

## Burners



## Linear burners

PYROLINE & MIDGET PYROLINE  
(E3201 rev. 01 - 17/11/2017)

## 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](http://www.esapyronics.com) website.

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

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

## CERTIFICATIONS:



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

## CONTACTS / SERVICE:



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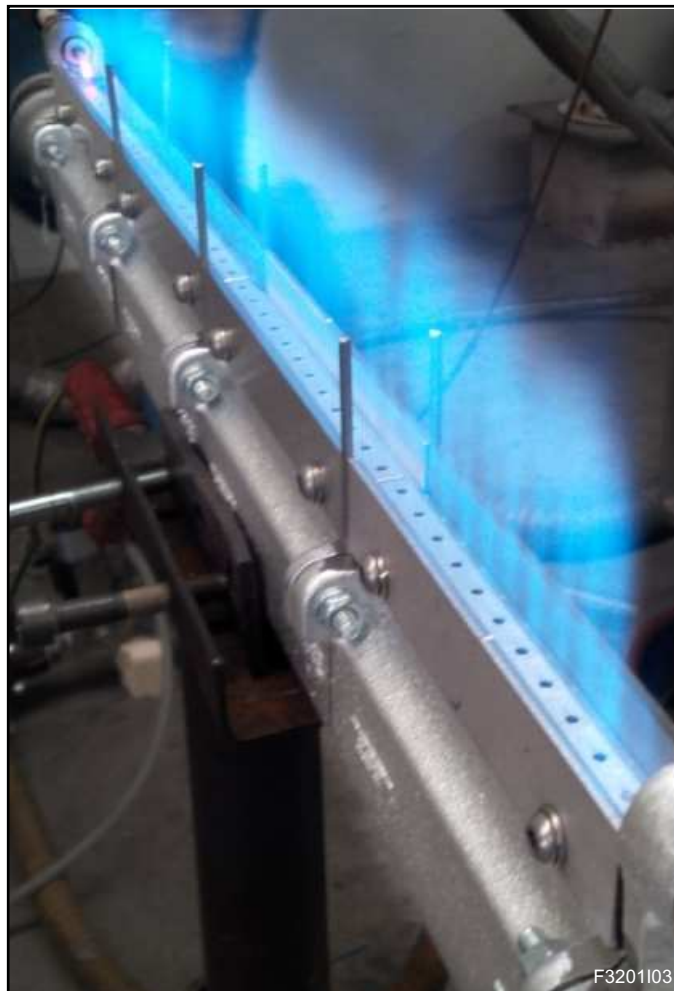
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The PYROLINE & PYROLINE-MIDGET series gas burners are linear pre-mix linear burners designed for operation with various types of gas, at low temperatures (400°C) with gas air mixtures from 70% to 80% of primary ventilation. Burners can be powered by FLOMIXERS (see data sheet E2301) or FMT mixers (see data sheet E2361) used for single units or groups of burners.

## APPLICATIONS

- Ingot mould preheating.
- Targeted surface heating.
- Brazing, welding and annealing machines.
- Flame curtains.
- Fume postcombustion.
- Furnaces and hot air generators.
- Annealing and glass polishing furnaces.
- Heating tanks and boilers.
- Textile drying and finishing machines.
- Drying machines.
- Machines for heating and drying moulds.
- Machines for food furnaces.
- Preheating grids or stone plates in food furnaces.
- Industrial fryers.
- Point-blank machines



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## CHARACTERISTICS

### GENERAL:

- |                                  |              |
|----------------------------------|--------------|
| ■ Midget pyroline "ML" capacity: | 2 ÷ 40kW     |
| ■ Midget pyroline "L" capacity:  | 4 ÷ 162k     |
| ■ Limit temperature:             | 400°C        |
| ■ Mixture pressure:              | 1 ÷ 40 mbar  |
| ■ Fuel gas:                      | 1/2/3 family |
| ■ Flow ratio:                    | 4:1          |

### MATERIAL COMPOSITIONS:

- |                         |               |
|-------------------------|---------------|
| ■ Burner body:          | Cast iron G25 |
| ■ Fire barrier spacers: | AISI304       |

\* The potential is expressed per single module and depends on the size of the holes on the body.



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## FLAME CAPACITY AND HEIGHT PARAMETERS

### PYROLINE

Model	Module width [mm]	Capacity [kW]	Flame height [mm]
6L-A	150	26	20
6L-B	150	55	40
6L-C	150	81	80
12L-A	300	53	20
12L-B	300	107	40
12L-C	300	162	80

### MIDGET - PYROLINE

Model	Module width [mm]	Capacity [kW]	Flame height [mm]
6ML-A	150	12	20
6ML-B	150	20	40
6ML-C	150	40	80

## IGNITION AND DETECTION

The ignition of PYROLINE and MIDGET PYROLINE burners occurs by high voltage discharge supplied by a special electrode. The standard configuration provides the mono-electrode flame detection. The flame detection can occur, on request, with a separate electrode or UV photo-

cell. All accessories, related to ignition and detection are excluded from the supply. The adoption of a flame control system is highly recommended in all plants operating with temperatures less than 750°C (UNI EN746/2 Standard).

## DESCRIPTION

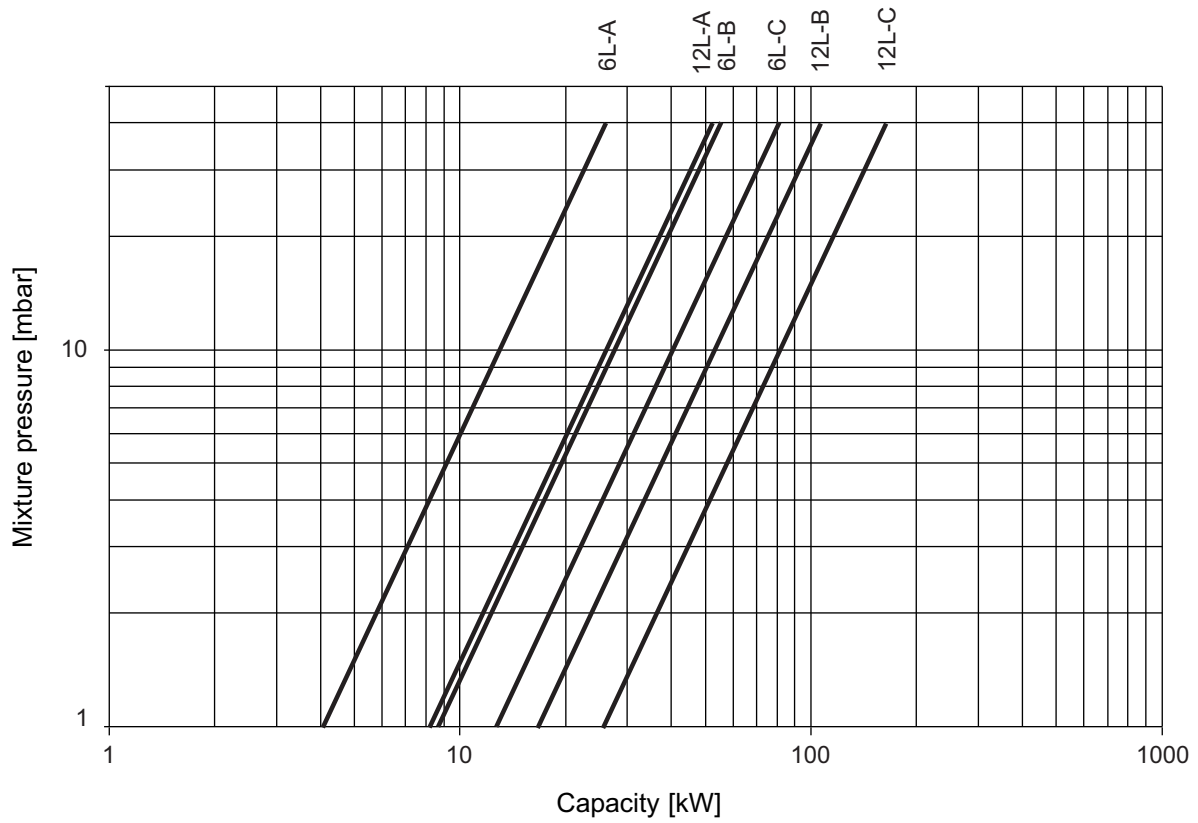
The PYROLINE and MIDGET PYROLINE have a cast-iron body on which emerges a perforated rail channeled by two side rails in AISI. The two sides are for improving the flame retention and allow the burner to work at a low temperature even in environments with high temperatures. The modules available can be linear with lateral or perpendicular gas inlet, and allow a personalized display of the flame front.

The burners reach their maximum functionality between

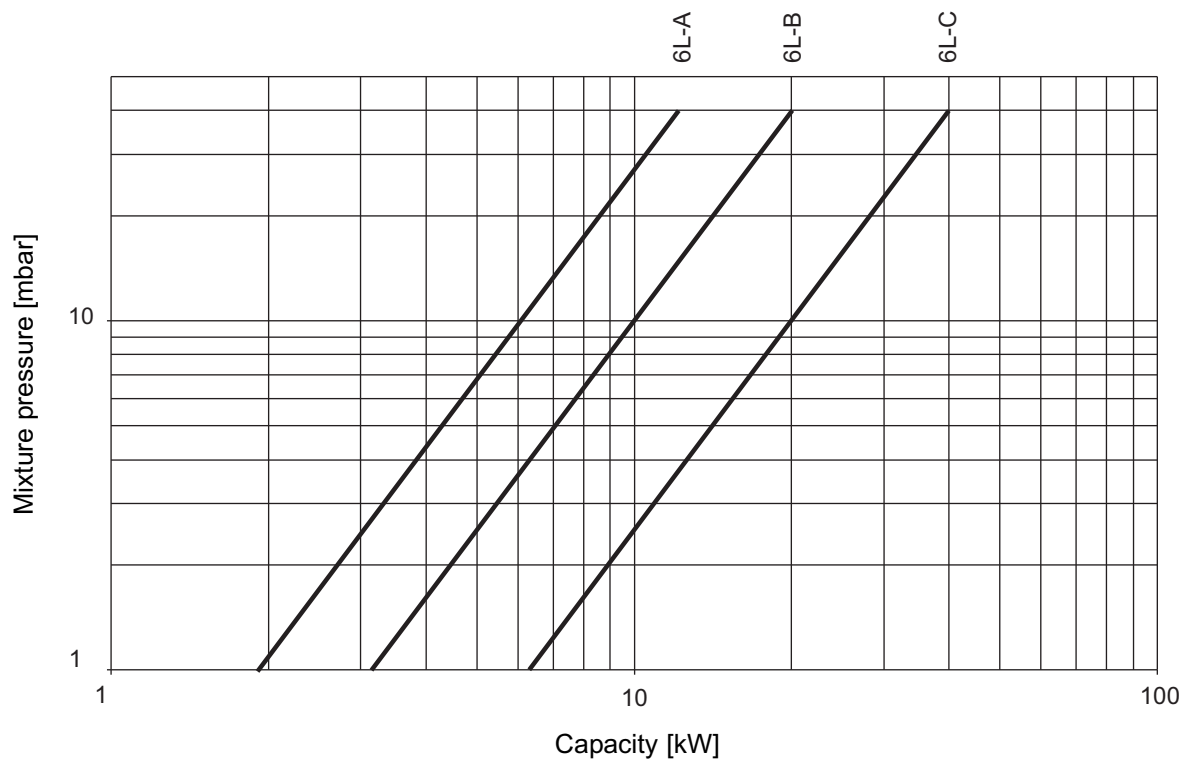
70% and 80% of ventilation, but can also be used with other air/gas ratios. At normal mixture pressures, the flame is very stable and reaches a speed up to 25.4 m/s. The spread of the flame during ignition is instantaneous and runs from one section to another.

The mounting bracket of the pilot burner is universal, and attaches to any flange on both sides of the burner. This guarantees a single ignition point and special flame protection.

**CAPACITY CHART FOR EACH SINGLE MODULE**

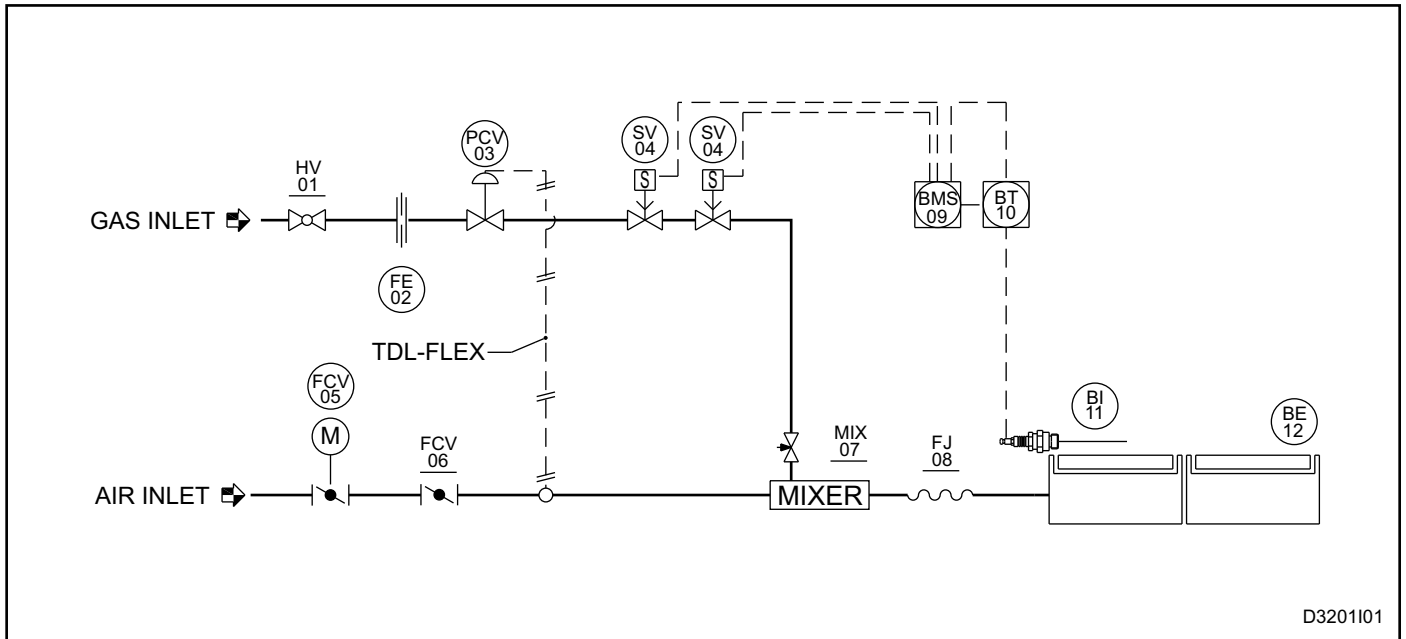


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**FLOW SCHEME**



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Pos.	Description	included	not included
HV 01	Gas interception valve		X
FE 02	Calibrated flange		X
PCV 03	Pressure regulator		X
SV 04	Gas safety valve		X
FCV 05	Motorized air valve		X
FCV 06	Manual air valve		X
MIX 07	Mixer		X
FJ 08	Mixture flexible pipe		X
BMS 09	Flame control device		X
BT 10	Ignition transformer		X
BI 11	Detection ignition electrode	X	
BE 12	Burner	X	

## WARNINGS

■ The PYROLINE and MIDGET PYROLINE series burners must be used for fixed installations. If mobile installations are necessary, it is necessary to first evaluate the possibility of any problems due to the movement of the actual furnace.

■ The ignition of the burners must always be performed at minimum power, and then modulated towards the maximum.

■ The transition from minimum to maximum power, and vice versa, must be gradual and not instantaneous

■ For all low temperature applications (up to 400°C), the ignition of the burner and the control of the fuel gas solenoid valves must be carried out by means of a certified burner control device.

■ To avoid any damage to the burners, make sure that the blower does not send stale air from combustion products, oils, solvents or other. To prevent these phenomena from occurring, install the blower or the suction duct, if possible, outside the building and away from exhaust ducts.

■ Check the correct connection of the power lines after

installation. Before igniting the burner, check that the combustion air and fuel gas pressure values are correct

■ If disturbances occur to other equipment during the burner start-up phase, use, for the connection of the HT (High Voltage) cable on the ignition electrode, the connector with an interference suppression filter.

■ Do not carry out close ignitions of the burner in order not to overheat the control devices of the ignition system (solenoid valves and transformers).

■ Consider a minimum time between one ignition and the next equal to the sum of the prewash time and the first safety time, increased by at least 5 seconds (however, do not perform more than 2 ignitions in a 30-second time period).

■ Operate on the burner and connected devices only in the absence of supply voltage. In case of malfunctioning, follow the instructions in this manual in the Maintenance chapter, or contact the ESA-PYRONICS service.

■ Any modification or repair carried out by third parties can compromise the application's security and automatically invalidate the general warranty conditions.

## INSTALLATION

PYROLINE and MIDGET-PYROLINE burners can be installed in any position even with flame facing down. For fitting the burner, suitable fixing flanges can be supplied. For air and gas piping connections we recommend the

use of flexible fittings, the connections between burner and mixer must be at least the same output diameter of the mixer, do not insert valves or restrictions of any kind on the mixture pipe.

## IGNITION AND SETTING

The operations indicated in the following chapter must be performed by expert or qualified technical personnel. Failure to follow the instructions can generate dangerous conditions:

- 1** - Verify that the combustion air pressures in output to the blower and the fuel supply gas are in the permitted range.
- 2** - Adjust the working and intervention pressures of the combustion system safety devices, whether there is one per burner or a general one for the whole combustion system, such as: gas pressure reducer, blocking valve, relief valve, pressure switches, etc. Simulate the intervention of all the safety devices, including the intervention of the safety overtemperature, verifying that the fuel blocking devices act correctly.
- 3** - Position the motorized air regulation valve in the maximum opening position and adjust the air pressures entering the burner, or the mixer (in nominal conditions, the inlet pressure is about 50mbar).
- 4** - Position the motorized air regulation valve in the minimum opening position and adjust the opening to obtain (at the entrance to the burner) the pressures relative to the minimum power (not less than 2mbar and however to be calibrated with burner switched on at minimum potential).
- 5** - Activate the burner control device and perform a few ignition attempts until the burner ignites. During the ignition attempts, act on the gas control valve and, starting from the fully closed position, open it gradually until the burner ignites.
- 6** - Position the motorized air regulation valve at maximum opening and adjust the maximum fuel flow rate via the gas control valve, if necessary, check the differential pressure created on the calibrated gas flange, if present, otherwise adjust the burner according to the indications in the images at the bottom of the page.
- 7** - Position the motorized air regulation valve at the minimum opening and check that the flame is stable. If necessary, adjust the gas flow to the minimum according to the image adjustments at the bottom of the page, by acting on the zerogovernor spring.
- 8** - Perform repeated ignition attempts at the minimum power of the burners, with maximum thermal excursions, to verify the reliability of the ignition and the flame stability during the adjustment.



### GENERAL MAINTENANCE PLAN

Operation	Type	Advised time	Notes
<b>Pilot burner electrode high voltage connector</b>	O	annual	Verify the integrity of the external plastic and oxidation of the internal connector and of the electrode terminal.
<b>Ignition / detection electrode</b>	O	annual	Replace if the kanthal terminal is worn or the ceramic is damaged.
<b>Integrity and cleaning of flame modules</b>	O	annual	Check the status of the reed valve If necessary, clean with compressed air.
	S	N/A	Replace the flame tube in the event of damage to the reed valve which could compromise the normal functioning of the burner.
<b>Burner settings</b>	O	annual	Repeat all the steps in the "IGNITION AND CALIBRATION" section.

**NOTES:**

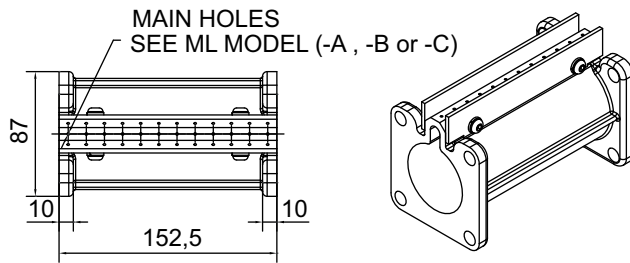
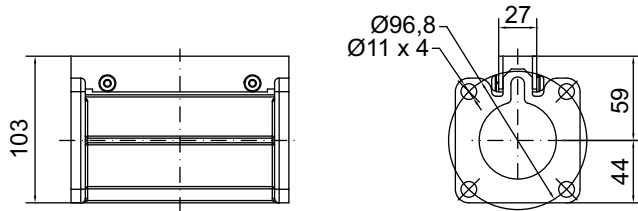
Legend: O = ordinary / E = extraordinary

(\*) it is advisable to replace the gas-side seals after each disassembly of the gas supply line

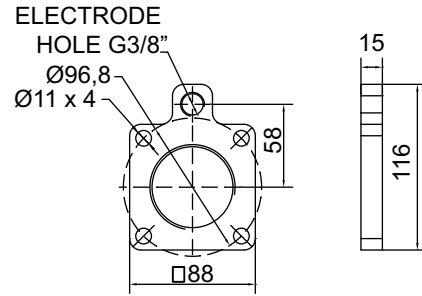
(\*\*) use high temperature seals.

**OVERALL DIMENSIONS - PYROLINE**

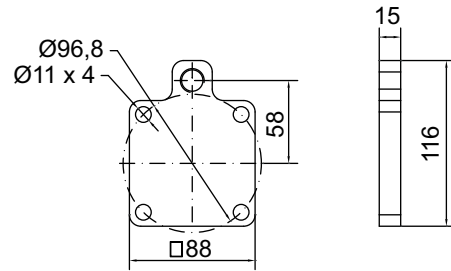
**6L BURNER**



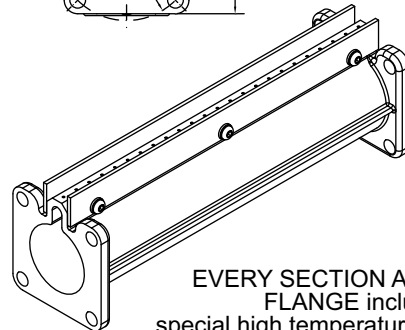
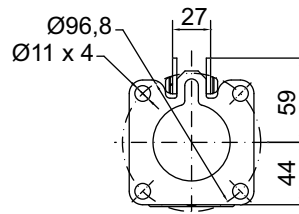
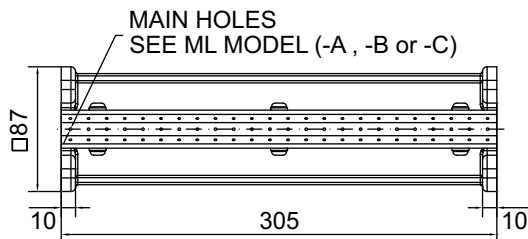
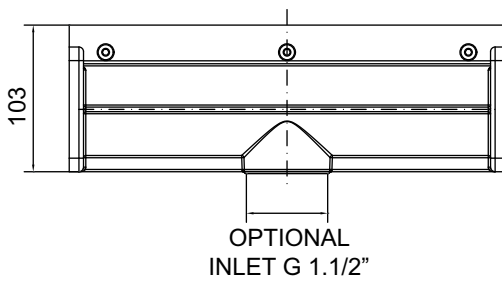
**INLET FLANGE**



**END FLANGE**

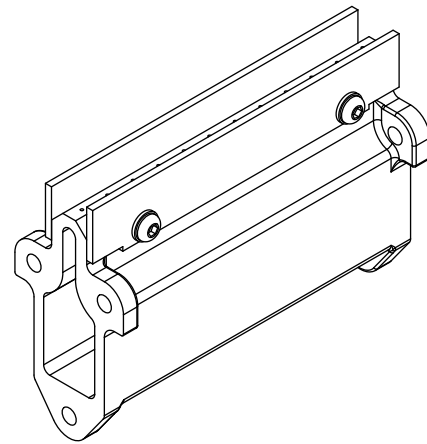
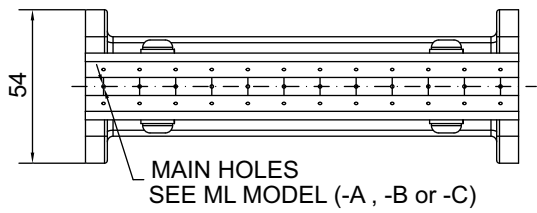
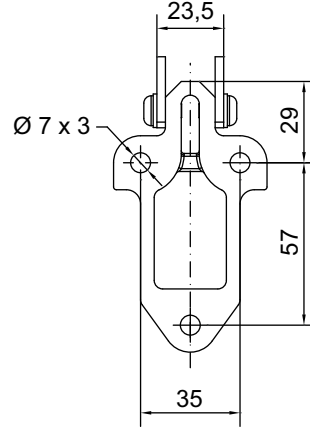
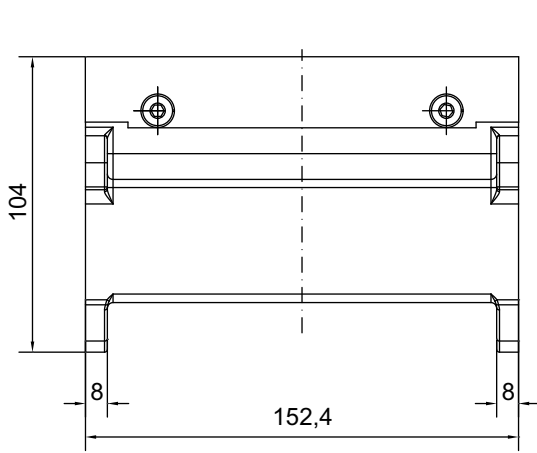


**12L BURNER**

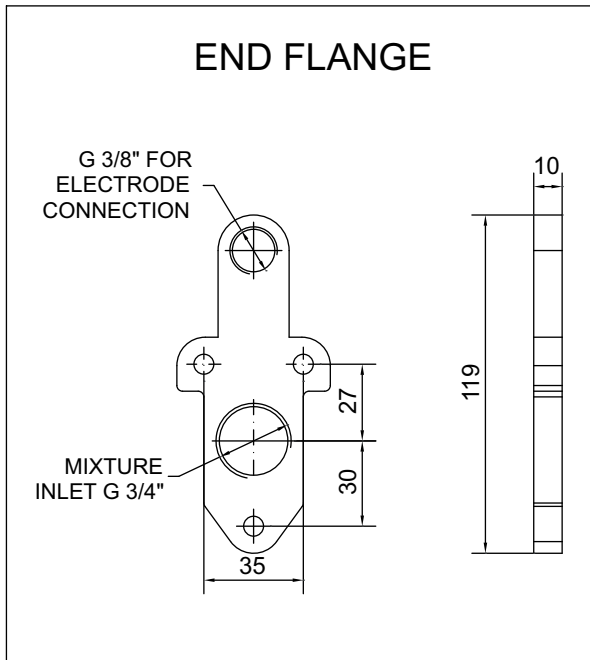


EVERY SECTION AND END FLANGE includes one special high temperature gasket, nuts, bolts and lock washers for assembly

**OVERALL DIMENSIONS - MIDGET PYROLINE "ML"**



**END FLANGE**



**EVERY SECTION AND END FLANGE** includes one special high temperature gasket, nuts, bolts and lock washers for assembly

**ORDERING CODE - PYROLINE 6L BURNER**

6L -

Configuration		01
A	26 kW	
B	55 kW	
C	81 kW	

**ORDERING CODE - PYROLINE 12L BURNER**

12L -

Configuration		01
A	53 kW	
B	107 kW	
C	162 kW	

**ORDERING CODE - MIDGET PYROLINE 6ML BURNER**

6ML -

Configuration		01
A	12 kW	
B	20 kW	
C	40 kW	

**NB: Accessories such as an inlet flange, closing flange, gaskets or other, must be expressly requested at the time of the offer.**