

POLISHING BURNER MODELS S-150-2 / S-250-2 / S-100-4

SAFETY INSTRUCTIONS FOR USE AND MAINTENANCE



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Original instructions

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 - SAFETY INSTRUCTIONS

1 - USE OF GASES

INSTRUCTIONS COMMON TO ALL OF GASES

1. OCCURRED RISKS

Bad conditions of gases use expose the user to two main dangers, in particular in case of work in stuffy space:

- The danger of asphyxiation or poisoning.
- The danger of fire and explosion.

2. PRECAUTIONS TO BE RESPECTED

- Storage under shape compressed in cylinders:
 - The storage or use area have to possess a good ventilation, to take away from cutting, welding and the other sources of heat area, and to be shielded from a technical hitch.
 - Fasten cylinders, avoid the shocks.
 - No excessive heat ($> 50^{\circ}\text{C}$).
- Channeling and piping:
 - Verify periodically the waterproof ness of the fixed channeling.
 - Never detect a leak with a flame. Use an appropriate detector or soapy water and a paintbrush.
 - Foresee a fire extinguisher to CO₂ (CO₂ snow) with lance of minimum 5 kg near the installation.
 - Distribute gases in the pressures recommended on the notes of the equipment
 - Do not leave the pipes lying around in the workshops, they risk being damaged.
- Use of devices:
 - Use only devices conceived for used gases.
 - Never grease valves. Maneuver them softly.
- Works of maintenance:
 - The works must be realized by the qualified personnel.

3. INTERVENTION FOLLOWING AN ACCIDENT

- In case of a leak which has not caught fire:
 - Close the gas inlet.
 - Do not use any flame or electrical device in the area where the leaking gas could have spread.
- In case of a leak which has caught fire:
 - Close the gas inlet if the valve can be reached.
 - Use powder extinguishers.
 - If the leak can not be stopped, let the fire burn while cooling the cylinders and the surrounding installations.
- In case of asphyxia:
 - Take the victim out into the open air.
 - Start artificial respiration and call the emergency.

2 - SAFETY WITH OXY-COMBUSTION

Every operator who manipulates the oxy-fuel Polishing S-150-2, S-250-2, S-100-4 burners should be trained on oxygen safety procedures. In particular, operators must be aware of the following minimum safety instructions for oxygen use:

- ◆ **Never use oil or grease for oxygen piping, nor assembling burner parts.**
- ◆ **Do not use organic materials for tightness components.**
- ◆ **Always clean all parts before installing them.**
- ◆ **Operators training for oxygen use.**

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

If in doubt on the equipment compliance or on a material, please contact an AIR LIQUIDE representative.

3 - PRODUCT SUPPORT

AIR LIQUIDE provides a support for the Polishing S-150-2, S-250-2, S-100-4 burners. If you need a product assistance or additional information relative to the Polishing S-150-2, S-250-2, S-100-4 burners, please contact :

AIR LIQUIDE
CombustioN Product Line
1, chemin de la Porte des Loges
78350 Les-Loges-En-Josas - France

-
E-mail : ww-al-cnpl@airliquide.com

B - DESCRIPTION

1 - GENERAL DESCRIPTION

The Polishing S-150-2, S-250-2, S-100-4 burners are a new generation of burner using 3D printing technology to improve their performances: fuel saving, weight gain and more efficient flame.

They are composed of a body integrating separate oxygen and fuel chambers. From these chambers, these gases are then distributed on the front face of the burner through numerous outlet holes. Oxygen and fuel supply pipes are fitted to these burners.

Models S-150-2, S-250-2 have 2 parallel rows of gas outlet holes, model S-100-4 has 4 parallel rows of gas outlet holes.

The Polishing S-150-2, S-250-2, S-100-4 burners have been specially designed for glass, crystal and quartz industries. They are dedicated to forming, edge melting, welding, polishing and heating applications, locally or in enclosures.

These Polishing S-150-2, S-250-2, S-100-4 burners are made of refractory stainless steel (type Inconel 625) to increase their resistance to heat and their service life.

The Polishing S-150-2, S-250-2, S-100-4 burners can be used with either natural gas or hydrogen (**any other type of fuel must not be used, otherwise the burner will deteriorate**).

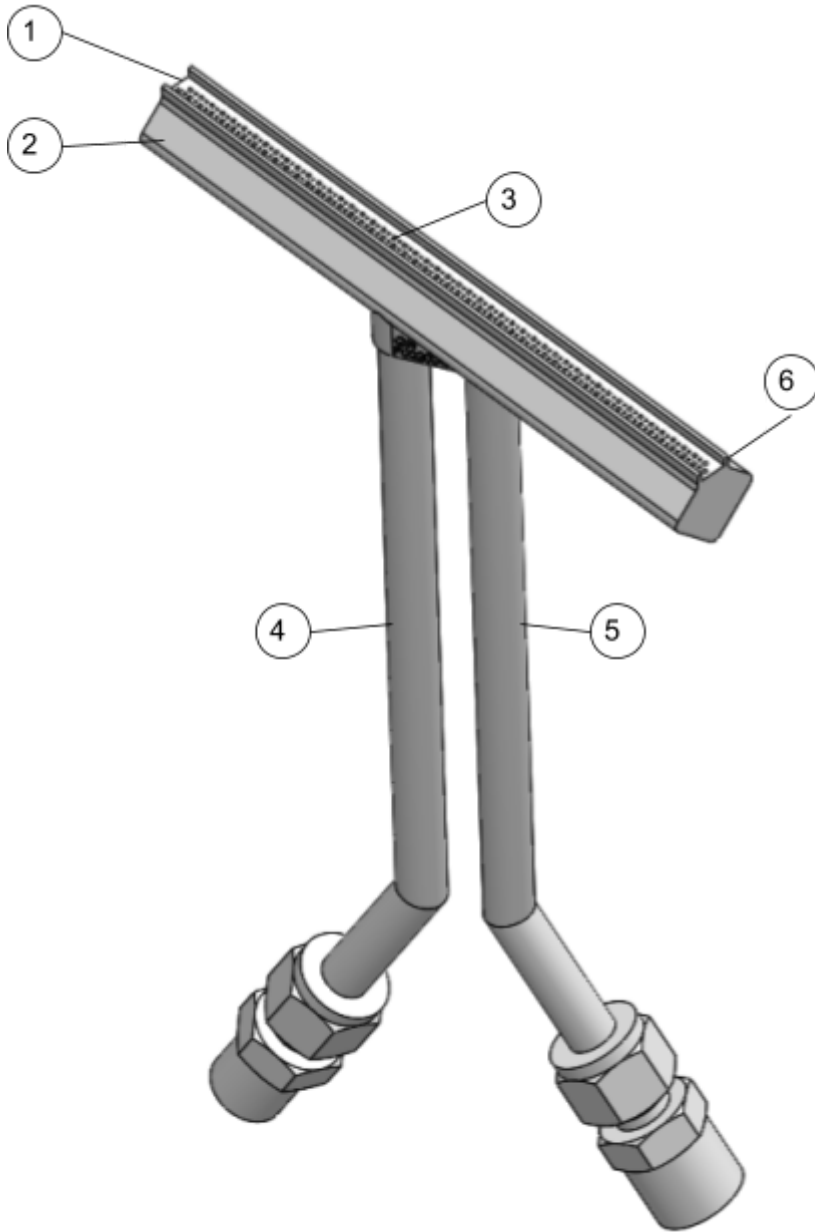
These Polishing S-150-2, S-250-2, S-100-4 burners have a flexible and safe operation thanks to the external mixing of gases. They can operate from 50 to 150 % of their nominal power.

The flame of the Polishing S-150-2, S-250-2, S-100-4 burners is uniform due to homogeneous distribution of fuel and oxygen through multiple alternating fuel and oxygen outlet holes. This flame can be adjusted: neutral, oxidizing or reducing.

Wider flame can be achieved by installing multiple burners side by side.

The active zone of the flame generally lies between 20 and 70 mm from the front face of the burner.

To protect the gas outlet holes from glass splashes, the Polishing burner is equipped with 2 lips on the front face.



1	Front face of the burner
2	Burner body
3	Oxygen or fuel outlet holes
4	Fuel inlet tube
5	Oxygen inlet tube
6	Protection lip

2 - SPECIFICATIONS

▪ Oxygen and fuel flow-rates :

	Polishing S-150-2 model		
Nature of gas	Minimum flow-rate (Nm ³ /h)	Nominal flow-rate (Nm ³ /h)	Maximum flow-rate (Nm ³ /h)
Natural gas	1,05	2,1	3,15
Hydrogen	3,75	7,5	11,25
Oxygen	2,1	4,2	6,3

	Polishing S-250-2 model		
Nature of gas	Minimum flow-rate (Nm ³ /h)	Nominal flow-rate (Nm ³ /h)	Maximum flow-rate (Nm ³ /h)
Natural gas	1,75	3,5	5,25
Hydrogen	6,35	12,7	19,05
Oxygen	3,5	7	10,5

	Polishing S-100-4 model		
Nature of gas	Minimum flow-rate (Nm ³ /h)	Nominal flow-rate (Nm ³ /h)	Maximum flow-rate (Nm ³ /h)
Natural gas	1,4	2,8	4,2
Hydrogen	5	10	15
Oxygen	2,8	5,6	8,4

▪ Gas pressure drop through the burner :

	Polishing S-150-2 / S-250-2 / S-100-4 models
Nature of gas	Gas pressure drop through the burner
Natural gas	20 to 100 mbar at the maximum recommended power
Hydrogen	
Oxygen	

C - INSTALLATION

1 - BURNER ASSEMBLING

Since the Polishing S-150-2, S-250-2, S-100-4 burners are intended to be mounted on different types of installations, this chapter can only give general information.

- ⇒ position the burner; if several burners supplied by the same manifold : calibrated holes must be installed at the burner inlet to get a good distribution of the fluids
- ⇒ connect the supplies : oxygen and fuel (natural gas or hydrogen)

The oxygen and fuel inlets are identified on each burner by "Ox" and "GN" markings on the body.

Use adapted hoses : in case of doubt, please contact an AIR LIQUIDE representative.

2 - IGNITION AND EXTINGUISHING PROCEDURES

Instructions for Polishing S-150-2, S-250-2, S-100-4 burners ignition :

- (1) place a pilot flame on the front face of the burner
- (2) inject fuel (natural gas or hydrogen) to the recommended flow-rates
- (3) inject oxygen to the recommended flow-rates
- (4) remove pilot flamme from the front face of the burner
- (5) control the presence of a flame on the font face of the burner

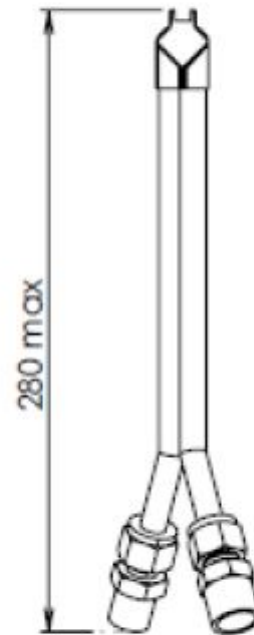
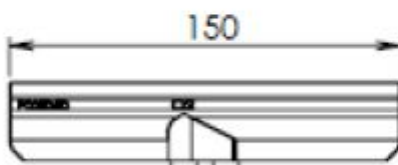
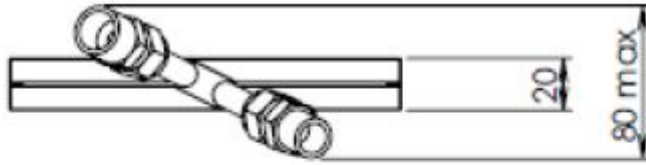
Instructions for burner Polishing S-150-2, S-250-2, S-100-4 burners extinguishing :

- (1) stop oxygen injection
- (2) stop fuel injection (natural gas or hydrogen)

Do not reverse the procedure : an explosion or a flashback could occur in the burner

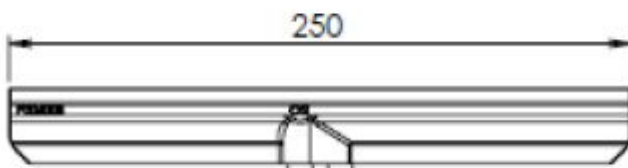
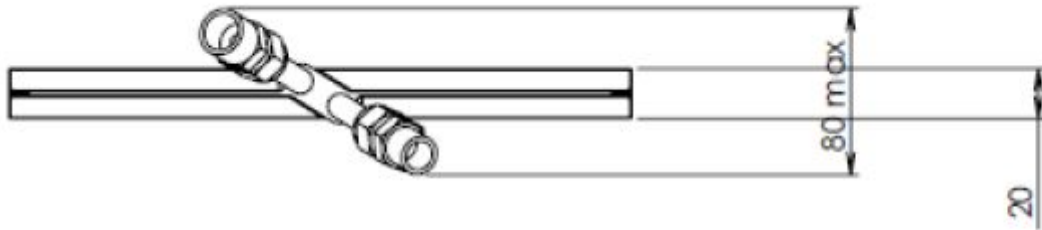
3 - DIMENSIONS

-S-150-2 model



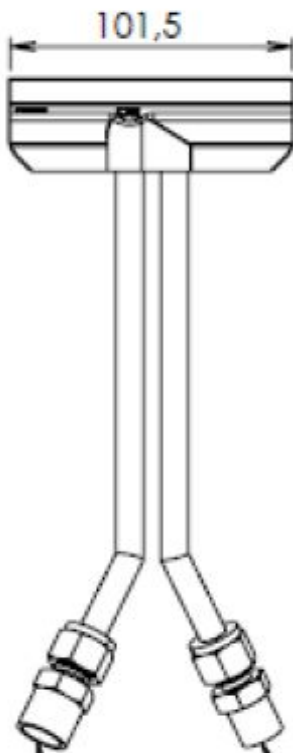
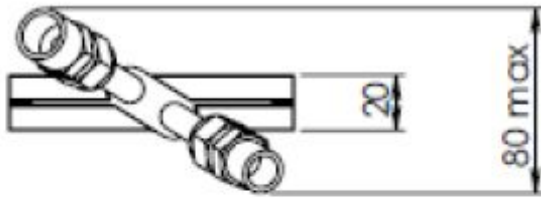
Natural gas inlet : 1/4" Female BSPP
Oxygen inlet : 3/8" Female BSPP

-S-250-2 model



Natural gas inlet : 1/4" Female BSPP
Oxygen inlet : 3/8" Female BSPP

-S-100-4 model



Natural gas inlet : 1/4" Female BSPP
Oxygen inlet : 3/8" Female BSPP

4 - GAS CONNECTIONS

Fuel inlet :

-G ¼" female (BSPP)

Oxygen inlet :

-G ⅜" female (BSPP)

D - MAINTENANCE

1 - REGULAR INSPECTION

Before each ignition and frequently, check the condition of the front face of the burner: deformation, glass residue, plugging of the holes and clean or replace the burner if necessary.

Do not clean the holes with a needle so as not to damage them.

2 - SEMI-ANNUAL INSPECTION

Check the leak-tightness of the connecting supply hoses on the burner

3 - SPARE PARTS

If the burner is to be replaced, here-below its reference :

Model	CNPL reference
Polishing S-150-2	P00206
Polishing S-250-2	P00601
Polishing S-100-4	P00661

PERSONAL NOTES
