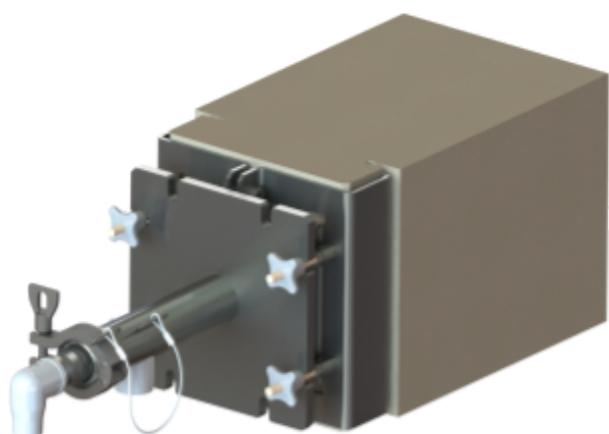
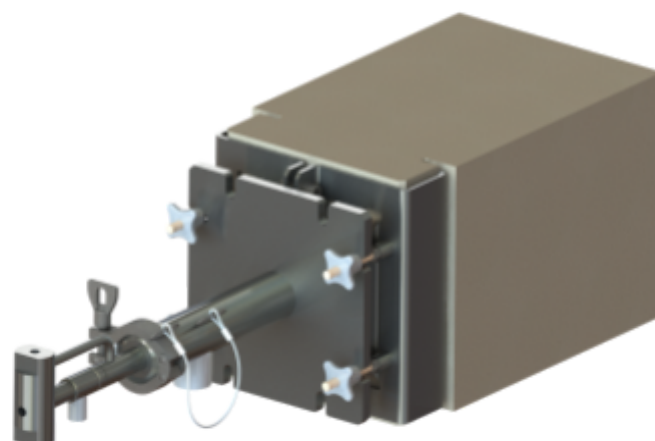
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ALGLASS P GAS / FUEL OIL BURNER


SAFETY INSTRUCTIONS FOR USE AND MAINTENANCE



ALGLASS P GAS VERSION



ALGLASS P FUEL OIL VERSION


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Thank you for the trust you have expressed by purchasing this equipment, which will give you full satisfaction if you follow its instructions for use and maintenance.

The manufacturer will not be held responsible where items not recommended by themselves are associated with this product.


For your safety, there follows a non-restrictive list of recommendations or requirements, many of which appear in the employment code.

Finally, we would ask you kindly to inform your supplier of any error which you may find in this instruction manual.

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A . IDENTIFICATION PLATE

A plate is fixed on the body of the ALGLASS P BURNER unit, it is used to identify it with the following information:

- Part number
- File number
- Manufacturing date
- Serial number
- Model


Please, use this information in all correspondence.

B . SAFETY INSTRUCTIONS

The use of oxygen in oxy-combustion imposes safety procedures:

- Never use oil or grease for oxygen piping, or for burner assembly parts
- No carbon steel for high temperature and/or high speed
- Do not use organic materials for sealing purposes
- Always clean all metallic parts before installing them (eliminate all traces of oil and grease)
- Operators training for oxygen use

Failure to follow these instructions may cause ignition in the oxygen circuit and further propagation along the oxygen piping.

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C . INTRODUCTION TO ALGLASS P BURNERS

The ALGLASS P burners are a new generation burners built to be used on glass furnaces.

The ALGLASS P burner is a non-water-cooled burner (this burner is cooling down in operation with fluids flowing, air cooling is only necessary when the burner is stopped).

The configuration of this burner is of pipe-in-pipe type; the fuel pipe is located inside the oxygen pipe. The fuel and oxygen mix at the burner outlet and the flame develops from the burner tip.

On each type of fuel, presently three ranges of nominal power exist:


ALGLASS P GAS Version :

- ALGLASS P GAS 200
- ALGLASS P GAS 500
- ALGLASS P GAS 1000

ALGLASS P Fuel Oil Version :

- ALGLASS P FUEL OIL 200
- ALGLASS P FUEL OIL 500
- ALGLASS P FUEL OIL 1000

This document describes the procedures for assembling these gas/fuel oil version burners and installing them on a furnace.

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D . DESCRIPTION OF THE ALGLASS P BURNER

Built to operate on various types of glass making furnaces, the material used for the ALGLASS P burner is especially suited for this purpose.

In general, the metals used offer a good resistance to corrosion for the burner's "cold part", and good resistance to temperature and oxidation for the "hot part".

Generally speaking, all of the metal alloys employed are perfectly compatible with pure oxygen use.


Each burner metal component part bears its production file number.

The burner block is made of refractory material. This refractory material is chosen to be compatible with the particular glass making process and the type of superstructures.

The ALGLASS P burner comprises six main component parts.

The ALGLASS P gas/fuel oil burner consists of the following parts. (Fig.1)

- A burner block made of refractory material: rep.1
- A fixation system for mounting the burner body on the block, consisting of two half sections: rep.2
- A ceramic fiber gasket to be positioned between the burner block and burner body: rep.3
- A burner body with its clamp fixation to mount the gas or fuel oil lance: rep.4
- A clamp gasket: rep.5
- A gas lance with 1, 3 or 5 tubes and speed 30 or 60 m/s: rep.6
- A fuel oil lance with injector and nozzle: rep.7

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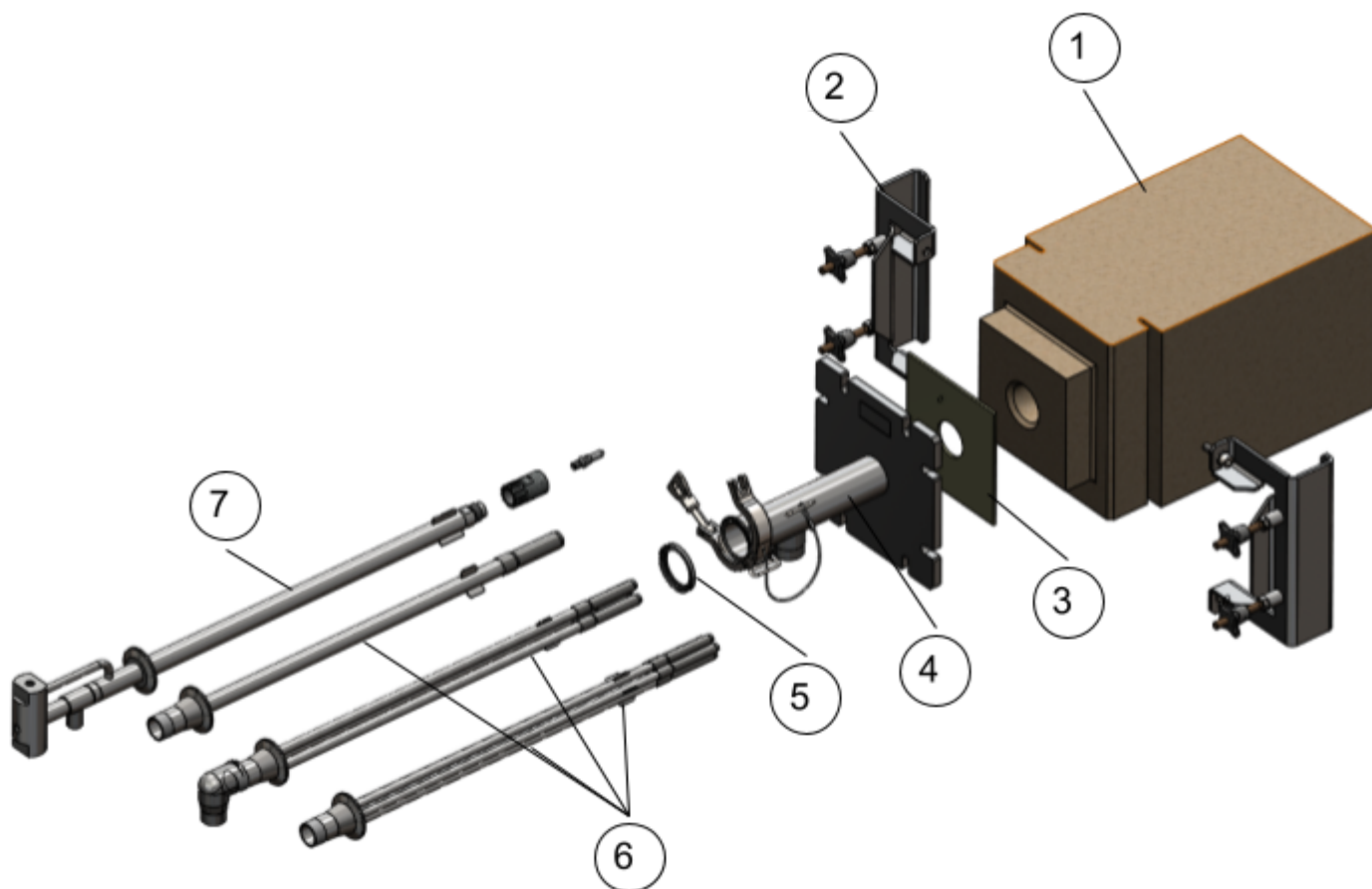



FIGURE 1


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E . BURNER SPECIFICATIONS

Capacity range:


MODEL	ALGLASS P GAS/FUEL OIL 200	ALGLASS P GAS/FUEL OIL 500
Max. Comb. Cap.	350 kW	850 kW
Nom. Comb. Cap.	200 kW	500 kW
Min. Comb. Cap.	70 kW	150 kW

MODEL	ALGLASS P GAS/FUEL OIL 1000
Max. Comb. Cap.	1750 kW
Nom. Comb. Cap.	1000 kW
Min. Comb. Cap.	300 kW

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Gas version:

BURNER MODEL	ALGLASS P GAS 200	ALGLASS P GAS 500	ALGLASS P GAS 1000
Min. oxygen temperature (°C) at burnet inlet	10 °C		
Max. oxygen temperature (°C) at burnet inlet	40 °C		
Min. Natural gas temperature (°C) at burnet inlet	10 °C		
Max. Natural gas temperature (°C) at burnet inlet	40 °C		
Min. oxygen supply pressure (mbar g.) at burnet inlet	25 mbar g. (Max. oxygen pressure drop through the burner at the maximum recommended firing rate)		
Min. Natural gas supply pressure (mbar g.) at burnet inlet	100 mbar g. (Max. Natural gas pressure drop through the burner at the maximum recommended firing rate)		
Cooling air flow rate (Nm3/h)	12 Nm3/h	30 Nm3/h	60 Nm3/h

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Fuel oil version:

BURNER MODEL	ALGLASS P FUEL OIL 200	ALGLASS P FUEL OIL 500	ALGLASS P FUEL OIL 1000
Min. oxygen temperature (°C) at burner inlet	10 °C		
Max. oxygen temperature (°C) at burner inlet	40 °C		
Min. fuel oil temperature (°C) at burner inlet	100 °C		
Max. fuel oil temperature (°C) at burner inlet	140 °C		
Min. oxygen supply pressure (mbar g.) at burner inlet	25 mbar g. (Max. oxygen pressure drop through the burner at the maximum recommended firing rate)		
Min. fuel oil supply pressure (bar g.) at burner inlet	2 bar g.		
Max. fuel oil supply pressure (bar g.) at burner inlet	5 bar g.		
Max. fuel oil viscosity (cst) at burner inlet	40 centistokes		
Nominal fuel oil viscosity (cst) at burner inlet	25 centistokes		
Min. atomizing air pressure (bar g.) at burner inlet	2 bar g.		
Max. atomizing air pressure (bar g.) at burner inlet	5 bar g.		
Atomizing air flow	5 ~ 15 mass % fuel oil		
Cooling air flow rate (Nm ³ /h)	12 Nm ³ /h	30 Nm ³ /h	60 Nm ³ /h

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F . BURNER CHOICE

1) FLAME LENGTH

Gas version: basically, this burner can adjust flame length changing the gas lance between 1, 3, 5 tubes geometry and speed 30 or 60 m/s. More tubes and higher speed make a shorter flame.

Fuel oil version: basically, this burner can adjust flame length using adjusting atomizing air pressure.

Attention : flame shape could be changed with oil viscosity. Please adjust suited viscosity.

2) COOLING AIR

During combustion, the burner body, gas lance and burner block are cooled down by the fluid used for combustion.

However, when combustion is off, all parts of the burner are heated.


In this case, put into cooling air using oxygen line.

Atomizing air is not only atomizing but also to cool down oil lance.

Never stop the atomizing air while oil lance is located in burner block and hot furnace.

3) BURNER BLOCK

The usual size of the burner block is 220 x 220 mm .The size of the furnace opening should be more than this dimension.

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G . INSTALLATION AND ASSEMBLY

The main difference between the gas and fuel oil versions resides in the fuel lance.

Their assembly and installation procedures are therefore practically the same.

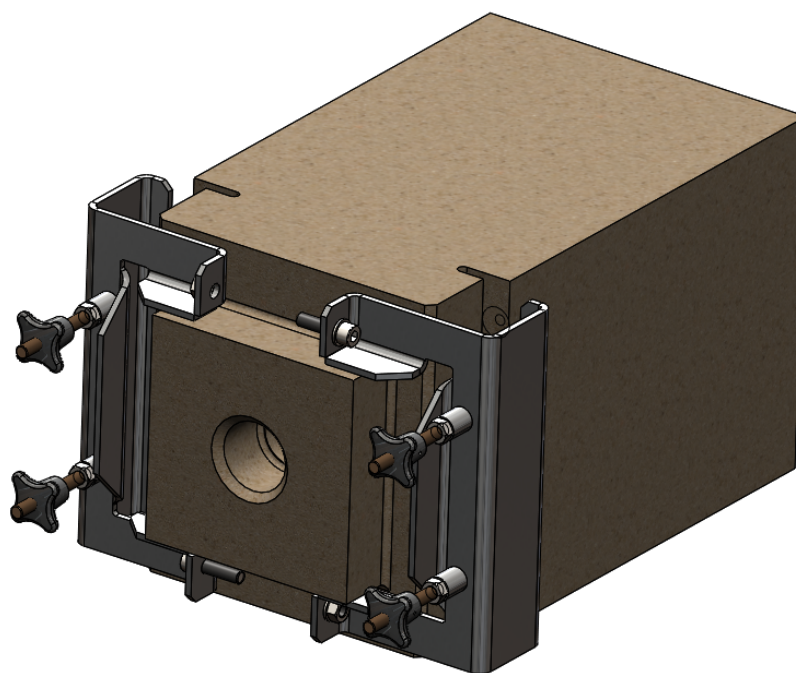
The burner block and adapters must be pre-assembled before installing on the furnace.

On a recently built furnace, burner block will be installed on the furnace before starting heating up.


1) INSTALLING THE BURNER ADAPTER

Before installing the burner block, check that the support of the block is horizontal or inclined a few angles towards the glass level, to be sure that flames are not oriented towards the crown of the furnace.

- Install the two half-sections adapter on the block with the attached bolts and tighten moderately



Setting of the fixation system

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- Place the burner block with its adapter in the furnace opening and push them into their final position, tightening the devices for securing the block in place.
- Plug the hole in the block with an alumina wool plug.

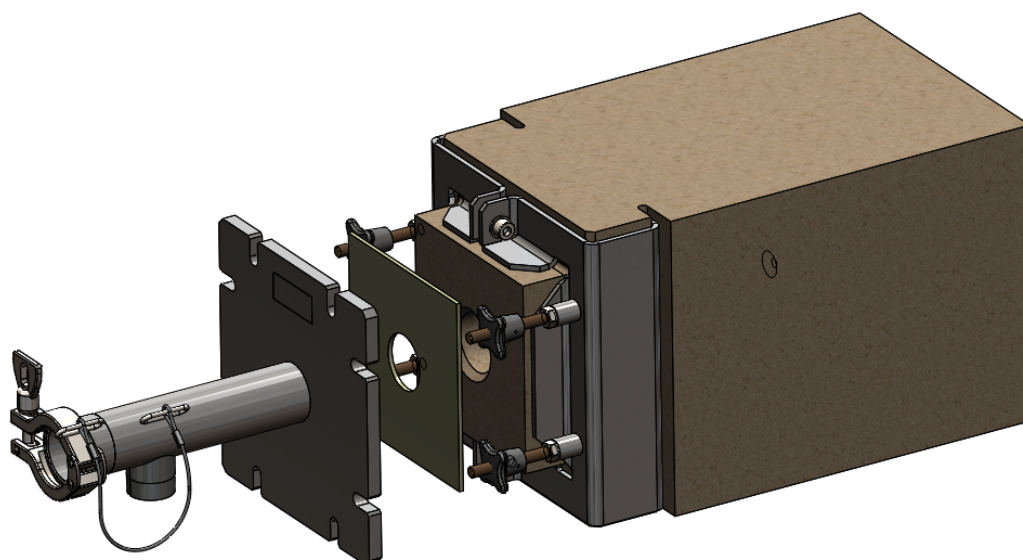
2) ASSEMBLY OF A BURNER BODY

First of all, for safety reasons it is essential that all traces of grease must be removed from the metal burner parts to avoid accidental combustion.


Before this burner is run, the burner body will be mounted on the block.

Then, for operating with fuel gas, the assembly procedure is as follows :

- Mount the ceramic fiber gasket on the burner body nozzle.
- Make sure that clamp gasket is set and mount the plug into the clamp fixation.
- Remove the alumina wool plug from the block and place the burner body nozzle in the hole of the block.



Mounting of the body

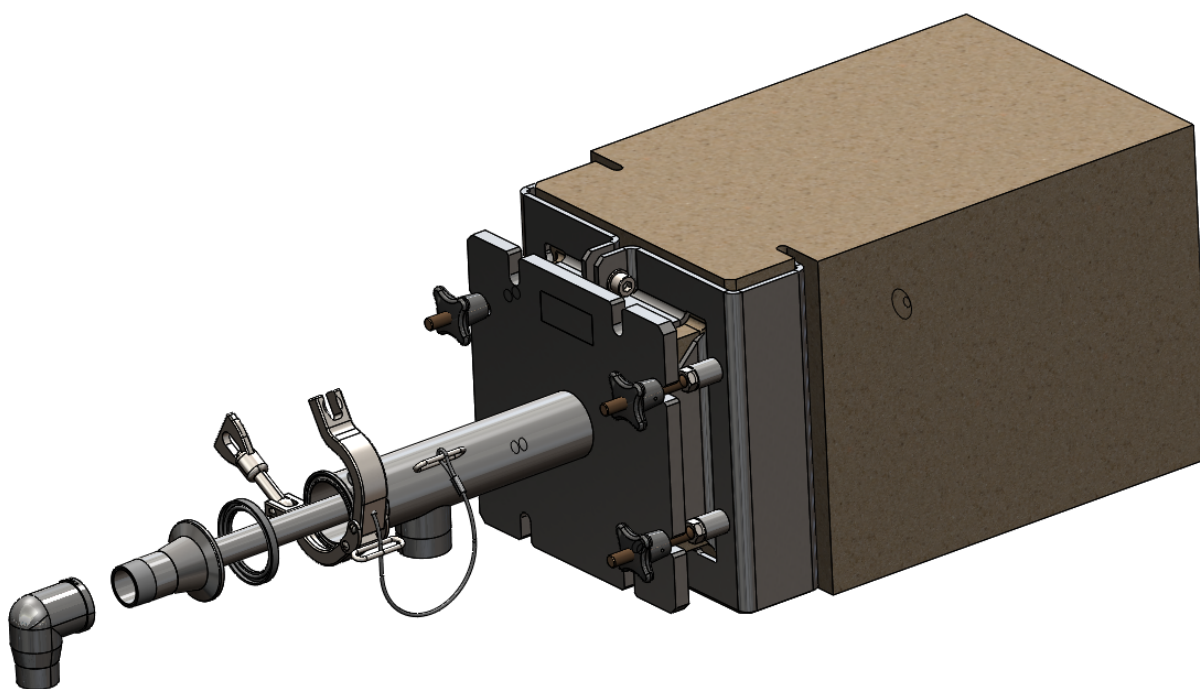
	ALGLASS P GAS / FUEL OIL BURNER SAFETY INSTRUCTIONS FOR USE AND MAINTENANCE	Reference:	CNPL-IOM-010-CNPL-A
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- Place the tie-rods in the burner body plate slots and tighten them to compress the ceramic fiber gasket.
- Connect the oxygen flexible hose to burner body oxygen inlet.
- Put into cooling air.

3) MOUNTING THE GAS LANCE ON THE BURNER


The assembly procedure is as follows:

- Remove the plug from the clamp fixation.
- Make sure that the clamp gasket is set.
- Place the gas lance into the burner body.



Mounting of the gas lance

- Close the clamp fixation and tighten it to seal the gasket.

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- Connect the gas flexible hose to lance gas inlet.
- Put into cooling air if the burner is not immediately ignited.
- Don't switch off the cooling air supply until combustion is started.


4) MOUNTING THE FUEL OIL LANCE ON THE BURNER

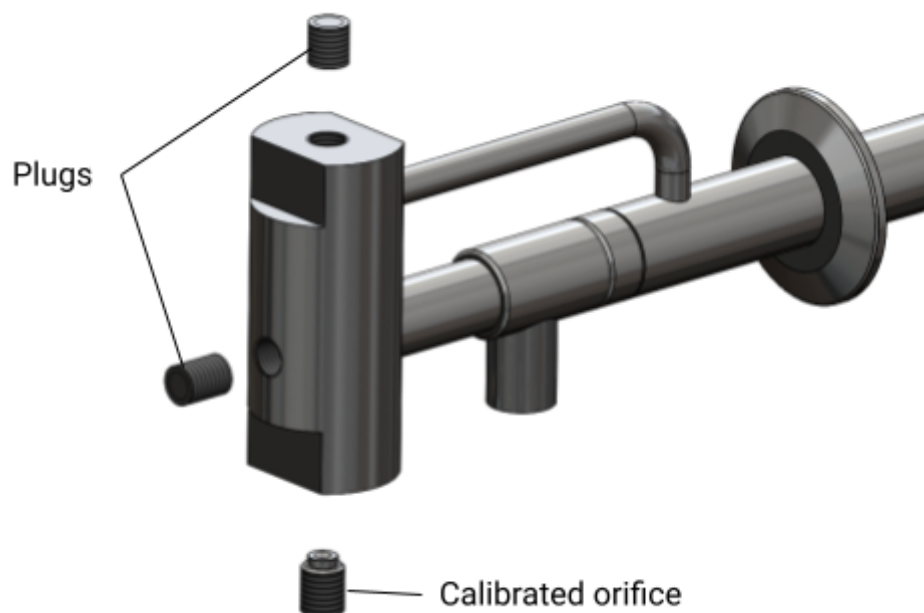
ASSEMBLING THE FUEL OIL LANCE:



Fuel oil lance composition

- Set the couplers to the fuel oil port ($\frac{1}{4}$ ") and atomization air port ($\frac{3}{8}$ ").
- As for the attached coupler, female part has check valve. So please set female parts to lance and male parts to flexible hose.
- Insert the O-ring on the fuel oil injector (only available for ALGLASS P Fuel oil 1000).
- Screw the fuel oil injector on the fuel oil lance tip and squeeze it to assure the tightness.
- Mount the nozzle on the fuel oil lance tip and squeeze to fix it without any tools.
- Check that the calibrated orifice and plugs are in place in the external air circuit.

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Atomizing fluid circuit


MOUNTING THE FUEL OIL LANCE IN THE BODY:

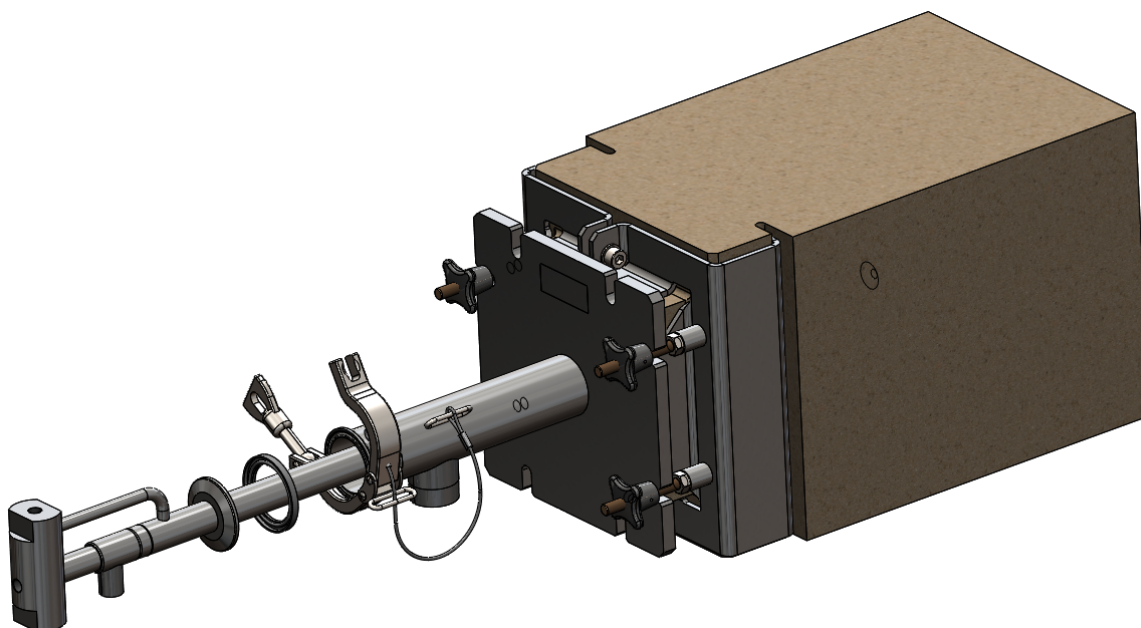
The fuel oil lance will be assembled to the burner body when ready for igniting the burner.

First, check that the fuel oil lance is correctly assembled.

The assembly procedure is as follows:

- Remove the plug from the clamp fixation.
- Make sure that the clamp gasket is set.
- Place the fuel oil lance into the burner body.
- Close the clamp fixation and tighten it to seal the gasket.
- Connect the fuel oil and atomizing air flexible hoses to each inlet.
- First, put into atomizing air.
- Put into cooling air if the burner is not immediately ignited.
- Don't switch off the cooling air supply until combustion is started.

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Mounting of the fuel oil lance

H . IGNITION AND EXTINCTION PROCEDURE

1) IGNITION

According to the previous section, at this moment, the burner is ready to ignite. There is air cooling flow on the burner and atomizing air if fuel oil lance is used.

- Check oxygen and gas valves position on piping.
- Flow oxygen in burner at minimum value (30% of nominal) and stoichiometric gas or fuel oil (using manual mode or automatic sequence of PID).
- Check the ignition of the flame.
- When oxygen flow exceeds 30% of the rating, close the air cooling valve.
- Adjust atomizing fluid pressure depending on the flame length if fuel oil lance is used.

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2) EXTINCTION

When stopping burners, observe the following sequence and fluid flow conditions:

- Decrease the power by around 30% of the rating.
- Close the gas valve nearest to the burner.
- Check that the flame is off.
- Open air cooling valve and check flow.
- Close the oxygen valve.
- if fuel oil lance is used:
 - Close the fuel oil valve.
 - Decrease atomizing fluid pressure until 1 bar to purge oil in the lance.
 - Just before removing the oil lance, close atomizing air valve.
- Remove the gas/fuel oil lance.

I . MAINTENANCE OPERATION

It may necessary to dismount a burner for the following two main reasons :

- Maintenance check or replacement of the lance.
- Decommissioning.


The dismounting procedures are complementary for these two situations and are described thereafter.

1) MAINTENANCE CHECK OR REPLACEMENT OF THE GAS/FUEL OIL LANCE

To shut down the burner

Gas version:

- Close the gas valve nearest to the burner.
- Check that the flame is off.
- Put into Cooling Air.

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- Close oxygen valve.
- Remove the gas lance.
- Mount the plug on the clamp fixation.
- Check the gas lance and injector(s) and replace it if necessary.
- Install the lance following the procedure described in the G.3.

Fuel oil version:


- Close the fuel oil valve nearest to the burner.
- Check that the flame is off.
- Put into Cooling Air.
- Close the oxygen valve.
- Purge oil in lance.
- Close the atomizing air valve.
- Remove the fuel oil lance.
- Mount the plug on the clamp fixation.
- Check the lance, nozzle and injector and replace them if necessary.
- Install the fuel oil lance following the procedure described in the G.4.

This maintenance operation must be done every month

2) TAKING THE BURNER OUT OF SERVICE

Remove the lance as mentioned above.

- Close all valves nearest to the burner.
- Remove the burner body from the block.
- Plug the block hole with a refractory material plug.

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J. GENERAL INSTRUCTIONS FOR PROPER WORKING CONDITIONS


- The ALGLASS P burner requires control over the fuel and oxygen, so we recommend the installation of a calibrated flow meter on the fuel and oxygen lines for determining accurate volumetric or mass flow rates.
- During combustion, the burner body and fuel lance are cooled by the oxygen flow. However when combustion is not taking place, all parts of the burner are heated and can be destroyed by high furnace temperatures. In this case, a cooling air flow should be established using the oxygen line (see chapter E Burner specifications to determine the cooling air flow rate).

When cooling air flow is not available, the fuel lance must be dismantled from the burner. If the fuel lance is left in the burner without cooling, systematically inspect it as damage to the metallic parts may have occurred.

The cooling air flow must be oil free ($\leq 1 \text{ mg/m}^3$ at 1 barg), dry ($-20 \text{ }^\circ\text{C} / 0,1\%$ at 1 barg) and without dust ($\leq 1\mu\text{m}$ and 1 mg/m^3).

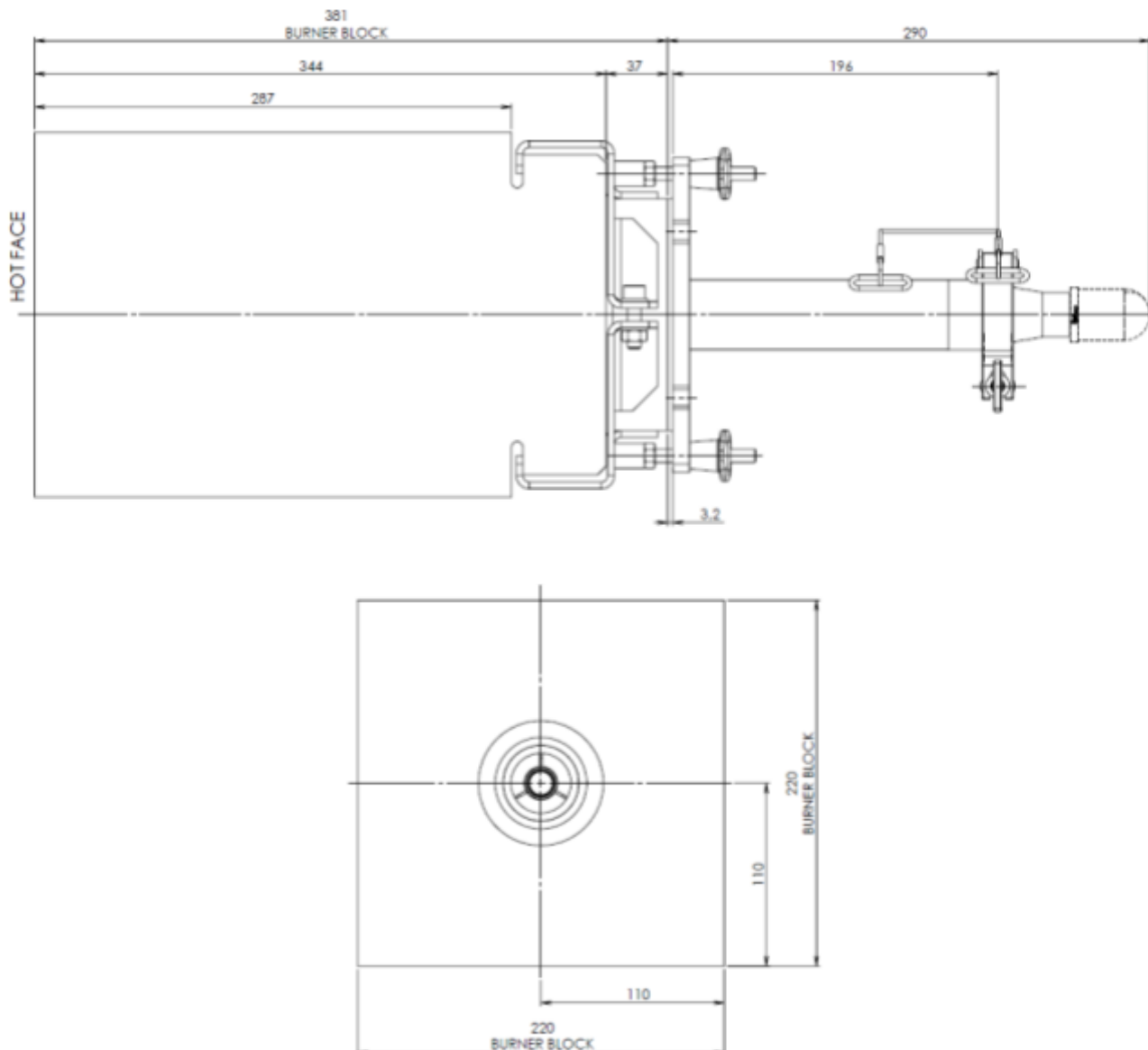
Note for the fuel oil lance: the atomizing air is not only for atomizing fuel oil but also for cooling the lance. Never switch off the atomizing air while the fuel oil lance is located in the burner block.

- Quick-coupling systems for the oxygen, fuel and atomizing fluid will facilitate disassembly and installation, especially when switching from a fuel oil lance to a gas lance. Quick-coupling systems also make it possible to limit the time for which the burner parts are subjected to furnace temperatures without cooling air flow.
- Piping needs to be supported in order to avoid stresses on the burner body which could give rise to cracking of the burner block.
- Flexible hoses are advised for the burner supply. Flexible hoses can prevent damage to the burner due to stresses and the expansion of the piping.
- The burner block made of AZS rebounded material is suitable for most applications. However, it is necessary to ensure that this material is compatible with the customer process.
- We recommend that the atomizing fluid be filtered.
- Viewing the flame through observation windows makes burner start-up and adjustments easier.
- Oxygen and fuel supply piping must be rated for the pressure and flow rate requirements of the burner operating at maximum capacity. Avoid long distances and turns in the piping as these increase the pressure drop.
- For optimum atomization, fuel oil will be supplied to the burner inlet at a suitable viscosity (see chapter E Burner specifications to determine the level of the viscosity).

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K . BURNER SIZE


ALGLASS P 200 Gas version:



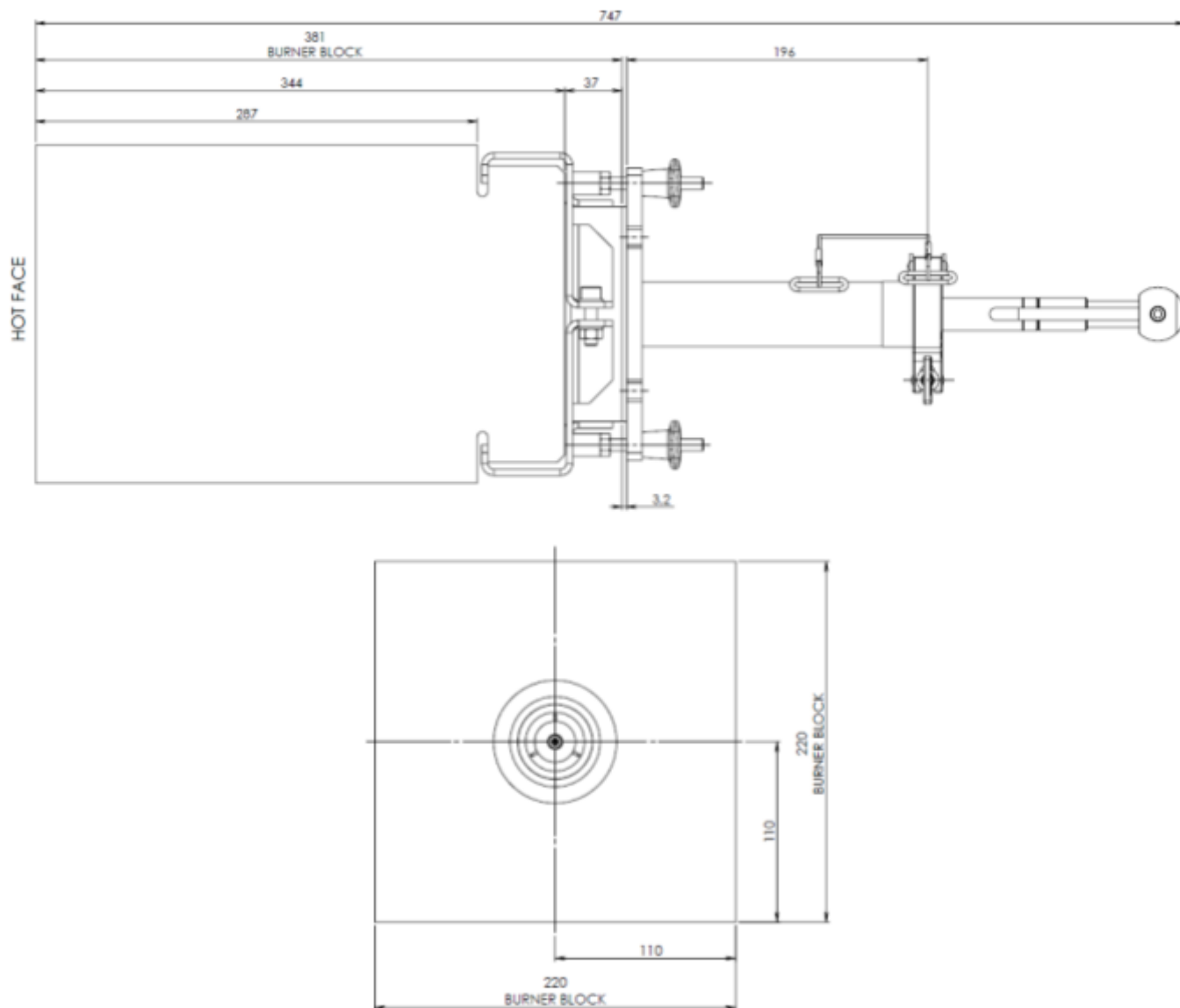
Fluid connections:

-O2 INLET: G 1" M BSPT

-NG INLET: G 3/4" M BSPT


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ALGLASS P 200 Fuel oil version:

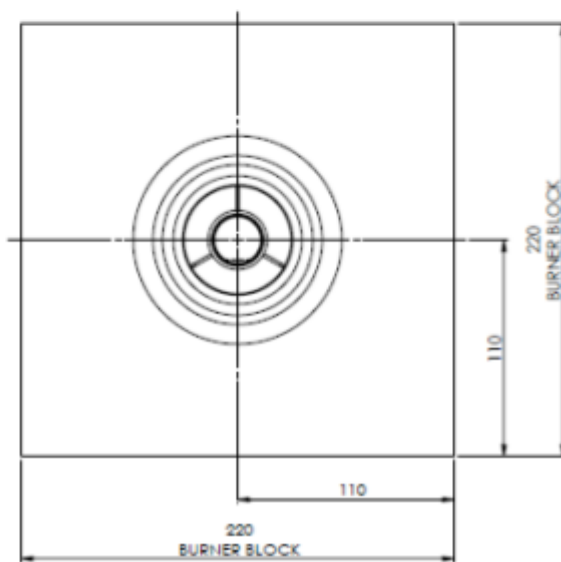
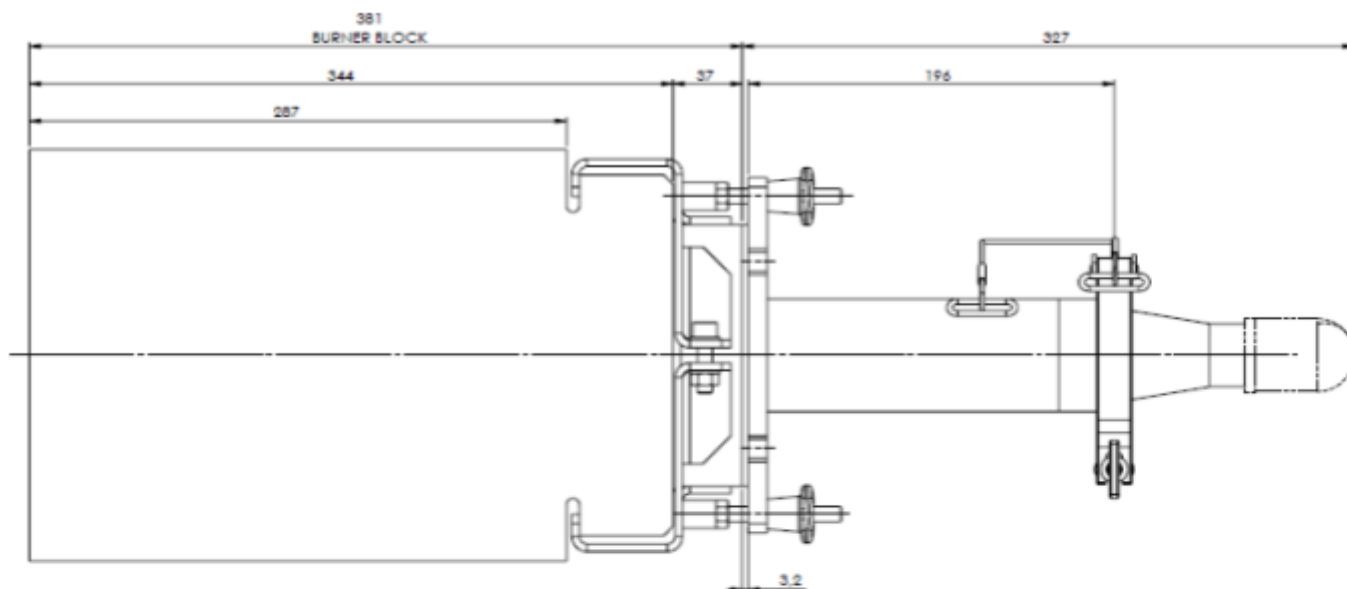


Fluid connections:


- O₂ INLET: G 1" M BSPT
- OIL INLET: G 1/4" F BSPT
- AIR INLET: G 3/8" F BSPT

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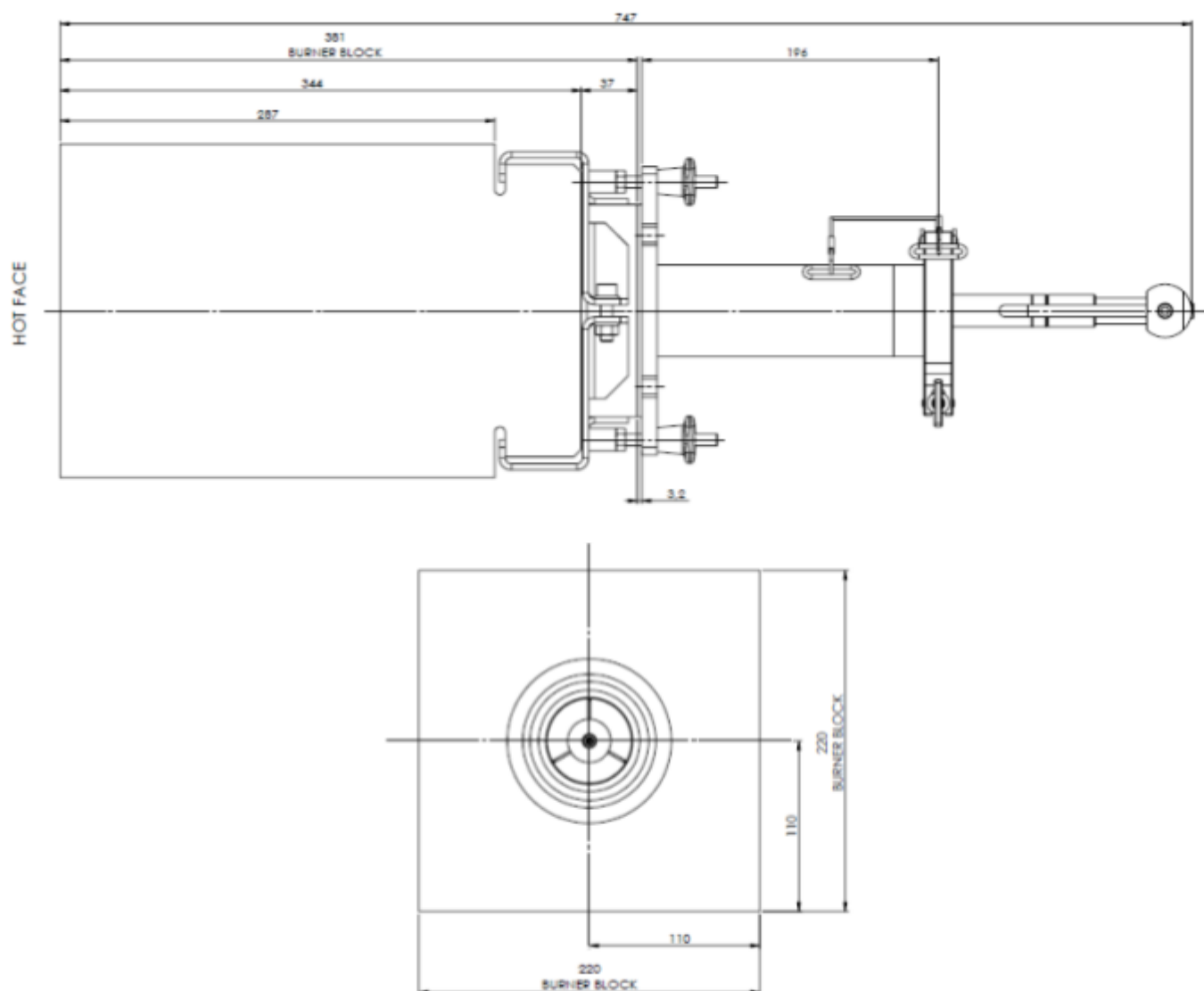
ALGLASS P 500 Gas version:



Fluid connections:
 -O₂ INLET: G 1"1/2 M BSPT
 -NG INLET: G 1" M BSPT


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ALGLASS P 500 Fuel oil version:

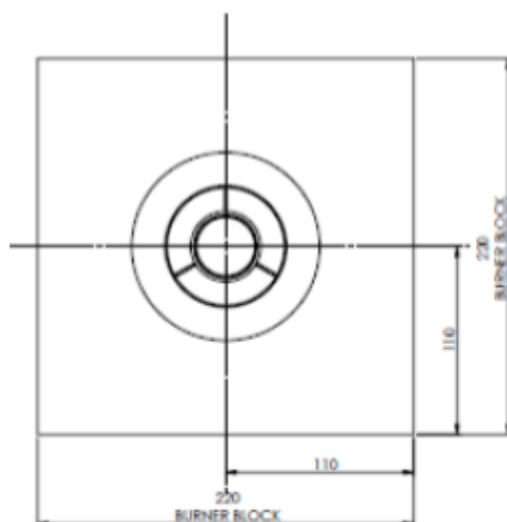
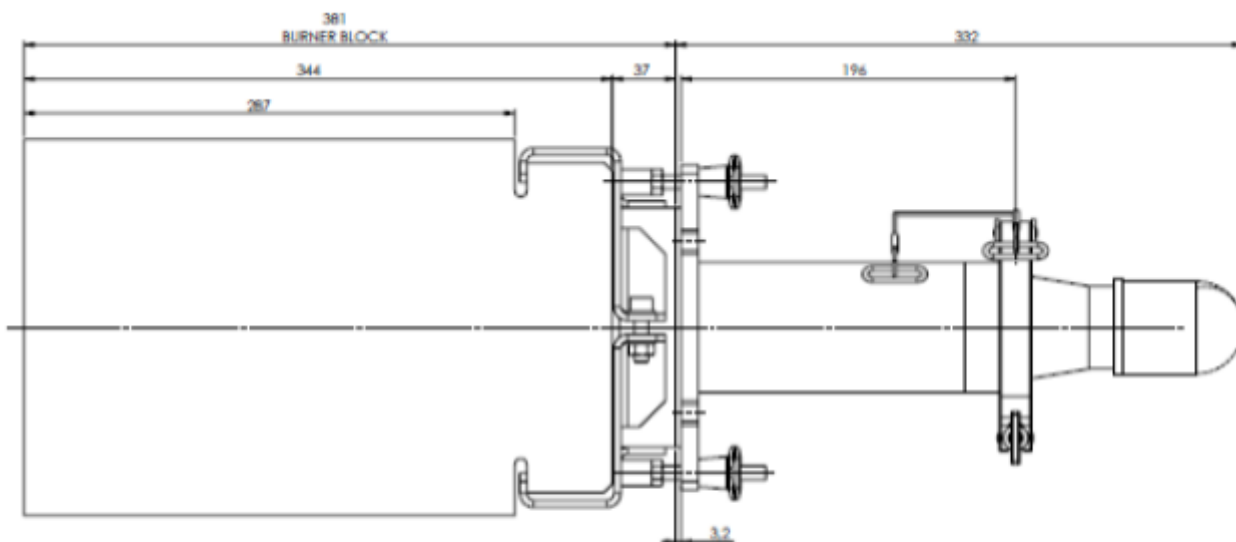


Fluid connections:


- O₂ INLET: G 1"1/2 M BSPT
- OIL INLET: G 1/4" F BSPT
- AIR INLET: G 3/8" F BSPT

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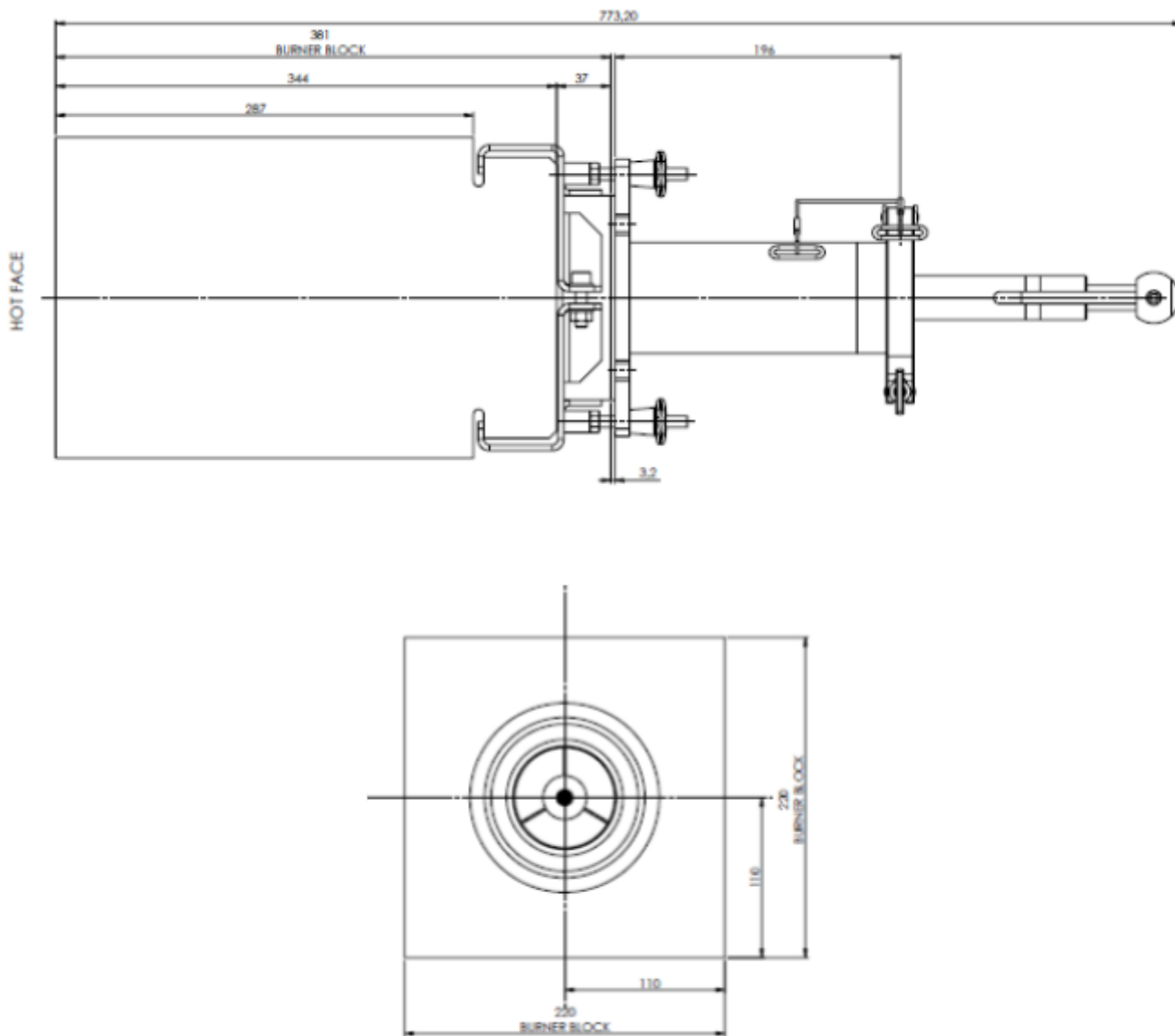
ALGLASS P 1000 Gas version:



Fluid connections:
 -O2 INLET: G 2" M BSPT
 -NG INLET: G 1"1/2 M BSPT


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ALGLASS P 1000 Fuel oil version:



Fluid connections:

- O₂ INLET: G 2" M BSPT
- OIL INLET: G 1/4" F BSPT
- AIR INLET: G 3/8" F BSPT

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L . SPARE PARTS

If a component, in case of failure, needs to be replaced, its designation and reference are shown in the table below.

Model	ALGLASS P 200	ALGLASS P 500	ALGLASS P 1000
Components	CNPL reference		
ERMOLD REFRACTORY BLOCK	P02024-10	P02025-10	P02026-10
ZM 9-27 V REFRACTORY BLOCK	P02024-11	P02025-11	P02026-11
ER 1681 RT REFRACTORY BLOCK	P02024-12	P02025-12	P02026-12
HALF BRACKET	P02024-20		
BODY	P02024-30	P02025-30	P02026-30
FIBER GASKET	P02024-31	P02025-31	P02026-31
CLAMP GASKET	C05361	C05363	C05364
NG LANCE 1T 30m/s	P02024-40	P02025-40	P02026-40
NG LANCE 3T 30m/s	P02024-41	P02025-41	P02026-41
NG LANCE 5T 30m/s	P02024-42	P02025-42	P02026-42
NG LANCE 1T 60m/s	P02024-43	P02025-43	P02026-43
NG LANCE 3T 60m/s	P02024-44	P02025-44	P02026-44
NG LANCE 5T 60m/s	P02024-45	P02025-45	P02026-45
FUEL OIL LANCE (without nozzle and injector)	P02024-50	P02025-50	P02026-50
INJECTOR	P02024-51	P02025-51	P02026-51
NOZZLE	P02024-52	P02025-52	P02026-52
CALIBRATED ORIFICE	P02024-53		
PLUG R1/8"	_5901351		

