Burners

High velocity burners with flame tube in SiC

EMB-SIK (E3506 rev. 12 - 10/02/2015)
GENERAL WARNINGS:

- All installation, maintenance, ignition and setting must be performed by qualified staff, respecting the norms present at the time and place of the installation.

- To avoid damage to people and things, it is essential to observe all the points indicated in this handbook. The reported indications do not exonerate the Client/User from observing general or specific laws concerning accidents and environmental safeguarding.

- The operator must wear proper DPI clothing (shoes, helmets...) and respect the general safety, prevention and precaution norms.

- To avoid the risks of burns or high voltage electrocution, the operator must avoid all contact with the burner and its control devices during the ignition phase and while it is running at high temperatures.

- All ordinary and extraordinary maintenance must be performed when the system is stopped.

- To assure correct and safe use of the combustion plant, it is of extreme importance that the contents of this document be brought to the attention of and be meticulously observed by all personnel in charge of controlling and working the devices.

- The functioning of a combustion plant can be dangerous and cause injuries to persons or damage to equipment. Every burner must be provided with certified combustion safety and supervision devices.

- The burner must be installed correctly to prevent any type of accidental/undesired heat transmission from the flame to the operator or the equipment.

- The performances indicated in this technical document regarding the range of products are a result of experimental tests carried out at ESA-PYRONICS. The tests have been performed using ignition systems, flame detectors and supervisors developed by ESA-PYRONICS. The respect of the above mentioned functioning conditions cannot be guaranteed if equipment, which is not present in the ESA-PYRONICS catalogue, is used.

DISPOSAL:

To dispose of the product, abide by the local legislations regarding it.

GENERAL NOTES:

- In accordance to the internal policy of constant quality improvement, ESA-PYRONICS reserves the right to modify the technical characteristics of the present document at any time and without warning.

- It is possible to download technical sheets which have been updated to the latest revision from the www.esapyronics.com website.

- The EMB-SIK products have been designed, manufactured and tested according to the most correct construction practices and following the applicable requirements described in UNI EN 746-2-2010 “Industrial heating process equipment - Part 2: Safety requirements for combustion and for the handling and processing of fuels”. We emphasize that the burners described in this data sheet are provided as independent units and are excluded from the scope of the Machine Directive 2006/42/EC not having any mobile items that are not exclusively manual.

- Certified in conformity with the UNI EN ISO 9001 Norm by DNV GL.

CERTIFICATIONS:

The products conform to the requests for the Euroasia market (Russia, Belarus and Kazakhstan).

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The EMB-SIK burners are gas burners used for direct heating. The shape of the silicon carbide flame tube produces a tense flame that allows high heat penetration and better temperature uniformity inside the combustion chamber, due to the high velocity of the combustion products.

Depending on the size and use, this type of burner can be used for natural gas or LPG combustion (in the standard version), and other types of gaseous combustive agents with different heating properties (special versions on request).

APPLICATIONS

- Fibre cover treatment furnaces.
- Tunnel or chariot furnaces.
- Treatment furnaces.
- Stretching furnaces.
- Ceramic furnaces.

CHARACTERISTICS

GENERAL:

- Capacity: from 30 to 900 kW
- Maximum Temperature: 1300°C
- Air and gas pressure to burner: 45mbar
- Flow ratio: 8 : 1
- Flame speed: from 50 m/s to 120 m/s
- Low CO e NOx content
- Excess air: upto 400%

MATERIAL COMPOSITION:

- Burner body: cast iron G25
- Gas collector: cast iron G25
- Flame tube: SiC
- Combustion head: AISI310
- Fixing flange: Fe360
IGNITION AND DETECTION

The EMB-SIK burner flame ignition and detection takes place via the use of two separate electrodes: both are included with the supply. The adoption of a flame control system is highly recommended in all plants operating at temperatures lower than 750°C (UNI EN746/2 Regulation).

PARAMETER CAPACITY AND FLAME LENGTH

The flame lengths and velocities are approximate, and refer to burners fed by natural gas that are placed in open air and function in stoichiometric ratio at nominal capacity. In special applications, mono-electrodes for ignition and detection are used or else an electrode for flame ignition and a UV photocel for the flame detection is used.

<table>
<thead>
<tr>
<th>Model</th>
<th>Flame type (*)</th>
<th>Capacity [kW]</th>
<th>Flame length [mm]</th>
<th>Flame tube outlet diameter [mm]</th>
<th>Combustion gas outlet speed @1500°C [m/s]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>at 0m</td>
</tr>
<tr>
<td>EMB-0-SIK</td>
<td>L0</td>
<td>20</td>
<td>150 + 300</td>
<td>19</td>
<td>140</td>
</tr>
<tr>
<td>EMB-1-SIK</td>
<td>M1</td>
<td>30</td>
<td>200 + 400</td>
<td>30</td>
<td>80</td>
</tr>
<tr>
<td>EMB-2-SIK</td>
<td>L2</td>
<td>80</td>
<td>400 + 600</td>
<td>60</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>M2</td>
<td></td>
<td></td>
<td></td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>H2</td>
<td></td>
<td></td>
<td></td>
<td>40</td>
</tr>
<tr>
<td>EMB-3-SIK</td>
<td>L3</td>
<td>150</td>
<td>600 + 900</td>
<td>85</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>M3</td>
<td></td>
<td></td>
<td></td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>H3</td>
<td></td>
<td></td>
<td></td>
<td>57</td>
</tr>
<tr>
<td>EMB-4-SIK</td>
<td>M4</td>
<td>300</td>
<td>900 + 1200</td>
<td>85</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>H4</td>
<td></td>
<td></td>
<td></td>
<td>70</td>
</tr>
<tr>
<td>EMB-5-SIK</td>
<td>H5</td>
<td>400</td>
<td>1200 + 1500</td>
<td>85</td>
<td>140</td>
</tr>
<tr>
<td>EMB-6-SIK</td>
<td>H6</td>
<td>600</td>
<td>1500 + 1800</td>
<td>120</td>
<td>105</td>
</tr>
<tr>
<td>EMB-7-SIK</td>
<td>H7</td>
<td>900</td>
<td>1800 + 2000</td>
<td>140</td>
<td>115</td>
</tr>
</tbody>
</table>

(*)
L: low flame tube (V<60 m/s)
M: medium flame tube (60<V<90 m/s)
H: high flame tube (V>90 m/s)
DESCRIPTION

The EMB-SIK burners are “nozzle mix” type burners. The fuel and combustion agents are mixed at the combustion head to avoid dangerous flame flashbacks. Furthermore, the special shape of the combustion head allows regulation in stoichiometric, oxidant or reducing ratio. The EMB-SIK burners develop the maximum capacity in stoichiometric ratio with 45mbar of air pressure; the setting is thus simplified by special absolute and differential pressure plugs that allow the measurement of air and gas flow.
The flame capacity, length and speed refer to a natural gas fed burner (8600 Kcal/Nm3), placed in a combustion chamber at zero pressure above sea level, functioning with 10% excess air.

- Functioning MIN/MAX (ON/OFF)
- Chamber temperature 1000°C
- Room air temperature
- NOx < 180 mg/Nm3 [O2 = 3% ref.]

### MAXIMUM CAPACITY

<table>
<thead>
<tr>
<th>Free flame application</th>
<th>Burner model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Burner capacity (2% O₂) [kW]</td>
</tr>
<tr>
<td></td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Burner air inlet pressure [mbar]</td>
</tr>
<tr>
<td></td>
<td>∆p flange gas measurement [mbar]</td>
</tr>
</tbody>
</table>

### MINIMUM CAPACITY

<table>
<thead>
<tr>
<th>Free flame application</th>
<th>Burner model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Burner capacity (2% O₂) [kW]</td>
</tr>
<tr>
<td></td>
<td>2,5</td>
</tr>
<tr>
<td></td>
<td>2,8</td>
</tr>
<tr>
<td></td>
<td>0,25</td>
</tr>
<tr>
<td></td>
<td>Burner air inlet pressure [mbar]</td>
</tr>
<tr>
<td></td>
<td>∆p flange gas measurement [mbar]</td>
</tr>
</tbody>
</table>
BURNER CAPACITY DEPENDING ON PREHEATED AIR TEMPERATURE

<table>
<thead>
<tr>
<th>EMB-4-SIK</th>
<th>EMB-3-SIK</th>
<th>EMB-2-SIK</th>
<th>EMB-1-SIK</th>
<th>EMB-0-SIK</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>180</td>
<td>160</td>
<td>140</td>
<td>120</td>
</tr>
<tr>
<td>220</td>
<td>200</td>
<td>180</td>
<td>160</td>
<td>140</td>
</tr>
<tr>
<td>240</td>
<td>220</td>
<td>200</td>
<td>180</td>
<td>160</td>
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<tr>
<td>260</td>
<td>240</td>
<td>220</td>
<td>200</td>
<td>180</td>
</tr>
<tr>
<td>280</td>
<td>260</td>
<td>240</td>
<td>220</td>
<td>200</td>
</tr>
<tr>
<td>300</td>
<td>280</td>
<td>260</td>
<td>240</td>
<td>220</td>
</tr>
</tbody>
</table>

Capacity [kW] vs. T air [°C]
BURNER CAPACITY DEPENDING ON PREHEATED AIR TEMPERATURE

- EMB-7-SIK
- EMB-6-SIK
- EMB-5-SIK

Capacity [kW]

T air [°C]

EMB-SIK - E3506 rev. 12 - 10/02/15
Burner at 100% capacity with 10% excess air

The emission value is subject to variations depending on different factors such as:
- Furnace working temperature.
- Heated air temperature.
- Excess air.
- Fuel chemical composition. The guaranteed value will thus be fixed, case by case, according to the conditions given by the client.
METHANE GAS FLOW DIAGRAM

Natural gas flow [Nm$^3$/h] @ 20 °C P.S.=0,6

AIR FLOW DIAGRAM

Total air flow [Nm$^3$/h] @ 30 °C P.S.= 1
FLOW SCHEME - SINGLE ZONE REGULATION

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Description</th>
<th>Included</th>
<th>Not Included</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Main gas interception ball valve</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Zerogovernor</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Impulse line</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Servo-controlled air regulation valve</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Electric servo-control</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Single burner gas interception ball valve</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Main burner safety gas solenoid valve</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>$\Delta P$ Calibrated measuring flange</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Gas passage limiting device</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Manual air regulation butterfly valve</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Air inlet orifice</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>High velocity burner</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Ignition transformer</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Flame control</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Premix air regulation kit (only LPG version)</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
FLOW SCHEME - SINGLE BURNER REGULATION

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Description</th>
<th>Included</th>
<th>Not included</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Main gas interception ball valve</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>Calibrated flange for $\Delta P$ gas measurement</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Impulse line</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>4</td>
<td>Zerogovernor</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>5</td>
<td>Safety gas solenoid valve</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>6</td>
<td>Gas passage limiting device</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Servo motor</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>8</td>
<td>Motorized air regulation valve</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>9</td>
<td>Ignition transformer</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Flame control</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>11</td>
<td>High velocity burner</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>12</td>
<td>Air inlet orifice</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>13</td>
<td>Premix air regulation kit (only LPG version)</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
WARNINGS

- The EMB-SIK burner ignition must always be carried out at minimum power, modulating towards the maximum, facilitating the ignition and reducing the outlet overpressures. Thus it is opportune to use slow opening solenoid valves on the fuel line.

- The passing from minimum to maximum power and vice-versa must be gradual and not instantaneous.

- The vertical mounting of burners with flame pointing upwards is NOT advised. Burners mounted in this position could suffer the lack of ignition or bad flame detection due to the presence of external objects depositing on the combustion head and electrodes.

- For all low temperature applications (up to 750°C), the burner ignition and fuel gas solenoid valve commands must be performed via a certified burner control device.

- To avoid possible damage to burners, make sure that the blower does not send them air that may be fouled by combustion products, oils, solvents or other. To avoid these phenomena from taking place, possibly install the blower or the scution duct outside the establishment and far from the exhaust pipes.

- Check the correct connection of the feeding lines after installation. Before switching the burner on, check that the combustive air and fuel gas pressure values are correct (pag 06).

- The burner can only function within the indicated power range. Functioning at lower or higher powers could compromise the burner performance as well as its lifespan, in which case, the general warantee conditions will automatically expire and ESA - PYRONICS will not be held responsible for any damage to persons or things.

- If there is trouble with other devices during the burner start-up phase, use the connector with anti disturbance filter for the high tension (HT) cable connection of the ignition electrode.

- Avoid burner ignition close to each other so as not to heat the ignition command system devices (solenoid valves and transformers). Prewash time lapse + first safety time lapse + min. of 5 sec. = time lapse between on ignition and another (however to not attempt more than 2 ignitions during a 30 sec. time lapse).

- Make sure the power supply is TURNED OFF when intervening on the burner and its devices. In case of burner malfunctioning, follow the indications in the “Maintenance” chapter of the present manual or contact ESA-PYRONICS assistance.

- Any modification or repair done by third parties could compromise the application safety and automatically cause the general warantee conditions to expire.
INSTALLATION

The EMB-SIK burners are supplied with a special furnace wall-fixing flange. The light obtained for the burner housing must leave open space around the burner. This space has then to be filled with ceramic fibre.

For the installation, carefully follow the instructions below:

1 - Place the EMB-SIK burners far from heat sources and products such as: liquids, solvents or corrosive gases.

2 - Make sure that the housing dimensions and the distance between the centres of the feeding pipes correspond to what has been specified in the “Overall Dimensions” chapter.

3 - Assemble the burner onto the furnace wall (pos.01), interposing a ceramic fibre gasket between the attachment flange and the furnace wall (pos. 02). Once the burner has been fixed to the furnace, from the inside of the combustion chamber, using ceramic-fibre, seal any possible cracks that may be left between the wall and the silicon carbide flameguard according to the indications given in the “Overall dimensions” chapter.

4 - Connect the combustion air and fuel gas piping, interposing, if possible, dilation joints with suitable diameters.

5 - Connect electrical current to the ignition and detection electrode and to the UV-scan detector, making sure not to pass the conductors near heat sources.

6 - Make sure that the burner body and all the connected metallic elements are connected to the plant’s earthing system with suitable conductors.

7 - The connecting cable from the ignition transformer to the electrode must be specific for high tension and not screened. It must not be more than 1 metre long; otherwise the ignition transformer must be positioned near the burner. The high tension cable must be placed far from the power cables and not in metallic ducts. Ideally it should be left in open air.

8 - For Further information please consult the technical data sheet concerning ignition transformers.
FACT SHEET FOR FURNACE WALL MOUNTING

WALL THICKNESS > “X”

WALL THICKNESS = “X”

WALL THICKNESS < “X”
START-UP - SETTING

The procedures indicated in the following chapter must be carried out by expert technicians. The non-observance of the instructions given could provoke dangerous conditions.

1 - Check that the combustion air pressure exiting the blower and the fuel gas feeding pressure are both within the allowed range.

2 - Regulate the working pressures and the combustion plant's safety device pressure, whether there is one per burner or one for the whole combustion plant, i.e. gas pressure reducer, block valve, relief valve, pressure switches etc. Simulate the intervention of all the safety devices, including the intervention of the safety overtemperature, checking that the fuel safety block devices act properly.

3 - Referring to the maximum capacity values indicated in the "Burner Performance" chapter, position the motorized air regulation valve.

4 - Referring to the minimum capacity values indicated in the "Burner Performance" chapter, position the motorized air regulation valve.

5 - Activate the burner control device and attempt ignition until the burner switches on. During the first burner ignition phases, act on the gas regulation valve and, starting from the totally closed position, open it gradually until the burner ignites.

6 - With burner on, place the motorized air regulation valve as described in point 3. Via the gas regulation valve, regulate the maximum fuel capacity, checking the differential pressure created on the calibrated gas flange.

7 - Double check that, at minimum and maximum power, the burner inlet pressure corresponds to the values in the "PARAMETER CAPACITY" chapter. These values may differ depending on whether the burner is on or off.

8 - If necessary, with all burners running at the same power, analyse the combustion products in the chamber (where possible).

9 - Repeatedly attempt ignition at minimum burner power, with maximum amplitude, to check the ignition reliability and flame stability during the regulation.

PREMIX AIR FLOW SETTING WHERE SCHEDULED (LPG BURNERS)

The premix line is supplied with the LPG burners. The setting must be carried out with burner off and in minimum flow conditions. The premix line must be fed by an inlet necessarily placed upstream the air flow regulation valve, whether it is in zone or interlocked by the single burner.

1 - Place the burner in the minimum combustion air flow conditions.

2 - Open the premix air tap upstream the general regulation valve (the flow must be fixed).

3 - Regulate the air flow using the micrometric pin valve consulting the appropriate setting table. The aim is to have a relatively tense bluish flame.

4 - Check however, that at minimum capacity, the burner does not create black smoke on the combustion head nor on the electrodes. Should this occur, increase the premix air setting.

5 - EMB-0-SIK: Gas body pressure = 2 mbar
5 - EMB-1-SIK: Gas body pressure = 2 mbar
5 - EMB-2-SIK: Gas body pressure = 2 mbar
5 - EMB-3-SIK: Gas body pressure = 2 mbar
5 - EMB-4-SIK: Gas body pressure = 2 mbar
5 - EMB-5-SIK: Gas body pressure = 2 mbar
5 - EMB-6-SIK: $\Delta p=6.5$ mbar
5 - EMB-7-SIK: $\Delta p=2.5$ mbar
# GENERAL MAINTENANCE PLAN

<table>
<thead>
<tr>
<th>Operation</th>
<th>Type</th>
<th>Advised time</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>High tension electrode connection</td>
<td>O</td>
<td>annual</td>
<td>check integrity of external plastic and oxidization of internal connector and electrode terminal.</td>
</tr>
<tr>
<td>Electrode ignition / detection</td>
<td>O</td>
<td>annual</td>
<td>replace if kantal terminal is worn or if ceramics are damaged.</td>
</tr>
<tr>
<td>Combustion head</td>
<td>O</td>
<td>annual</td>
<td>during furnace shut down, check that the element does not show any signs of oxidation due to high temperature or material deposits on its surface.</td>
</tr>
<tr>
<td>SiC flame tube</td>
<td>O</td>
<td>annual</td>
<td>during furnace shut down check that there are no cracks or ruptures in the ceramic material. If necessary replace it.</td>
</tr>
<tr>
<td>Replacement of gas side gaskets</td>
<td>E</td>
<td>annual</td>
<td>See note (*) and note (**)</td>
</tr>
<tr>
<td>Burner settings</td>
<td>O</td>
<td>annual</td>
<td>Repeat all the steps in the “START-UP AND SETTING” section.</td>
</tr>
<tr>
<td>Premix air settings (where scheduled)</td>
<td>O</td>
<td>annual</td>
<td>Repeat all the steps in the “PREMIX AIR SETTING” section.</td>
</tr>
</tbody>
</table>

**NOTES:**
Key: O = ordinary / E = extraordinary
(*) replacement of the gaskets on the gas side is suggested after each time the gas feeding line is dismantled.
(**) use high temperature gaskets.
EXTRAORDINARY MAINTENANCE

For correct dismantling and better maintenance of the EMB-SIK burners, meticulously follow the instructions below with the plant turned off.

IGNITION AND FLAME DETECTION ELECTRODE REPLACEMENT

1 - Check that the burner control device is off.

2 - Disconnect electrical supply to the electrodes (pos. 01).

3 - Unscrew the connector (pos. 02) at the base of the gas collector, removing the electrode (pos. 03).

4 - Replace the faulty electrode (pos. 03) paying attention to the positioning of the new electrode.

5 - Reconnect the electrical supply (pos. 01).

6 - Check the electrode’s correct flame ignition/detection.

BURNER IN LOCKOUT

In burner lockout conditions refer to the burner control device indications and to the relative manual to identify the cause. The main cases have been indicated here below:

- **Illegal flame detection**: shutdown is due to an illegal flame detection during the phases prior to ignition or after the turning off. The causes are within the detection system (broken or faulty sensor or presence of humidity), or in the gas draw from the solenoid safety valve, which allows the burner to remain turned on.

- **Failed ignition**: shutdown is caused due to the fact that no flame has been created during the starting process. The causes can be found in the start-up system (spark absence, faulty electrodes or incorrect position), in the bad setting of the fuel and combustion flow or in the detection system (faulty sensor or interrupted cables). More precisely, in the first two cases the flame is not ignited, while in the last case the flame is created but the burner control device is unable to detect it.

- **Flame signal loss**: shutdown due to the flame signal loss during the normal functioning of the burner. The causes can be found in the combustion air flow regulation (rapid flow variations, adjustment out of allowed range). They can also be found in the detection system (faulty, dirty or badly positioned sensors).
OVERALL DIMENSIONS - EMB-0-SIK

NOTES:
(a) Suitable on customer request
(b) by customer
OVERALL DIMENSIONS - EMB-1-SIK-CH4

FURNACE HOUSING
HOLE Ø75

Gas Inlet
Rp 1/2"

Air Inlet
Rp 1.1/2"

Ceramic fiber
insulation

Gas orifice flowmeter (included)
Assembly by customer

R 1/2"

Min.100 (b)

Min.100 (b)

Gas Inlet
R 1/2"

NOTES:
(a) Suitable on customer request
(b) by customer

87 107.5

88.2

280

100

300

168

86.2

339

282

44

449

140

334

353

371

D3506I08

0.150 (a)

0.120 (a)

Nr.4 holes Ø11 eq.sp.
OVERALL DIMENSIONS - EMB-2-SIK-CH4

- **FURNACE HOUSING HOLE**: Ø100
- **GAS INLET**: Rp 1/2"
- **AIR INLET**: Rp 1 1/2"
- **Ceramic fiber insulation**
- **Gas orifice flowmeter (included)**
- **Assembly by client**

**NOTES:**
(a) Suitable on client request
(b) by client

- **Nr.4 holes Ø13 eq.sp.**
OVERALL DIMENSIONS - EMB-2-SIK-LPG

FURNACE HOUSING
HOLE Ø100

NOTES:
(a) Suitable on customer request
(b) by customer

PREMIXING AIR INLET Rp 1/2"

GAS ORIFICE FLOWMETER (INCLUDED)
Assembly by customer

GAS INLET Rp 1/2"

AIR INLET Rp 1 1/2"

CERAMIC FIBER INSULATION

N.4 HOLES Ø13 eq.sp.
OVERALL DIMENSIONS - EMB-3-SIK-CH4

NOTES:
(a) Suitable on customer request
(b) by client
OVERALL DIMENSIONS - EMB-3-SIK-LPG

- Furnace housing hole Ø140
- Gas inlet Rp 3/4"
- Gas orifice flowmeter (included)
- Assembly by client
- Ceramic fiber insulation
- Air inlet DN65 Rp 1/4"
- Premixing air inlet Rp 1/4"
- Nr.4 holes Ø 14 (a)

NOTES:
(a) Suitable on client request
(b) by client
OVERALL DIMENSIONS - EMB-4-SIK-CH4

**NOTES:**
(a) Suitable on customer request
(b) by customer

- Gas orifice flowmeter (included)
- Assembly by customer
- Gas Inlet R 1.1/2"
- Min. 100 (b)
- Ø240 (a)
- Ø200 (a)
- Nr. 4 holes Ø14 eq.sp.
OVERALL DIMENSIONS - EMB-4-SIK-LPG

**NOTES:**

(a) Suitable on client request

(b) by client

Gas orifice flowmeter (included)
Assembly by client

**FURNACE HOUSING**

**HOLE Ø140**

**PREMIX AIR**

**INLET Rp 1/4"**

**GAS INLET**

**DN65**

**Rp 1"**

**GAS INLET**

**R 1"**

Ceramic fiber insulation

**Nr.4 holes Ø 14**

**Ø 200 (a)**

**Ø 240 (a)**

**282**

**231**

**216**

**24**

**131**

**104**

**Min.100 (a)**

**47.5**

**Min.100 (a)**

**Min.100 (a)**
OVERALL DIMENSIONS - EMB-5-SIK-CH4

NOTES:
(a) Suitable on customer request
(b) by customer
OVERALL DIMENSIONS - EMB-5-SIK-LPG

NOTES:
(a) Suitable on customer request
(b) by customer

Premixing Air Inlet Rp 1/2"
Gas Inlet Rp 1"

FURNACE HOUSING

Ceramic fiber insulation

Gas orifice flowmeter (included)
Assembly by customer

Min.100 (b)
43.5

Min.100 (b)

406
147
149
82.2
360.5

126
421

100
301

Ø295 (a)
Ø320 (a)

Nr.4 holes Ø14 eq.sp.

D350617
OVERALL DIMENSIONS - EMB-6-SIK-CH4

FURNACE HOUSING
HOLE Ø 220

Air Inlet
DN150

Gas Inlet
Rp2"

Ceramic fiber insulation

Gas orifice flowmeter (included)
Assembly by customer

NOTES:
(a) Suitable on customer request
(b) by customer

Nr.4 holes Ø14 eq.sp.
OVERALL DIMENSIONS - EMB-6-SIK-LPG

NOTES:
(a) Suitable on customer request
(b) by customer

FURNACE HOUSING
HOLE Ø220

Premixing Air Inlet
ø1/2"

Gas Inlet Rp1.1/2"

Gas orifice flowmeter (included)
Assembly by customer

Ceramic fiber insulation

Air Inlet DN150

Ø320

100

287

179

485

449.5

501

156

356

70

Min. 100 lb

Min. 100 lb

D350619
OVERALL DIMENSIONS - EMB-7-SIK-CH4

GAS INLET DN50

AIR INLET DN150

CERAMIC FIBER BY CLIENT

GAS ORIFICE FLOWMETER (INCLUDED)

ASSEMBLY BY CLIENT

NOTES:
(a) Suitable on client request
(b) by client

AIR INLET DN150

 Nr.4 holes Ø18 (a)

FURNACE HOUSING Ø250

GAS INLET R 2”

Min. 100 (b)

Min. 100 (b)

R 2”

Ø360 (a)

Ø400 (a)
OVERALL DIMENSIONS - EMB-7-SIK-LPG

Gas orifice flowmeter (included)
Assembly by client

NOTES:
(a) Suitable on client request
(b) by client
### ORDERING CODE - COMPLETE BURNER

![Ordering Code Diagram]

**Model**

<table>
<thead>
<tr>
<th>Model</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMB-0-SIK</td>
<td>01</td>
</tr>
<tr>
<td>EMB-1-SIK</td>
<td>02</td>
</tr>
<tr>
<td>EMB-2-SIK</td>
<td>03</td>
</tr>
<tr>
<td>... (see capacity table)</td>
<td>....</td>
</tr>
</tbody>
</table>

**Ignition**

<table>
<thead>
<tr>
<th>Ignition Type</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ign. electrode + det. electrode</td>
<td>E*</td>
</tr>
<tr>
<td>Monoelectrode</td>
<td>M</td>
</tr>
</tbody>
</table>

**Gas adjuster**

<table>
<thead>
<tr>
<th>Gas adjuster</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>With gas adjuster</td>
<td>GA*</td>
</tr>
<tr>
<td>Without gas adjuster</td>
<td>F</td>
</tr>
</tbody>
</table>

**Fuel**

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural gas</td>
<td>CH4*</td>
</tr>
<tr>
<td>LPG</td>
<td>LPG</td>
</tr>
<tr>
<td>Poor gas (*)</td>
<td>GP</td>
</tr>
</tbody>
</table>

**SiC Flame tube type**

<table>
<thead>
<tr>
<th>Flame tube type</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbide low velocity</td>
<td>L...</td>
</tr>
<tr>
<td>Carbide medium velocity</td>
<td>M...</td>
</tr>
<tr>
<td>Carbide high velocity</td>
<td>H...</td>
</tr>
<tr>
<td>Carbide by Client (*)</td>
<td>C</td>
</tr>
</tbody>
</table>

**Flange type**

<table>
<thead>
<tr>
<th>Flange type</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acc. to ESA drawing</td>
<td>E*</td>
</tr>
<tr>
<td>Acc. to Client's drawing</td>
<td>C</td>
</tr>
</tbody>
</table>

The codes marked with an asterisk (*) identify the standards.

Notes:

1. Particular performance according to gas characteristics
2. See "Capacity parameters and flame length" table
3. Specify construction characteristics and overall dimensions of the carbide SiC flame tube