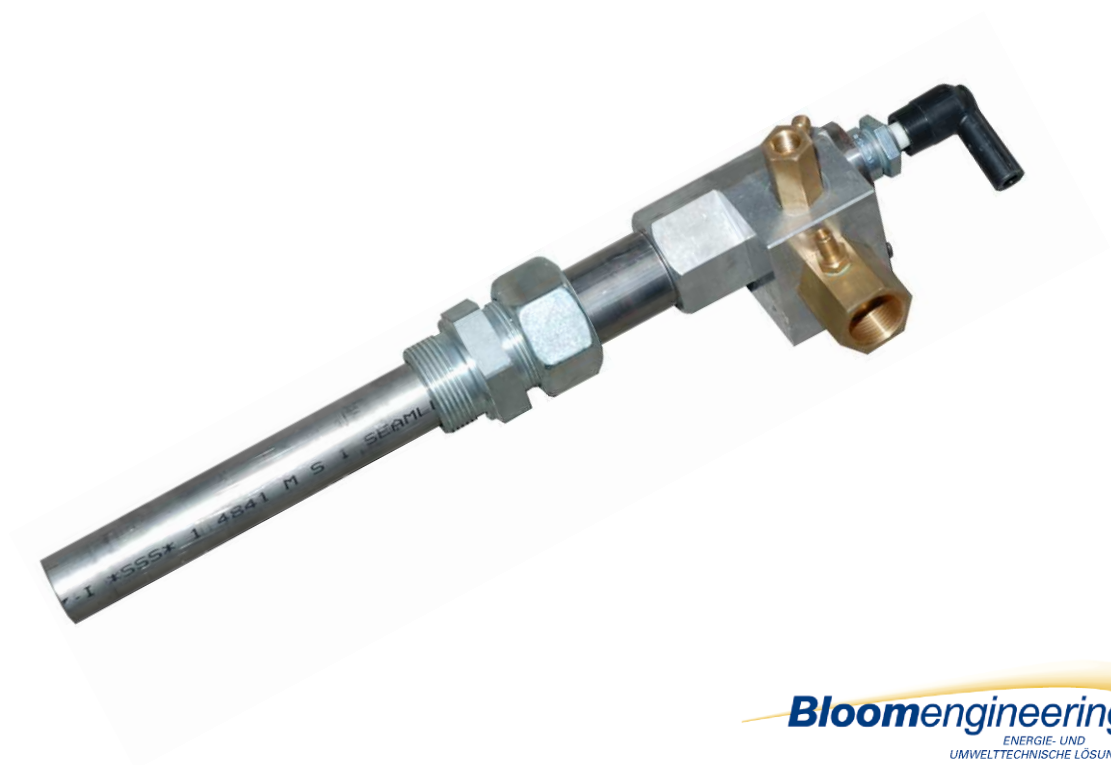


# Operating Manual

**Bloom Engineering**  
**Bloom 3001 Pilot Burner <sup>TM</sup>**



**Bloomengineering**  
ENERGIE- UND  
UMWELTECHNISCHE LÖSUNGEN

OM-3001-2010-GB 30092010.doc

Always carefully read this operating manual before carrying out any work on the unit! This manual is an integral part of the burner and must be at all times accessible to all personnel near the unit.

Before carrying out any work, read this manual carefully. This operating manual contains important information for the safe operation of the burner. Always strictly adhere to the instructions in this document to protect yourself and others from injury. Familiarise yourself with the applicable statutory accident prevention and general safety regulations.

When transferring the unit to another party, also hand over the manual.

The illustrations in this manual are intended to clarify certain points. They might not be to scale or depict a unit that deviates from the design of your equipment.

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# **1 General**

## **1.1 About this manual**

This operating manual contains important information for the safe operation of the equipment.

This manual is an integral part of the equipment and must be at all times accessible to all personnel near the unit.

The personnel should read and understand this operating manual and all the mentioned safety instructions carefully before carrying out any work on the unit.

Precondition for health and safety working condition is to strictly adhere to this instructions and the listed handling advice.

Familiarise yourself with the applicable statutory accident prevention and general safety regulations.

When transferring the unit to another party, also hand over the manual.

The illustrations in this manual are intended to clarify certain points. They might not be to scale or depict a unit that deviates from the design of your equipment.

Instructions in the manuals of supplied components have precedence over the instructions in this operating manual.





## General

### 1.2 Symbols

#### Warning

Warnings in this manual are identified with the warning symbol (⚠) and/or appropriate warning texts. These expressions indicate the severity of the potential risk.

Always strictly adhere to the instructions and proceed with special caution to prevent accidents, injury and damage to property.

Warning symbol /warning text	Explanation
 <b>DANGER</b> or <b>DANGER!</b>	Indicates a situation that, if not avoided, will result in serious injury or death.
 <b>WARNING</b> or <b>WARNING!</b>	Indicates a situation that, if not avoided, might result in serious injury or death.
 <b>CAUTION</b> or <b>CAUTION!</b>	Indicates a situation that, if not avoided, might result in minor injury.
<b>IMPORTANT</b> or <b>IMPORTANT!</b>	Indicates a potentially dangerous situation that, if not avoided, might result in damage to property.
Tips and hints	Explanation
	Indicates tips and recommendations as well as other information required for the efficient and disruption-free operation of the burner unit.

### **1.3 Limitation of Liability**

All information and instructions in this operating manual have been compiled with reference to the applicable standards and regulations, best practice and our extensive expertise and experience in this field.

The manufacturer shall not be liable for damage caused by:

- Non-compliance with instructions in this manual
- Improper use
- Operation by insufficiently qualified personnel
- Unauthorised modifications to the equipment
- Technical modifications
- Use of unapproved spare parts

The operating company only is responsible for damages caused by improper use as described above.

The actual scope of delivery might vary from that described in this document and shown in the drawings in the case of customised models, additional options are ordered or changes made to the equipment, due to technical development.

The supply of the equipment is subject to the terms of the order contract, the general business terms and conditions of the manufacturer, the manufacturer's delivery terms and the statutory regulations applicable at the time of closing of the contract.

We reserve the right to make technical modifications in order to improve usability.

## General

### 1.4 Copyright

Copyright 2010, Bloom Engineering (Europa) GmbH

The information included in this manual and associated documents are the intellectual property of Bloom Engineering (Europa) GmbH and are protected by international copyright.

The information compiled in these documents is intended to ensure safe operation, maintenance and troubleshooting of the equipment to which they refer.

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Bloom Engineering (Europa) GmbH shall not be liable for damage caused by the improper use of the information.

Bloom Engineering (Europa) GmbH reserves the right to retract, review and modify its products as well as the information in this manual at any time and without prior notice.

### 1.5 Spare parts

Use only original spare parts available from the manufacturer! The use of unsuitable or defective spare parts might impair the safety of the equipment and can result in damage, malfunction or complete failure of the burner. This poses a risk of serious injury or even death.

Order spare parts from Bloom Engineering (Europa) GmbH. For address details, see page 2.

### 1.6 Warranty terms

Unless the parties have entered into a separate extended warranty agreement, the warranty terms laid down in the general business terms and conditions of Bloom Engineering apply.



## **1.7 Customer service**

Our Customer Service is always available for technical information. Notes on the responsible contact partner are on call by phone, fax, e-mail or via internet, see address of manufacturer on page 2. Apart from that, our members of staff are permanently interested in receiving new information and experience resulting from the use of our products and which could be of great value for future improvements.

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## 2 Health and Safety

This chapter provides an overview of all relevant safety issues for the best protection of personnel and the safe and trouble-free operation of the burner.

Non-compliance with the instructions and safety warnings in this manual might result in injury or damage to the equipment.

### 2.1 Duties of the operating company

#### 2.1.1 General

The unit is designed for commercial use. The operator of the unit is therefore bound by the relevant occupation safety legislation.

In addition to the safety instructions in this manual, all statutory occupational health and safety, accident prevention and environmental protection regulations must be strictly adhered to. This applies in particular to:

- The operator is obliged to keep himself informed of the applicable workplace safety regulations. He must also be in a position to identify and assess risks that might occur in connection with the specific conditions at the location of operation of the unit. The results of such a risk analysis must be implemented in the form of operating instructions for the operation of the unit. Danger areas must be identified as such and cordoned off, if applicable (barriers, danger warnings, prohibited access).
- The operator must assign clear responsibilities for the installation, operation, maintenance and regulation of the unit.
- It is the responsibility of the operator to ensure that all employees involved in the operation of the unit have read and understood the instructions in this manual. In addition, all personnel must be regularly trained and informed of potential risks.
- The operator must provide personnel with suitable personal protective equipment
- The operator is responsible for installing all the warning and operating signs at the equipment and maintain them in good reading conditions.
- The operator has to equip the equipment with sufficient safety equipment in sufficient distances.
- The operator has to install a safety shut off system tailor made for the installed equipment and implement it in the control system considering the local health and safety regulations.

- During the entire period of service of the unit, the operator must ensure that the operating instructions issued by him are kept up to date and conform to the latest version of the relevant standards and regulations.
- Compliance with the maintenance schedule prescribed in this operating manual.
- Regular testing and inspection of the safety guards and devices.

### 2.1.2 Design criteria

It is the responsibility of the operator to ensure that the lines and devices installed for the supply of the unit with fuel and combustion air are of suitable capacity and conform to the latest state of technology and the applicable statutory regulations.

In EU member states, these regulations are found in the EN 746-2 standard as amended.

## 2.2 Requirements regarding operating personnel

### 2.2.1 Qualification

#### **⚠ WARNING**

**Only persons who are qualified for a particular tasks are permitted to carry it out! Improper handling of the equipment can lead to serious injury to persons and damage to equipment.**

The following qualifications for the various tasks are specified in this operating manual.

- **Instructed person (production personnel)**  
Person who was instructed about the tasks assigned to him/her and the potential risks arising from improper behaviour.
- **Specialist personnel**  
Person who, due to his/her professional training, skills and experience, and knowledge of the relevant regulations, is in a position to carry out the work assigned to him/her and to identify and avoid potential risks.
- **Electrician**  
Person who, due to his/her professional training, skills, experience and knowledge of the relevant regulations, is in a position to carry out the work on electrical components assigned to him/her and to identify and avoid potential risks.

## Health and Safety

Electricians with the above skills are trained specifically for the location of operation at which they work.

- **Specialist technician with special qualification for the handling of fuels**

Due to their technical training, knowledge, experience and familiarity with the relevant standards and statutory regulations, such persons are in a position to carry out work in connection with the fuel supply of the unit and to identify possible risks. Specialist technicians with the above skills are trained specifically for the location of operation at which they work.

- Only persons who can be expected to carry out the assigned work with the necessary care are allowed to work on the burner. Persons under the influence of illegal drugs, alcohol or medication may not work on or near the burner.
- By assigning personnel comply with the statutory regulations regarding minimum age and specialist training.

### 2.2.2 Unauthorised persons

#### ⚠ WARNING

**Keep unauthorised persons away from the working area!**

**If in doubt, approach persons and ask them to leave the working area!**

**Interrupt the work, if there are unauthorised persons in the working area!**

**Unauthorised persons tend not to be aware of the potential risks in the working area. Their presence in the working area might result in serious injury or even death, as workers might be distracted by their presence.**

### 2.3 Designated use

The equipment is only for the in the manual designated use appropriate:

The pilot burner is designed to be part of a combustion system. This system has to be controlled by licensed burner control unit. With this burner control unit the pilot burner is used for ignition of the main burner used for heating or melting in industrial furnaces.

Appropriate use is to adhere with theses instructions.

**Do omit to use the burner other than designated. Every or different use going out the designated use of the device counts as a false use and can lead to dangerous situations**

All types of no proper use of the burner can be lead directly to dangerous situations. Disadvantages in case of no proper use are excluded.

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## Health and Safety

### 2.4 Manufacturer's declaration

The Pilot burners provided by the manufacturer are not designed for operation as stand-alone units. They must be integrated into an overall plant where they become functional unit components.

The manufacturer therefore cannot issue a valid Manufacturer's Declaration confirming compliance with the relevant standards. The Manufacturer's Declaration is included in the documentation of the respective burner.

### 2.5 Personal protective equipment

When working on or at the burner, always wear personal protective equipment in order to minimise the health risks.

- The personal protective equipment must be worn at all times while working on or near the burner.
- Always adhere to the signs and instructions for protective equipment attached to the burner.

#### To be worn for all work

The following personal protective equipment must be worn for all work:



#### Protective clothing

Wear tightly fitting wear-proof cloths with tight sleeves and no loose parts. This prevents cloths being caught by moving machine parts.

Do not wear any jewellery such as rings, necklaces, etc.



#### Hard hat

The hard hat protects workers against injury from falling parts or processing material.



#### Safety footwear

Safety footwear protects the feet against injury from falling parts and against slipping on floors.



#### Protective gloves

Gloves protect the hands against abrasion, laceration, punctures and deep cuts. They also protect the hands against burns when touching hot surfaces.



#### **Protective glasses**

for the protection of the eyes off parts throwing around and liquid splashes

#### **To be worn in special cases**



#### **Light-duty respiratory protection device**

The device protects the respiratory system against harmful dusts.



#### **Respiratory protection device, customised for ambient atmosphere**

Protect the respiratory system against harmful gases, vapours and dust.

If a set limit value is exceeded, a full respirator must be used. The full respirator must be operated with a minimum oxygen concentration of 17%.

## **2.6 Special risks**

The following section lists the known residual risks.

### **⚠ DANGER**

**Always observe the safety instructions and warnings in this and all following chapters in this manual. They are designed to reduce the risk to your health and to prevent dangerous situations!**

#### **Suspended loads**

**DANGER!** Never stand under suspended loads!  
Move loads only under proper supervision!  
When leaving the workplace, lower the suspended load to the ground!

Falling loads can cause serious injury or even death.

#### **Flammable substances**

**WARNING!** Do not smoke in the danger area or its vicinity! Do not use naked flames or other ignition sources!  
Keep a suitable fire extinguisher nearby!  
Immediately notify your supervisor if you detect any suspicious substances, liquids or gases!  
In the event of a fire, immediately shut down the unit and stop working. Vacate the danger area until you are instructed that it is safe to return to your workplace!

Highly flammable substances, liquids and gases can ignite and cause serious injury or even death.

## Health and Safety

### Explosive dusts

**WARNING!** Do not smoke, use naked flames and/or ignition sources of any type near the unit and in the hall!

Keep the danger area dust-free.

In the event of dust formation, stop working. Wait until the dust has settled and then remove it.

Dust deposits can be whirled up so that the particles become airborne forming a dangerous explosive atmosphere.

### Hazardous dusts

**WARNING!** When working in the danger area, always wear light-duty respiratory protection equipment!

If dust is inhaled over a long period, it might cause damage to lungs or other vital organs.

### Hot working materials

**WARNING!** Before handling working materials, ensure that they are not hot! If necessary, let them cool down!

Working materials can reach high temperatures during operation and therefore cause injury from burns when touched.

### Forklift trucks

**WARNING!** Forklift trucks must be driven by suitably trained operators!

Use only approved forklift trucks with the necessary load capacity!

Never transport suspended goods across areas where persons are standing!

Only pass forklift trucks, if the driver indicates to you that he/she has seen you!

When transporting goods on forklift trucks, there is a risk that they might become dislodged, causing serious injury!

There is also a risk that forklift truck operators fail to see a person in their path and thus cause a collision.

### Sharp edges and pointed corners

**CAUTION!** Proceed with special caution when working near sharp edges and pointed corners!

If in doubt, wear protective gloves!

### Hot surfaces

**CAUTION!** During all work near hot component parts, always wear protective clothing and gloves!

Before commencing work, ensure that all components are cooled down to ambient temperature!

Skin contact with hot parts and surfaces can lead to injury from burns.



**Open flame**

**CAUTION!** During all work near naked flames, wear additional protective equipment!  
Never look into the flames without special goggles!  
Keep a safe distance from the flames!  
There is a risk of burns and damage to eyes, even if direct contact with the flames is avoided!

**Dirt and untidy workplaces**

**CAUTION!** Always keep the working area clean and tidy!  
Clear away equipment and tools that you don't need!  
Mark trip hazards with yellow and black marking tape!  
There is a risk that people might trip or slip on dirt and tools left on the floor!

**Electrical stroke**

**CAUTION!** Insure before working at electrical Units that the power supply is safely interrupted and secured against unintended switch on. An electrical stroke can cause considerably injuries.

## Health and Safety

### 2.7 Protective devices

#### ⚠WARNING

At the beginning of the shift, check whether the safety devices are safely installed and working properly.  
Never disable safety devices!

Ensure that safety devices such as emergency-stop buttons, rip cords, etc. are accessible at all times!

The safety of the unit depends on properly working safety devices. In the event of defective or disabled safety devices, there is a serious risk to life and limb!

#### ⚠WARNING

The surfaces of the burner may become very hot during normal unit operation. The unit operator must ensure that the unit is equipped with suitable safety devices and guards at suitable distances to each other. He must also carry out regular function checks of these devices.

#### Necessity of integrated emergency-stop concept

The burners are designed for integration into an overall unit. They are not equipped with a separate control system or independent emergency-stop function.

It is the responsibility of the unit operator to ensure that the equipment is protected with a suitable emergency-stop concept and that the necessary emergency-stop circuits are integrated into the unit control system and conform to the relevant regulations.

### 2.8 Securing unit against inadvertent start-up

#### ⚠DANGER

When restarting the unit, always follow the instructions below! Adhere to the instructions for the securing of the unit against unauthorised start-up in the chapters of this manual!

When working in the danger area, you are at serious risk of injury if the power supply to the unit is inadvertently switched on.

- 1 Close the gas supply by closing the respective tap or valve.
2. Switch off the burner control system and secure it against inadvertent switching on.

## 2.9 Operator behaviour in the event of an emergency

If the unit operator has drawn up an contingency plan for emergencies, adhere to it in the event of an emergency or accident.

If no such contingency plan is in place, follow the instructions below.

### Preventive measures

- Always be prepared for the eventuality of an accident or fire!
- Keep fire extinguishers and first-aid equipment (first-aid kit, blankets) ready.
- Ensure that all personnel are familiar with the alarm, emergency, first aid and rescue equipment.
- Ensure that the access routes for rescue vehicles are kept free at all times.

### Measures to be taken in the event of an accident

- Stop the unit by pressing an emergency-stop button.
- Take suitable first-aid measures.
- Remove persons from the danger area.
- Notify the plant supervisor.
- Contact the emergency services.
- Ensure that the access routes for rescue vehicles are kept free at all times.

## 2.10 Environmental protection measures

### **IMPORTANT**

**Always adhere to the instructions below!**

**If polluting substances have inadvertently been released, take the necessary measures to prevent damage. If in doubt, contact your local environmental protection authorities and inform them of the incident!**

**Incorrect handling of pollinations, and in particular improper disposal of such substances, can lead to serious damage to the environment.**

The following polluting substances are used:

## Health and Safety

### Propane, natural gas and CO

The gases do not have a direct adverse effect on the environment.

In the event of a gas leak, attempt to stop the gas from escaping. Prevent the gas from entering the sewage system, basements, excavated pits and other areas where it could pose a hazard and ventilate the areas thoroughly.

CO is toxic even in small concentrations. Immediately evacuate all persons from the danger area. The operator is obliged to carry out the following measures on site:

- Measure the gas concentrations at the workplace regularly and at short intervals.
- If harmful concentrations are detected, immediately stop all work, leave the affected area and ventilate the workplaces thoroughly.
- Take suitable safety measures (e.g. extraction of fumes from the working area, installation of filter systems in exhaust gas extractors).

### 2.11 Signage

It is the responsibility of the unit operator to ensure that there are suitable safety, warning and operating signs attached to the unit. These signs must be kept legible at all times.

The unit operator must inform all personnel of the possible risks and dangers associated with the unit and instruct them to adhere strictly to the instructions on attached signs.

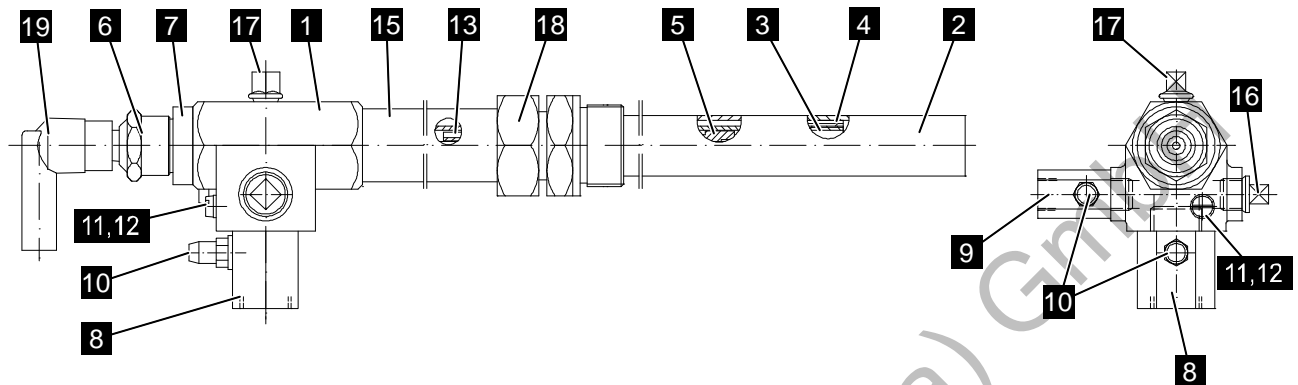
### 3 Design and function

#### 3.1 Overview

Pilot burner type		3001-6012	3001-6020	3001-6030	3001-6050	3001-6100	3001-6150
capacity	KW	3,5	6	7,5	15	26	40
Gas consumption (Erdgas)	Nm <sup>3</sup> /h	0,35	0,6	0,75	1,5	2,6	4
Gas pressure at 20°C	mbar	20	20	20	20	20	20
Air consumption for NG operation	Nm <sup>3</sup> /h	3,5	6	7,5	15	26	40
Air pressure at 20°C	mbar	20	20	20	20	20	20
Gas connection		R 1/4"	R 1/4"	R 1/4"	R 1/4"	R 1/2"	R 1/2"
Air connection		R 3/8"	R 1/2"	R 1/2"	R 3/4"	R 1"	R 1 1/4"

## Design and function

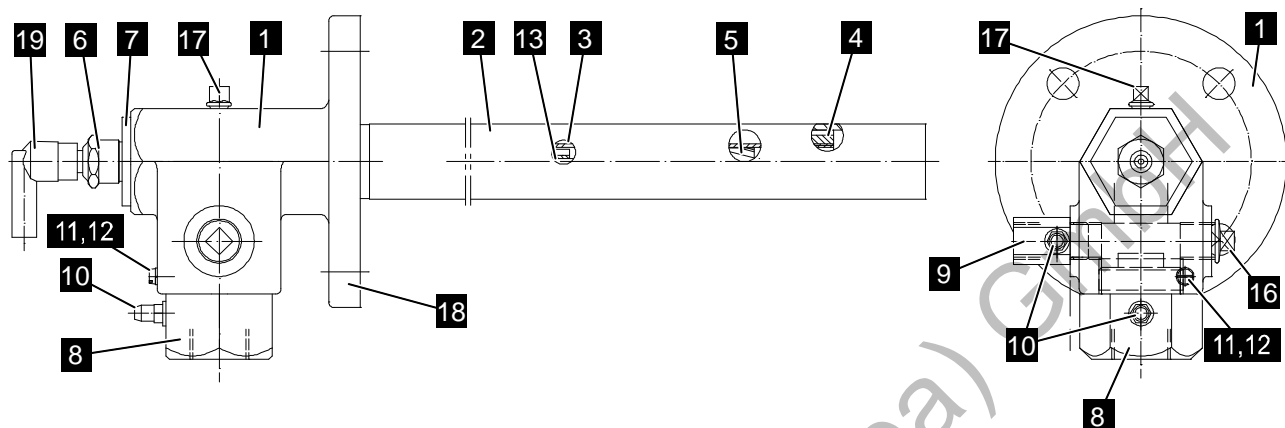
### 3.1.1 Pilot burner with thread connection ( Größe 6012 bis 6050)



pic. 1: Overview pilot burner with thread connection Übersicht Zündbrenner mit Einschraubverschraubung

- |    |                        |    |   |
|----|------------------------|----|---|
| 1  | body                   | 11 | earthing connection                           |
| 2  | outer pipe             | 12 | serrated washer                               |
| 3  | inner pipe             | 13 | isolation star                                |
| 4  | ceramic jet nozzle     | 15 | spacer pipe                                   |
| 5  | tip                    | 16 | plug  |
| 6  | ignition electrode     | 17 | plug  |
| 7  | plug screw             | 18 | main burner connection:<br>male stud coupling |
| 8  | air orifice            | 19 | spark plug socket                             |
| 9  | gas orifice            |    |   |
| 10 | measurement connection |    |   |

### 3.1.2 Pilot burner with flange connection ( Größe 6100 bis 6150)



pic. 2: Overview pilot burner with flange connection

- |    |                        |    |                                   |
|----|------------------------|----|-----------------------------------|
| 1  | body                   | 11 | earthing connection               |
| 2  | outer pipe             | 12 | serrated washer                   |
| 3  | inner pipe             | 13 | isolation star                    |
| 4  | ceramic jet nozzle     | 15 | spacer pipe                       |
| 5  | tip                    | 16 | plug                              |
| 6  | ignition electrode     | 17 | plug                              |
| 7  | plug screw             | 18 | main burner connection:<br>flange |
| 8  | air orifice            | 19 | spark plug socket                 |
| 9  | gas orifice            |    |                                   |
| 10 | measurement connection |    |                                   |

### 3.2 Functional description

The pilot burner used to ignite a main burner, which one fired furnace. The pilot burner is equipped with a common spark electrode for ignition and monitoring.

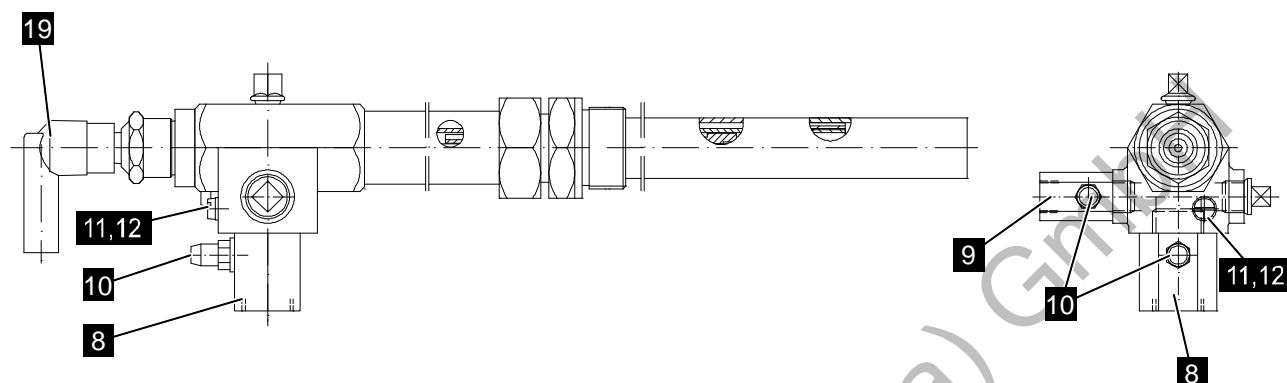
The ignition takes place electrically via a transformer. The flame is monitored by ionization. The air and gas supply is adjusted by means of pressure regulator and fine regulation valve.

The pilot burner is used in combination with a burner control system for a common ignition and monitoring electrode. With appropriate construction monitoring with a UV sensor is possible.

## Design and function

### 3.3 connections

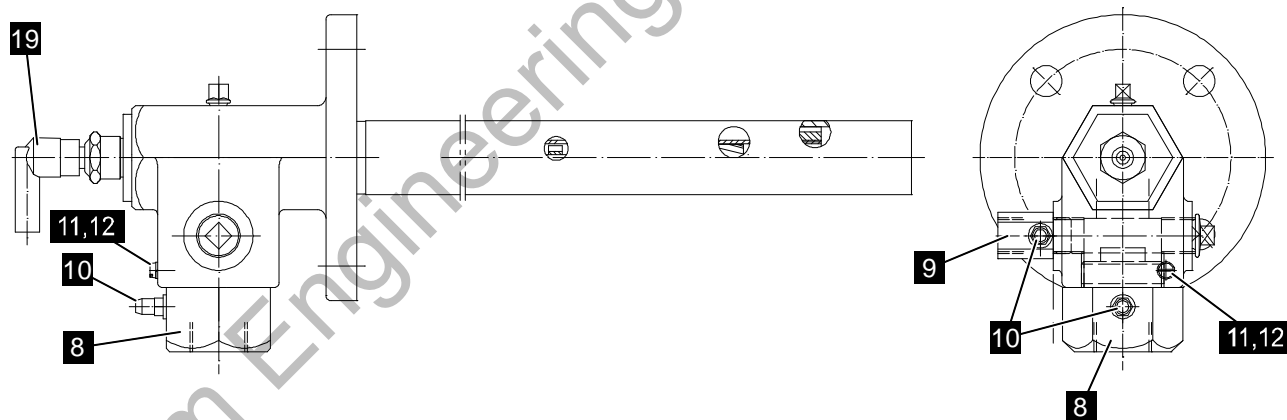
#### 3.3.1 Pilot with thread connection



pic. 3: pilot burner with thread connection

- |    |                        |    |                     |
|----|------------------------|----|---------------------|
| 8  | air orifice            | 11 | earthing connection |
| 9  | gas orifice            | 12 | serrated washer     |
| 10 | measurement connection | 19 | spark plug socket   |

#### 3.3.2 Pilot burner with flange connection

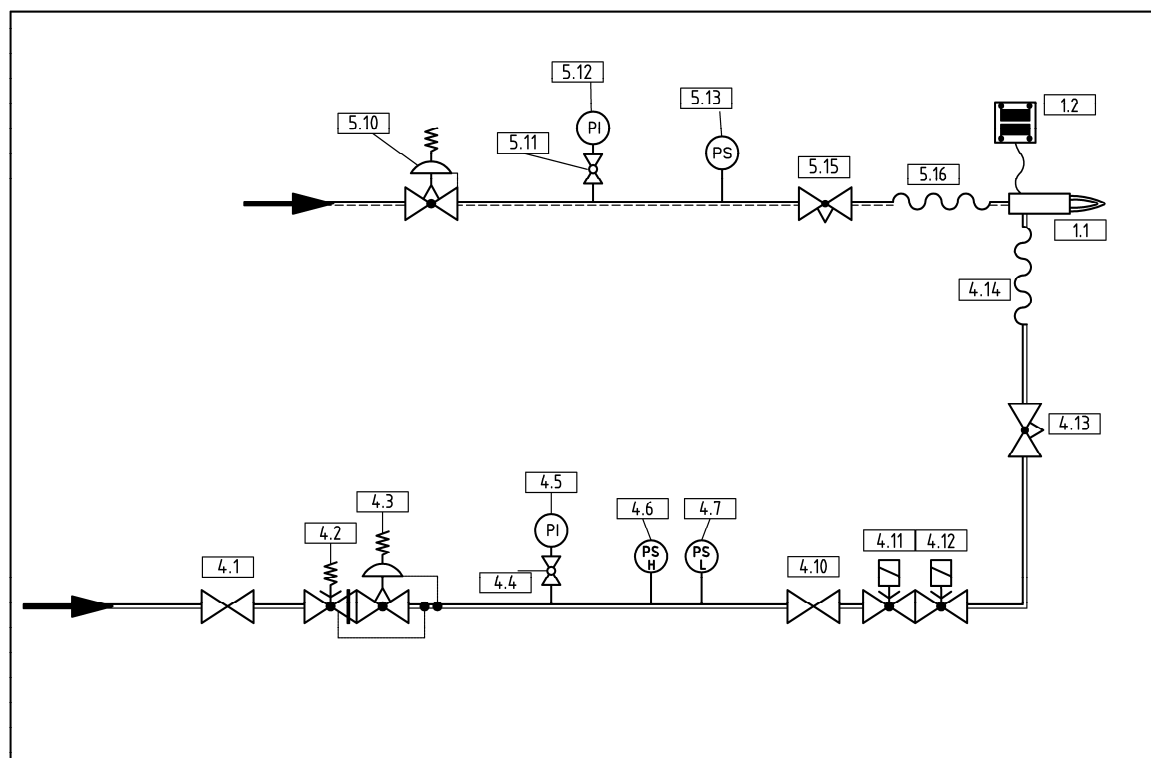


pic. 4: pilot burner with flange connection

- |    |                        |    |                     |
|----|------------------------|----|---------------------|
| 8  | air orifice            | 11 | earthing connection |
| 9  | gas orifice            | 12 | serrated washer     |
| 10 | measurement connection | 19 | spark plug socket   |



### 3.4 Principle gas train valve for Bloom pilot burner



4.1	Manual shut off valve	4.11/4.12	Solenoid shut off valves (1 and 2)
4.2	Safety shut off valve	4.13	Limiting orifice valve
4.3	Gas pressure regulator	4.14/5.16	Flexible hose
4.4	Manometer cock	5.10	Air pressure regulator
4.5	Pressure gauge	5.11	Manometer cock
4.6	Pressure switch min	5.12	Pressure gauge
4.7	Pressure switch max	5.13	Pressure switch min.
4.10	Manual shut off valve	5.15	Limiting orifice valve
1.1	Pilot burner	1.2	Ignition transformer 7,5 kV ED100%

## **Design and function**

### **3.5 Operating device**

The pilot burner does not come with a control system. He must be integrated to a pilot burner control system. (see the pilot burner control system manual)

### **3.6 Ignition transformers**

For the ignition of the pilot burner an ignition transformer is used. Bloom Engineering recommends to use a transformer with an outlet currency of 7,5 kV and 100% ED.

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## 4 Transportation, packaging and storage

### **IMPORTANT**

At the request of the customer, the units are installed and commissioned by a technician of the manufacturer or another person authorised by the manufacturer. During the installation work and subsequent procedures, operating and/or maintenance staff of the machine operator might be requested to handle parcels. If this is the case, the following instructions must be adhered to.

### 4.1 Safety instructions for transportation

#### **⚠ WARNING**

**Never stand under suspended loads!**

**Attach the lifting tackle only at the provided attachment points!**

**Do not attach lifting tackle to protruding machine parts or eyelets at mounted components! Ensure that the tackle is properly secured!**

**Use only suitable lifting gear and tackle with the necessary load capacity!**

**Do not use torn or worn ropes, belts and cables!**

**Do not place cables or belts around sharp edges! Do not knot or twist cables or belts! To avoid dangerous situations and damage to equipment, always strictly adhere to the safety instruction and warnings!**

**When lifting loads, there is a risk of serious injury or even death from parts that become dislodged or begin to swerve uncontrolled.**

#### **⚠ WARNING**

**The centre of gravity of packed goods might not be at the geometric centre of the parcel. If attached incorrectly, parcels might tip over, causing serious injury or even death.**

**Observe the safety instructions and symbols on the packaging!**

**Attach the crane hook in such a way that is located directly above the centre of gravity!**

**Carefully lift the goods and prevent tipping!**

**If necessary, change the attachment!**

## Transportation, packaging and storage

### ⚠ CAUTION

**When unloading parcels after delivery or during internal transportation, proceed with special caution and always observe the symbols and instructions printed on the packaging!**

**Attach the lifting tackle only to the attachment points provided!**

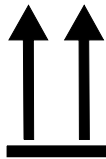
**Remove the packaging only immediately before installing the respective part!**

**Improper transport can cause serious damage to the equipment.**

## 4.2 Symbols on packaging

The symbols listed here are widely used, but are sometimes omitted from packaging.

Other signs and symbols can be applied to the packaging at the request of the customer. It is the responsibility of the unit operator to ensure that all personnel involved in the transportation of the goods adhere to the instructions.



### Top

The points of the arrows must face upwards. Otherwise, the goods could be damaged.



### Fragile

Indicates that the package contains fragile or otherwise easily damaged goods.

Handle the package with care, do not drop and protect it against impact.



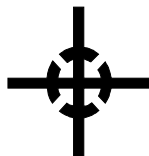
### Keep dry

Protect goods against dampness and store them in a dry place.



### Attach here

Attach lifting gear (chain, belt) only at the points marked with this symbol.



### Centre of gravity

Indicates the centre of gravity of the package.

Observe the centre of gravity when lifting and transporting the packages.

## Transportation, packaging and storage



### Weight, attached load

Indicates the weight of the package.

Handle the packages according to their weight.

### 4.3 Inspection for transport damage

Upon receipt of the goods, inspect the delivery for completeness and visible damage caused during transportation.

If there is visible damage caused by transportation, proceed as follows:

- Do not accept the delivery, or accept it with reservations.
- Note the damage in the transport dockets or the delivery note of the carrier company.  
Take pictures of the damage.
- Express your concern without delay.

**IMPORTANT!** Always make a complaint the moment you detect a defect!

**Claims for compensation of damages shall only be accepted if announced on delivery.**

### 4.4 Packaging

#### Packaging

The individual parcels are packed to protect the goods during transport.

The packaging must also protect the individual parts against corrosion and other damage prior to installation. Therefore do not damage the packaging and remove it only immediately prior to installation of the component.

#### Handling of packaging material

Dispose of the packaging material according to the statutory waste management regulations.

**IMPORTANT!** Packaging material should be disposed of in an environmentally friendly manner! Observe the applicable statutory regulations! If appropriate, contract a specialist waste management company with the disposal of the packaging!

**Some packaging material can be recycled or reused. Improper disposal can cause damage to the environment.**

## Transportation, packaging and storage

### 4.5 Storage

#### Storage of parcels

Store the parcels under the following conditions:

- Do not store outdoors.
- Store in a dry and frost-protected room.
- Do not expose to aggressive media.
- Avoid mechanical impact or vibration.
- Avoid condensation.
- If goods are stored for more than 3 months, regularly check all parts and the packaging for damage or moisture. If necessary, replace the desiccant.

#### **IMPORTANT**

**Storage in a humid environment can cause i.e damage from moisture penetrating the refractory lining or corrosion at burner parts. Installation or start up of the wrong stored equipment can cause malfunction of the burner.**

#### **IMPORTANT**

**Under certain circumstances, the parcels are delivered with special instructions for storage, which exceed the general instructions in this manual. Always adhere to the special instructions!**

## 5 Installation and commissioning

### IMPORTANT

At the request of the customer, the units are installed and commissioned by a technician of the manufacturer or another person authorised by the manufacturer. Normally, the installation and commissioning procedures are supervised by an experienced topping-out supervisor of the manufacturer.

If the customer/operator wishes to carry out the installation work without assistance from the manufacturer, he shall be responsible to ensure that all relevant standards and safety regulations have been adhered to and that all work is carried out to best practice.

### 5.1 Safety instructions for installation

#### DANGER

Before carrying out any work at the units, disconnect the electric power supply and secure it against inadvertent reconnection!

Contact with powered components can cause death. Powered parts might perform unexpected movements that can cause serious injury.

#### DANGER

Before carrying out any work at the units, disconnect the electric power supply and secure it against inadvertent reconnection!

When working in the danger area, you are at serious risk of injury if the power supply to the unit is inadvertently switched on.

#### WARNING

All work in connection with the installation and commissioning of the unit must be carried out by qualified specialist personnel!

These tasks require special skills, knowledge and experience. Incorrect installation can lead to dangerous situations, where lives can be put at risk.

## Installation and commissioning

### WARNING

**Before starting any work, ensure that you have the necessary room for manoeuvre!**

**Proceed with special caution when handling components with sharp edges!**

**Keep the installation site clean and tidy! Loosely stacked components and tools can cause injury!**

**Mount all components according to best practice! Tighten the bolts with the prescribed tightening torques!**

**If necessary, secure components to prevent them from falling or tipping!**

**Improper installation and commissioning can result in serious injury or damage to property.**

### CAUTION

**At all works close to hot surfaces in principal is personal protective equipment required and mandatory.**

**Before starting the work at such equipment the worker is obliged to check if the equipment is cooled down to acceptable working conditions.**

**Contact with hot surfaces will cause burn of skin.**

### Personnel

■ All work in connection with the installation and commissioning of the burner must be carried out by specially trained technical staff.

■ All work on the electrical components must be carried out by a qualified electrician.

### Personal protective equipment

The following personal protective equipment must be worn when installing and commissioning the unit:

- Protective goggles
- Hearing protection
- Protective clothing
- Hard hat
- Safety footwear
- Protective gloves



**A warning symbol in this chapter indicates whether additional protective equipment is required for specific work.**



## 5.2 Installation

All installation work must be carried out by specialist personnel.

All work must be carried out according to the instructions of the manufacturer.

### 5.2.1 Preparation

The unit operator or the installation contractor must ensure that the following issues are duly considered before the commencement of the installation work:

- During all work, always adhere to the applicable safety regulations and document all steps as required.
- Strictly adhere to the order-specific design and installation drawing supplied by the manufacturer.  
Instructions in the design and installation drawings have precedence over the instructions in this operating manual.

**All components and parts of the equipment must be positioned and connected to each other as shown in the installation drawings. Otherwise, we cannot guarantee proper operation of the burner system.**

- Prepare location of installation. Ensure that there are suitable transportation routes to the location of installation. Clear the area to provide ample space for manoeuvre around the location for installation.
- The pipelines must be dimensioned so that condensate collection is prevented. If necessary, install suitable water traps and condensate drains and valves at the appropriate points.
- All welding work must be carried out by suitably qualified welders. Carefully clean all welds and test them for leakage.

## Installation and commissioning

### 5.3 Installation instructions

#### IMPORTANT

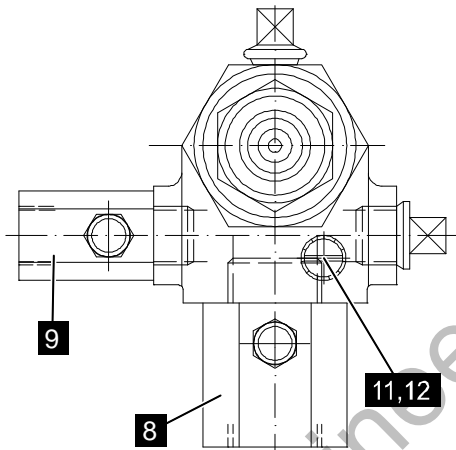


Abb. 5: gas air and earth connection

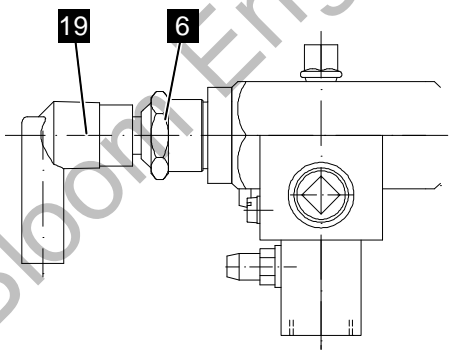



Abb. 6: spark plug connection

1. The pilot burner in the proposed opening of the main burner screw.  
Pilot burner with flange with appropriate mounting screws and gaskets on the mounting flange of the main burner on tightly.

**To prevent thermal overload, the depth should not "K" (see technical drawing in the overall documentation) will be exceeded.**

**However, exceeding the penetration depth can lead to property damage at the pilot burner.**

2. The Gas and air distribution must be correct engineered.
3. The gas (9) and air (8) connections and pipe or horse must be cleaned, before the installation.
4. Gas (9) and Air Line (8) and screw into the pilot burner.  
 *Gas- and air orifice must be secured against torsion during installation (i.e. with suitable spanner). In the case of disregarding the thread can shear off..*
5. Leak check at the gas and air pipe work.
6. The grounding/earth wire to the earthing terminal (11.12) from the pilot burner to the earthing screw terminal of the burner control
7. Spark plug with the ignition with a non-shielded high voltage cable (cable length max.) 5 m) connect (see manual ignition).

8. The last step is to connected the Spark Plugs (versa 19) to the ignition electrode (6)

## 5.4 First start up

- All installation work must be carried out by specialist

All work must be carried out according to the instructions and standards of the local guidelines.

1. Ensure that pipes pressure tested and cleaned properly.



During the time of setting of the ignition burner, the gas supply to the main burner shut off.

2. Close the gas valves to the pilot burner.  
(PID Sheet item 4.10)
3. Vent the gas pipe line and fill it with fuel until the pilot burner  
(instructions for the entire system).
4. Open furnace door and waste gas valve (see instructions for the entire system).
5. Start the combustion air  
(see instructions for the entire system).
6. Open all valve for the entire combustion air system  
(see instructions for the entire system).
7. Set point before pressure regulator set at about 40 mbar combustion air side.  
(PID Sheet item 5.10)
8. Ensure that the set point is not affected through fluctuations.  
(PID Sheet item 5.10)
9. The combustion air before the pilot burner to be set with the limiting orifice valve at 20 mbar  
(PID Sheet item 5.15)
10. Fully open the ignition gas valve. pilot gas shutoff valve for the pilot burner is open completely.  
(PID Sheet item 4.1)
11. Set point before pressure regulator set at about 40 mbar gas side. (PID Sheet item 4.3)




*It is recommended to install a measuring nipple in the gas supply pipe before the shut off valves to measure the gas pressure*


12. Open the valve for the gas supply at the pilot burner fully.  
(PID Sheet 4.10)

## Installation and commissioning

13. Turn on the burner pilot burner control and light the pilot burner  
(see instructions for the burner control)
14. After the pilot gas solenoid valve opens (PID Sheet 4.11/4.12), adjust the limiting orifice valve (PID Sheet 5.15/4.14) that the pilot burner burns with a stable flame. In addition, where appropriate, re-ignite if the self-running time is too short to detect the flame.
15. Next Ignition start period after cooling down the ignition burner again and correct settings if necessary.
16. Once the pilot burner has formed a flame check ionisation signal (see instructions for the burner control).

 The flame signal must be above the cut-off threshold (see the instructions for the burner control to be). By systematically adjusting the ignition gas and ignition gas fuel can be maximized the ionisation signal.

17. Ignition gas pressure (PID Sheet 5.15) reduced slowly, with a minimum pressure of 15 mbar should not be allowed. If no improvement of the signal one, the ignition gas pressure slowly push back to the starting pressure.
18. Increase gently the gas pressure (PID Sheet 4.13) until the maximum signal strength is achieved.

 The adjusted values recorded and archived, in order to draw them in subsequent revisions as a comparison to.

### 5.4.1 Example flame pictures

**Adjustments:**

**Gas pressure: 20 mbar**

**Air pressure: 20 mbar**

**correct air/gas ratio and correct pressure (air/gas).**



Abb.7

Typical Bloom pilot burner figure, a short wide high reaction zone.

**Adjustments:**

**Air pressure: 26 mbar**

**Gas pressure: 20 mbar**

**Excess gas**



Abb.8

Poor flame figure, because the high reaction zone started not on the burner, so that the flame can be cut off the pilot burner.

**Adjustments:**

**Air pressure: 20 mbar**

**Gas pressure: 26 mbar**

**Excess air**



Abb.9

Poor flame figure, because the excess air do not allowed the high reaction zone build up correctly, so that it can come to fault starts of the main burner.

**Adjustments:**

**Air pressure: 50 mbar**

**Gas pressure: 50 mbar**

**Gas and air pressure to high, correct gas/air ratio**



Abb.10

Poor flame figure, because the pilot burner works out of his ranges, so that the pilot burner life time will be shorter.

## Installation and commissioning

Adjustemnts:

Gas pressure: 5 mbar

Air pressure: 5 mbar

Gas and air pressure to low, correct air/gas ratio

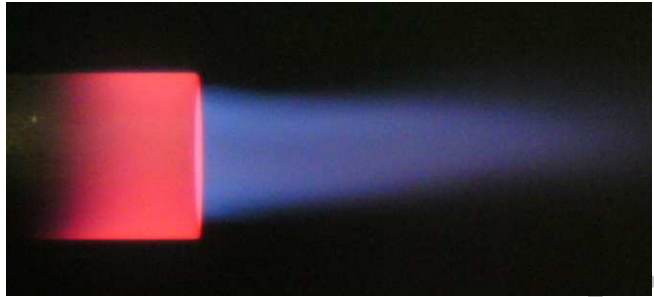


Abb.11

Poor flame figure, because the high reaction zone is inside the pilot burner, so that the pilot burner will be destroyed with in no time.

### **⚠WARNING**

**All different flame figures have be started with a pilot burner control system, as well all of them were running after the pre ignition time hold by a ionisation signal!**

**Only the adjustments of the flame figure Abb.7 are correct a will not destroy the pilot burner !**

**Only with the adjustments of the flame figure of Abb.7 the main burner can be surely started every time !**

**A poor flame adjustment of the pilot burner can result in heavy personal injury's or to material damages!**

## 6 Operation

### 6.1 Safety

#### ⚠ WARNING

**All operating steps must be carried out according to the instructions in this operating manual!**

**At the beginning of the shift ensure that all covers, guards and safety devices are safely installed and working properly!**

**Never disable safety devices while the unit is in operation!**

**Keep the working area clean and tidy!**

**Loosely stacked components and tools can cause injury!**

**At any case the local codes and regulation have to be followed and noticed**

**Improper operation can result in serious injury or damage to property.**

#### Personal protective equipment

The following personal protective equipment must be worn when operating the unit:

- Protective clothing
- Safety footwear
- Protective goggles
- Hard hat
- Hearing protection

### 6.2 Start burner

- See also operating instructions for the burner control.
  1. Before the burner will be started below the self ignition temperature of the air/gas mixture purge the furnace according to the local standard. At least the EN746 has to be considered.
  2. Comparison of the measured gas and air pressure values ( pressure and volume) with the ones from the commissioning. They have to be corrected from specialists In case of major differences. (see chapter 5 Installation and commissioning)
  3. With the burner control unit there will be a spark generated at the electrode of the pilot burner. Please insure that the electricity supply is sufficient. ( see operation manual of the burner control unit )
  4. After checking all items the pilot burner can be lit over the

## Operation

burner control unit. Make sure the dangerous area is safe and all local standards have been observed and considered.

Operate the pilot burner only over the burner control unit.

### 6.3 Switching off burner

1. Turn off the pilot burner by the burner control (see the instructions for the burner control).
2. Close all gas valves.

### 6.4 Shutdown in the event of an emergency

In the event of danger:

- Immediately stop the unit by pressing an emergency-stop button.
- Shut off the fuel supply to the pilot burners.
- Follow local safety instructions
- Take suitable safety measures.

The burners do not feature a built-in mechanism for the shutting down of the fuel and air supply.

It is therefore necessary to install quick-closing valves in the supply lines to the burners. These valves must conform to the relevant applicable safety regulations.



## 7 Troubleshooting

In this chapter, you find information regarding possible malfunctions and remedies to eliminate them.

In the event of frequent malfunction, shorten the maintenance intervals according to the actual burner load.

If you encounter problems that cannot be eliminated by following the instructions below, contact the manufacturer. For service contact details, see page 2.

### 7.1 Safety

#### DANGER

**Before carrying out any work at the units, disconnect the electric power supply and secure it against inadvertent reconnection!**

**Contact with powered components can cause death. Powered parts might perform unexpected movements that can cause serious injury.**

#### WARNING

**Before starting any work, ensure that you have the necessary room for manoeuvre!**

**Proceed with special caution when handling components with sharp edges!**

**Keep the installation site clean and tidy! Loosely stacked components and tools can cause injury!**

**If components were removed, ensure that they are properly aligned when remounting them again. Mount all fixtures and tighten the bolts with the prescribed tightening torque!**

**Improper operation can result in serious injury or damage to property.**

#### Personnel

- The tasks for the elimination of problems described below can be carried out by the burner operator, unless specified otherwise.
- Certain work must be carried out by specially trained technical personnel or the manufacturer. This is indicated in the following instructions.
- All work on the electrical components must be carried out by a qualified electrician.

## Troubleshooting

### Personal protective equipment

For all maintenance work, wear the following protective equipment:

- Hard hat
- Protective gloves
- Protective clothing

### Behaviour in the event of malfunctions and faults

The following principle applies:

1. In the event of malfunctions or faults that might pose a direct threat to persons property, immediately shut down the unit an the emergency-stop device.
2. Identify the cause of the malfunction or fault.
3. If the elimination of the malfunction requires work to be carried out in the danger area, shut down the unit and secure it against inadvertent switching on.
4. Depending on the type of the malfunction or fault, it might be necessary to deploy specialist personnel to carry out the necessary repair work.

## 7.2 Fault signalling

### 7.2.1 Control system

All measuring, control and regulating functions are carried out by a separate unit control system. This system is equipped with an integrated fault management system that indicates possible faults and malfunctions in plaint text or by means of numerical codes (⇒ *separate documentation of control system*).

The steps required for the elimination of the fault or malfunction must be explained in help texts shown by the MCR system, or in the unit-specific documentation. These steps must be carried out in accordance with the instructions.

### 7.2.2 Pilot Burner

The burners are not equipped with a fault display system.

When attempting to locate a fault, always also check the fittings and devices of the supply lines.

## Troubleshooting

### 7.3 Fault table

Fault/malfunction	Possible cause	Remedy	To be carried out by
Pilot burner does not start	Not sufficient gas supply or air supply	Check the gas and air supply	operator
	Fault at the burner control	Check the burner control unit and make sure the safety shut off valve are opened	electrician
	Settings out of range	Check adjustment	operator
	Gas pressure regulator / Gas- and/or Air filter dirty	Check gas or air filter (see manual)	operator
	Pilot burner is dirty	Clean Pilot burner	operator
	No spark	Check power supply	electrician
		Check distance of electrodes at the spark plug	electrician
Pilot burner starts, but the flame is unstable	Malfunction at the gas or air regulator	Check gas and air regulator (see manual)	operator
	Settings out of range	Check adjustment (see Chapter 5)	operator
Flame burns back into the pilot burner	Air / gas ratio or mixture pressure is out of range	Check adjustment (see Chapter 5)	operator

## Troubleshooting

### 7.4 Work on fault elimination

#### WARNING

**Before starting any work, ensure that you have the necessary room for manoeuvre!  
Cool down the pilot burner system, if necessary cool it with additional cooling air.**

**Improper operation can result in serious injury or damage to property.**

#### Pilot burner cleaning

■ **This work has to be done by a specialist**

1. Dismantle the pilot burner.
2. Clean all parts with a towel or scratch brush.
3. Install pilot burner again

### 7.5 Restart after fault elimination

After elimination of the cause of the danger, carry out the following steps for restart of the unit:

1. Acknowledge the malfunction or fault at the control system.
2. Ensure that no persons are standing in the danger area.
3. Start the unit according to the instructions in chapter "Operation".

## 8 Maintenance

### 8.1 Safety

#### DANGER

Before carrying out any work at the units, disconnect the electric power supply and secure it against inadvertent reconnection!

Contact with powered components can cause death. Powered parts might perform unexpected movements that can cause serious injury.

All necessary safety shut off valves of the gas system are closed.

#### WARNING

Before starting any work, ensure that you have the necessary room for manoeuvre!

Keep the installation site clean and tidy! Loosely stacked components and tools can cause injury!

If components were removed, ensure that they are properly aligned when remounting them again. Mount all fixtures and tighten the bolts with the prescribed tightening torque!

Improper maintenance can result in serious injury or damage to property.

#### WARNING

Proceed with special caution when carrying out the following work!

Wear personal protective equipment!

Even if the burner system is shut down, the surfaces of certain components might still be hot. Under certain circumstances, this heat might lead to serious injuries from burns when a person stands close to the equipment or touches it.

#### WARNING

Observe the safety instructions on the manufacturer data sheet of the refractory lining!

During all inspection and maintenance work on the refractory lining and associated components, wear appropriate personal protective equipment!

## Maintenance

### Personnel

- The maintenance tasks described below can be carried out by the burner operator, unless specified otherwise.
- Certain maintenance work must be carried out by specially trained technical personnel or the manufacturer. This is indicated in the following instructions.
- All work on the electrical components must be carried out by a qualified electrician.

### Personal protective equipment

For all maintenance work, wear the following protective equipment:

- Protective clothing
- Protective gloves
- Safety footwear



#### **NOTE!**

**A warning symbol in this chapter indicates whether additional protective equipment is required for specific work.**

### Environmental protection measures

Always strictly adhere to the following environmental protection instructions for maintenance work.

## 8.2 Maintenance schedule

In this chapter, all maintenance tasks required for the trouble-free and safe operation of the burner are described in detail.

If regular inspections reveal that there is excessive wear, shorten the maintenance intervals according to the actual wear and operating load.

If you have any queries regarding the maintenance tasks or intervals, contact the manufacturer. For service contact details, see page 2.

Interval	Maintenance task	To be carried out by
After the first 3 months of operation, upon each service of the unit	Check burner connections and pipe work for leakage	Unit operator
	Check and clean pilot burner.	
annually, or according to the applicable statutory regulations	Check pilot burner.	
	Complete a visual inspection of spark plug and pilot burner tip.	
	Check burner for dirt and clean it	
	Check all flange connections on the air/ fuel side	

## 8.3 Maintenance tasks

### 8.3.1 Check burner connections for leakage

- To be carried out by the operator.
- Required additional protective equipment:
  - Protective gloves
  - Protective goggles
  - Protective clothing
- Tools:
  - Foam leakage tester

All bolt and flange connections at the burner must be regularly tested for leakage.

These tests are to be carried out when the unit is in operation.

## Maintenance

1. Apply leakage testing agent to the bolt connections and then the flange connections.
2. Check whether there are any bubbles.  
Bubbles indicate leaks.
3. In the event of bubbles, tighten the respective connection until no bubbles are formed, maybe new sealing.

### 8.3.2 Check and clean burner

#### ⚠ WARNING

**Before carrying out any work at the burners, shut down the burner system and allow the burners to cool down. The cooling process can be accelerated by feeding cold air through the burners.**

**Even if the burner system is shut down, there might be considerable residual heat in the burners that is might not be easily detected. Under certain circumstances, this heat might lead to serious injuries from burns when a person stands close to the equipment or touches it.**

#### IMPORTANT

**Ash and dust residue collected during the above work is hazardous waste and must be disposed of accordingly. Collect the material and dispose of it according to the applicable statutory regulations.**

- To be carried out by the operator.
- Required additional protective equipment:
  - Protective goggles
  - Protective gloves
  - Protective overall
  - Fine dust mask/light-duty respiratory protection devices

#### Preparation

1. Switch off the pilot burner system
2. Cool down the pilot burner with running cooling air through the air side of the pilot burner.

#### Execution

The following steps have to be carried out with the pilot burner:

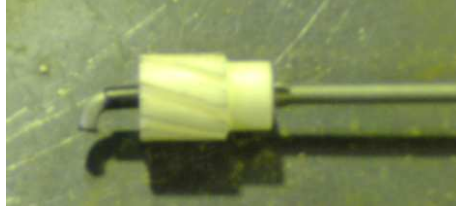
3. dismantle the pilot burner and the electrode  
( chapter 9 Dismantling )
4. pilot burner and electrode has to be cleaned from dust and other particles
5. assembly of the pilot burner



Clean electrode



Clean electrode tip



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## Dismantling

# 9 Dismantling

After the burner has reached the end of its service life, dismantle it and dispose of it according to the relevant waste disposal regulations.

## 9.1 Safety

### DANGER

Before starting dismantling the unit, disconnect it from the electric power supply.

Contact with powered components can cause death. Powered parts might perform unexpected movements that can cause serious injury.

All necessary safety shut off valves of the gas system are closed.

### WARNING

Before starting any work, ensure that you have the necessary room for manoeuvre!

Proceed with special caution when handling components with sharp edges!

Keep the workplace clean and tidy! Loosely stacked components and tools can cause injury!

Dismantle all components according to best practice!

Please note that some parts are very heavy. If necessary, use suitable lifting gear.

Secure components properly to prevent them from falling or tipping!

If unsure how to secure or dismantle parts, consult the manufacturer.

Residual energy, sharp edges, pointed corners, etc. can cause injury.

### WARNING

Observe the safety instructions on the manufacturer data sheet of the refractory lining!

During all inspection and maintenance work on the refractory lining and associated components, wear appropriate personal protective equipment!

Dust particles in the regenerator might be carcinogenic when inhaled. After prolonged standstill, dust might deposit in the regenerator and become airborne when work is carried out.

**⚠️ WARNUNG**

**Proceed with special caution when carrying out the following work!**

**Wear personal protective equipment!**

**Even if the burner system is shut down, the surfaces of certain components might still be hot. Under certain circumstances, this heat might lead to serious injuries from burns when a person stands close to the equipment or touches it.**

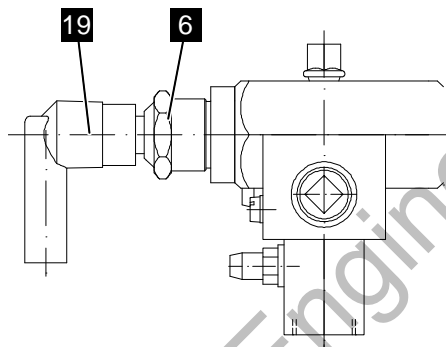
**Personnel**

- The burner must be dismantled by specially trained personnel.
- All work on the electrical components must be carried out by a qualified electrician.

## 9.2 Dismantling

Preparation for dismantling:

- Shut off the burner system and secure against start
- Power shut off at the burner.
- Collect the waste material and dispose of it according to the applicable statutory regulations.



1. Unplug (19) the electrode (6) by pull off the plug

Abb. 7: Unplug the electrode

## Dismantling

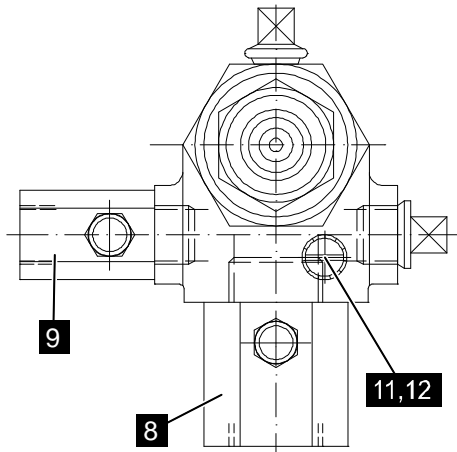


Abb. 8: disconnect gas, air and earthing

2. disconnect air (8) and gas (9) supply from the pilot burner
3. disconnect the earthing cable (11,12) from the pilot burner
4. pilot burner with threaded connection:  
open the union and pull out the pilot burner from the main burner.  
pilot burner with flanged connection:  
unlock and take out the screws of the flange connection and pull out the pilot burner from the main burner

### 9.3 Disposal

Unless a return or disposal contract has been entered into, dispose of the dismantled components as follows:

- Scrap metals.
- Sort other components by material and dispose of separately.

#### IMPORTANT

**Electronic scrap, electronic components, lubrications and others are special waste and needs to be collected and disposed only by authorized companies. A wrong disposal can cause environmental damages.**

Contract the local waste management authorities or specialist waste disposal company with the disposal of the material.

## 10 Spare parts

Bloom Engineering recommends to store on stock the following spare parts in order to reduce the stoppage time for maintenance.

- 1 electrode complete
- 1 gas orifice
- 1 air orifice
- 1 outer pipe
- 1 inner pipe ( not for type 6020)
- 1 spinner ( not for type 6020)

In case of ordering the spare parts please refer to the attached drawing / part list and the in there listed article numbers.

Bloom Engineering (Europe) GmbH

## Drawing and Part list

### 11 Drawing and Part list

To each pilot burner there are all engineering and technical data's on the project pilot burner drawing.

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