Special versions are available for using the BIC in kilns for household and sanitary ceramics. These versions are characterized by a burner head made of heat-resistant steel and a body with special corrosion protection (nickel-plated).

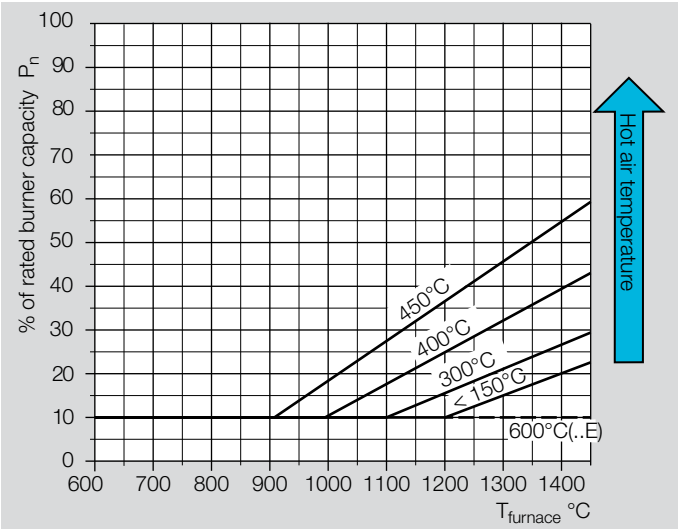
6.10 Extended burner head identifier

The following special burner heads are available on request for special applications:

Code letter	Special version
A	Heat-resistant
B	Sulphur-resistant
D	Electrodes with air connection
E	Heat-resistant, with purged electrodes

The version of the burner head is indicated in the type code after the burner head identifier: -(1A) – (199E).

6.11 Minimum low-fire rate



To avoid thermal overload of the burner head, a minimum low-fire rate is recommended, depending on the hot air and furnace temperature, see diagram.

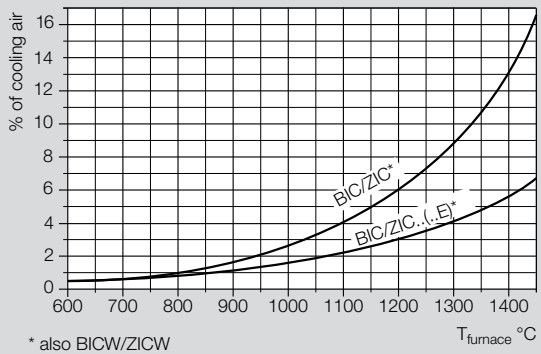
In the heat-resistant and high temperature version, the minimum low-fire rate is reduced to 10% of the rated burner capacity up to a maximum furnace temperature of 1450°C.

On burner heads with the code letter “R”, an extremely high turndown of > 1:30 can be achieved if they are operated at low-fire rate with excess air (lambda > 3) (size 50 on request).

When the burner is switched off, the air volume at low-fire rate is more than sufficient to cool the burner.

Calculating the low-fire rate
see Adlatus

6.12 Purge air/cooling air



While the burner is switched off and depending on the furnace temperature, there must be a certain air flow in order to ensure safe ignition and monitoring of the burners, and for cooling the burner components.

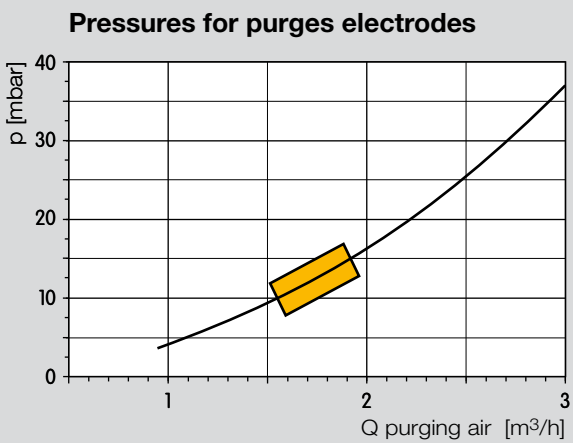
The cooling air percentage specified in the diagram refers to the operating flow rate for air.

Example: BIC, ZIC
If 1000 m_N^3/h of combustion air is required at rated capacity and if the furnace is at a temperature of 1200°C, 60 m^3/h of cooling air is required to cool the switched-off burner if the air temperature is 20°C, or 147 m^3/h if the air temperature is 450°C. The air fan must remain switched on until the furnace has cooled down completely.

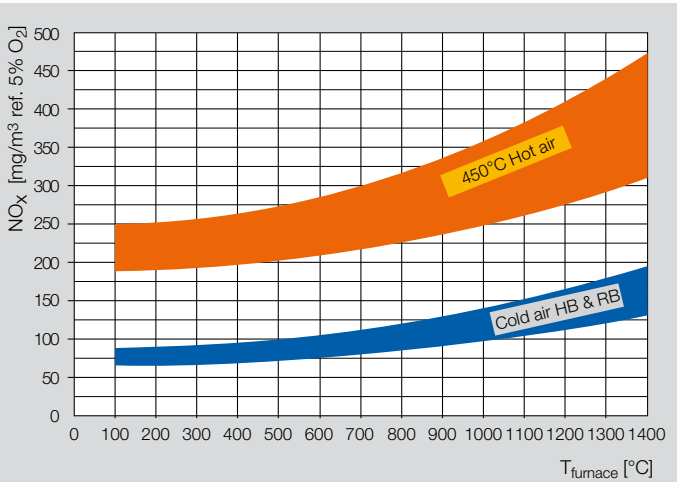
Calculating the purge/cooling air
see Adlatus

6.12.1 Electrodes with air connection

The purged electrodes in high temperature version burners must be operated with a purge air volume of approx. 1.5 to 2.0 m³/h per electrode. This corresponds to a pressure of 10 to 15 mbar (3.94 to 5.91 "WC). The purge air may not be switched off until the furnace is cold and formation of condensation is no longer possible.



6.13 Emissions

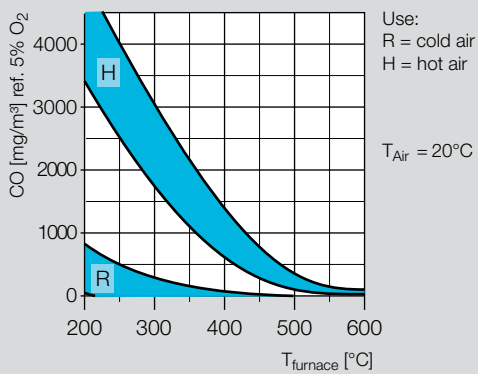


The NOx ranges shown apply to all burners BIC/ZIC at rated capacity (near-stoichiometric, operation with natural gas), regardless of the TSC combination. Precise values on request since the NOx formation is influenced by the temperature, burner head, combustion chamber, furnace chamber, λ value and capacity.

Emissions for cold air operating mode are below the limit values stipulated by the German Clean Air Directive.

If operated with LPG, NOx values are approx. 25% higher.

Values for operation with hot air of 450°C – 600°C or other fuel gases are available on request.



The CO ranges shown indicate the maximum emissions for a cold start (rated capacity, near-stoichiometric) and are significantly increased compared to normal operation. Precise values on request since the CO formation is influenced by the temperature, burner head, combustion chamber, control type, furnace chamber, λ value and capacity.

6.14 Gas line connection

We recommend the following to ensure optimum flow and to avoid incorrect measurements and burner operation with excess gas:

– Do not screw the manual valve directly into the burner.

To ensure an accurate measurement of the pressure differential on the integrated gas measuring orifice for the burner BIC/BICA (size 65 – 140), the following applies to the design of the gas connection:

– Ensure undisturbed flow to the gas connection on the burner inlet for a distance of ≥ 5 × DN.
– Use a bellows unit with the same nominal as the gas connection on the burner.
– Use a pipe elbow up to an angle of 90° with the same nominal as the gas connection on the burner.
– Only use reducing nipples with an external thread at both ends in order to reduce the nominal diameter on the burner (e.g. from 1" to ¾").

6.15 Air line connection

Ensure there is a bellows unit and an air adjusting cock upstream of the burner. It is recommended to install a measuring orifice FLS to determine the air flow rate.

6.16 Gaskets for higher connection pressures

The standard gaskets for the burners are suitable for a connection pressure of up to max. 100 mbar (gas and air).

Special gaskets are available on request for higher connection pressures of up to max. 500 mbar.

6.17 Condition on delivery

Gas and air connections are fitted opposite one another at the factory.

6.18 Intermittent operation

Note the opening and closing times of the control elements when determining the cycle times. Unnecessarily high numbers of operating cycles should be avoided.

6.19 Build up of noise

The noise volume of a burner in the open air is approx. 95 dBA at a distance of 1 m from the burner tube end (measured at an angle of < 45° to the flame).

If the burner is installed in a furnace, the noise volume is greatly reduced by the furnace insulation (with a 300 mm (11.8") fibre lining, the noise volume is approx. 75 dBA).

6.20 Installation in a humid environment

The burners can be installed in a humid environment. It must be noted that the paint-coated burner body may rust in a humid environment. The corrosion will not affect the function of the burners. We recommend the application of an anti-corrosion coating in a humid environment to prevent corrosion.

6.21 Heat guard

During operation, the burner body can reach surface temperatures of over 80°C. We recommend that warning signs and a contact guard be fitted, for example made of perforated sheet metal.

7 Accessories

7.1 NPT adapter set

7.1.1 Burner connections



BIC 50–100 **BICA 65** **BIC 125–140**
ZIC 165, 200

For connecting BIC and BICA burners to NPT/ANSI connections.

Burner	Adapter set	Gas connection	Air connection	Order No.
BIC 50	BR 50 NPT	½" – 14 NPT	1½ – 11.5 NPT	74922630
BIC 65	BR 65 NPT	¾" – 14 NPT	1½ – 11.5 NPT	74922631
BICA 65*	–	½" – 14 NPT	∅ 1.89"	75456281
BIC 80	BR 80 NPT	¾" – 14 NPT	2 – 11.5 NPT	74922632
BIC 100	BR 100 NPT	1" – 11.5 NPT	2 – 11.5 NPT	74922633
BIC 125	BR 125 NPT	1½" – 11.5 NPT	∅ 2,94"	74922634
BIC 140	BR 140 NPT	1½" – 11.5 NPT	∅ 3,57"	74922635
ZIC 165	BR 165 NPT	1½" – 11.5 NPT	∅ 4,57"	74922636
ZIC 200	BR 200 NPT	2" – 11.5 NPT	∅ 6,72"	74922637

* *An NPT thread adapter is required for connection to the gas circuit only.*

Adapter set for BICW and ZICW available on request.

7.1.2 Integrated torch connections

Nozzle set BR 65 – 140 with NPT thread is required for integrated torches (sizes 165 and 200 on request).

Gas type	Order No.
Natural gas	74922638
LPG	74922639

7.2 Ceramic paste

For avoiding cold-setting on screw connections after replacing burner components.

Order No.: 050120009.

7.3 UV sensor



UVS 10 *UVC*

For monitoring gas burners in conjunction with flame detectors or automatic burner control units.

An installation set is required for installing the UV sensor on a burner BIC, BICA or ZIC (on request).

UV sensor and installation set supplied on request.

7.4 Gasket sets for reverse flow pressure

For reverse flow pressures of 100 mbar < p < 500 mbar.

"Gasket set BR XY 500 mbar" contains a mounting gasket, a gas housing gasket and a burner tube gasket made of pressure-resistant gasket material. The standard gaskets must be replaced with the gaskets from the gasket set for reverse flow pressure. The gasket sets are available on request.

8 Technical data

Gas supply pressure and air supply pressure each depend on the use and gas type
(gas and air pressures: see burner diagrams at www.docuthek.com, Type of document: Flow rate curve).
Special gaskets are available on request for connection pressures of > 100 mbar (39.4 "WC) (e.g. reverse flow pressure in the furnace).

Gas types: natural gas, LPG (gaseous), coke oven gas, town gas, low calorific value gas and biogas; other types of gas on request.

Combustion air: the air must be dry and clean in all temperature conditions and must not contain condensate.

Overall lengths:

0 to 400 mm (0 to 15.7"),
100 mm (3.94") length increments
(other lengths available on request).

Control type:
staged: On/Off,
modulating: constant λ value.

Control: with flame rod; UV control as an option.

Ignition: direct spark ignition; torch as an option.

Burner body:
BIC: cast steel,
BICA: AlSi,
ZIC: St,
BICW: St + internal insulation,
ZICW: St + internal insulation.
Most of the burner components are made of corrosion-resistant stainless steel.

Ambient conditions: -20°C to +180°C (-4°F to +356°F) (outside the thermoprocessing system); no condensation permitted, painted surfaces may corrode.

Max. furnace temperature: 1450°C (2642°F).

Hot air:
BIC and ZIC: max. 450°C (842°F),
BICA: max. 200°C (392°F),
BICW, ZICW: max. 600°C (1112°F).

Flame outlet velocity: medium to high.

The flame diameter is one to two times that of the burner tube outlet diameter.

REACH Regulation

Applies to BICW and ZICW only.

Information pursuant to REACH Regulation No. 1907/2006, Article 33:
Insulation contains refractory ceramic fibres (RCF)/aluminium silicate wool (ASW).
RCF/ASW are listed in the Candidate List of the European REACH Regulation No. 1907/2006.

Burner	Ceramic tube	Rated capacity[1]		Code letter/Use	Visible flame length[2]		Outlet velocity[3]	
		kW	10^3 BTU/h		cm	inch	m/s	ft/s
BIC 50	B020	15	56.7	H	22	8.66	100	328
BIC 50	B028	30	113.4	R	25	9.84	110	361
BIC 50	B028	30	113.4	H	32	12.6	100	328
BIC 50	A035	35	132.4	R	30	11.8	80	262
BIC 50	A035	35	132.4	H	36	14.2	75	246
BIC(A) 65	B033	50	189.1	R	22	8.66	130	427
BIC(A) 65	B033	50	189.1	H	27	10.6	120	394
BIC(A) 65	B040	60	226.9	R	25	9.84	105	344
BIC(A) 65	B040	60	226.9	H	33	13	100	328
BIC(A) 65	A048	70	264.7	R	30	11.8	85	279
BIC(A) 65	A048	70	264.7	H	40	15.7	80	262
BIC 80	B040	90	340.3	R	35	13.8	155	509
BIC 80	B040	90	340.3	H	45	17.7	150	492
BIC 80	B050	105	397.1	R	40	15.7	120	394
BIC 80	B050	105	397.1	H	50	19.7	110	361
BIC 80	A064	120	453.8	R	45	17.7	80	262
BIC 80	A064	120	453.8	H	60	23.6	70	230
BIC 100	B050	130	491.6	R	40	15.7	140	459
BIC 100	B050	130	491.6	H	65	25.6	130	427
BIC 100	B065	160	605.1	R	45	17.7	105	344
BIC 100	B065	160	605.1	H	60	23.6	100	328
BIC 100	A082	180	680.7	R	50	19.7	75	246
BIC 100	A082	180	680.7	H	65	25.6	70	230
BIC 125	B066	200	756.3	R	50	19.7	130	427
BIC 125	B066	200	756.3	H	70	27.6	120	394

1) *Capacities in kW refer to the lower heating value H_u and capacities in BTU/h refer to the higher heating value H_o (calorific value).*
2) *Measured from ceramic tube opening at rated capacity in the open air for natural gas, $\lambda = 1.05$.*
3) *Based on rated capacity, calculated using the flame temperature: 1600°C = type "R" flame shape, 1500°C = type "H" flame shape.*

Burner	Ceramic tube	Rated capacity[1)]		Code letter/Use	Visible flame length[2)]		Outlet velocity[3)]	
		kW	10^3 BTU/h		cm	inch	m/s	ft/s
BIC 125	B075	230	869.8	R	60	23.6	115	377
BIC 125	B075	230	869.8	H	80	31.5	110	361
BIC 125	A100	260	983.2	R	70	27.6	75	246
BIC 125	A100	260	983.2	H	100	39.4	70	230
BIC 140	B070	270	1021	R	40	15.7	155	509
BIC 140	B070	270	1021	H	60	23.6	145	476
BIC 140	B085	320	1210	R	60	23.6	125	410
BIC 140	B085	320	1210	H	80	31.5	120	394
BIC 140	A120	360	1361	R	80	31.5	70	230
BIC 140	A120	360	1361	H	90	35.4	65	213
ZIC 165	A154	630	2382	R	100	39.4	70	230
ZIC 165	A154	630	2382	H	160	63	65	213
ZIC 165	B120	550	2080	HB[4)]	40	15.7	95	295
ZIC 200	A180	1000	3782	R	130	51.2	85	279
ZIC 200	A180	1000	3782	H	200	78.7	80	262
ZIC 200	B145	800	3025	HB[4)]	65	25.6	95	295

1) Capacities in kW refer to the lower heating value H_u and capacities in BTU/h refer to the higher heating value H_o (calorific value).

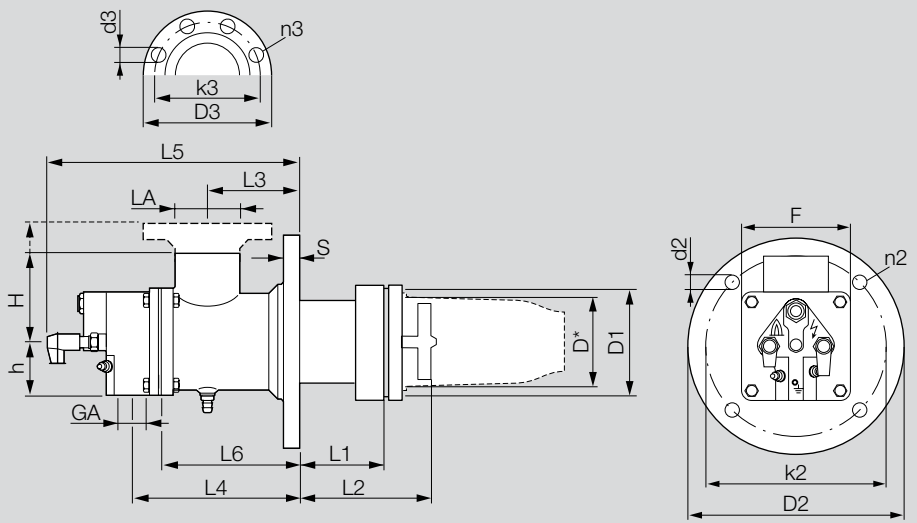
2) Measured from ceramic tube opening at rated capacity and with cold air in the open air for natural gas, $\lambda = 1.05$.

3) Based on rated capacity and cold air, calculated using the flame temperature: 1600°C = type "R" flame shape, 1500°C = type "H" flame shape.

4) For cold air only.

8.1 Dimensions

8.1.1 BIC [mm]

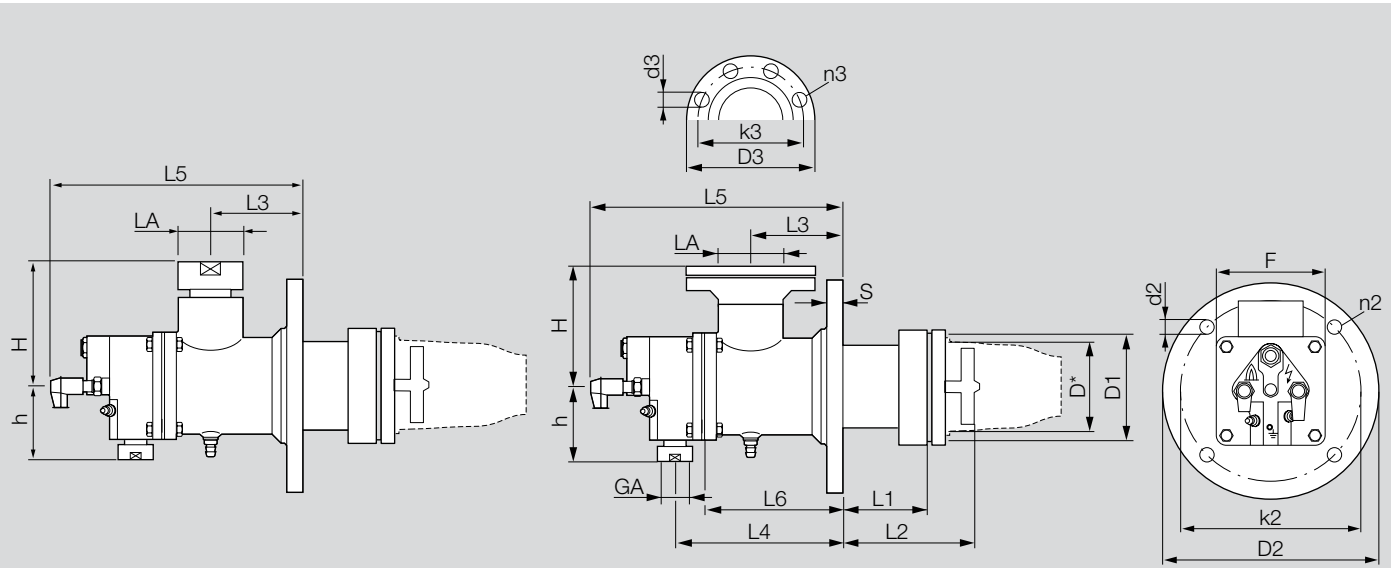


BIC *Standard: L1 = 100, 200, 300, 400 mm and L2 = L1 + 35 mm, see page 17 (Burner length for horizontal installation)*

Type	Connections		Dimensions [mm]																No. of drillings		Weight
	Gas	Air																			
	GA	LA	D	D1	H	h	S	L3	L4	L5	L6	D2	k2	d2	F	D3	k3	d3	n2	n3	[kg]
BIC 50	Rp ½	Rp 1½	55	75	50	38	12	73	149	237	127	181	151	12	75	–	–	–	4	–	5
BIC 65	Rp ¾	Rp 1½	68	90	62	48	12	73	156	244	127	195	165	12	95	–	–	–	4	–	6.6
BIC 80	Rp ¾	Rp 2	87	114	112	55	14	90	172	268	140	240	210	14	110	–	–	–	4	–	10.7
BIC 100	Rp 1	Rp 2	104	125	100	60	16	103	185	284	153	240	200	14	120	–	–	–	4	–	11.7
BIC 125	Rp 1½	DN 65	127	155	135	73	16	120	251	350	212	270	240	14	145	185	145	18	4	4	19.7
BIC 140	Rp 1½	DN 80	142	168	150	80	18	130	271	380	232	300	265	14	160	200	160	18	4	8	26.7

** Shape L: max. 1.15 x D*

8.1.2 BIC [inch]

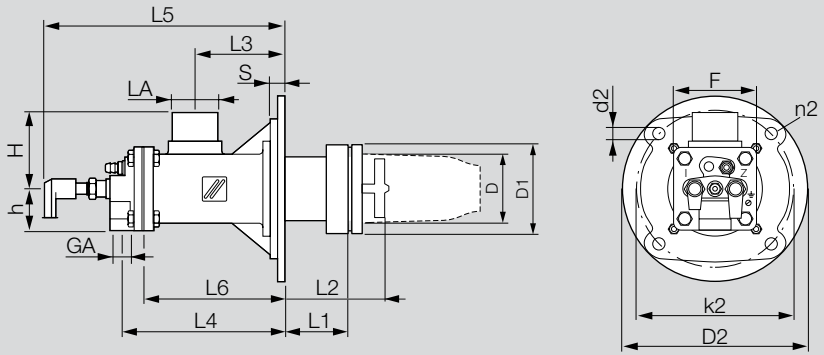


BIC *Standard: L1 = 100, 200, 300, 400 mm and L2 = L1 + 35 mm, see page 17 (Burner length for horizontal installation)*

Type	Connections		Dimensions [inch]																No. of drillings		Weight
	Gas	Air																			
	GA	LA	D	D1	H	h	S	L3	L4	L5	L6	D2	k2	d2	F	D3	k3	d3	n2	n3	[lbs]
BIC 50	½ NPT	1½ NPT	2.17	2.95	3.23	2.46	0.47	2.87	5.87	9.33	5	7.13	5.94	0.47	2.95	–	–	–	4	–	11
BIC 65	¾ NPT	1½ NPT	2.68	3.54	3.7	2.89	0.47	2.87	6.14	9.61	5	7.68	6.5	0.47	3.74	–	–	–	4	–	14.5
BIC 80	¾ NPT	2 NPT	3.43	4.49	5.71	3.19	0.55	3.54	6.77	10.6	5.51	9.45	8.27	0.55	4.33	–	–	–	4	–	23.5
BIC 100	1 NPT	2 NPT	4.09	4.92	5.24	3.5	0.63	4.06	7.28	11.2	6.02	9.45	7.87	0.55	4.72	–	–	–	4	–	25.7
BIC 125	1½ NPT	2½	5	6.1	5.79	4.11	0.63	4.72	9.88	13.8	8.35	10.6	9.45	0.55	5.71	7.28	5.71	0.71	4	4	43.3
BIC 140	1½ NPT	3"	5.59	6.61	6.98	4.41	0.71	5.12	10.7	15	9.13	11.8	10.4	0.55	6.3	7.87	6.3	0.71	4	8	58.7

** Shape L: max. 1.15 x D*

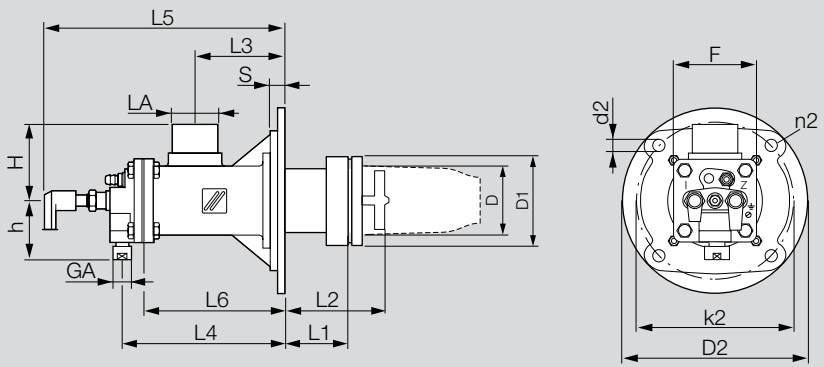
8.1.3 BICA [mm]



BICA *Standard: L1 = 100, 200, 300, 400 mm and L2 = L1 + 35 mm, see page 17 (Burner length for horizontal installation)*

Type	Connections		Dimensions [mm]																No. of drillings		Weight
	Gas	Air																			
	GA	LA	D	D1	H	h	S	L3	L4	L5	L6	D2	k2	d2	F	D3	k3	d3	n2	n3	[kg]
BICA 65	Rp ½	Ø 48	68	90	80	44	16	95	170	253	149	195	165	13	88	–	–	–	4	–	2.7

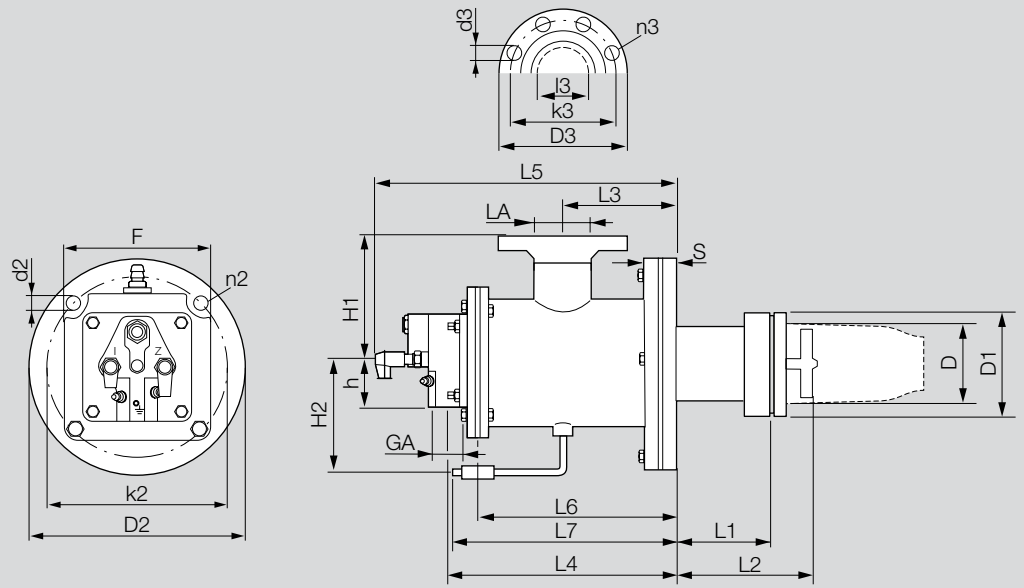
8.1.4 BICA [inch]



BICA *Standard: L1 = 100, 200, 300, 400 mm and L2 = L1 + 35 mm, see page 17 (Burner length for horizontal installation)*

Type	Connections		Dimensions [inch]																No. of drillings		Weight
	Gas	Air																			
	GA	LA	D	D1	H	h	S	L3	L4	L5	L6	D2	k2	d2	F	D3	k3	d3	n2	n3	[lbs]
BICA 65	½ NPT	Ø 1.89	2.68	3.54	3.15	2.72	0.63	3.74	6.69	9.96	5.87	7.68	6.5	0.51	3.46	–	–	–	4	–	5.94

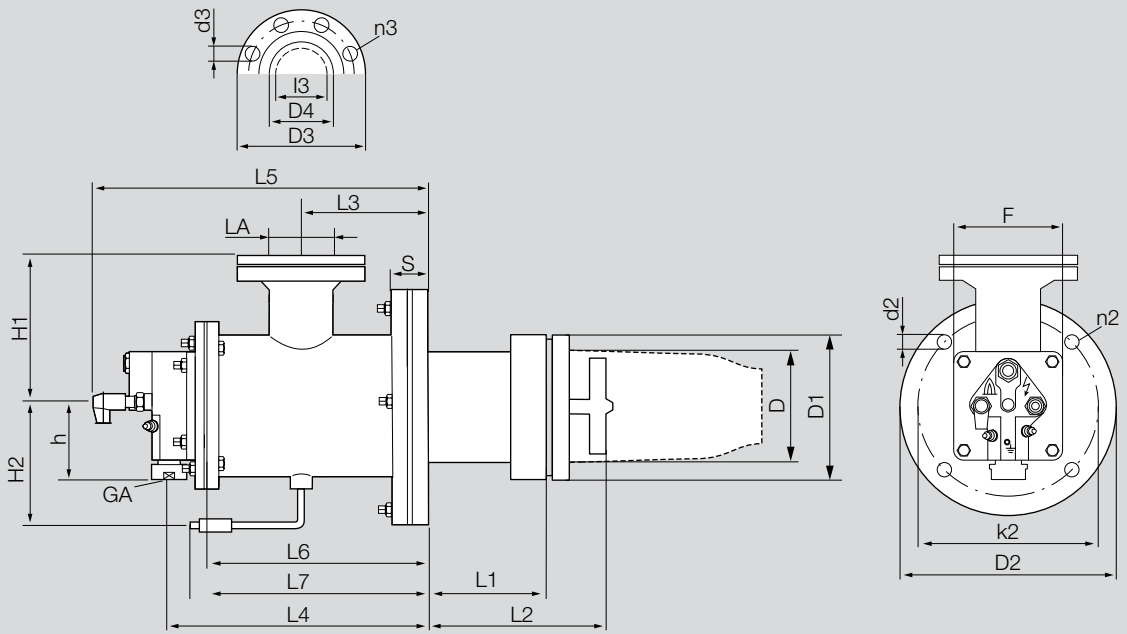
8.1.5 BICW [mm]



BICW *Standard: L1 = 100, 200, 300, 400 mm and L2 = L1 + 35 mm, see page 17 (Burner length for horizontal installation)*

Type	Connections		Dimensions [mm]																			No. of drillings		Weight
	Gas	Air																						
	GA	LA	D	D1	H1	H2	h	S	L3	L4	L5	L6	L7	D2	k2	d2	F	D3	k3	l3	d3	n2	n3	[kg]
BICW 65	Rp ¾	DN 65	68	90	142	93.5	48	22	121.5	256	344	216	283	195	165	12	138	185	145	58	18	4	8	12.3
BICW 80	Rp ¾	DN 80	87	114	152	103	55	22	139	272	368	229	305	240	210	14	156	200	160	70	18	4	8	16.6
BICW 100	Rp 1	DN 80	104	125	152	110	60	22	139	285	382	242	305	240	200	14	172	200	160	70	18	4	8	17.4
BICW 125	Rp 1½	DN 100	127	155	182	123	73	22	170	351	450	299	331	270	240	14	200	220	180	83	18	4	8	23.5
BICW 140	Rp 1½	DN 125	142	168	195	130	80	22	180	371	480	319	341	300	265	14	215	250	210	106	18	4	8	32.3

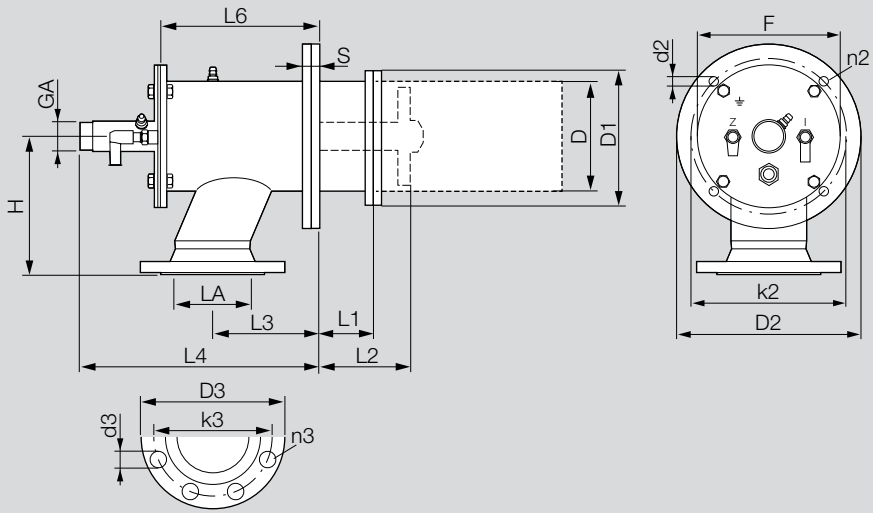
8.1.6 BICW [inch]



BICW *Standard: L1 = 100, 200, 300, 400 mm and L2 = L1 + 35 mm, see page 17 (Burner length for horizontal installation)*

Type	Connections		Dimensions [inch]																			No. of drillings		Weight
	Gas	Air																						
	GA	LA	D	D1	H1	H2	h	S	L3	L4	L5	L6	L7	D2	k2	d2	F	D3	k3	l3	d3	n2	n3	[lbs]
BICW 65	¾ NPT	DN 65	2.68	3.54	6.26	3.68	2.89	0.87	4.78	10.1	13.5	8.5	11.1	7.68	6.5	0.47	5.43	7.28	5.71	2.28	0.71	4	8	27.1
BICW 80	¾ NPT	DN 80	3.43	4.49	6.65	4.06	3.19	0.87	5.47	10.7	14.5	9.02	12	9.45	8.27	0.55	6.14	7.87	6.3	2.76	0.71	4	8	36.5
BICW 100	1 NPT	DN 80	4.09	4.92	6.65	4.33	3.5	0.87	5.47	11.2	15	9.53	12	9.45	7.87	0.55	6.77	7.87	6.3	2.76	0.71	4	8	38.3
BICW 125	1½ NPT	DN 100	5	6.1	7.83	4.84	4.11	0.87	6.69	13.8	17.7	11.8	13	10.6	9.45	0.55	7.87	8.66	7.09	3.27	0.71	4	8	51.7
BICW 140	1½ NPT	DN 125	5.59	6.61	8.34	5.12	4.41	0.87	7.09	14.6	18.9	12.6	13.4	11.8	10.4	0.55	8.46	9.84	8.27	4.17	0.71	4	8	71.1

8.1.7 ZIC [mm]

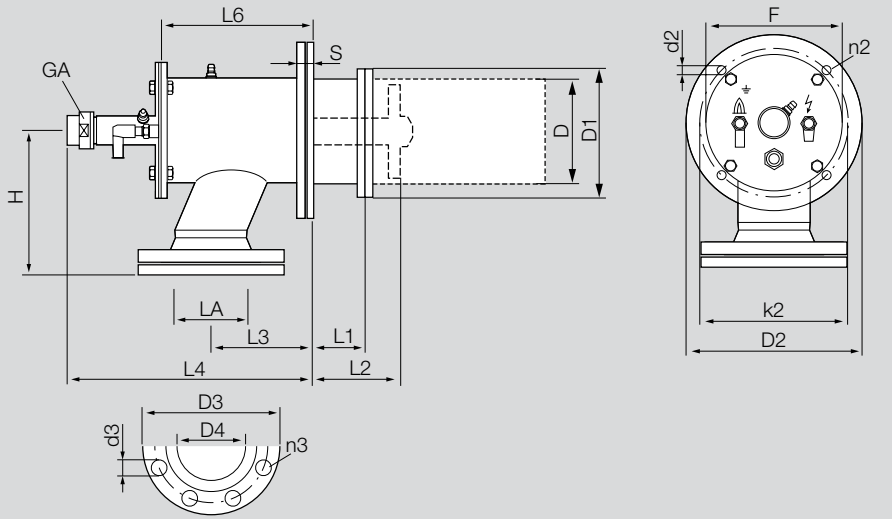


ZIC *Standard: L1 = 100, 200, 300, 400 mm and L2 = L1 + 35 mm, see page 17 (Burner length for horizontal installation)*

Type	Connections		Dimensions [mm]														No. of drillings		Weight*
	Gas	Air																	
	GA	LA	D	D1	H	S	L3	L4	L6	D2	k2	d2	F	D3	k3	d3	n2	n3	[kg]
ZIC 165	R 1½	DN 100	168	202	213	20	150	359	230	285	240	14	∅ 220	220	180	18	4	8	23
ZIC 200	R 2	DN 150	197	237	220	20	220	469	340	330	295	22	∅ 255	285	240	22	8	8	34.6

** Details for the shortest overall length.*

8.1.8 ZIC [inch]

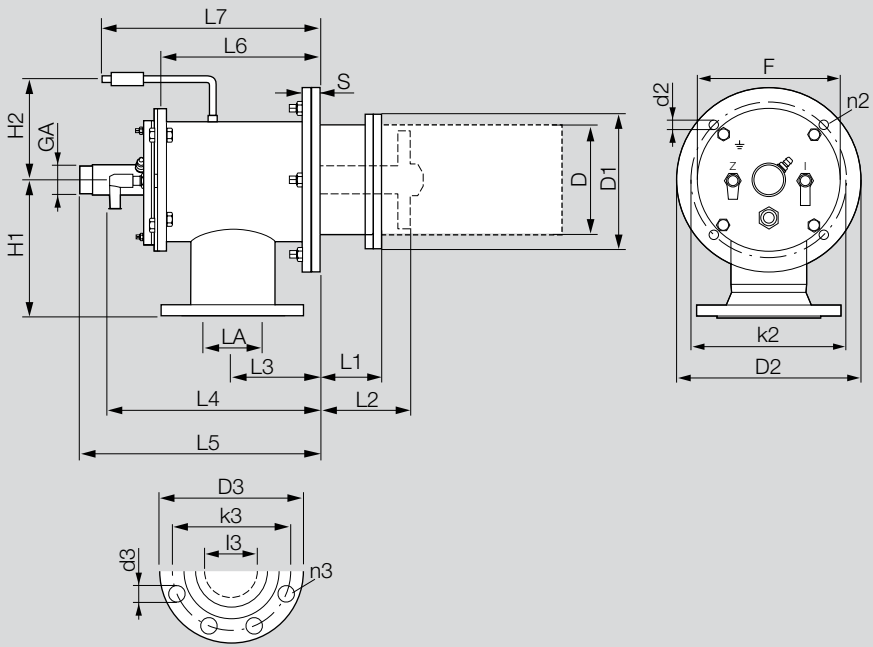


ZIC *Standard: L1 = 100, 200, 300, 400 mm and L2 = L1 + 35 mm, see page 17 (Burner length for horizontal installation)*

Type	Connections		Dimensions [inch]														No. of drillings		Weight*
	Gas	Air																	
	GA	LA	D	D1	H	S	L3	L4	L6	D2	k2	d2	F	D3	k3	d3	n2	n3	[lbs]
ZIC 165	1½ NPT	DN 100	6.61	7.95	8.86	0.79	5.91	15.6	9.06	11.2	9.45	0.55	∅ 8.66	8.66	7.09	0.71	4	8	50.6
ZIC 200	2 NPT	DN 150	7.76	9.33	9.13	0.79	8.66	19.9	13.4	13	11.6	0.87	∅ 10	11.2	9.45	0.87	8	8	76.1

** Details for the shortest overall length.*

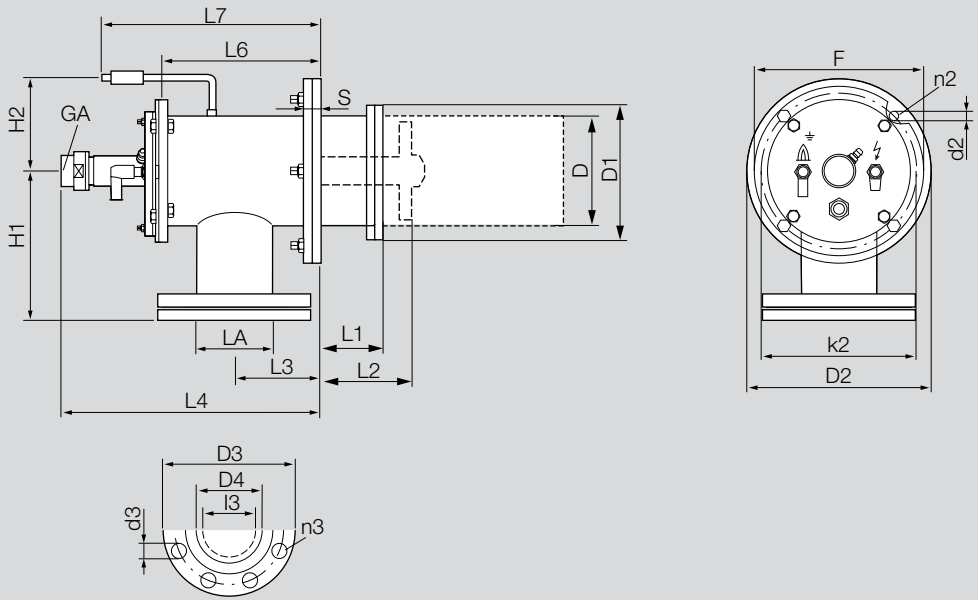
8.1.9 ZICW [mm]



ZICW *Standard: L1 = 100, 200, 300, 400 mm and L2 = L1 + 35 mm, see page 17 (Burner length for horizontal installation)*

Type	Connections		Dimensions [mm]																		No. of drillings		Weight
	Gas	Air																					
	GA	LA	D	D1	H1	H2	S	L3	L4	L5	L6	L7	D2	k2	d2	F	D3	k3	l3	d3	n2	n3	[kg]
ZICW 165	R 1½	DN 150	168	202	213	139	20	187	405	460	320	349	285	240	14	∅ 264	285	240	130	22	4	8	29.9
ZICW 200	R2	DN 200	197	237	217	157	20	256	516	569	427	417	330	295	22	∅ 300	340	295	160	22	8	12	43.8

8.1.10 ZICW [inch]



ZICW *Standard: L1 = 100, 200, 300, 400 mm and L2 = L1 + 35 mm, see page 17 (Burner length for horizontal installation)*

Type	Connections		Dimensions [inch]																		No. of drillings		Weight
	Gas	Air																					
	GA	LA	D	D1	H1	H2	S	L3	L4	L5	L6	L7	D2	k2	d2	F	D3	k3	l3	d3	n2	n3	[lbs]
ZICW 165	1½ NPT	DN 150	6.61	7.95	9.06	5.47	0.79	7.36	17.4	18.1	12.6	13.7	11.2	9.45	0.55	∅ 10.4	11.2	9.45	5.12	0.87	4	8	65.8
ZICW 200	2 NPT	DN 200	7.76	9.33	9.21	6.18	0.79	10.1	21.8	22.4	16.8	16.4	13	11.6	0.87	∅ 11.8	13.4	11.6	6.3	0.87	8	12	96.4

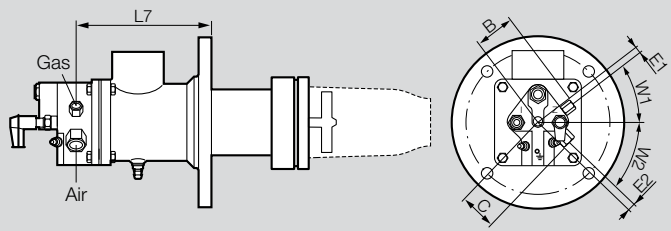
8.1.11 Torch BIC

Gas connection: Rp ¼ (NPT ¼ – see page 32 (Integrated torch connections).

Air connection: Rp $^3/_8$ (NPT $^3/_8$ – see page 32 (Integrated torch connections).

Gas pressure: 30 – 50 mbar (11.8 – 19.7 "WC).

Air pressure: 30 – 50 mbar (11.8 – 19.7 "WC).



Burner	Gas connection		Air connection		Dimensions							
	B		C		E1		E2		L7		W1	W2
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	∠°	∠°
BIC 65..L	101	3.98	61	2.4	20	0.787	47	1.85	158	6.22	29	61
BIC 80..L	57	2.24	54	2.13	7	0.276	10	0.394	177	6.97	36	45
BIC 100..L	57	2.24	54	2.13	7	0.276	10	0.394	190	7.48	36	45
BIC 125..L	69	2.72	65	2.56	8	0.315	8	0.315	249	10.3	30	30
BIC 140..L	63	2.48	62	2.44	16	0.63	18	0.709	276	10.9	42	45
BICW 65..L	101	9.98	61	2.42	20	0.787	47	1.85	247	9.72	29	61
BICW 80..L	57	2.24	54	2.13	7	0.276	10	0.394	266	10.5	36	45
BICW 100..L	57	2.24	54	2.13	7	0.276	10	0.394	279	11	36	45
BICW 125..L	69	2.72	65	2.56	8	0.315	8	0.315	348	13.7	30	30
BICW 140..L	63	2.48	62	2.44	16	0.63	18	0.709	363	14.3	42	45

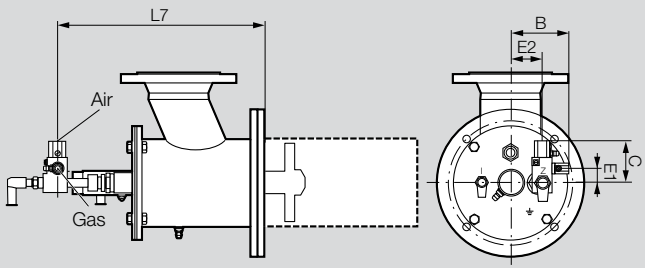
8.1.12 Torch ZIC

Gas connection: Rp ¼ (NPT ¼).

Air connection: Rp ½ (NPT ½).

Gas pressure: 30 – 50 mbar (11.8 – 19.7 "WC).

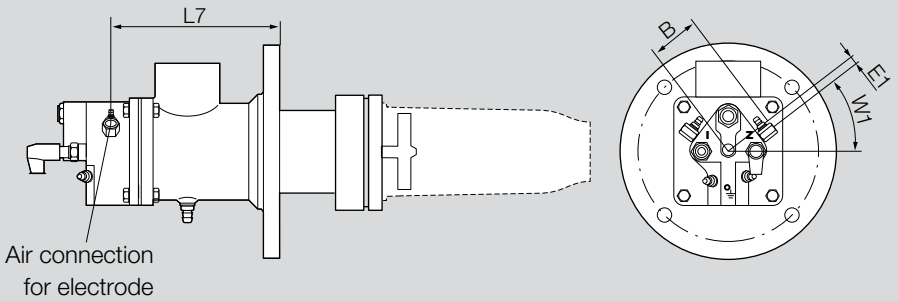
Air pressure: 30 – 50 mbar (11.8 – 19.7 "WC).



Burner	Gas connection		Air connection		Dimensions					
	B		C		E1		E2		L7	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
ZIC 165..L	118	4.65	77	3.03	27	1.06	71	2.8	382	15
ZIC 200..L	137	5.39	77	3.03	27	1.06	89	3.5	482	19
ZICW 165..L	118	4.65	77	3.03	27	1.06	71	2.8	472	18.6
ZICW 200..L	137	5.39	77	3.03	27	1.06	89	3.5	569	22.4

8.1.13 Electrodes with air connection BIC/BICW

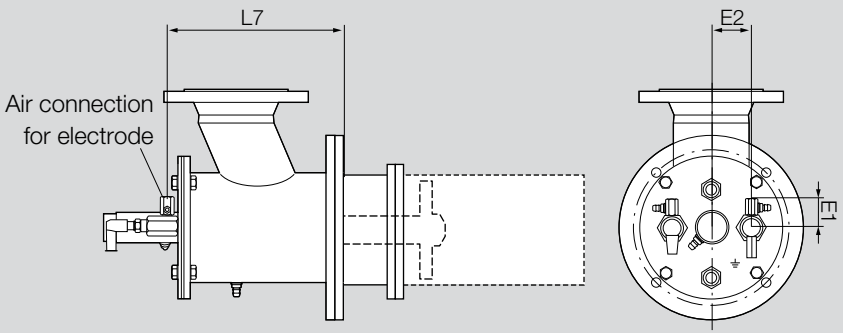
Air connection: Rp ¼ (NPT ¼)



Burner	Dimensions						
	B		E1		L7		W1
	mm	inch	mm	inch	mm	inch	∠ °
BIC 80	57	2.24	7	0.276	177	6.97	36
BIC 100	57	2.24	7	0.276	190	7.48	36
BIC 125	69	2.72	8	0.315	249	10.3	30
BIC 140	63	2.48	16	0.63	276	10.9	42
BICW 80	57	2.24	7	0.276	277	10.9	36
BICW 100	57	2.24	7	0.276	290	11.4	36
BICW 125	69	2.72	8	0.315	361	14.2	30
BICW 140	63	2.48	16	0.63	376	14.8	42

8.1.14 Electrodes with air connection ZIC/ZICW

Air connection: Rp ¼ (NPT ¼)



Burner	Dimensions					
	L7		E1		E2	
	mm	inch	mm	inch	mm	inch
ZIC 165	259	10.2	45.5	1.79	49	1.93
ZIC 200	369	14.5	45.5	1.79	55	2.17
ZICW 165	349	13.7	45.5	1.79	49	1.93
ZICW 200	456	18	45.5	1.79	55	2.17

9 Maintenance cycles

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

10 Legend

	Manual valve
	Gas solenoid valve
	Air/gas ratio control with solenoid valve
	Flow adjusting cock
	Butterfly valve with actuator
	Butterfly valve with manual adjustment
	Gas solenoid valve, slow opening
	Air/gas ratio control with bypass nozzle

10.1 Converting units

See www.adlatus.org
(also optimized for smartphones)

Feedback

Finally, we are offering you the opportunity to assess this “Technical Information (TI)” and to give us your opinion, so that we can improve our documents further and suit them to your needs.

Clarity

- ◯ Found information quickly
- ◯ Searched for a long time
- ◯ Didn’t find information

  What is missing?
- ◯ No answer

Comprehension

- ◯ Coherent
- ◯ Too complicated
- ◯ No answer

Scope

- ◯ Too little
- ◯ Sufficient
- ◯ Too wide
- ◯ No answer

Use

- ☐ To get to know the product
- ☐ To choose a product
- ☐ Planning
- ☐ To look for information

Navigation

- ◯ I can find my way around
- ◯ I got “lost”
- ◯ No answer

My scope of functions

- ◯ Technical department
- ◯ Sales
- ◯ No answer

Remarks



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