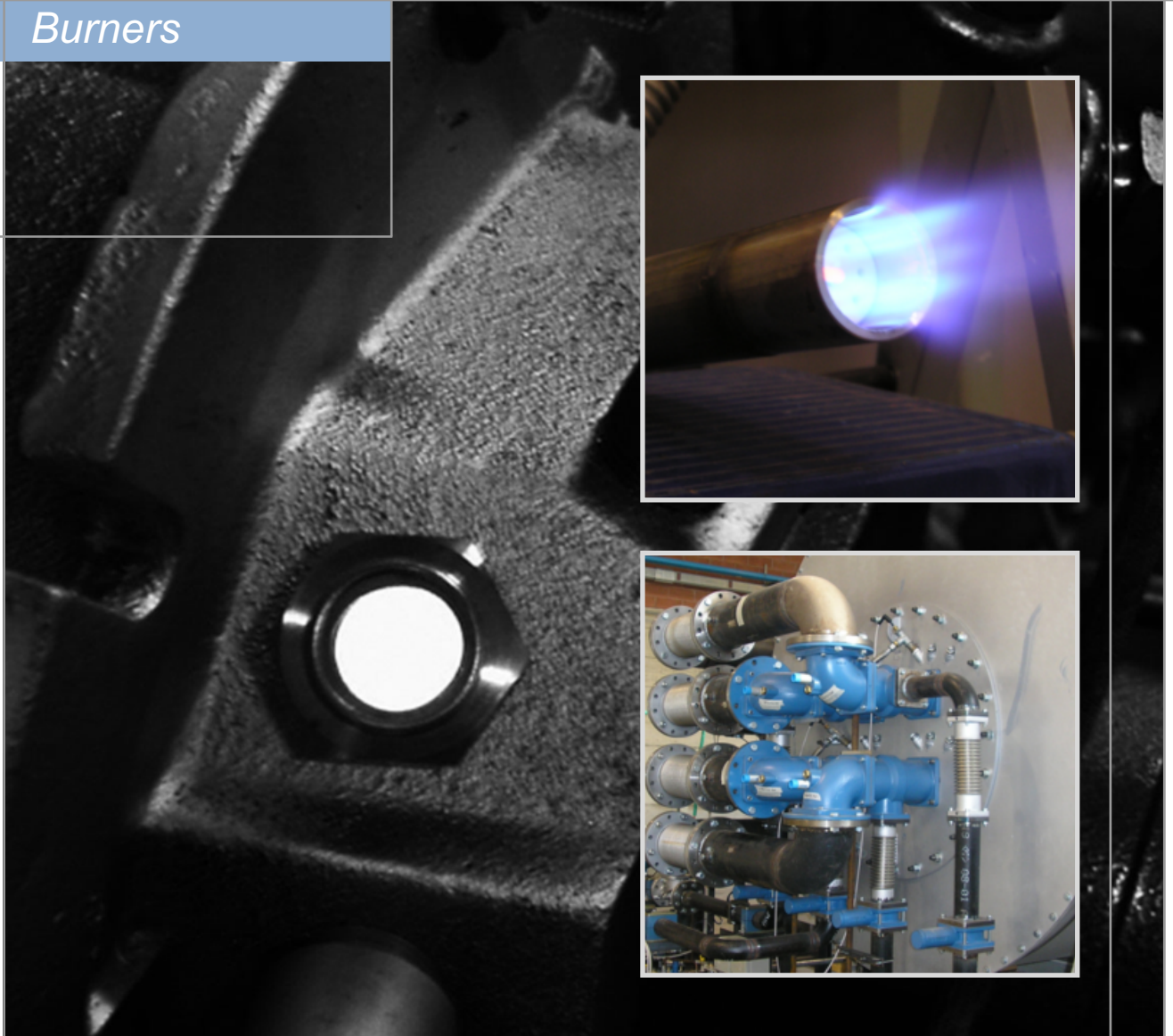


Burners



Blast pilots

PBC & PBST (E3280 rev. 03 - 23/04/2018)

GENERAL WARNINGS:



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

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

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

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

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

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

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

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

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

DISPOSAL:



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

GENERAL NOTES:



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

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

■ The products manufactured by ESA-PYRONICS have been created in conformity to the **UNI EN 746-2:2010** Norms: Equipment for industrial thermal process - Part 2: Safety requirements for combustion and the movement and treatment of combustible elements. This norm is in harmony with the Machine Directive **2006/42/CE**. It is certified that the products in question respect all the requirements prescribed by the above mentioned Norms and Directives.

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

CERTIFICATIONS:



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

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The PBC & PBST series identifies a range of premix burners that are mainly used as pilot flames to ignite burners with larger capacities. The particular conformation of the combustion head guarantees excellent flame retention, high resistance to temperature changes and long life.

APPLICATIONS

- Main burner blast pilot.
- Billet heating.
- Glass furnaces.
- Bunsen burner casting.

CHARACTERISTICS

GENERAL:

- Capacity: from 1 to 15 kW
- Combustion gas: CH₄/GPL/Propane
- Ignition/Detection: monoelectrode
- Max. temperature used: 1100°C
- Excellent flame stability
- Maximum air inlet pressure: 360 mbar
- Maximum gas inlet pressure: 100 mbar

MATERIAL COMPOSITION:

- Combustion head: AISI310/Aluminium oxide 96%
- Flame tube: AISI304/INCOLOY 601

PBC & PBST



F3280I03

PBC-MX



F3280I04

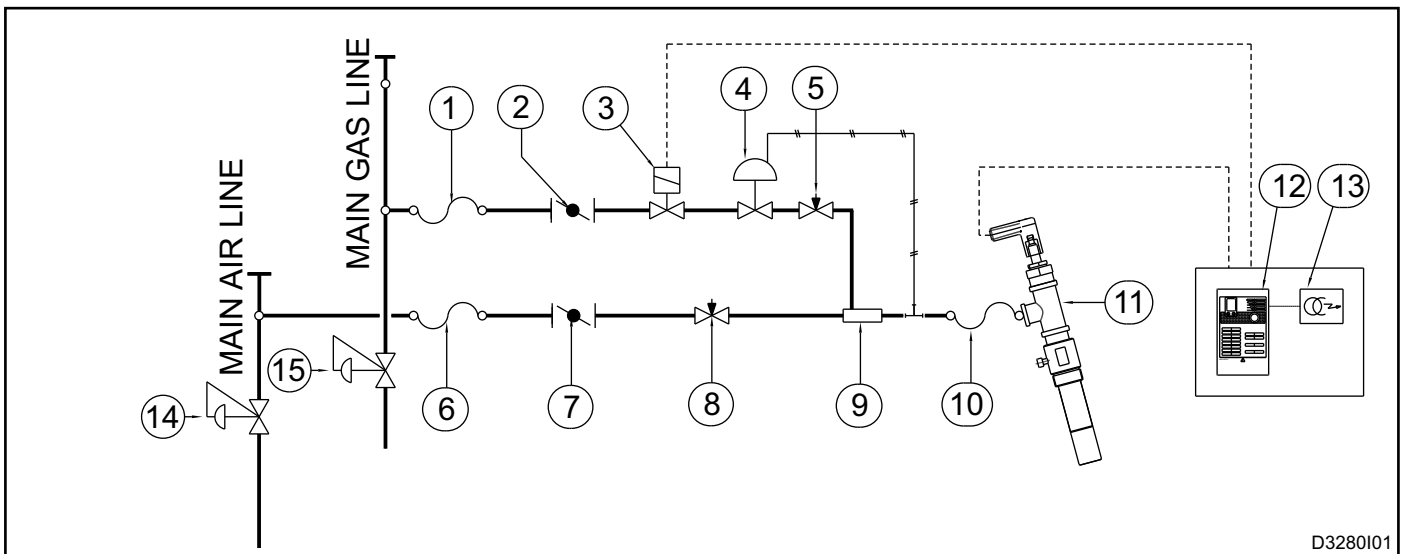
CAPACITY PARAMETERS

Coupled with MM or FLOWMIXER mixers, the PBC & PBST burners develop maximum flame capacity at roughly 15 mbar premix pressure.

The burners remain stable with mixed pressures between 10 and 20mbar.

Model	Max capacity [kW]	Flame length [mm]	Ignition/Detection electrode
P32PBC	1	20÷30	32CWFR & 32CWFR/X
P42PBC	2	30÷40	42CWFR & 42CWFR/X
P64PBC	5	50÷70	64CWFR & 64CWFR/X
P86PBC	10	80÷100	86CWFR & 86CWFR/X
P64PBST	5	50÷70	10MM
P86PBST	10	80÷100	10MM
P108PBST	15	100÷120	6EN/10MM
P42PBC-MX-FR	2	30÷40	42CWFR-MX/X
P64PBC-MX-FR	5	50÷70	64CWFR-MX/X
P86PBC-MX-FR	10	80÷100	86CWFR-MX/X

FLOW SCHEME - CERAMIC BLAST PILOTS WITH EXTERNAL MIXER



Pos.	Description	Included	Not Included
1	Gas flexible hose (*)		x
2	Gas interception valve	x	
3	Solenoid safety valve (**)		x
4	Zerogovernor		x
5	Micrometric regulation screw	x	
6	Flexible air hose (*)		x
7	Air interception valve	x	
8	Pressure stabilizer		x
9	Venturi mixer	x	
10	Extensible flexible hose	x	
11	Pilot burner	x	
12	Flame control		x
13	Ignition transformer		x

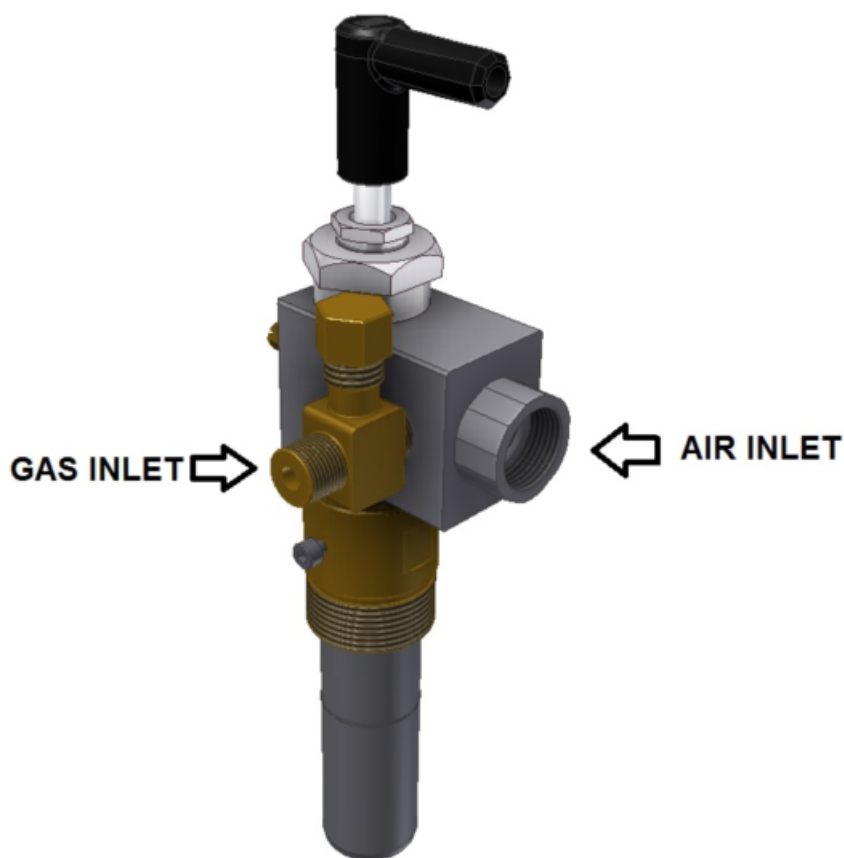
(*) Client's responsibility

(**) Optional

PBC-MX PILOT WITH INCORPORATED MIXER

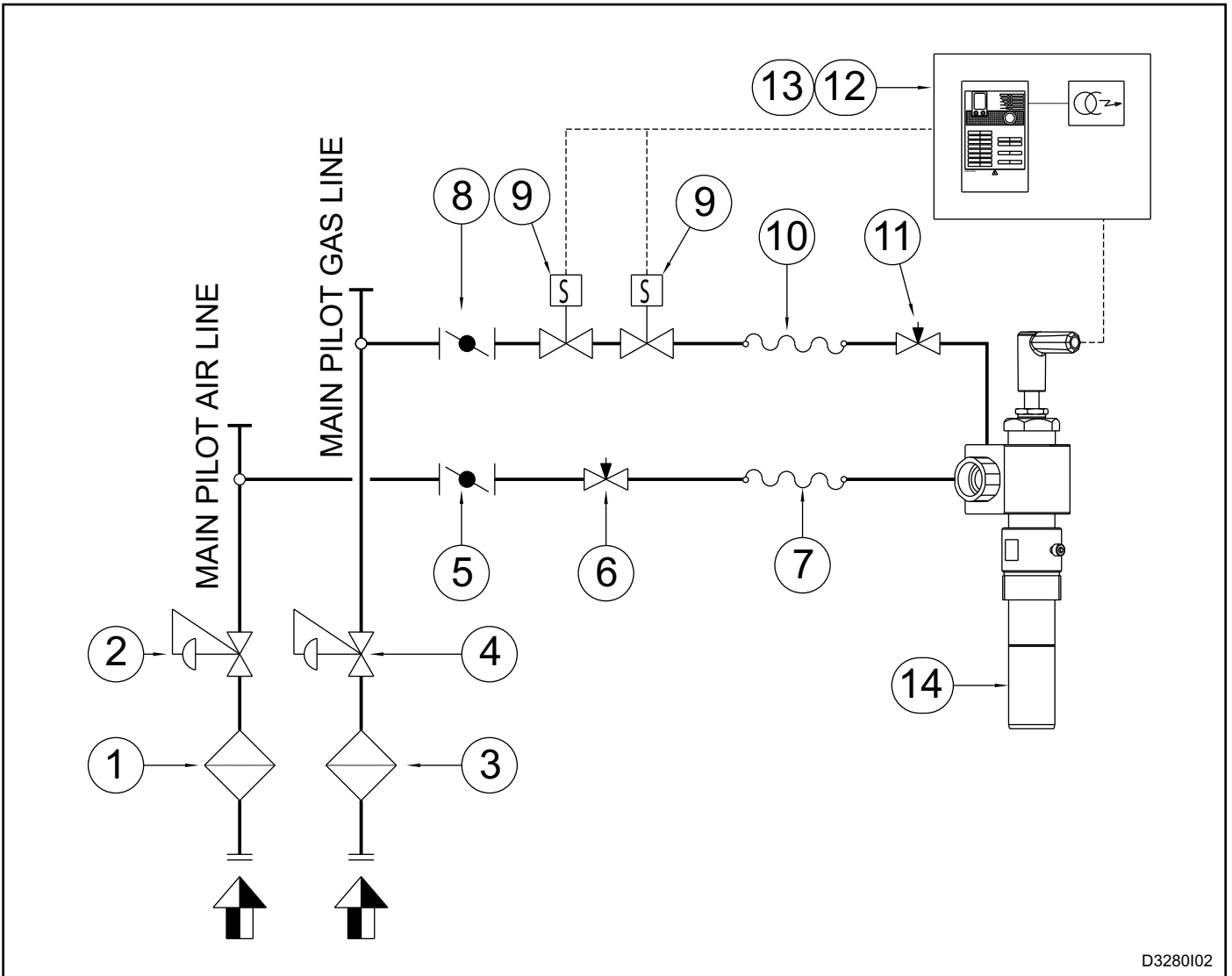
The pilot PBC-MX is equipped with a separate air and gas inlet. The mixing of the fuel and combustion occurs within the body of the burner, without the aid of an external mixer. For this reason, the pressures of the combustion air and fuel lines must be suitably stabilized using special pressure stabilizers: pressure that is not constant within the collectors can create problems in flame instability. Furthermore, to ensure correct operation of the pilot burner, the air and gas pressures that feed it must be higher than the pressure present in the main burner con-

nection zone. Ignition and flame detection are done through the use of an electrode (unirod configuration). The electrode is easily replaceable from outside. The gas inlet is provided with a micrometric regulation valve, so we can use the pilot with different types of gas fuels (with lower calorific value however not less than 4000kcal / m³). To prevent the internal organs of the pilot burner and its regulation bodies from getting dirty, we recommended the use of special filters on the air and gas power lines.



F3280I08

FLOW SCHEME FOR BURNER WITH INCORPORATED MIXER - PBC-MX



D3280I02

Pos.	Description	Included	Not Included
1	Air filter		x
2	Air pressure stabilizer		x
3	Gas filter		x
4	Gas pressure stabilizer		x
5	Air interception valve		x
6	Gas regulation valve		x
7	Air flexible pipe		x
8	Gas interception valve		x
9	Safety solenoid valve (**)		x
10	Gas flexible pipe		x
11	Gas micrometric valve	x	
12	Flame control device		x
13	Ignition transformer		x
14	Pilot burner	x	

(*) Client's responsibility

(**) Optional

WARNINGS

- - For all applications at low temperatures (up to 750°C), the burner ignition and the gas fuel solenoid valve command must be carried out using a certified burner control device.
- - To avoid any possible damage to the burners, make sure that the air is not preheated or foul due to combustion products, oils, solvents or other. To avoid these phenomena, it is preferable to install the blower or suction duct outside the premises and far from exhaust pipes, or else to fit filters upstream the premix group. If the atomizing air should come from the compressed air lines, NEVER exceed the maximum allowable pressure $P_{max}=360$ [mm].
- - After installation, check that the power feeding lines are connected correctly. Before switching the burner on check that the combustion air and fuel pressure values are correct.
- - The burner must only function within the indicated power ranges. Working with lower or higher power may compromise the functioning and life span of the burner, in which case the general guarantee conditions will automatically expire and ESA-PYRONICS will not be held liable for possible damage caused to persons and objects.
- - Should there be disturbances with other devices during the burner start-up phase, use an anti-disturbance filter for the high voltage cable (hv) connection to the ignition electrode.
- - Avoid burner ignition close to each other so as not to heat the ignition command system devices (solenoid valves and transformers). Prewash time lapse + first safety time lapse + min. of 5 sec. = time lapse between one ignition and another. (However, do not attempt more than 2 ignitions during a 30sec. time lapse).
- - Make sure the power supply is TURNED OFF when intervening on the burner and its devices. In case of burner malfunctioning, follow the indications in the 'Maintenance' chapter of the present manual or contact ESA-PYRONICS assistance.
- - Any modification or repair done by third parties can compromise the application safety and automatically cause the general warranty conditions to expire. Contact ESA-PYRONICS assistance.

INSTALLATION

The PBC and PBST pilot burners are provided with threaded fastening fittings. It is possible to create fasteners according to specific needs. We do not recommend mounting with the flame pointing upwards as condensation phenomena could create problems with ignition and detection avoiding thus foreign materials from getting into the burner flame tube and obstructing it.

For the connection of the mixing pipes we recommend using extendable flexible fittings: the connections between the burner and the mixer must have at least the same diameter as the output of the mixer.

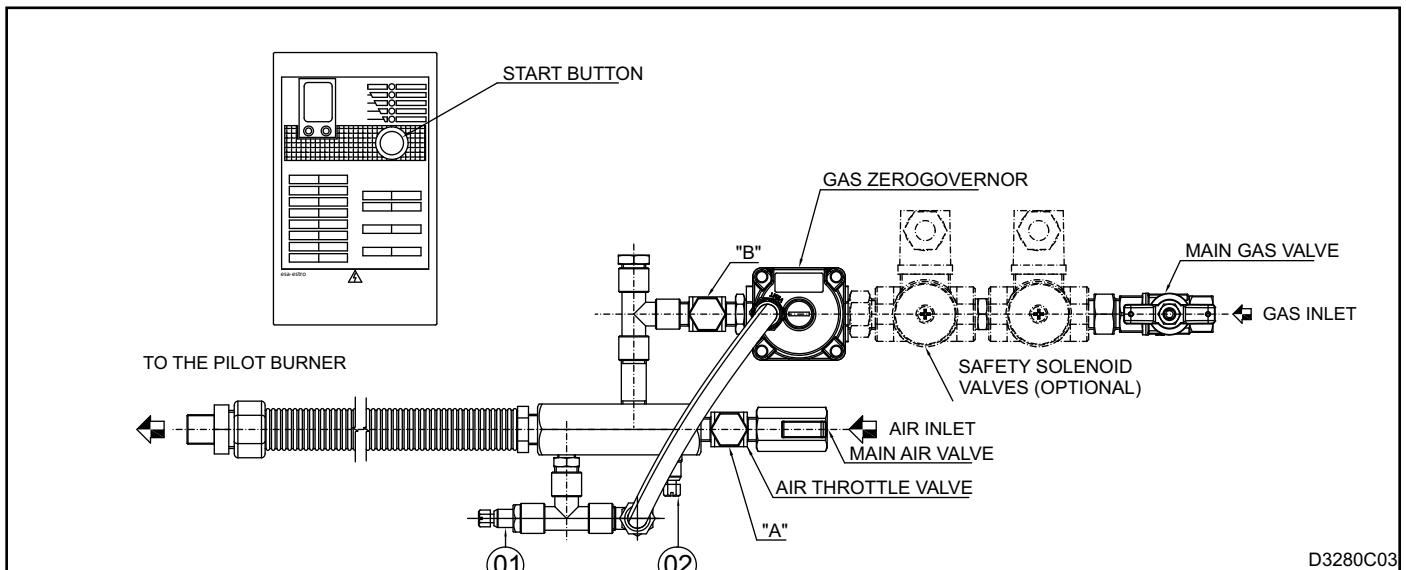
Do not put valves or any type of restrictions on the mixing pipes.

For the PBC/X & PBST/X (with variable lengths and sliding anchoring coupling) make sure that the pilot burner output is not in direct contact with the flame of the main burner, to preserve the integrity of the metallic tube.

The burner head must not be in contact with the main flame as being a premix burner, the flame tube which is placed before the combustion head, must not be subject to temperatures higher than 500°C. This avoids phenomena of self-priming of the mixture.

If necessary provide adequate cooling on the outside of the flame tube. In any case, with the pilot burner off, make sure that the combustion air continues to flow through the inside of the pilot burner.

IGNITION - SETTING



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

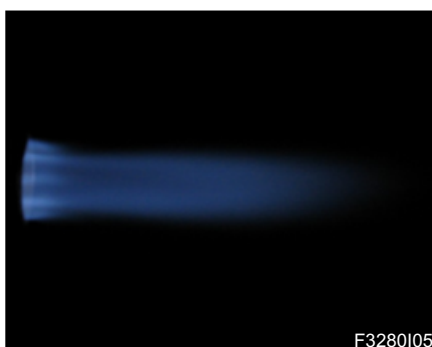
- 1 - Check the safety solenoid valve (if present), ignition electrode and flame control electrical connections.
- 2 - Check for an air minimum feeding pressure of 36mbar and a gas minimum feeding pressure 20mbar.
- 3 - Open the main air valve.
- 4 - Open the air stabilizer cap ("A").
- 5 - Adjust the spring regulation (screwing on or unscrewing the regulation plug) until reaching a mix-pressure of 10÷15 mbar on the pressure plug (**pos. 01**) with "burner OFF". Screwing on increases the pressure/unscrewing decreases the pressure.
- 6 - The gas pressure with burner off (**pos.02**) must be negative. The air inlet pressure (**pos.03**) must be 40÷50 mbar.
- 7 - Open the main gas valve.
- 8 - Switch the burner on with the start button found on the flame control device, opening the gas throttle valve nee-

dle ("B") very slowly, during ignition (repeat the step until you see a stable flame on the pilot burner).

- 9 - Adjust the gas flow via the gas throttle valve screw cap to reach the highest detection value on the flame control.
- 10 - To obtain an excellent flame, adjust the gas flow in the following conditions:

- A** - Excess of air: short blue flame that disappears into the pilot tube (low detection).
- B** - Right ratio: light blue tense flame with a good detection (40÷60 μA).
- C** - Excess of gas: long blue-green flame near flame detachment (low detection).

- 11 - Once the right regulation has been reached, check for a mix-pressure of 15÷20 mbar (**pos.01**) with "burner on". Adjust the air stabilizer screw if necessary.
- 12 - Turn off the burner and make sure it starts again, checking for several positive ignitions.
- 13 - Make sure there is pressure downstream the zero-governor (**pos.02**). The right value is similar to the mix-pressure value that is set in the air regulation (it can be adjusted by adjusting the zero-governor spring position).



Excess of air

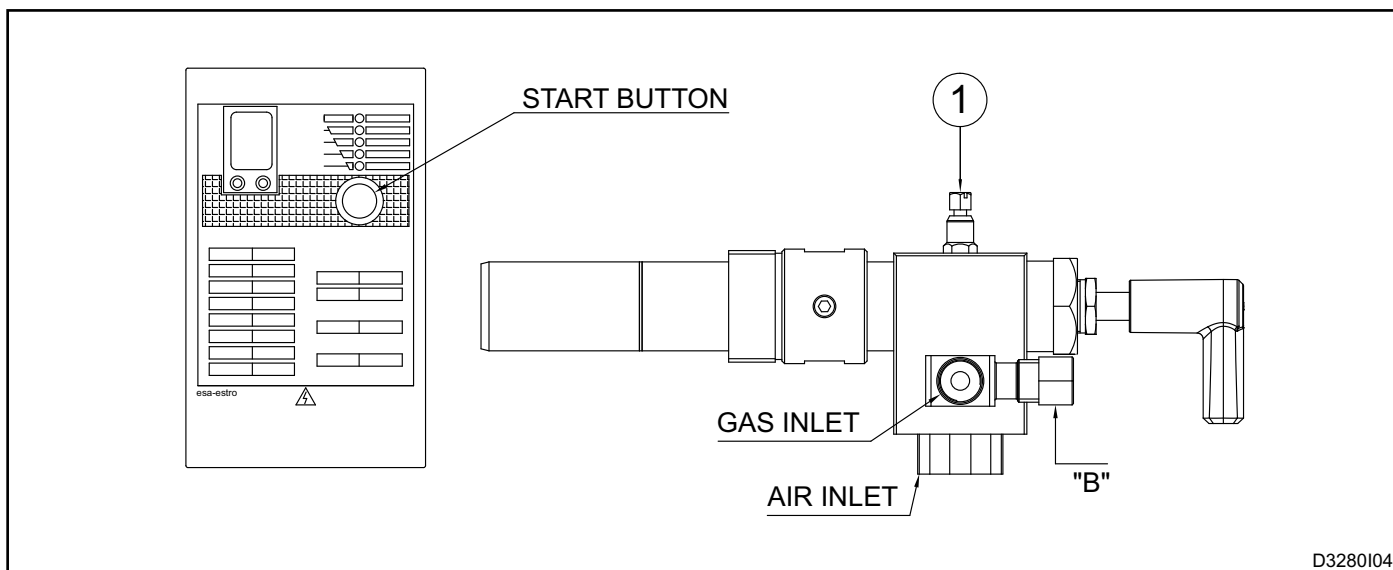


Right ratio



Excess of gas

IGNITION - SETTING OF THE PILOT WITH INCORPORATED MIXER - PBC-MX



D3280104

The procedures indicated in the following chapter must be carried out by expert technicians. The failure to follow instructions can cause dangerous conditions.

- 1 - Check the safety solenoid valve (if present), the ignition electrode and the electrical connections of the flame control device.
- 2 - Check that there is a minimum air supply pressure equal to 80 mbar, and a minimum gas supply pressure equal to 80 mbar by acting on the pressure stabilizers on the line.
- 3 - Open the air interception valve and regulate the regulation valve to reach a mixture pressure of 10÷15 mbar on the pressure outlet (**pos. 01**).
- 4 - Open the main gas valve
- 5 - Switch the burner on using the start button on the flame control device. Slowly open the micrometric regulation valve "B" during ignition (repeat this operation until flame stability on the pilot burner is visually detected)

6 - Regulate the gas flow through the micrometric regulation valve using the screw cap to obtain the maximum detection value on the flame control device.

7 - To obtain an optimal flame adjust the gas flow in the following conditions:

A - Excess air: a short blue flame disappears inside the tube of the pilot burner (state of low detection).

B - Correct ratios: tense blue flame with a good detection (40 to 60 mA).

C - Excess gas: a long blue / green flame that tends to break (state of low detection).

11 - With the burner on, once you reach the adjustment make sure there is a mixture pressure of 15 to 20 mbar (pos. 01). Regulate the air control valve if necessary.

12 - Turn off the burner and check the restart, testing multiple consecutive ignitions.



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Excess of air



F3280106

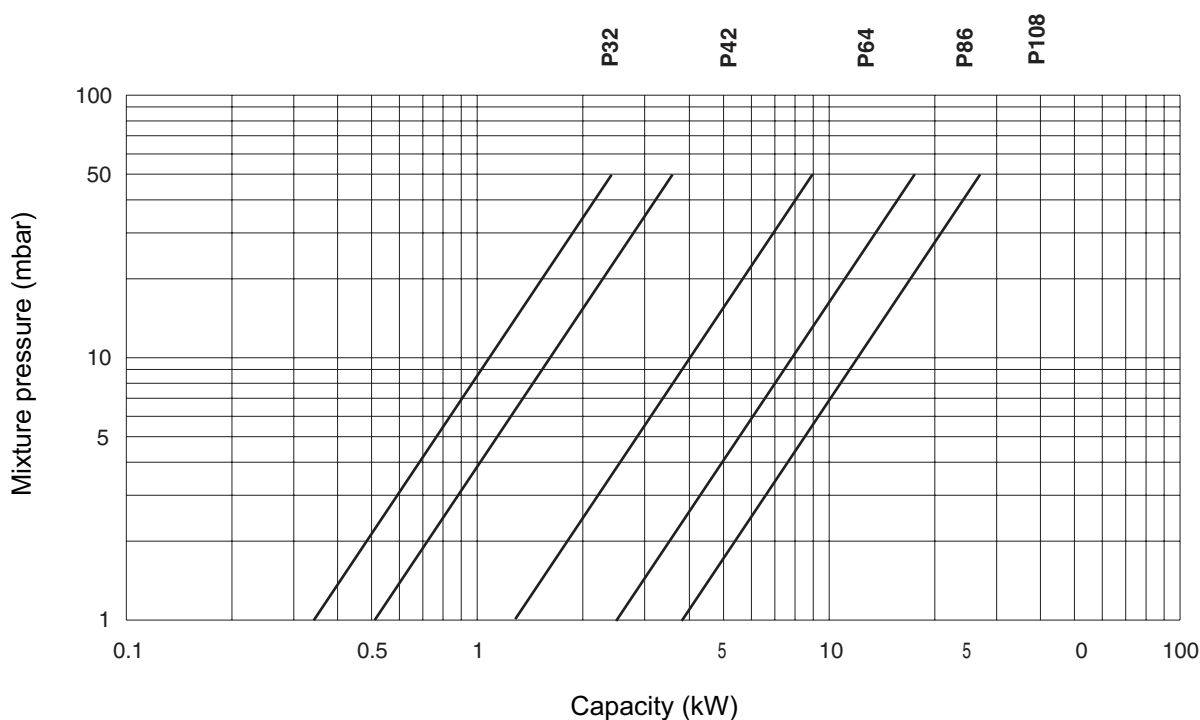
Right ratio



F3280107

Excess of gas

CAPACITY DIAGRAM



G3280C01

GENERAL MAINTENANCE PLAN

Operation	Type	Advised time	Notes
High voltage electrode connection	O	annual	Check integrity of outer plastic and oxidation of internal connector and of the electrode terminal
Ignition electrode and nozzle	O	annual	Replace if the Kantal terminal is worn or if the ceramic is damaged.
Stainless steel flexible hose	E	every six months	Check that there are no possible mixture leaks from the connectors and flexible hose
Burner settings	O	annual	Repeat all the steps in the "IGNITION AND SETTINGS" chapter on pg 9

O= Ordinary
E= Extraordinary

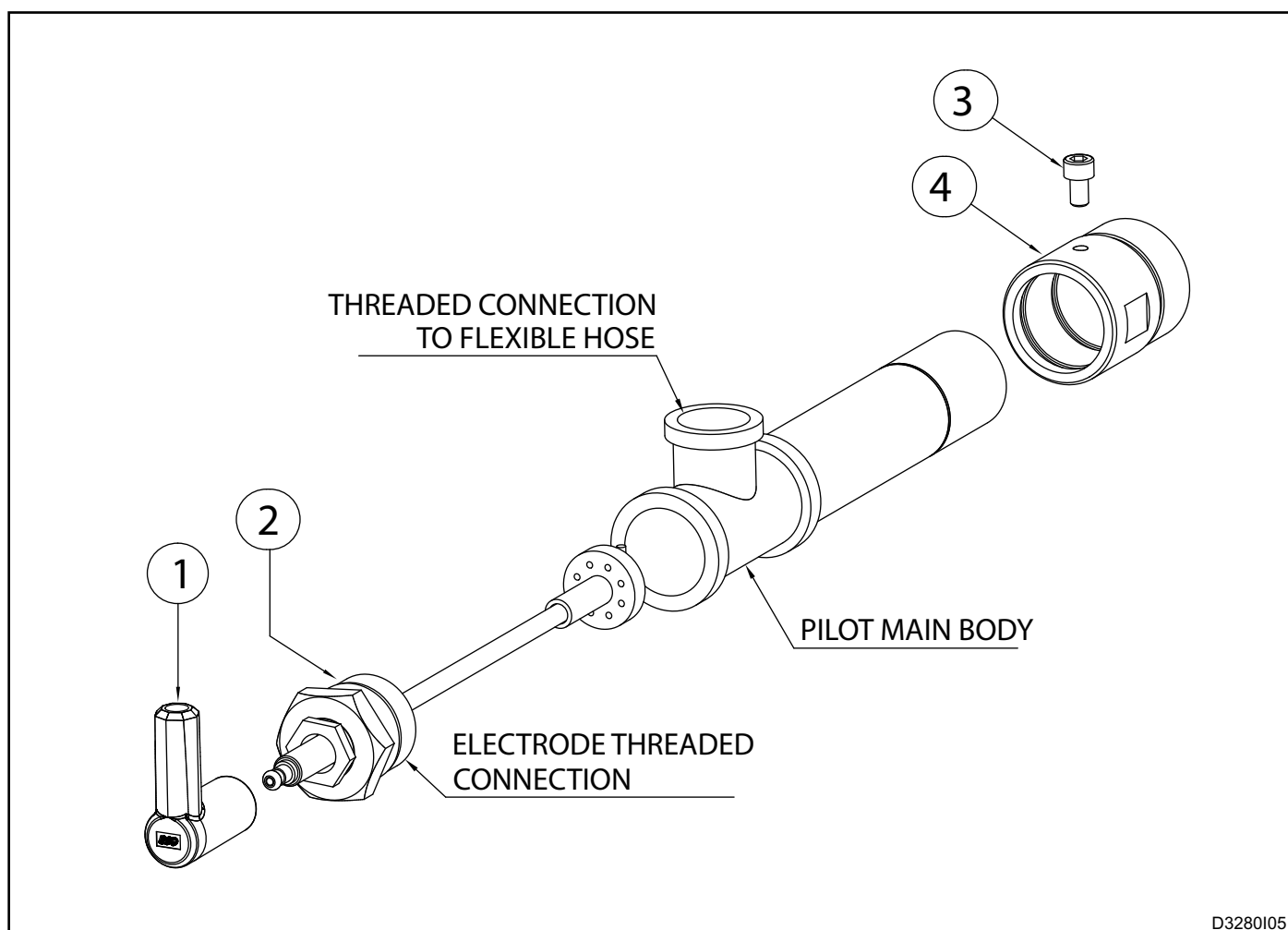
ORDINARY MAINTENANCE - BURNERS PBC & P108PBST-FR/X

IGNITION ELECTRODE REPLACEMENT

- 1 - Check that the burner control device power is off.
- 2 - Disconnect the HV cable, disconnecting the insulating connector from the electrode (**pos. 01**).
- 3 - Unscrew the block screw (**pos. 03**) and extract the pilot burner from the fastening connection (**pos. 04**).
- 4 - Unscrew the upper connection (**pos. 02**) and comple-

tely extract the electrode from the pilot burner.

- 5 - Insert the spare electrode and screw on the connection completely.
- 6 - Place the pilot burner in the correct position, tightening the appropriate screw (**pos. 03**).
- 7 - Check that the insulator connector is properly connected.



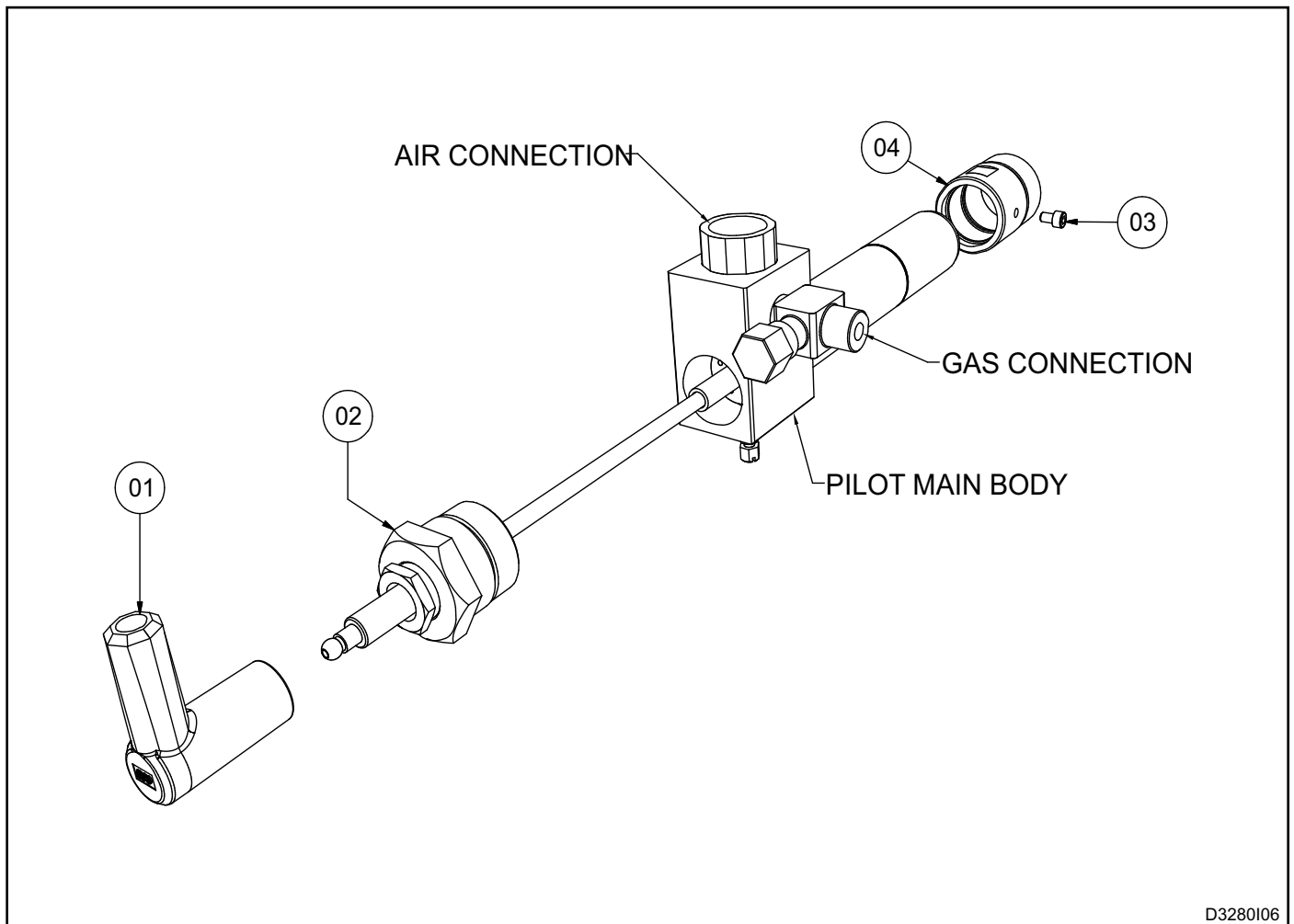
EXTRAORDINARY MAINTENANCE - PBC-MX BURNER

IGNITION ELECTRODE REPLACEMENT

- 1 - Make sure the burner control device is not connected.
- 2 - Disconnect the HV cable, disconnecting the insulator plug from the electrode (**pos. 01**).
- 3 - Unscrew the locking screw (**pos. 03**) and remove the pilot burner from the bleed nipple (**pos. 04**).
- 4 - Unscrew the top (**pos. 02**) and pull the electrode out

from the pilot burner.

- 5 - Insert the electrode parts and screw on the connector.
- 6 - Correctly reposition the pilot burner by tightening the screw (**pos. 03**).
- 7 - Check the correct connection of the insulating connector (**pos. 01**).



ORDINARY MAINTENANCE - BURNERS PBST

IGNITION ELECTRODE REPLACEMENT

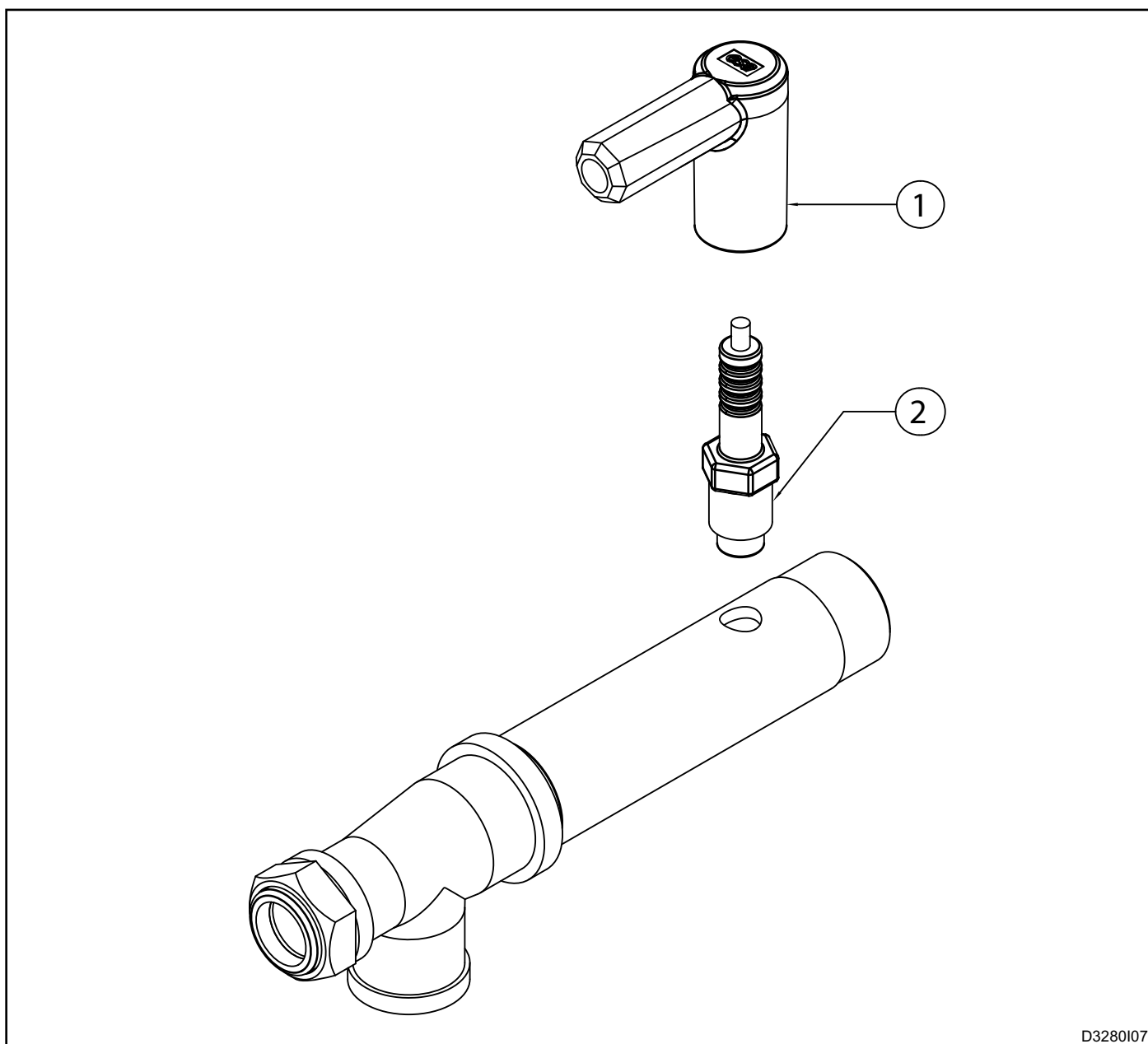
1 - Check that the burner control device power is off.

2 - Disconnect the HV cable, disconnecting the insulating connector from the electrode (**pos. 01**).

3 - Unscrew the spark-plug (**pos. 02**) and extract it from the threaded seat.

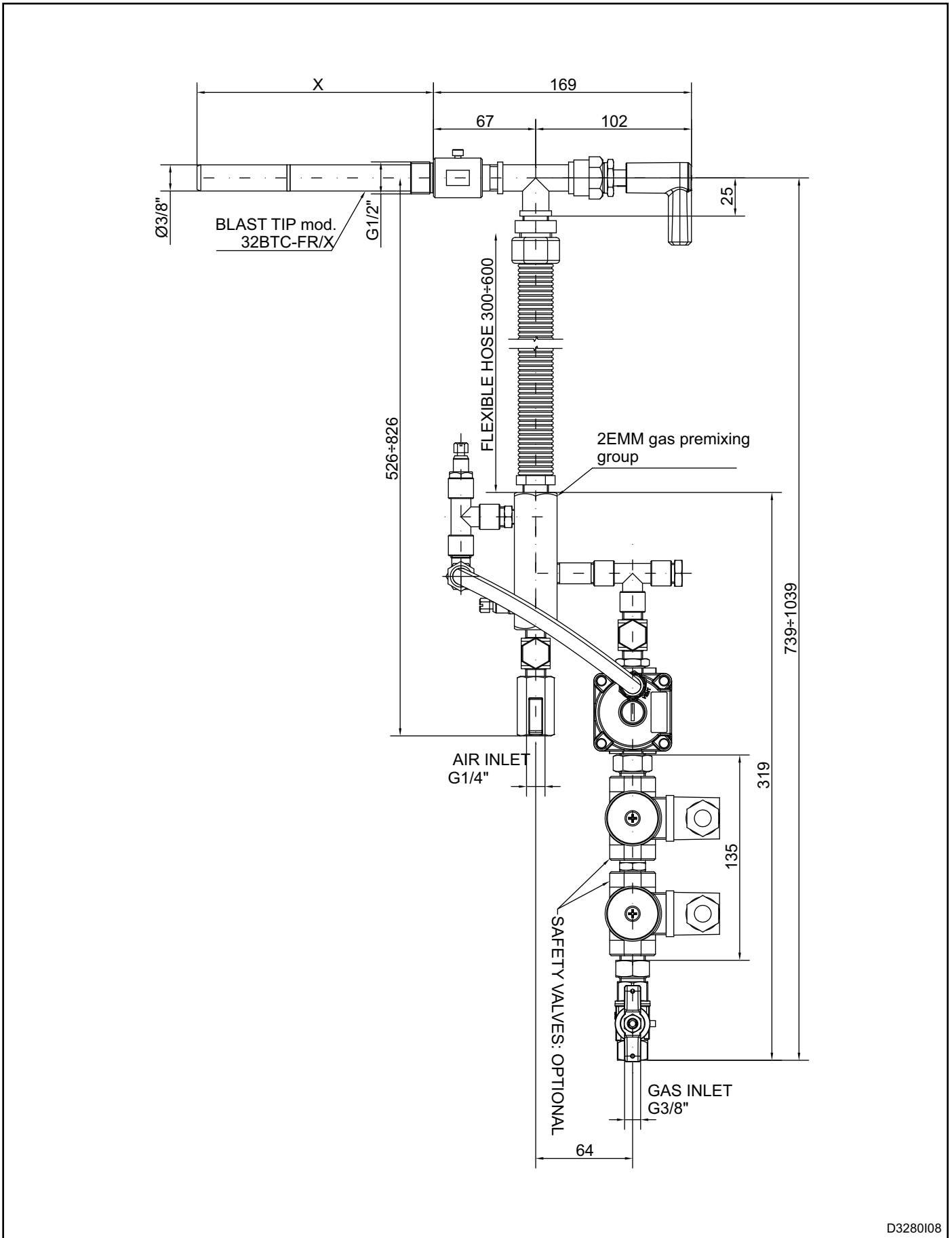
4 - Insert the new spark-plug rescrewing it on until it clicks into place.

5 - Check that the insulator connector is properly connected.



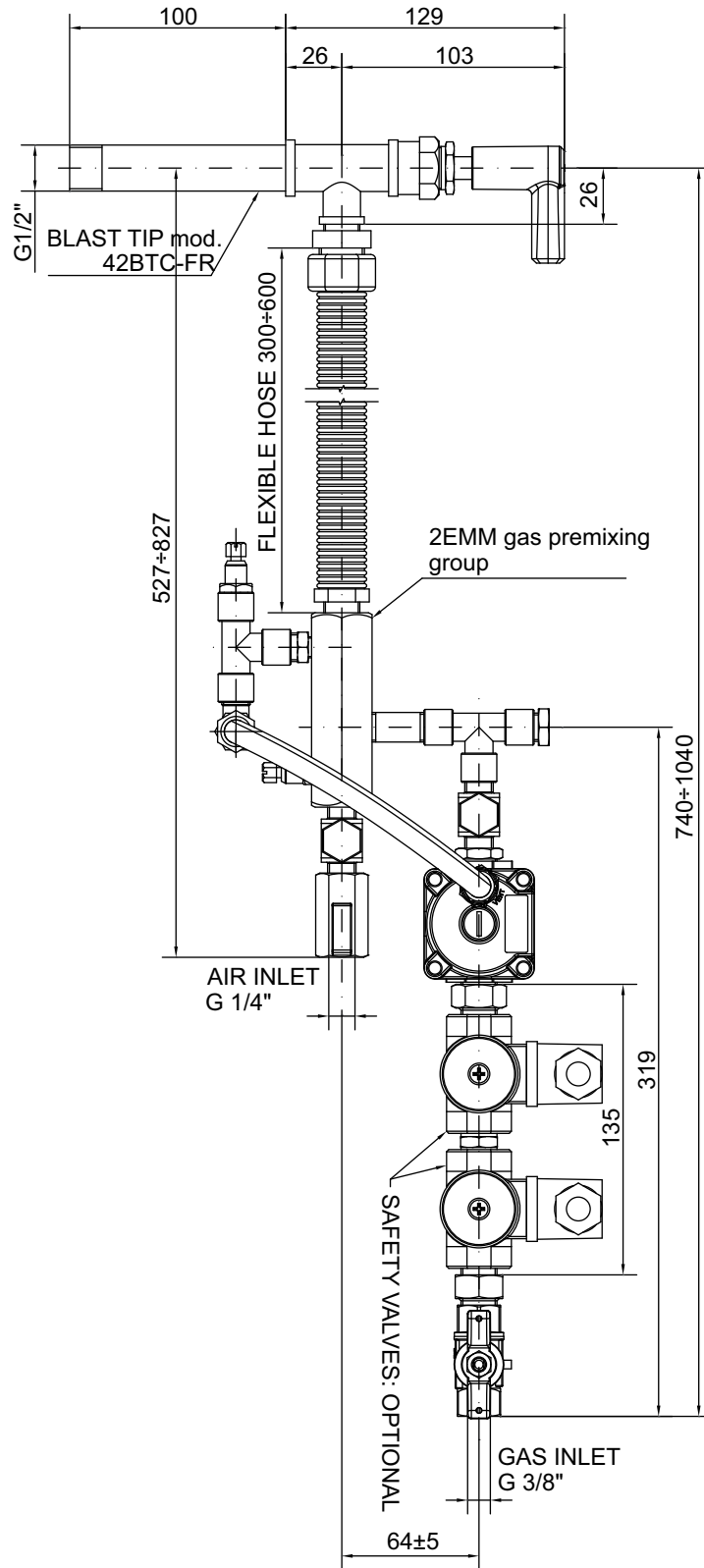
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OVERALL DIMENSIONS - P32PBC-FR/X



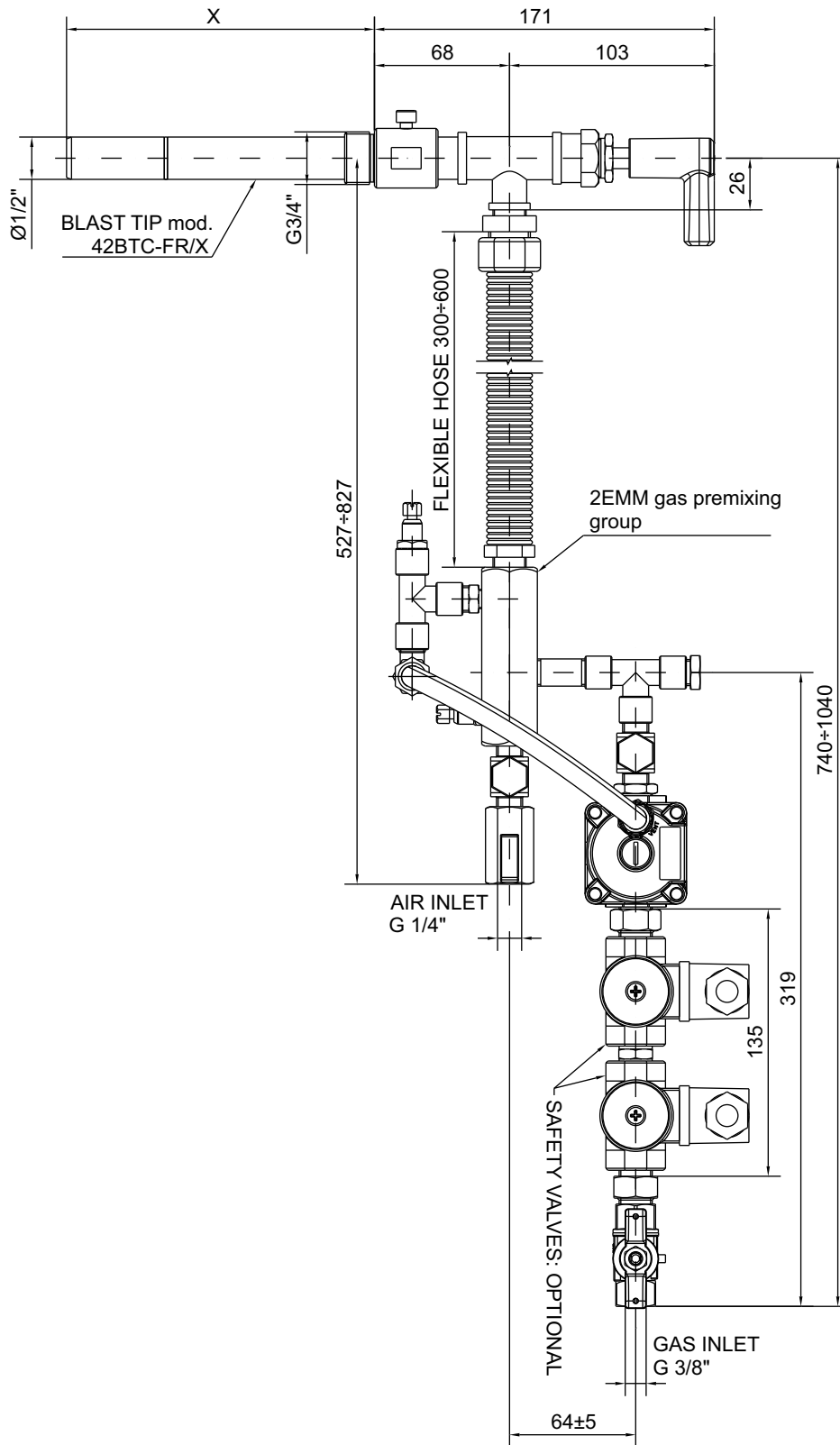
D3280I08

OVERALL DIMENSIONS - P42PBC-FR



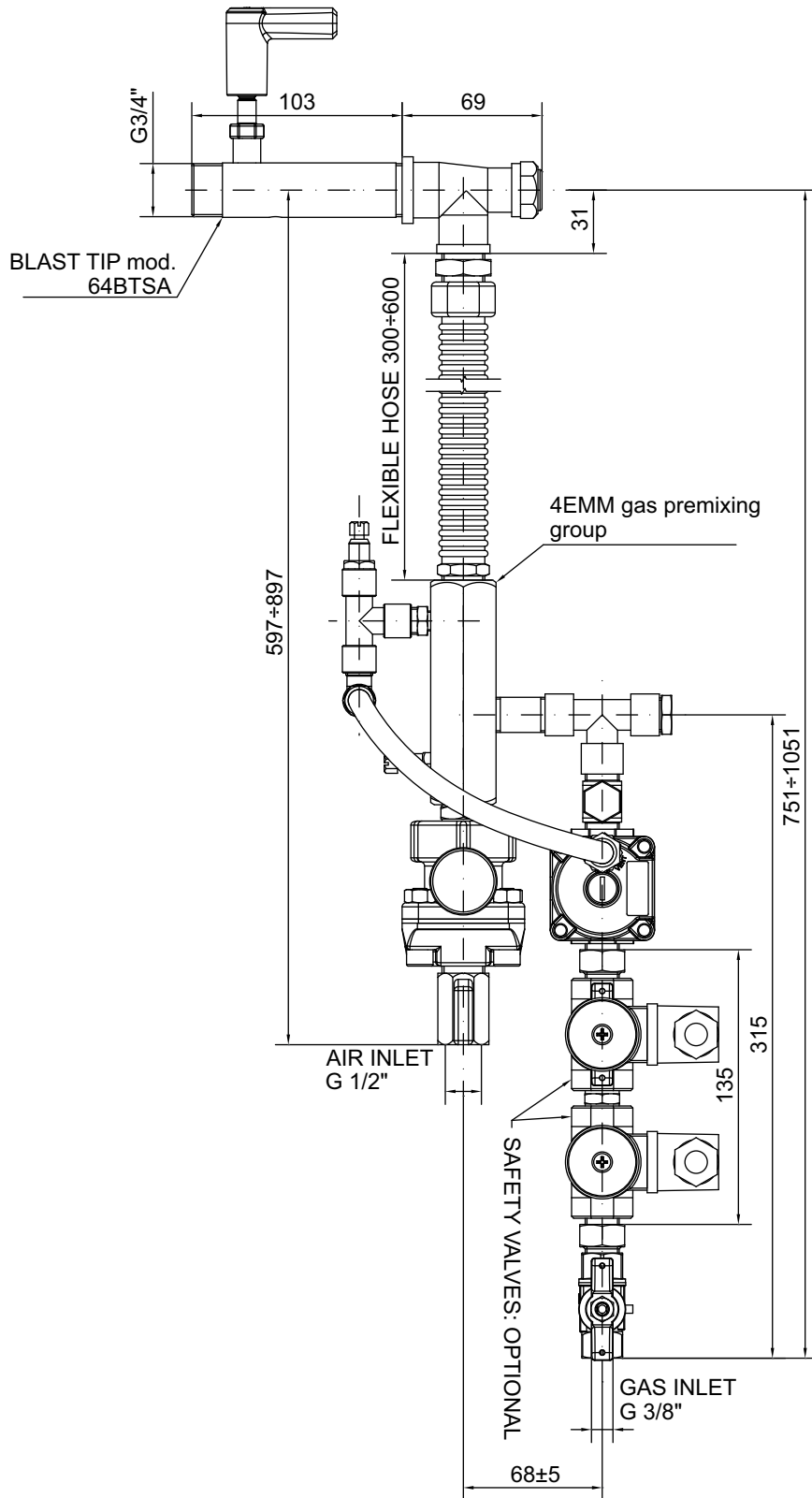
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OVERALL DIMENSIONS - P42PBC-FR/X



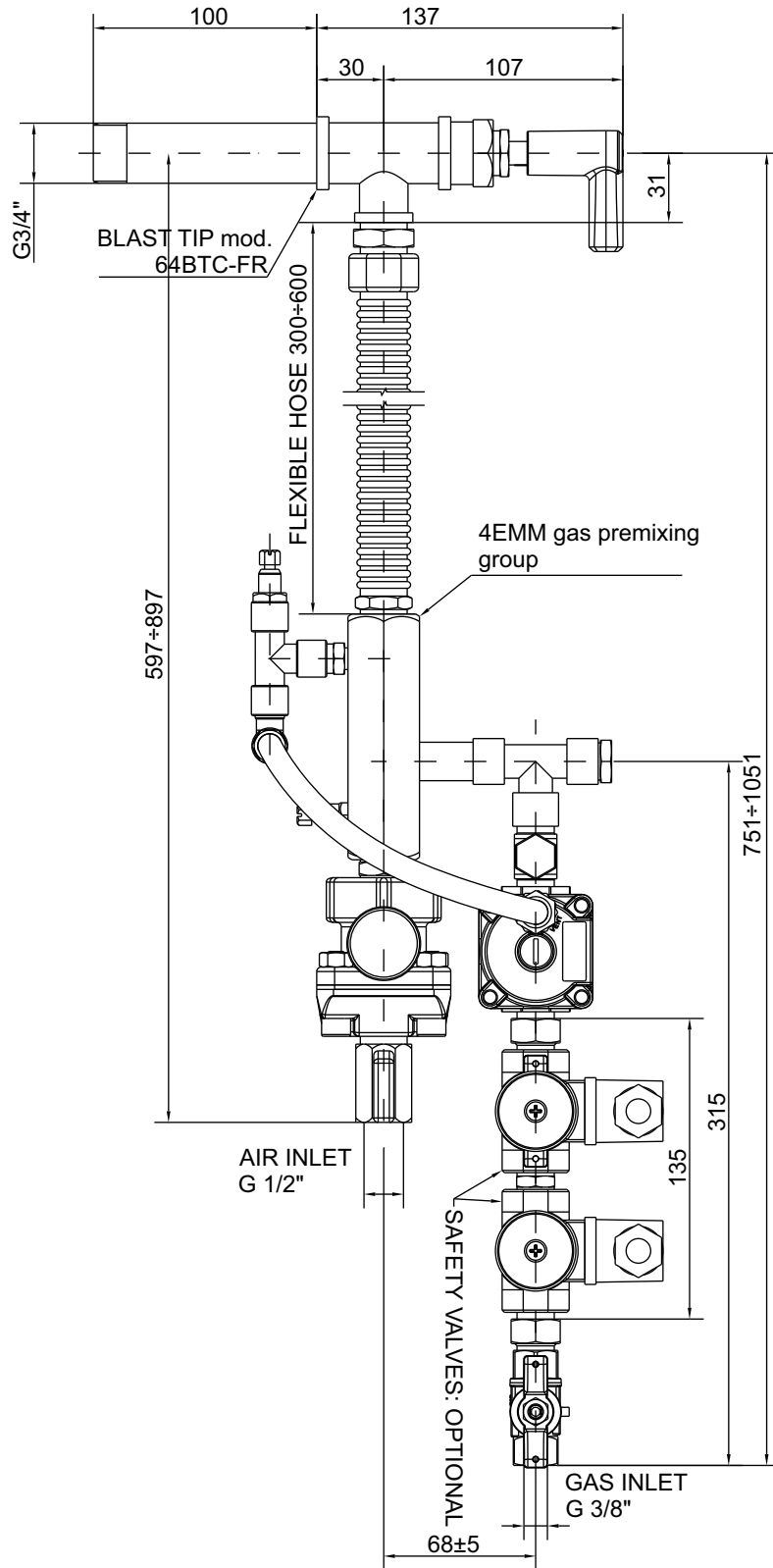
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OVERALL DIMENSIONS - P64PBST



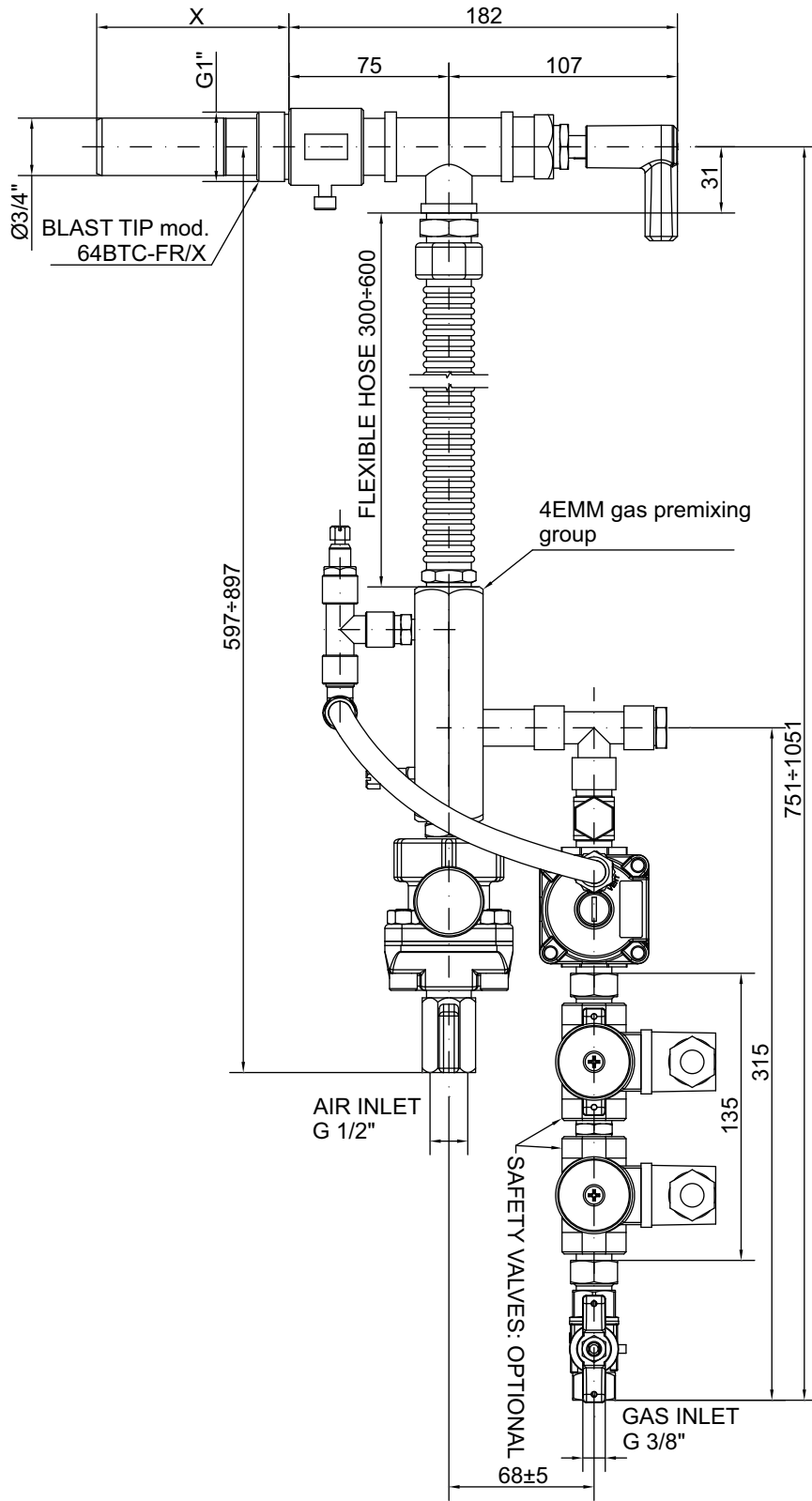
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OVERALL DIMENSIONS - P64PBC-FR



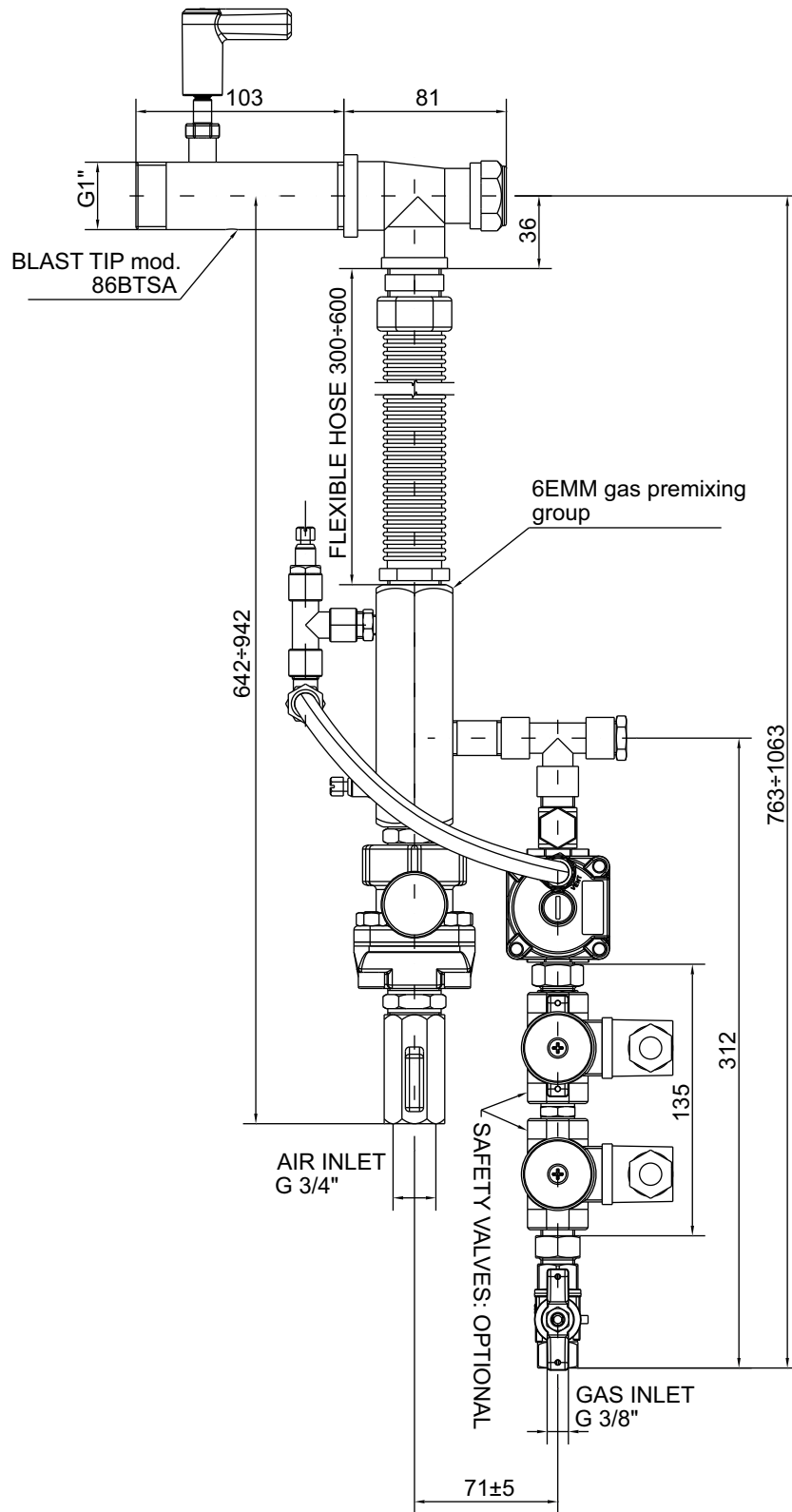
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OVERALL DIMENSIONS - P64PBC-FR/X



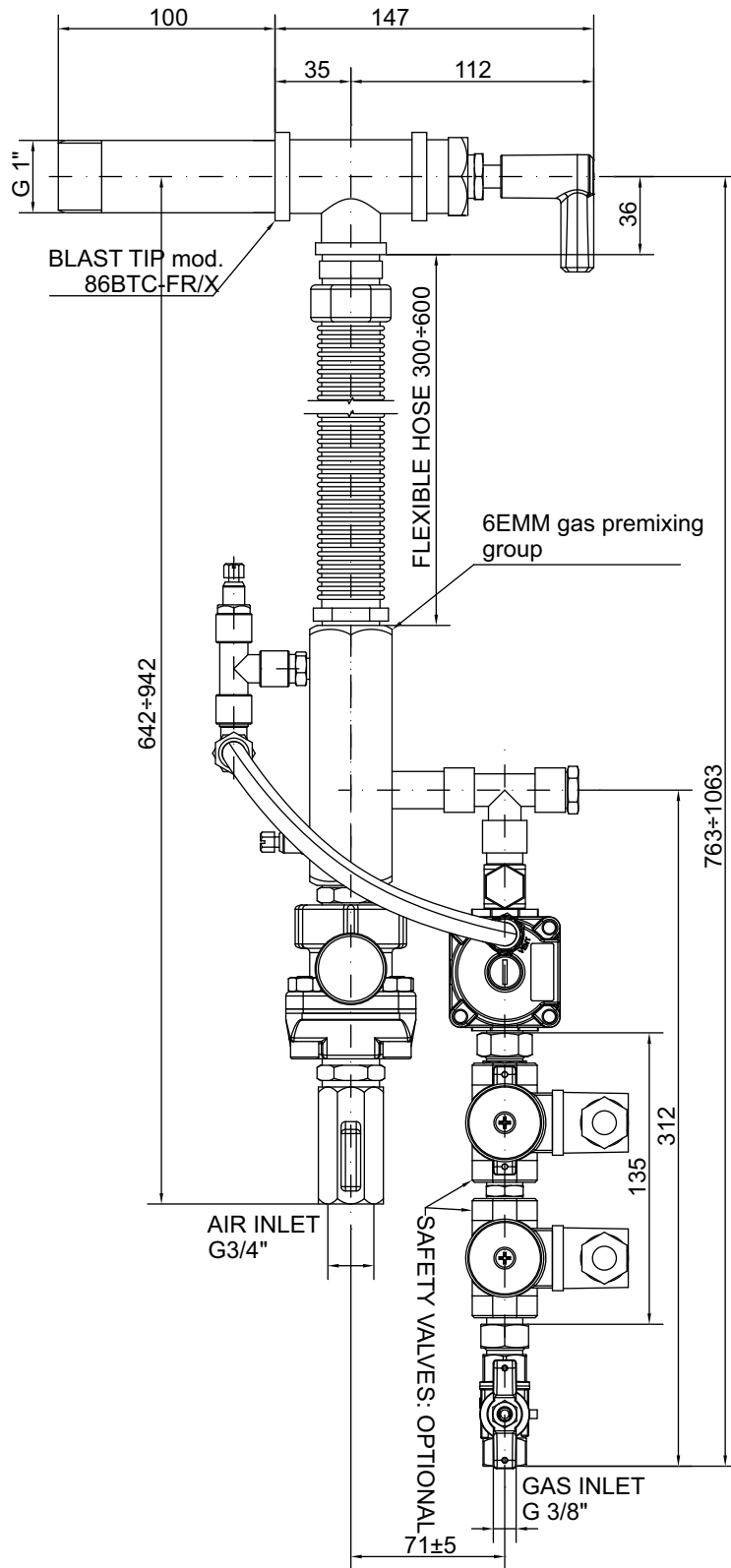
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OVERALL DIMENSIONS - P86PBST



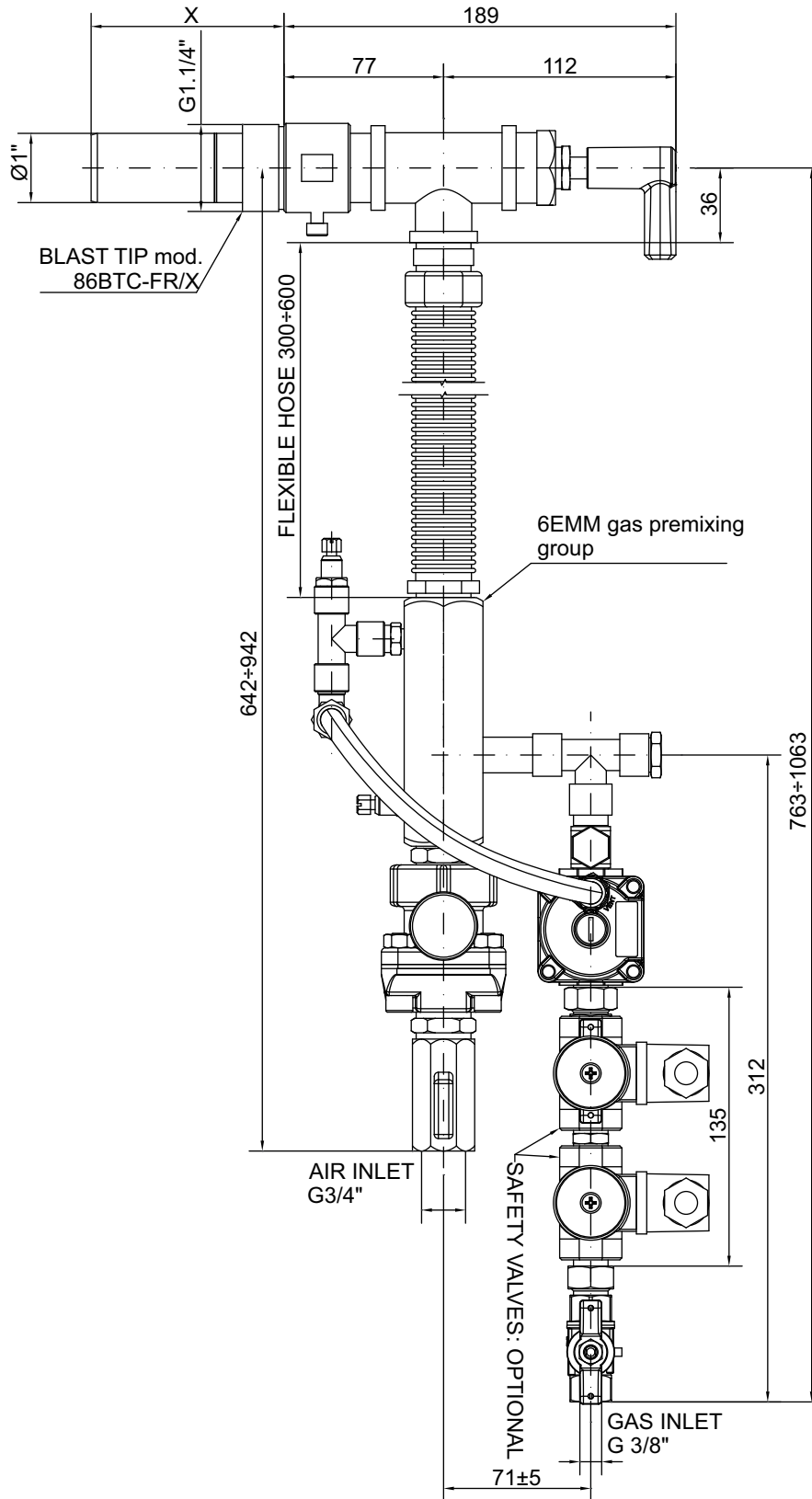
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OVERALL DIMENSIONS - P86PBC-FR



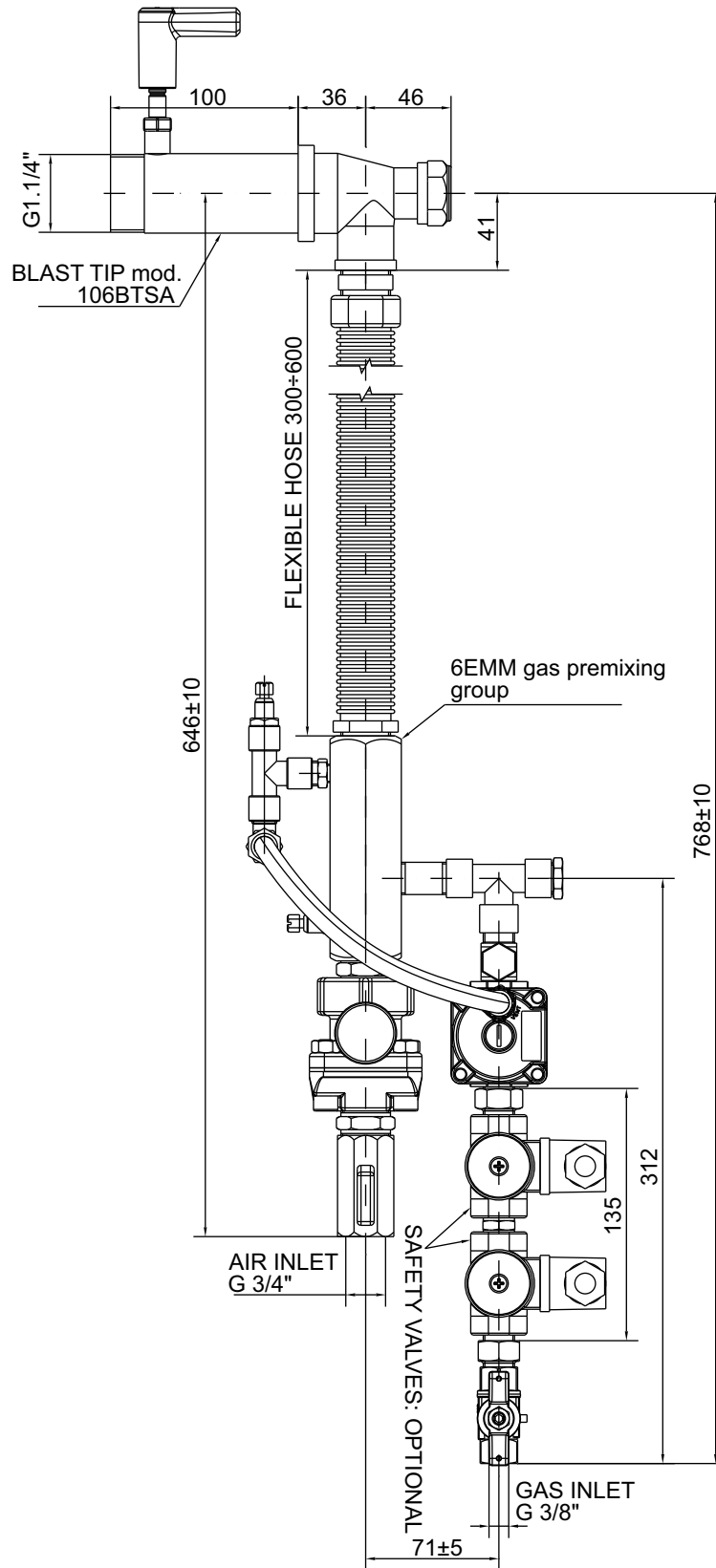
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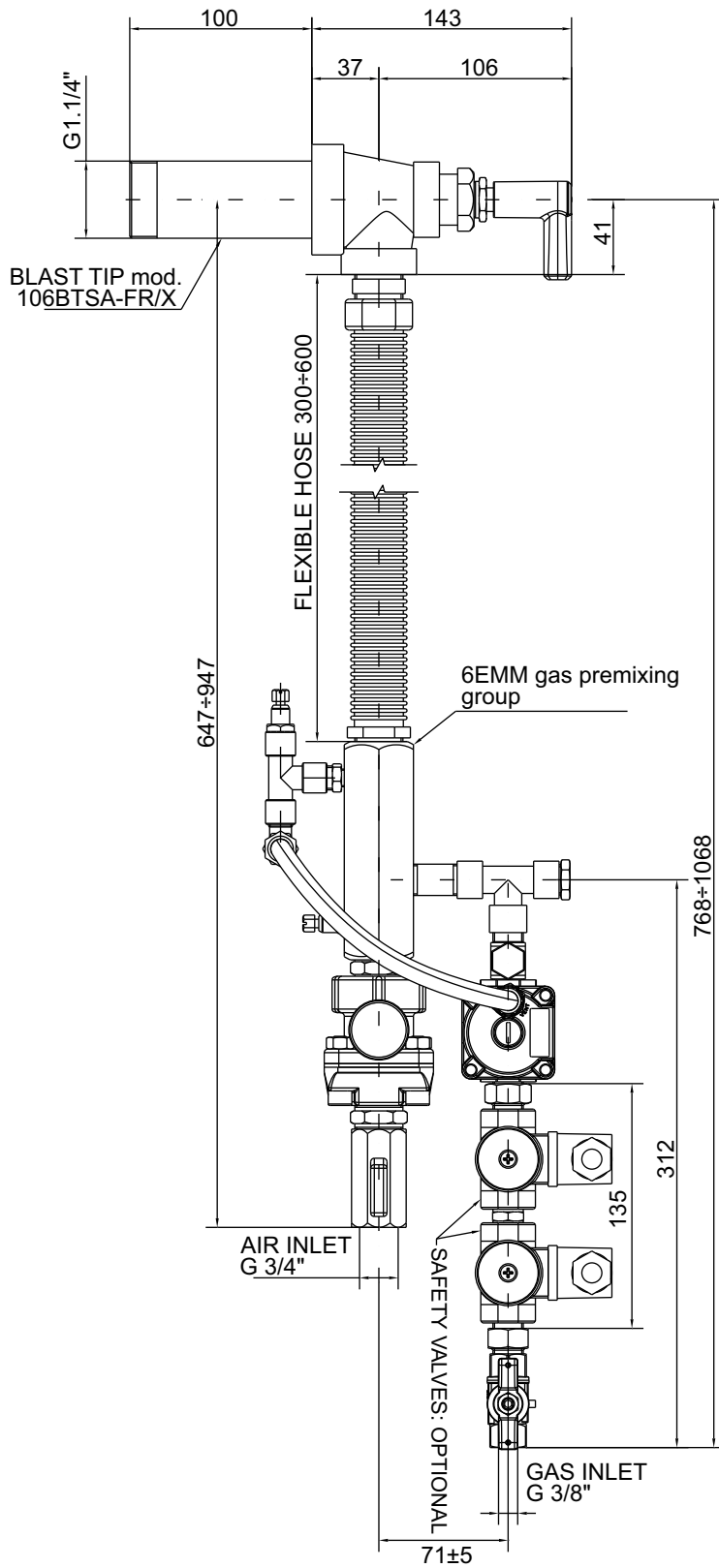
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OVERALL DIMENSIONS - P106PBST



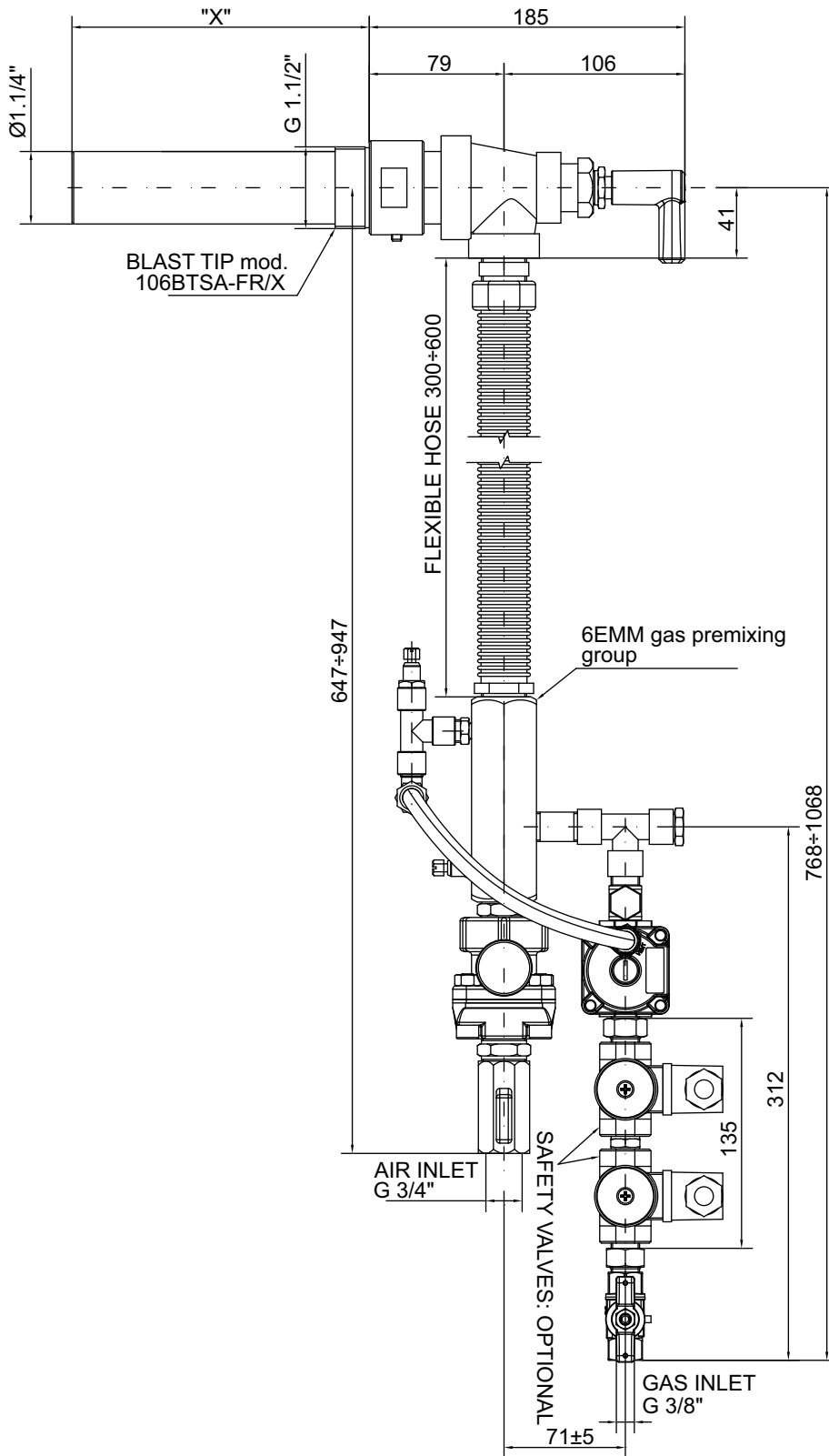
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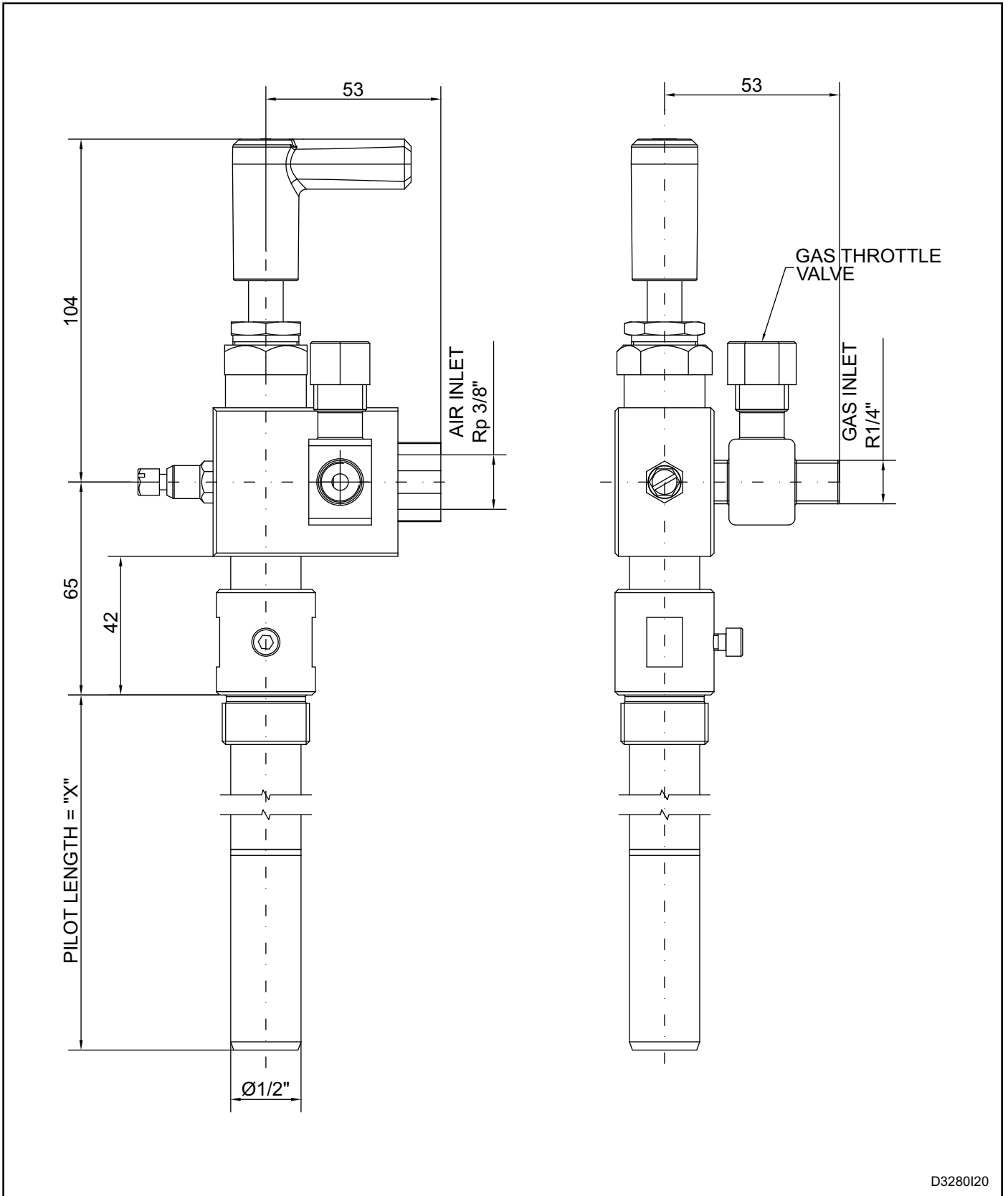
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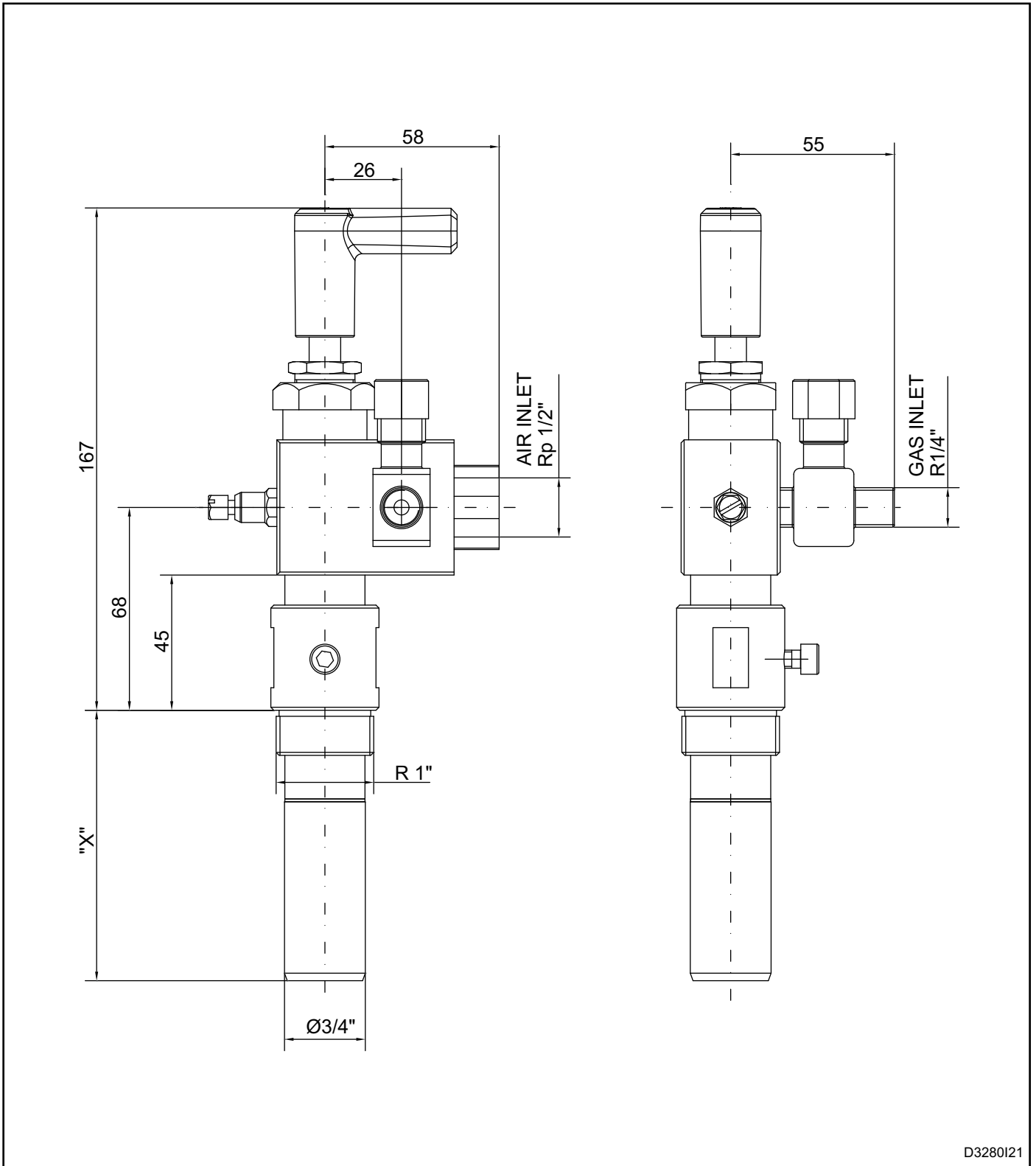
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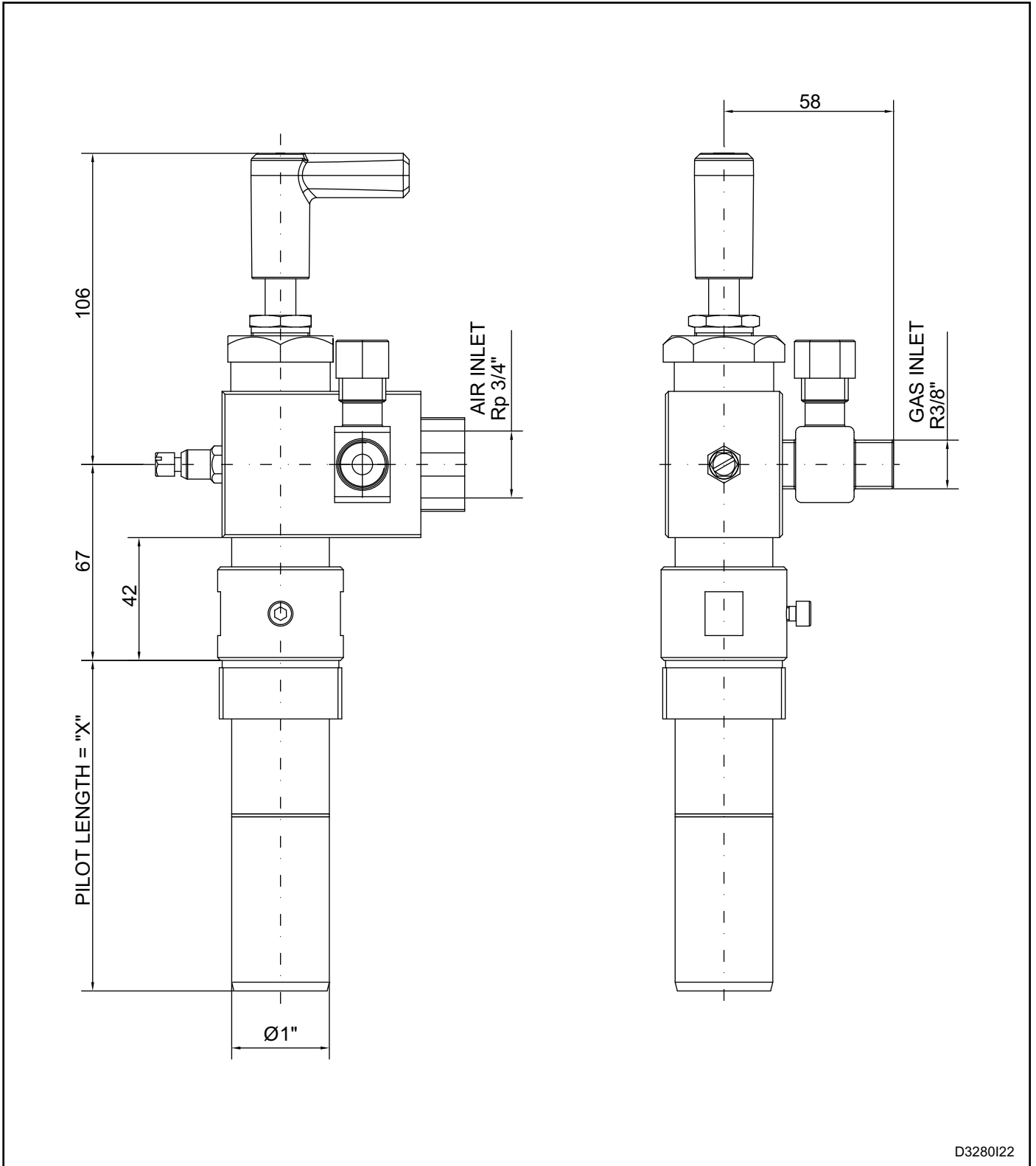
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OVERALL DIMENSIONS - P64PBC-MX-FR/X



D3280I21

OVERALL DIMENSIONS - P86PBC-MX-FR/X



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