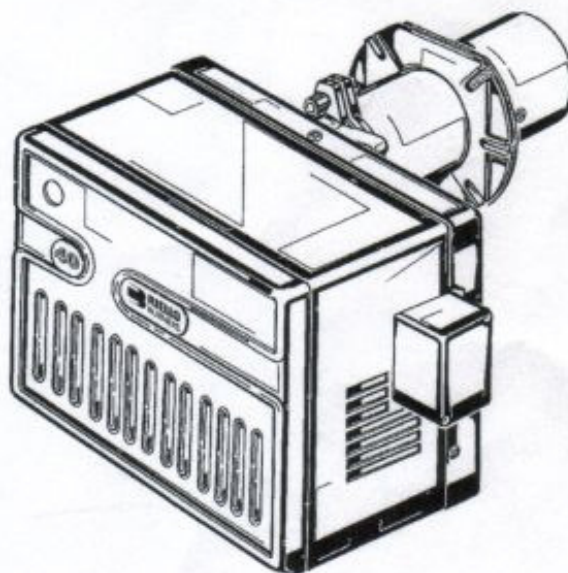


Forced draught gas burner

One stage operation

CE



RIELLO 40

CODE	MODEL	TYPE
3755453	GS10P	554T51

INDEX

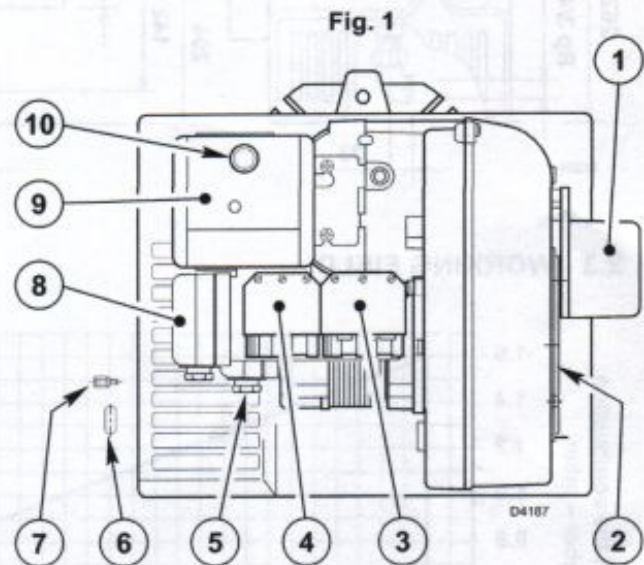
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1. BURNER DESCRIPTION

GAS BURNER WITH ONE STAGE WORKING AND USE WITH APPLICATIONS ACCORDING TO EN 1020.

- 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.**

- 1 – Air damper actuator
- 2 – Air dampers
- 3 – 7 pole socket for electrical supply and control
- 4 – 6 pole socket for gas train
- 5 – Min. air pressure switch
- 6 – Cable grommet
- 7 – Screw for fixing the cover
- 8 – Max. air pressure switch
- 9 – Control box
- 10 – Reset button with lock-out lamp



NOTE

The cable grommet (6) and the screw for fixing the cover (7) supplied with the burner, must be fitted to the same side of the gas train.

1.1 BURNER EQUIPMENT

Insulating gasket	No. 1	Screws and nuts for flange to be fixed to boiler. . .	No. 4
Cable grommet	No. 1	Screw for fixing the cover	No. 1
Hinge	No. 1	7 pin plug	No. 1
6 pin plug	No. 1		

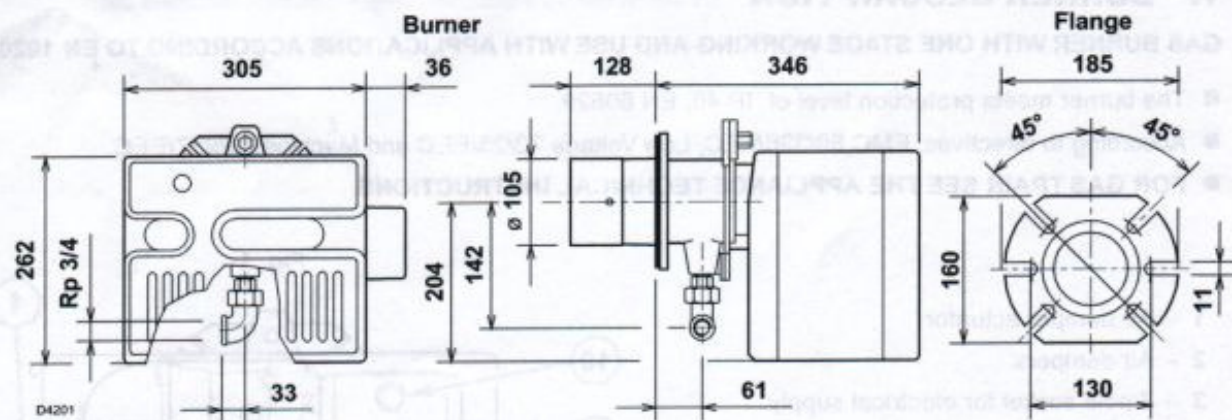
2. TECHNICAL DATA

2.1 TECHNICAL DATA

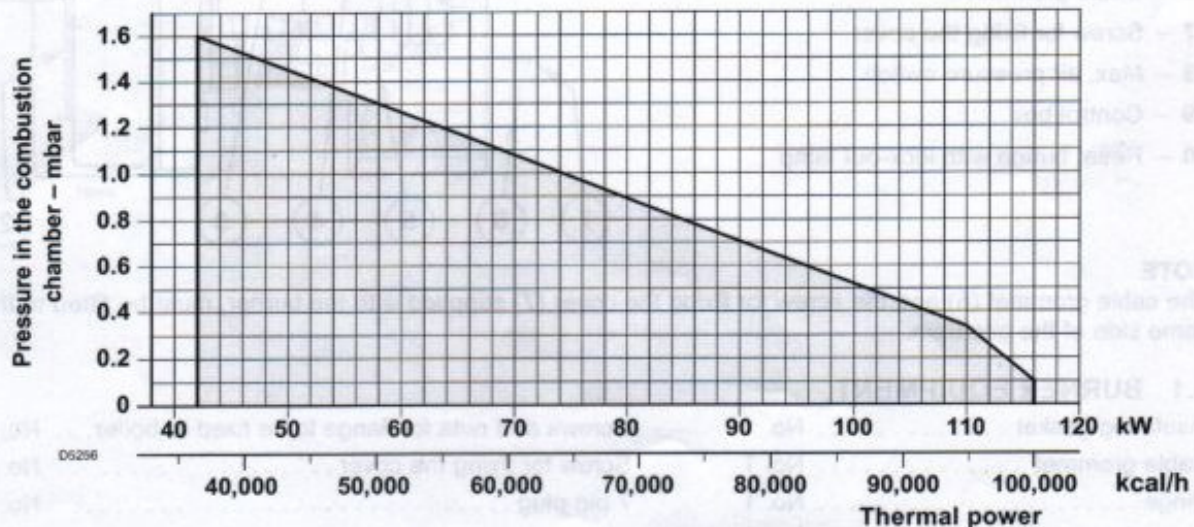
Thermal power (1)	42 – 116 kW - 36,000 – 100,000 kcal/h
Natural gas (Family 2)	Net heat value: 8 – 12 kWh/Nm ³ - 7,000 – 10,340 kcal/Nm ³
	Pressure: min. 16 mbar - max. 100 mbar
Electrical supply	Single phase, 230V ± 10% ~ 50Hz
Motor	230V / 0.7A
Capacitor	2 µF
Ignition transformer	Primary 230V / 1.8A - Secondary 8 kV / 30 mA
Absorbed electrical power	0.13 kW
(1) Reference conditions: Temp. 20°C - Barometric pressure 1013 mbar – Altitude 0 m above sea level.	

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

2.2 OVERALL DIMENSIONS



2.3 WORKING FIELD

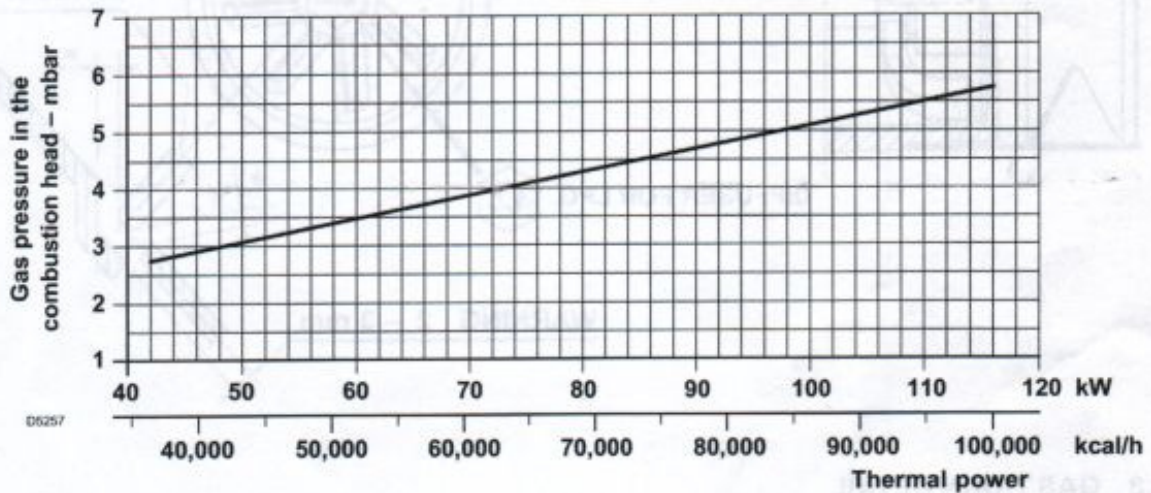


TEST BOILER

The working field has been defined according to EN 676 standard.

CORRELATION BETWEEN GAS PRESSURE AND BURNER OUTPUT

To obtain the maximum output, a gas head pressure of 5.8 mbar is measured with the combustion chamber at 0 mbar using gas G20 with a net heat value of 10 kWh/Nm³ (8,570 kcal/Nm³).



3. INSTALLATION

THE BURNER MUST BE INSTALLED IN CONFORMITY WITH LEGISLATION AND LOCAL STANDARDS.

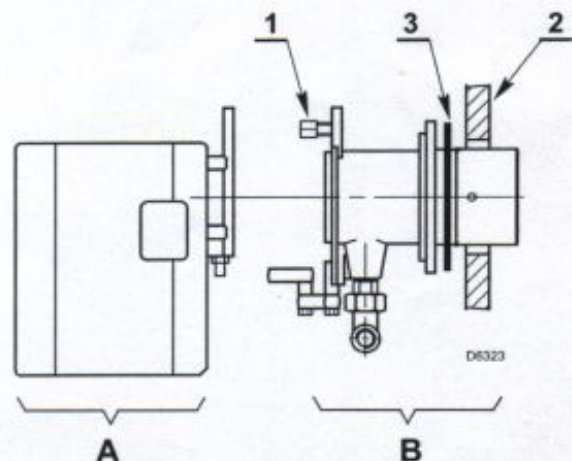
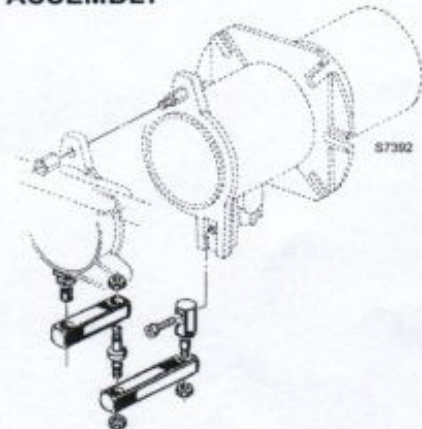
3.1 BOILER FIXING

IMPORTANT

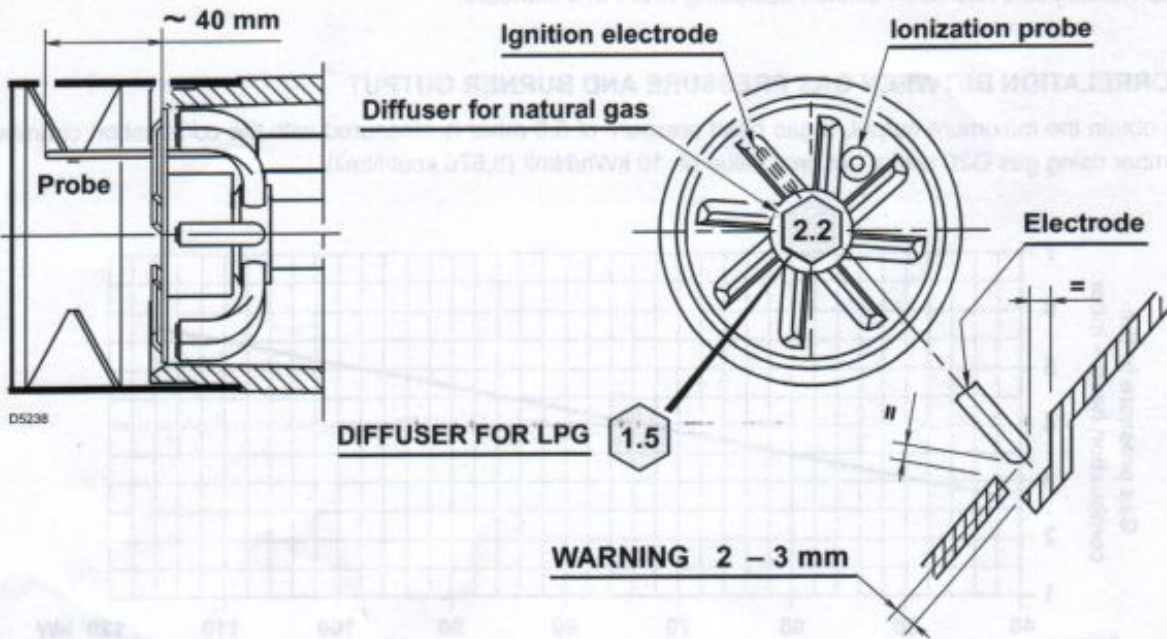
Boiler door must have a max. thickness of 108 mm, refractory lining included.

- 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 supplied insulating gasket (3).

HINGE ASSEMBLY



3.2 PROBE - ELECTRODE POSITIONING

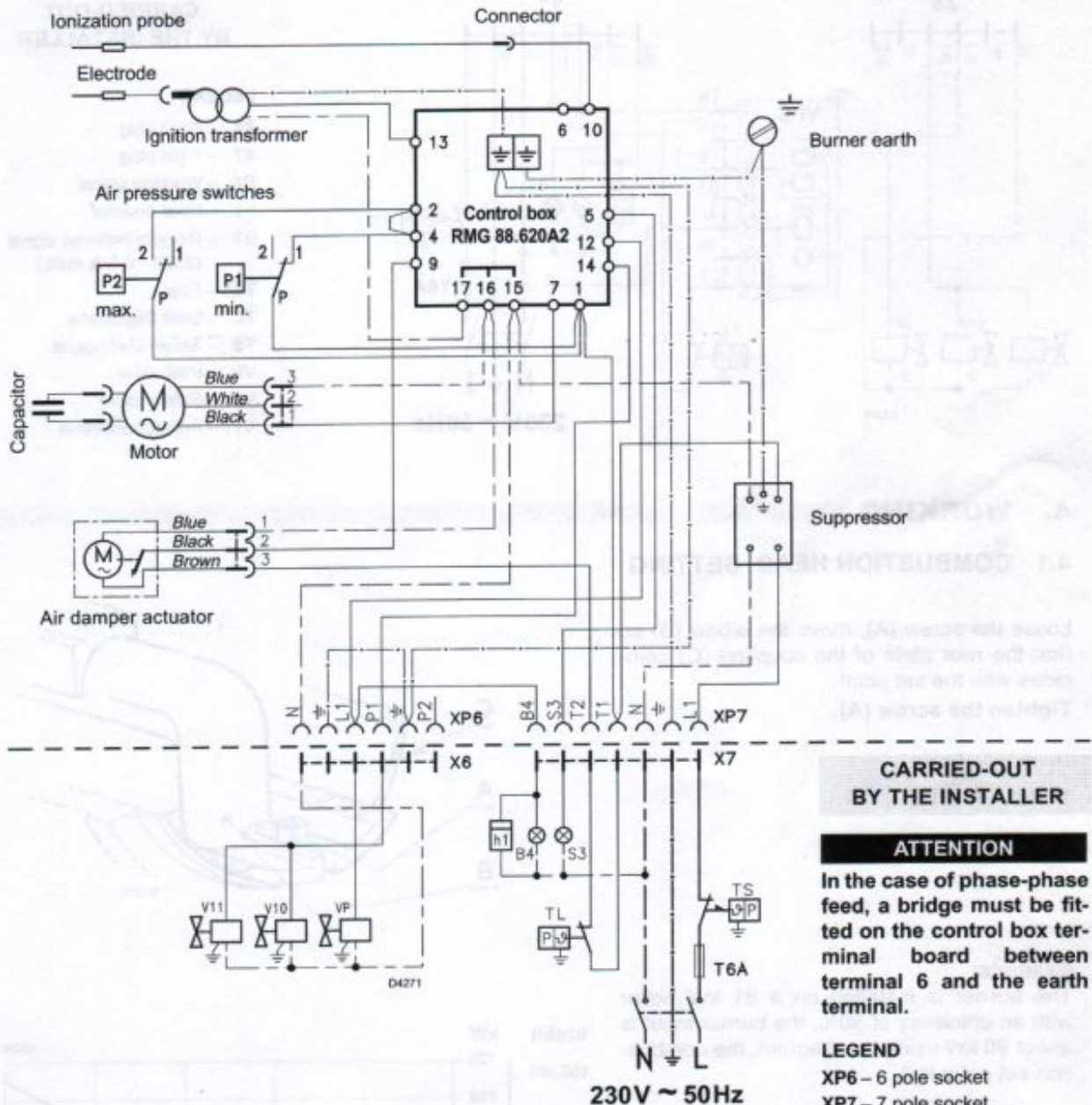


3.3 GAS TRAIN DETAIL

For gas train information please see the appliance technical instruction.

3.4 ELECTRICAL WIRING

3.4.1 STANDARD ELECTRICAL WIRING



**CARRIED-OUT
BY THE INSTALLER**

ATTENTION

In the case of phase-phase feed, a bridge must be fitted on the control box terminal board between terminal 6 and the earth terminal.

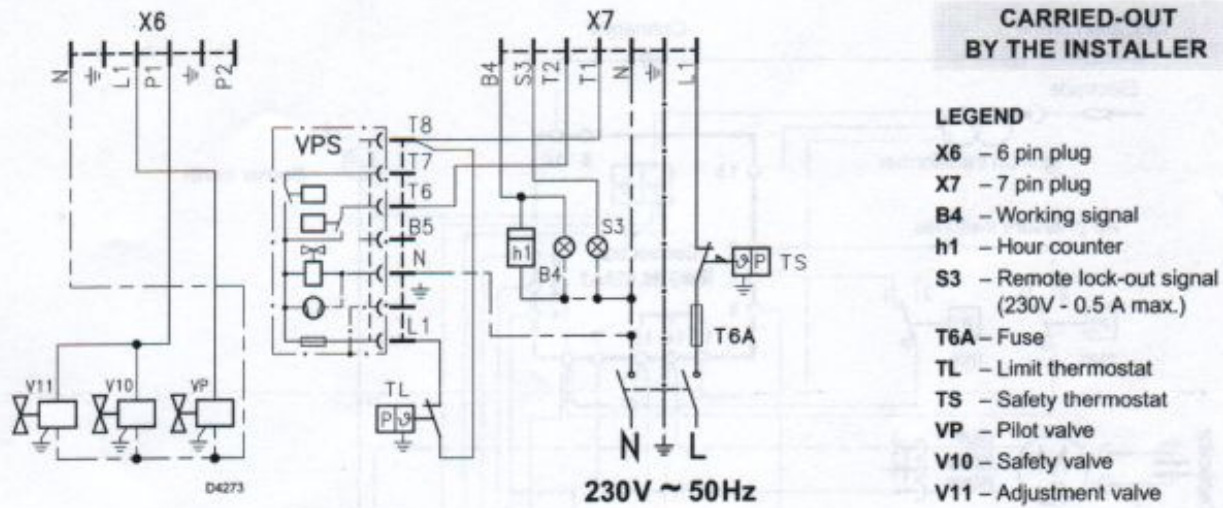
LEGEND

- XP6 – 6 pole socket
- XP7 – 7 pole socket
- X6 – 6 pin plug
- X7 – 7 pin plug
- B4 – Working signal
- h1 – Hour counter
- S3 – Remote lock-out signal (230V - 0.5 A max.)
- T6A – Fuse
- TL – Limit thermostat
- TS – Safety thermostat
- VP – Pilot valve
- V10 – Safety valve
- V11 – Adjustment valve

NOTES:

- Do not exchange the neutral with the phase and connect exactly the above wiring.
- Wires of min. 1 mm² section. (Unless requested otherwise by local standards and legislation).
- Carry out a safe earth connection.
- Verify that the burner stops by operating the boiler control thermostats and that the burner locks out by separating the red ionisation probe lead connector.
- The electric wiring carried out by the installer must be in compliance with regulations in force in the Country.

3.4.2 ELECTRICAL WIRING WITH GAS LEAK CONTROL DEVICE (DUNGS VPS 504)

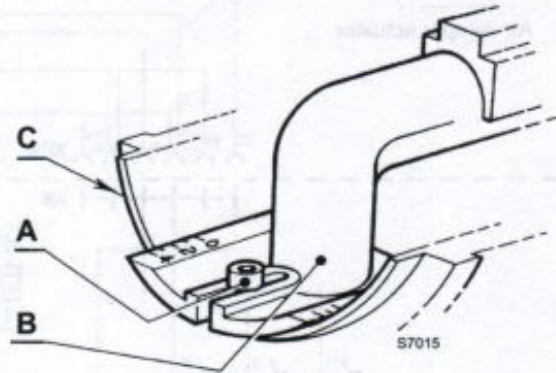


4. WORKING

4.1 COMBUSTION HEAD SETTING

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

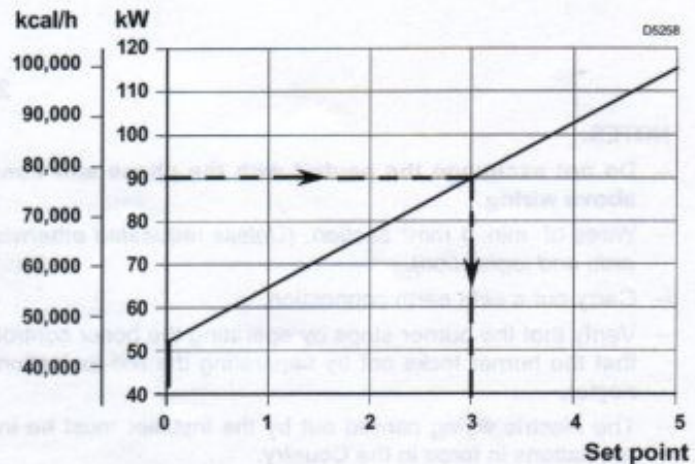
Tighten the screw (A).



Example:

The burner is installed on a 81 kW boiler with an efficiency of 90%, the burner input is about 90 kW using the diagram, the combustion set point is 3.

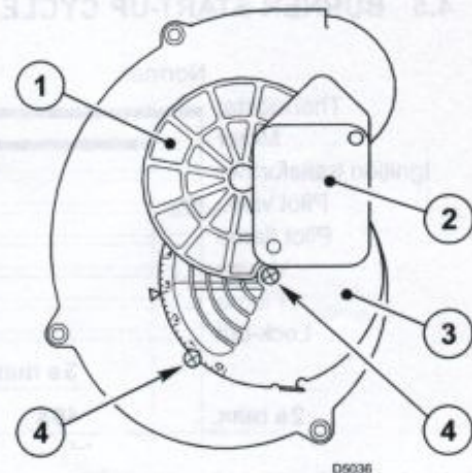
The diagram is to be used only for initial settings, to improve air pressure switch operation or improve combustion, it may be necessary to reduce this setting (*set point toward 0*).



4.2 AIR DAMPER SETTING

The air damper (1) is operated by the actuator (2) and assures that the air damper is fully open before the burner start cycle begins. The regulation of the air-rate is made by adjusting the fixed air damper (3), after loosening the screws (4).

When the optimal regulation is reached, **screw tight the screws (4)** to assure a free movement of the mobile air damper (1).



4.3 COMBUSTION CHECK

CO₂

It is advisable to not exceed 10% of CO₂, 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.

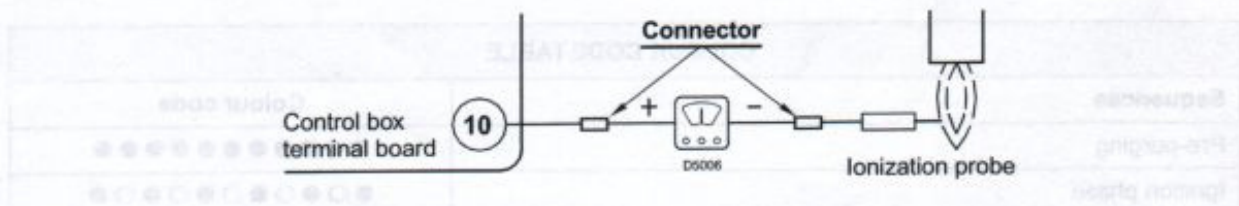
CO

According to EN 1020 requirements.

IONIZATION CURRENT

The minimum current required by the control box is 3 μ 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.



4.4 AIR PRESSURE SWITCHES

MINIMUM AIR PRESSURE SWITCH (P1)

The min. 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 knob clockwise, increasing its value until the burner locks out. Now reduce the value by one set point, turning the knob anti-clockwise.

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

MAXIMUM AIR PRESSURE SWITCH (P2)

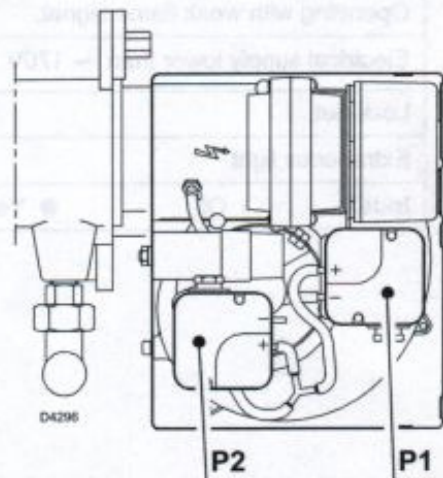
The max. air pressure switch must be set after all other adjustments have been made. Its purpose is to cause the burner to shut down if the combustion chamber pressure increases above normal operational values.

Begin with the switch at the highest setting, with the burner working at the maximum output, adjust the knob anti-clockwise, decreasing its value until the burner shuts down.

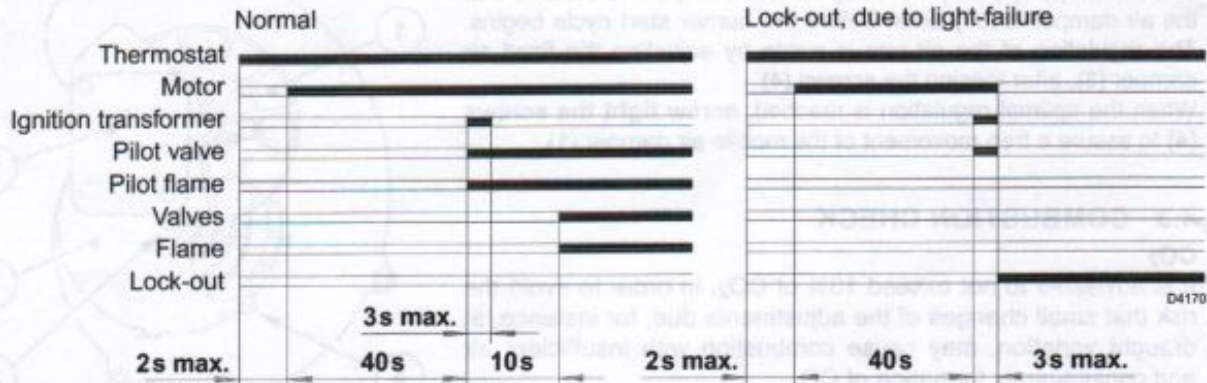
Now increase the value by one set point and re-start the burner. If the burner shuts down due to the pressure surge in the combustion chamber caused by the ignition gas, check that the start gas rate is less than 25% of the main gas rate. If it is, increase the value on the over pressure switch by a further half a set point and repeat the test.

Note:

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



4.5 BURNER START-UP CYCLE



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

4.6 START-UP CYCLE DIAGNOSTICS

During start-up, indication is according to the following table:

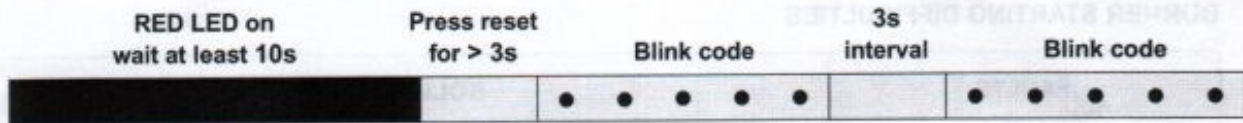
COLOUR CODE TABLE	
Sequences	Colour code
Pre-purging	●●●●●●●●●●●●●●
Ignition phase	●○●○●○●○●○●○●○●○
Operation, flame ok	□□□□□□□□□□□□□□
Operating with weak flame signal.	□○□○□○□○□○□○□○□○
Electrical supply lower than ~ 170V	●▲●▲●▲●▲●▲●▲●▲●▲
Lock-out	▲▲▲▲▲▲▲▲▲▲▲▲▲▲
Extraneous light	▲□▲□▲□▲□▲□▲□▲□▲□▲
Index:	○ Off ● Yellow □ Green ▲ Red

4.7 OPERATING FAULT DIAGNOSTICS

The control box has a self-diagnostic system, which easily allows identifying the operating faults (**RED LED** signal).

To use this function, wait at least ten seconds from the safety lock out, and then press the reset button for a minimum of 3 seconds.

After releasing the button, the RED LED starts flashing as shown in the diagram below.



The LED gives of a blink code every 3 seconds.

The blink codes give the information about the possible faults, as follows:

SIGNAL	PROBABLE CAUSE
2 flashes ● ●	The flame does not stabilise at the end of the safety time: – faulty ionisation probe; – faulty or soiled gas valves; – neutral/phase exchange; – faulty ignition transformer – poor burner regulation (insufficient gas).
3 flashes ● ● ●	Min. air pressure switch does not close: – air pressure switch faulty; – air pressure switch incorrectly regulated; – max. air pressure switch triggered (if installed).
4 flashes ● ● ● ●	Min. air pressure switch does not open or light in the chamber before firing: – air pressure switch faulty; – air pressure switch incorrectly regulated.
7 flashes ● ● ● ● ● ● ●	Loss of flame during operations: – poor burner regulation (insufficient gas); – faulty or soiled gas valves; – short circuit between ionisation probe and earth.
10 flashes ● ● ● ● ● ● ● ● ● ●	– Wiring error or internal fault.

5. MAINTENANCE

The burner requires periodic maintenance carried out by a qualified and authorised technician **in conformity with legislation and local standards**.

Maintenance is essential for the reliability of the burner, avoiding the excessive consumption of fuel and consequent pollution.

Before carrying out any cleaning or control always first switch off the electrical supply to the burner acting on the main switch of the system.

THE BASIC CHECKS ARE:

Leave the burner working without interruption for 10 min., checking the right settings of all the components stated in this manual. Then carry out a combustion check verifying:

- CO₂ (%) content
- Smoke temperature at the chimney
- CO content (ppm).

6. FAULTS / SOLUTIONS

Here below you can find some causes and the possible solutions for some problems that could cause a failure to start or a bad working of the burner. A fault usually makes the lock-out lamp light which is situated inside the reset button of the control box (9, fig. 1, page 1).

When lock out lamp lights the burner will attempt to light only after pushing the reset button. After this if the burner functions correctly, the lock-out can be attributed to a temporary fault.

If however the lock out continues the cause must be determined and the solution found.

BURNER STARTING DIFFICULTIES

FAULTS	SOLUTIONS
The burner does not start at the limit thermostat closing.	Gas is not supplied.
	The actuator is faulty. Replace.
	The min. air pressure switch (P1) has changed over to the operational position.
The burner does not pass through the pre-purge and locks out.	The min. air pressure switch (P1) does not change over: it has failed or the min. air pressure is too low (<i>combustion head incorrectly set</i>).
	The air pressure is too high, verify the possible obstruction of the chimney or if the max. air pressure switch (P2) has failed.
	Flame simulation exists (<i>or the flame really lights</i>).
The burner locks out, after the pre-purge period, because the flame does not ignite.	The gas valve pass too little gas (<i>low pressure in the gas pipework</i>).
	The valves are faulty.
	The ignition arc is irregular or not present.
	The air has not been purged from the pipe.
The burner goes through the normal pre-purge, the flame ignites but the burner locks out within 3 seconds after 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 μA</i>). (See chapter 4.6).

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.