

G3

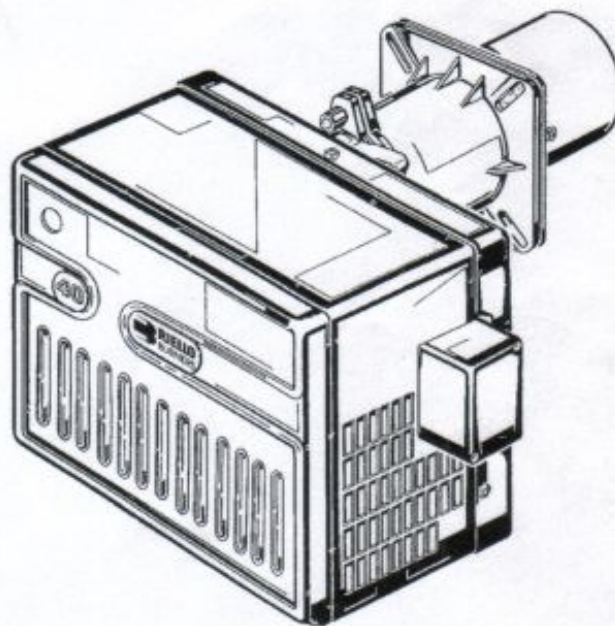
Installation, use and maintenance instructions

**RIELLO**  
BURNERS

## Forced draught gas burner

One stage operation

CE



**RIELLO 40**

CODE	MODEL	TYPE
3755653	GS20P	556T51

2902433 (1)

## BURNER USE WITH APPLICATIONS ACCORDING TO PrEN 1020.

### TECHNICAL FEATURES

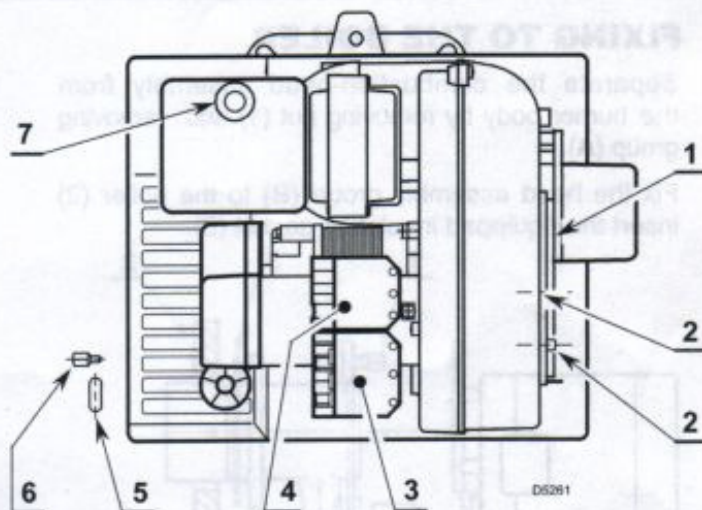
Thermal output		81 – 232 kW – 70,000 – 200,000 kcal/h
Gas (Family 2)	Net heat value	8 – 12 kWh/m <sup>3</sup> – 7,000 – 10,340 kcal/m <sup>3</sup>
	Pressure	min. 20 mbar – max. 35 mbar
Electrical supply		single phase, 230V ± 10% ~ 50Hz
Motor		230V / 1.4A
Capacitor		5 µF
Ignition transformer		primary 230V / 1.8A – secondary 8 kV / 30 mA
Absorbed electrical power		0.25 kW

**For gas family 3 (LPG) ask for separate kit.**

- ◆ The burner meets protection level of IP 40, EN 60529.
- ◆ According to directives: EMC 89/336/EEC, Low Voltage 73/23/EEC and Machines 98/37/EEC.
- ◆ **FOR GAS TRAIN SEE THE APPLIANCE TECHNICAL INSTRUCTIONS.**

**Fig. 1**

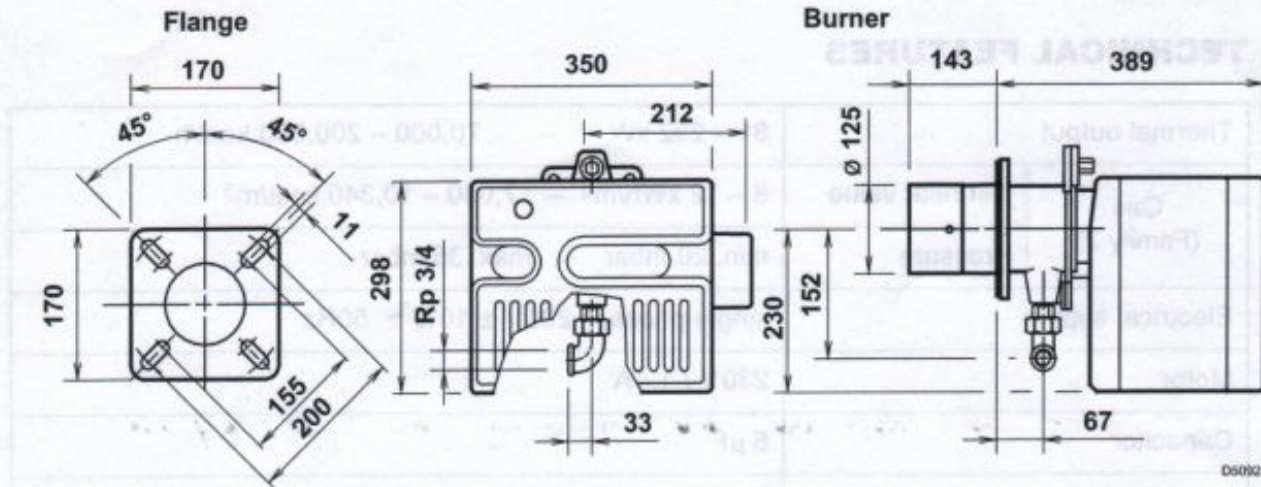
- 1 – Air-dampers
- 2 – Screws for fixing the air-damper
- 3 – 7 pole socket for electrical supply and control
- 4 – 6 pole socket for gas train
- 5 – Grommet
- 6 – Screw for fixing the cover
- 7 – Lock-out lamp and reset button



### NOTE

The grommet (5) and the screw for fixing the cover (6) supplied with the burner, must be fitted to the same side of the gas train.

## DIMENSIONS



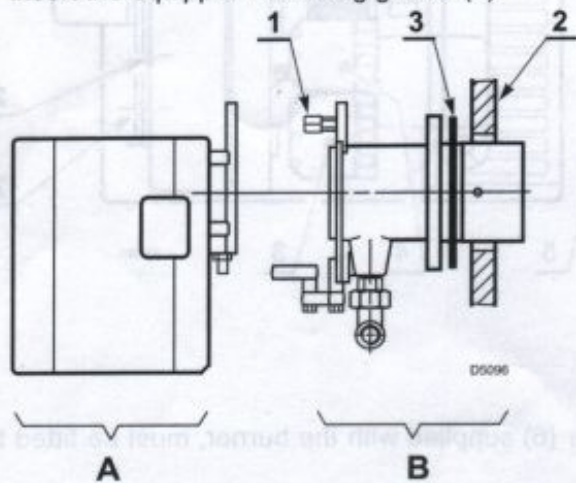
## EQUIPMENT

Quantity	Description
1	7 pin plug
1	6 pin plug
4	Screws with nuts
1	Insulating gasket
1	Screw for fixing the cover
1	Grommet
1	Hinge

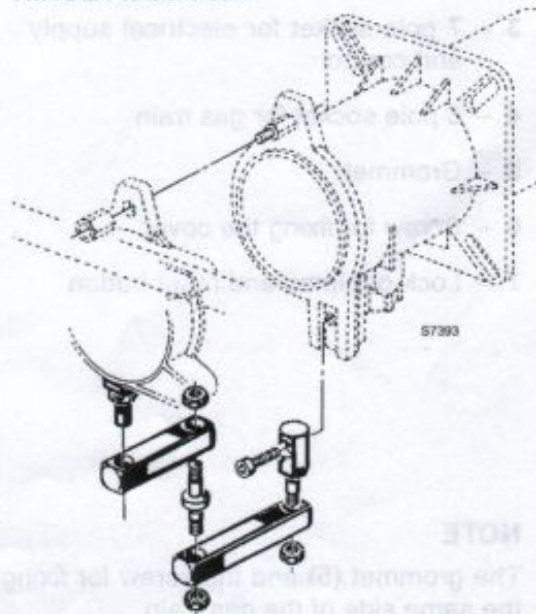
## FIXING TO THE BOILER

Separate the combustion-head assembly from the burner body by removing nut (1) and removing group (A).

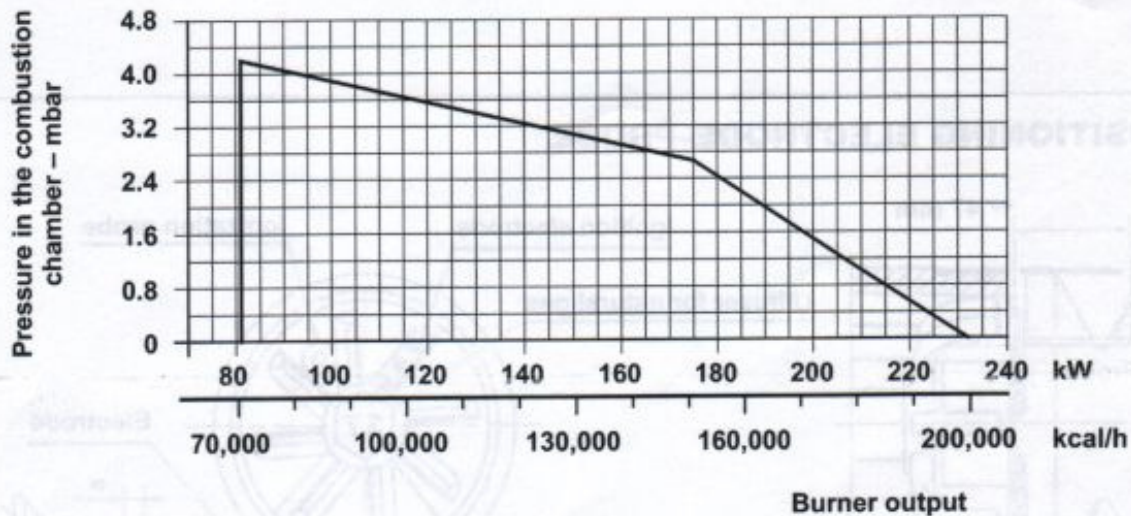
Fix the head assembly group (B) to the boiler (2) insert the equipped insulating gasket (3).



## HINGE ASSEMBLY



## WORKING RANGE



## TEST BOILER

The working field has been defined according to DIN 4788 and EN 676 standards.

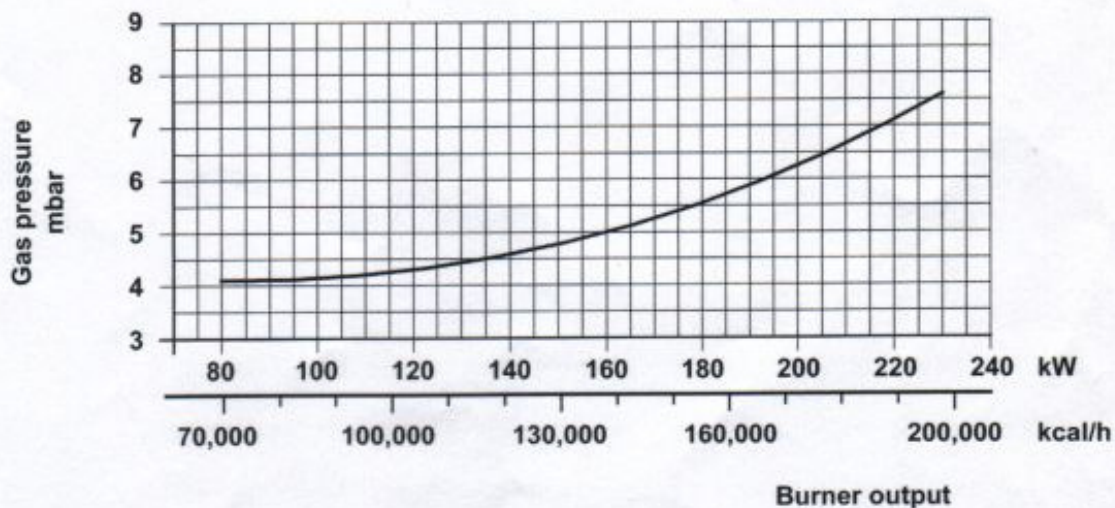
## COMMERCIAL BOILERS

The burner-boiler matching is assured if the boiler is according to EN 303 and the combustion chamber dimensions are similar to those shown in the diagram EN 676.

For applications where the boiler is not according to EN 303, or where the combustion chamber dimensions differ from those shown in EN 676, please consult the manufacturers.

## CORRELATION BETWEEN GAS PRESSURE AND BURNER OUTPUT

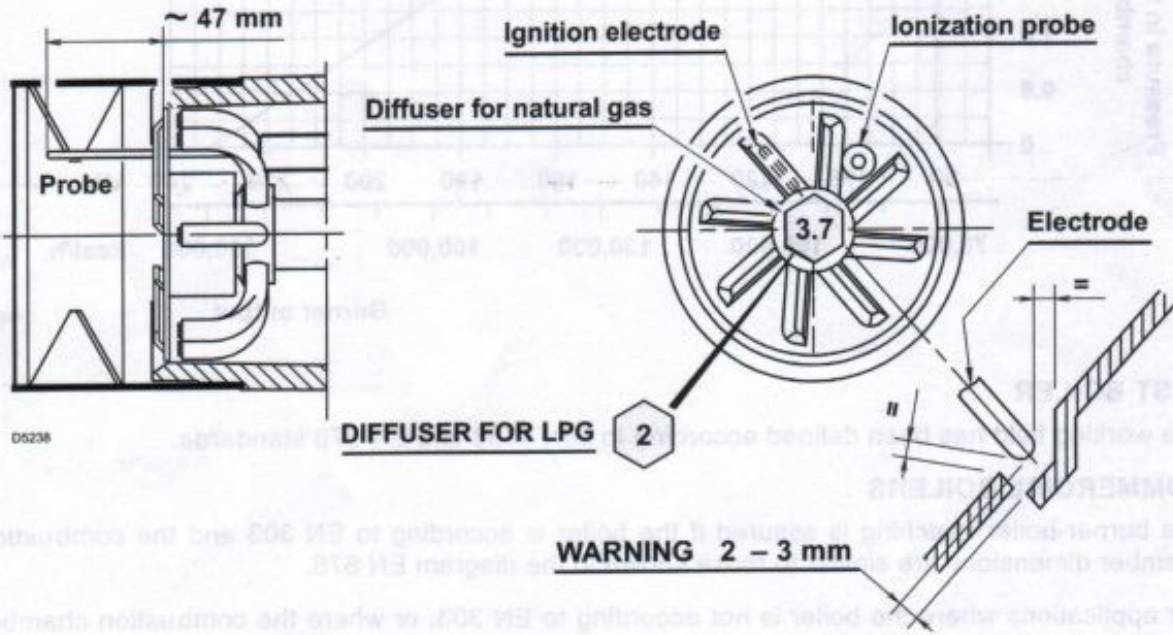
To obtain the maximum output, a gas head pressure of 7.7 mbar is measured with the combustion chamber at 0 mbar using gas G20 with a net heat value of 8600 kcal/m<sup>3</sup>.



## GAS TRAIN DETAIL

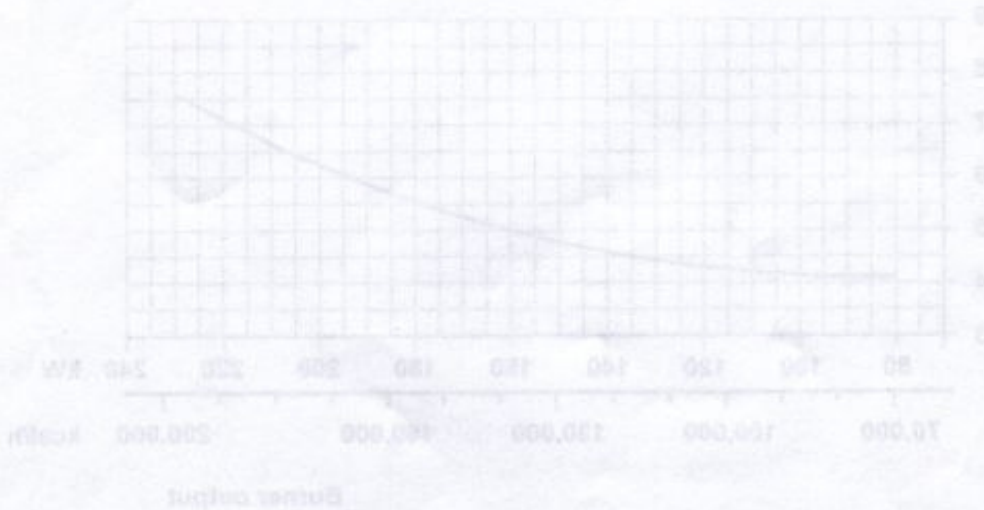
For gas train information please see the appliance technical instruction.

## POSITIONING ELECTRODE-PROBE



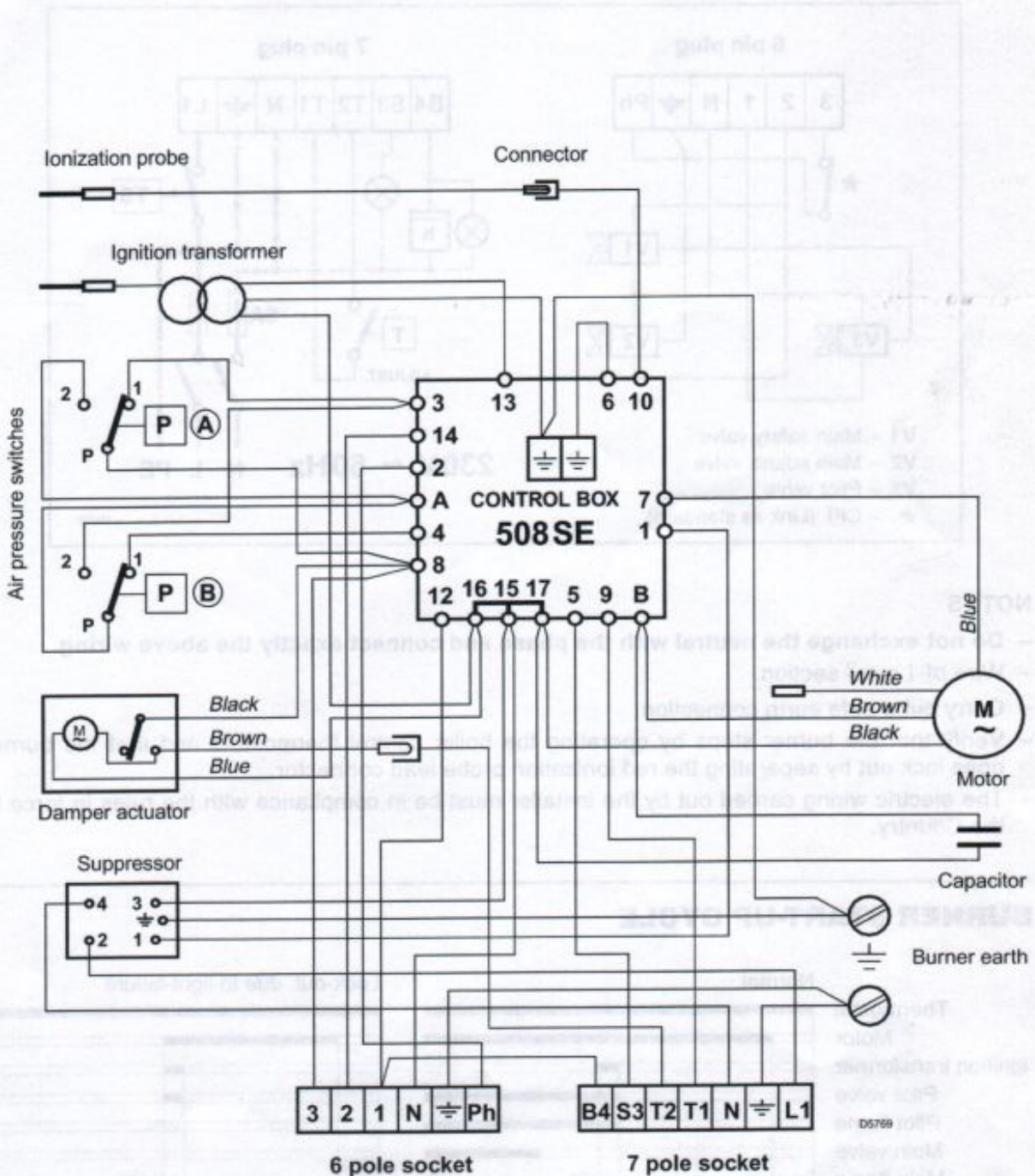
## CORRELATION BETWEEN GAS PRESSURE AND BURNER OUTPUT

To obtain the maximum output, a gas pressure of 17.7 mbar is measured with the condition diameter of 0 mm using gas G20 with a net heat value of 36.00 kJ/m<sup>3</sup>.



# BURNER ELECTRICAL WIRING

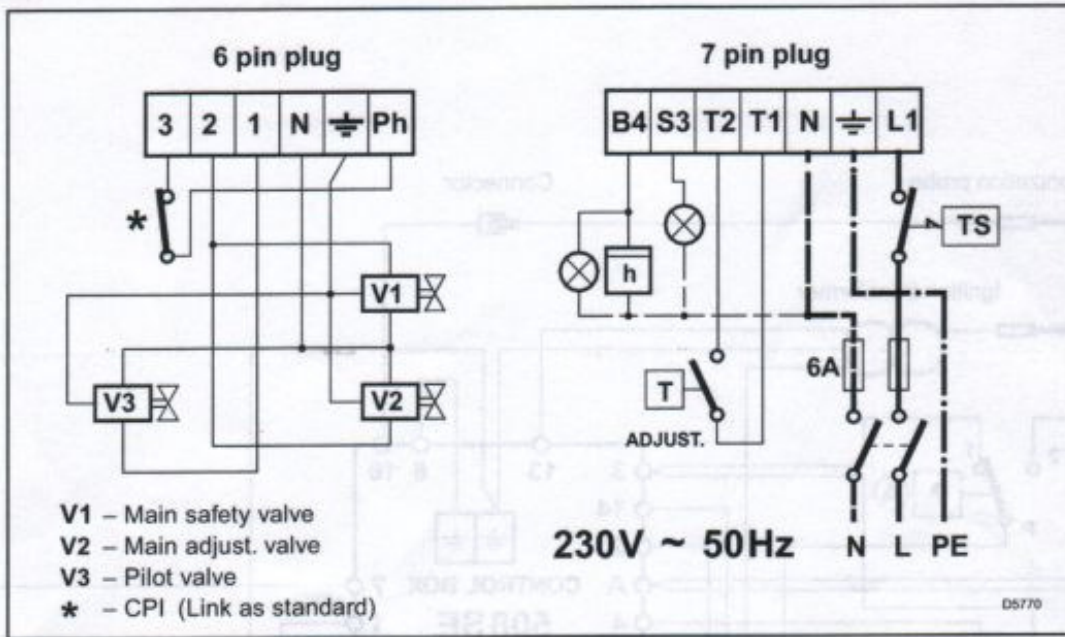
(carried out in the factory)



- (A) Air pressure switch
- (B) Over pressure switch

## ELECTRICAL WIRING

(to be carried-out by the installer)

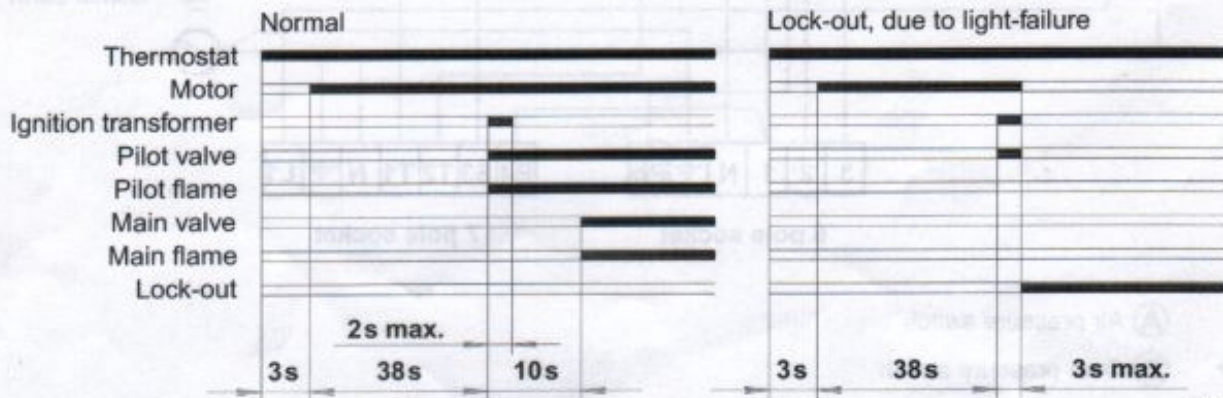


- V1 – Main safety valve
- V2 – Main adjust. valve
- V3 – Pilot valve
- \* – CPI (Link as standard)

### NOTES

- Do not exchange the neutral with the phase and connect exactly the above wiring.
- Wire of 1 mm<sup>2</sup> section.
- Carry out a safe earth connection.
- Verify that the burner stops by operating the boiler control thermostats and that the burner goes lock out by separating the red ionisation probe lead connector.
- The electric wiring carried out by the installer must be in compliance with the rules in force in the Country.

### BURNER START-UP CYCLE



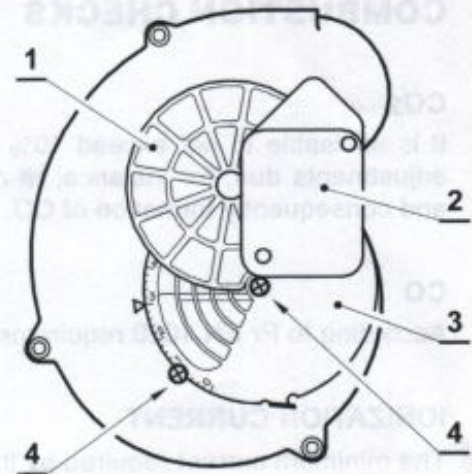
When flame-failure occurs during working, shut down takes place within one second.

## AIR DAMPER ADJUSTMENT

The air damper (1) is operated by the motor (2) and assures that the air damper is fully open before the burner start cycle begins.

The regulation of the air plate is made by adjusting the disc (3) after releasing the screws (4).

When optimum setting is reached, **tighten the screws (4)**, the air damper leaves the factory set at position 3.

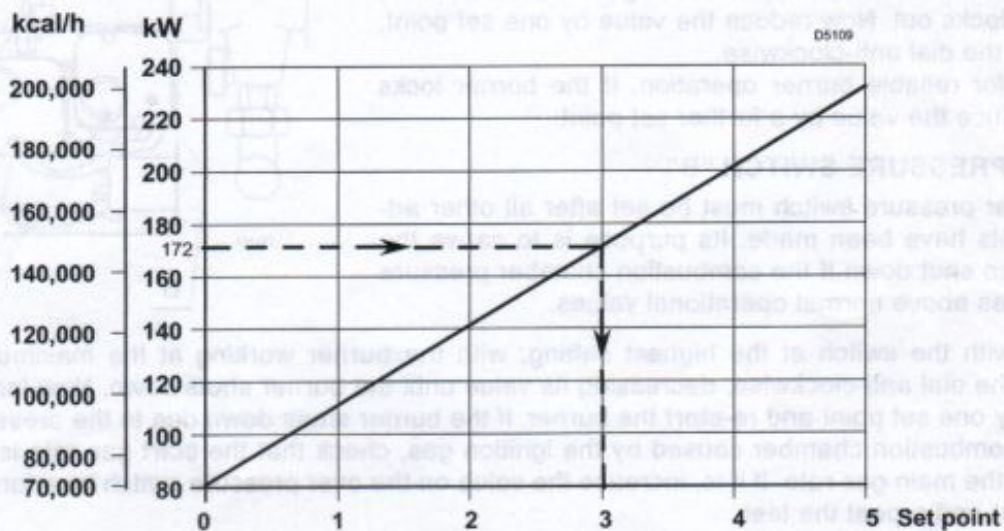
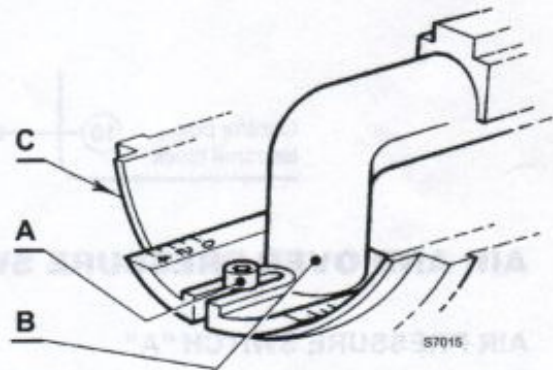


## COMBUSTION-HEAD ADJUSTMENT

Loose the screw (A), move the elbow (B) so that the rear plan of the coupling (C) coincides with the set point.

### Example:

The burner is installed on a 155 kW boiler with an efficiency of 90%, the burner input is about 172 kW using the diagram below, the combustion set point is 3.



The diagram is to be used only for initial settings, to improve air pressure switch operation or improve combustion, it may be necessary to reduce this setting (*set point toward position 0*).



## COMBUSTION CHECKS

### CO<sub>2</sub>

It is advisable to not exceed 10% of CO<sub>2</sub>, in order to avoid the risk that small changes of the adjustments due, for instance, at draught variation, may cause combustion with insufficient air and consequently formation of CO.

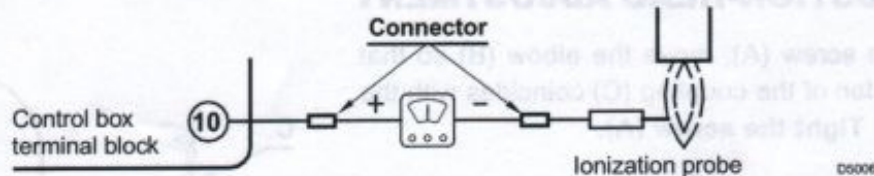
### CO

According to Pr EN 1020 requirements.

### IONIZATION CURRENT

The minimum current required by the control box is 3  $\mu$ A.

The burner would normally have a higher current value than this, but if a check is required, open the connector fitted in the red probe lead and insert a microammeter as shown.



## AIR AND OVER PRESSURE SWITCH

### AIR PRESSURE SWITCH "A"

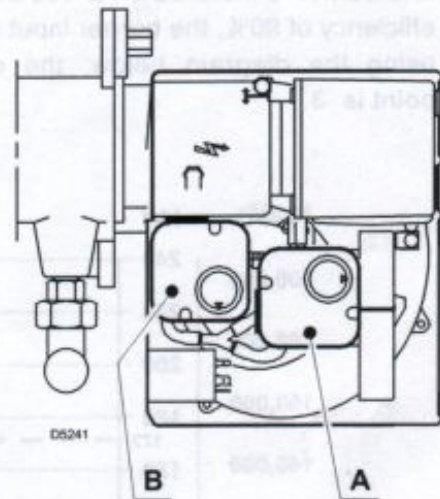
The air pressure switch is set after all other adjustments have been made. Begin with the switch at the lowest setting. With the burner working at the minimum output, adjust the dial clockwise, increasing its value until the burner locks out. Now reduce the value by one set point, turning the dial anti-clockwise.

Check for reliable burner operation. If the burner locks out, reduce the value by a further set point.

### OVER PRESSURE SWITCH "B"

The over pressure switch must be set after all other adjustments have been made. Its purpose is to cause the burner to shut down if the combustion chamber pressure increases above normal operational values.

Begin with the switch at the highest setting, with the burner working at the maximum output, adjust the dial anti-clockwise, decreasing its value until the burner shuts down. Now increase the value by one set point and re-start the burner. If the burner shuts down due to the pressure surge in the combustion chamber caused by the ignition gas, check that the start gas rate is less than 25% of the main gas rate. If it is, increase the value on the over pressure switch by a further half a set point and repeat the test.



### Note:

To comply with the Appliance Standard Pr EN 1020, the CO value must not exceed 0.1% under normal operational conditions.

## BURNER STARTING DIFFICULTIES AND THEIR CAUSES

DIFFICULTIES	CAUSES
The burner goes through the pre-purge period normally, the flame ignites, but the burner goes to lock-out within 3 seconds after the ignition.	The ionization probe is earthed or not in contact with the flame, or its wiring to the control box is broken, or there is a fault on its insulation to earth.
	The ionization current is weak ( <i>lower than 3 <math>\mu</math>A</i> ).
The burner goes to lock-out, after the pre-purge period, because the flame does not ignite.	The valves are passing too little gas ( <i>low pressure in the gas pipe-work</i> ).
	The valves are defective.
	The ignition arc is irregular or not present.
	The pipe has not been purged from the air.
	Gas is not supplied.
The burner does not pass through the pre-purge period and the control box goes to lock-out.	The air pressure switch (A) does not change over: it has failed or the air pressure is too low ( <i>combustion head bad set</i> ).
	The air pressure is too high, verify: possible obstruction of the chimney or the pressure switch (B) has failed.
	Flame simulation exists ( <i>or the flame really lights</i> ).
The burner does not start at the thermostat closing.	The contact of the valve end stroke is open (CPI, see page 6).
	The air pressure switch (A) is changed over to the operational position.
	The damper actuator is failed.

**N.B.:** If problems still occur after all of the above checks have been made, check the electrical connections on the plug and sockets, the damper and burner motor, gas control wiring ignition transformer and external interlocks, if the burner still fails to function, replace the control box.

### OPERATING FAULTS

The burner goes to lock-out because of :

- Flame failure
- Ionization probe earthed
- Opening of the air pressure switch