

Gas burner



CODE	MODEL	TYPE
3783082	GS 24	808 T80

Thermal power	140 ÷ 280 kW / 120000 ÷ 240000 kcal/h
Fuel	natural gas Pci 8-10 kWh/Nm ³ = 7000 - 8600 kcal/Nm ³
Minimum gas pressure	for maximum output 9.5 mbar are needed measured at the coupling with nil pressure in the combustion chamber and gas with calorific value of 8600 kcal/Nm ³
Electrical supply	single-phase 220V +10% -15% ~ 60Hz
Motor	1.85A / 220V
Capacitor	6.3 µF / 450V
Ignition transformer	Primary: 1.6A / 220V - Secondary: 30 mA / 1x 8 kV
Absorbed electrical power	0.4 kW
Burner weight	20.4 kg

- 1 - Air shutter control
- 2 - Air shutter indicator lock-screw
- 3 - Wiring terminal block
- 4 - Fair leads
- 5 - Control box reset button
- 6 - Air pressure switch
- 7 - Gas pressure test point

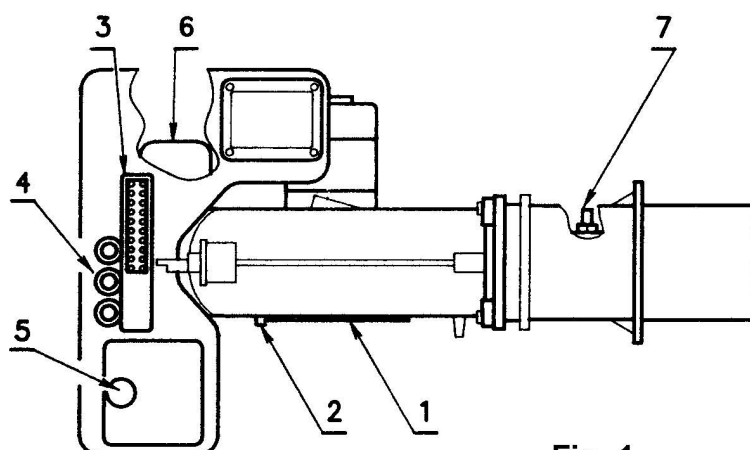
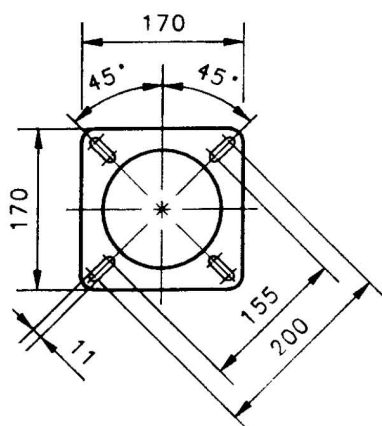


Fig. 1

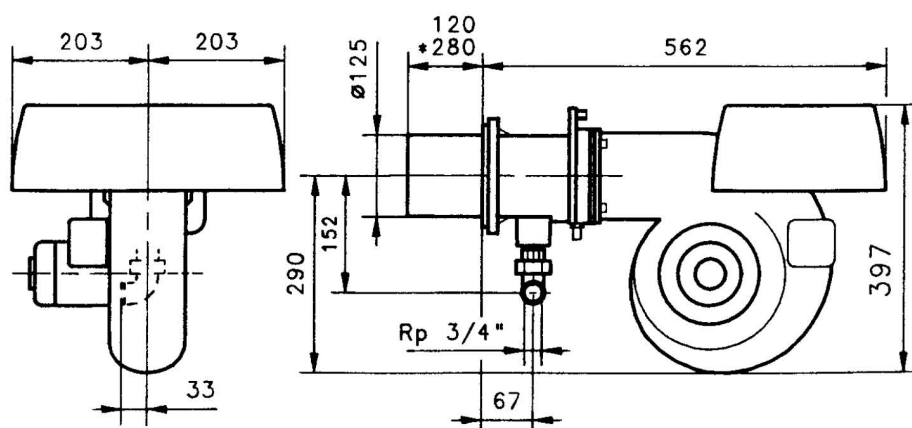
Quantity	Accessories
4	Bolts
1	Flange gasket

OVERALL DIMENSIONS

FLANGE

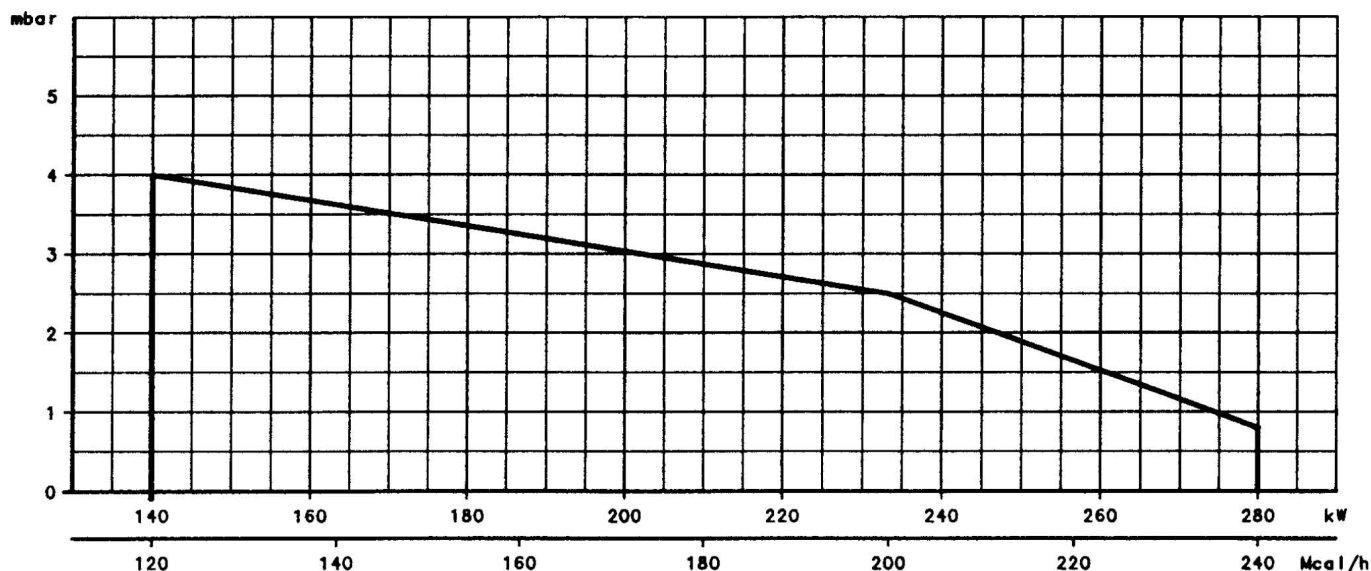


BURNER



* Length available with special blast tube to be separately required

COMBUSTION CHAMBER PRESSURE - MAXIMUM OUTPUT

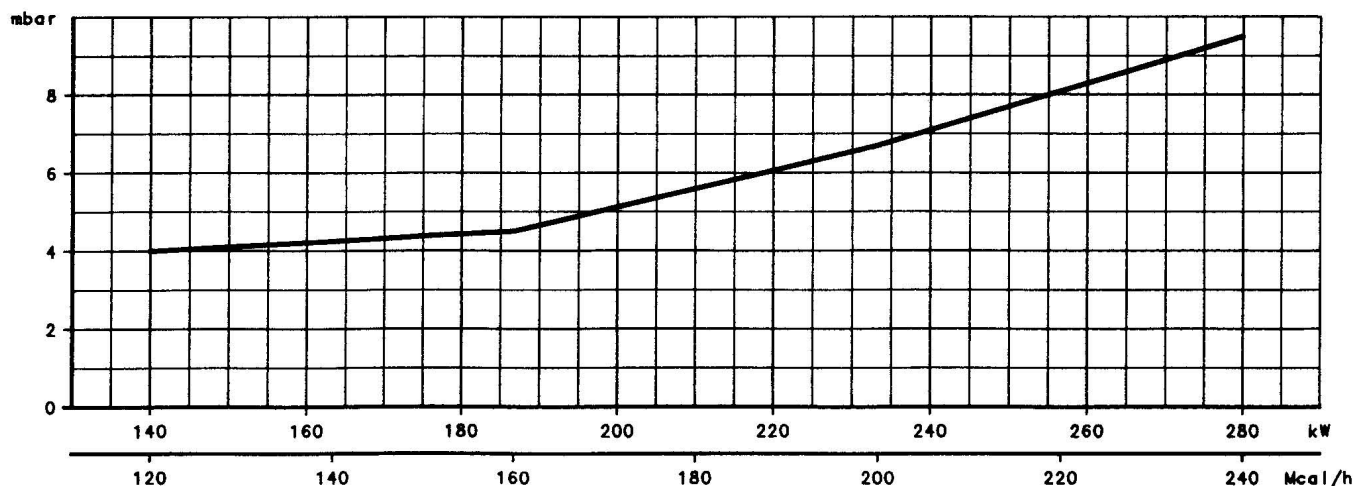


MINIMUM GAS PRESSURE - OUTPUT

PRESSURE: measured at the pressure test-point 7 (fig. 1) with nil pressure in the combustion chamber. If the combustion chamber is pressurized, the required pressure will be the one of the graph plus the pressurization value.

Example: to obtain 255 kW a gas pressure of 8 mbar is required with the combustion head sets as indicated on page 8. If the combustion chamber is pressurized at 2 mbar, the pressure measured at the test-point 7 has to be 8+2 mbar.

OUTPUT: maximum value obtainable with gas $P_{ci} = 8600 \text{ kcal/Nm}^3$



FIXING TO THE BOILER

Separate the combustion head from the burner body, by removing the nut 1 (fig. 2) and unthreading the group **A**. Fix the group **B** to the boiler front plate 2, using the gasket 3 provided as accessory.

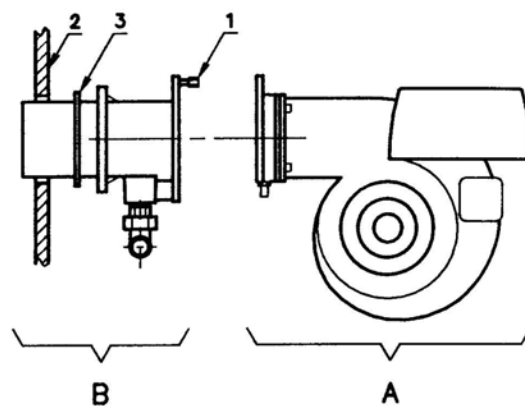
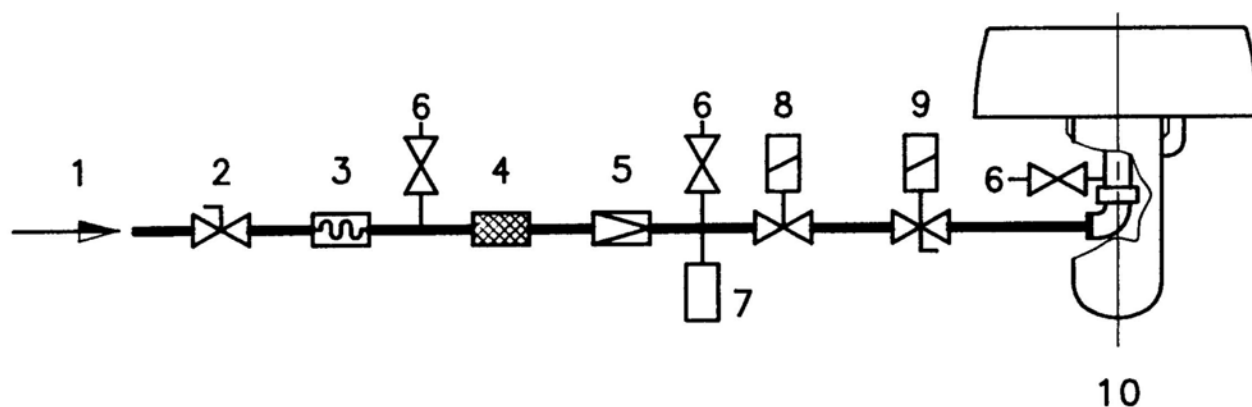


Fig. 2

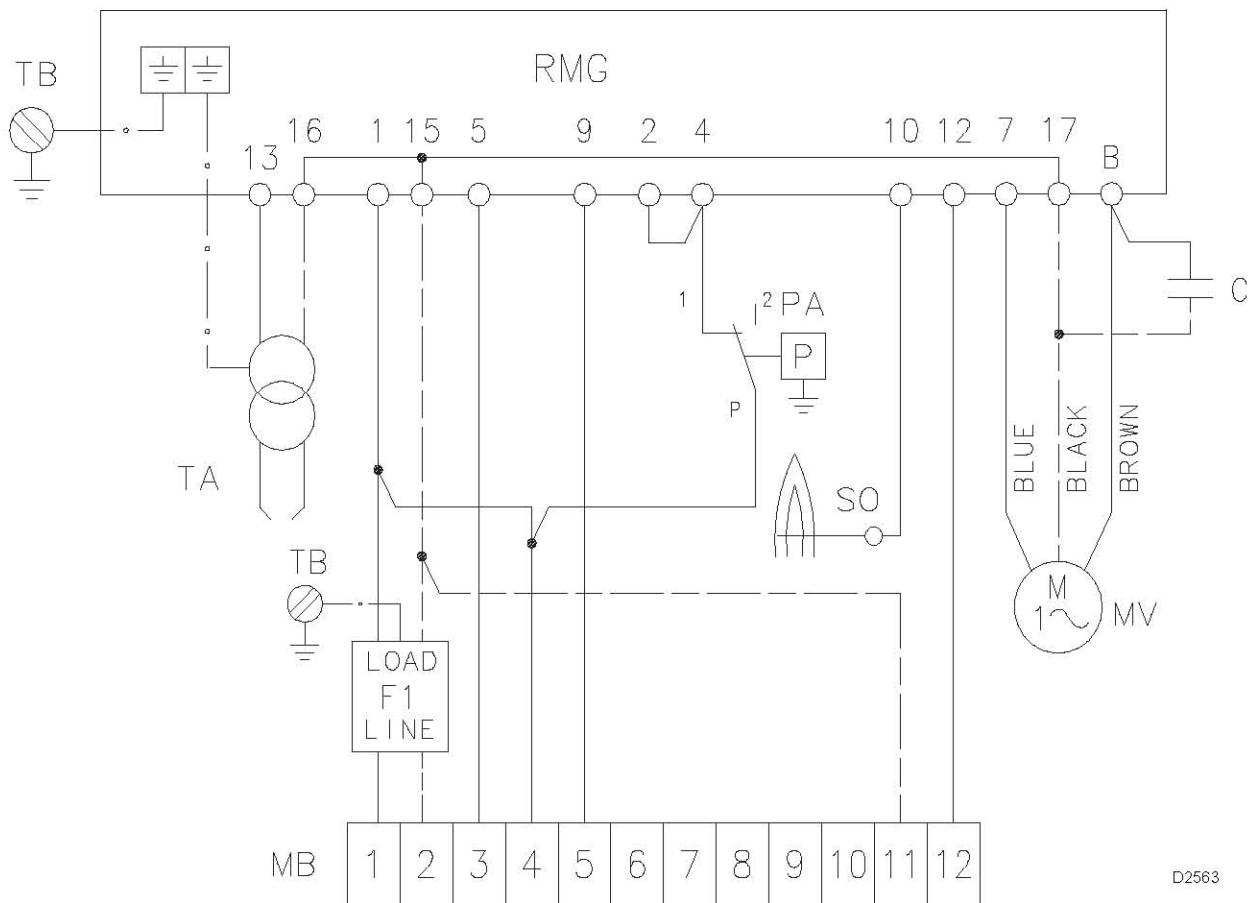
GAS SUPPLY



KEY

- | | |
|-----------------------|-------------------------------|
| 1 Gas pipe line | 6 Pressure test-point |
| 2 Cock valve | 7 Minimal gas pressure switch |
| 3 Isolator joint | 8 Gas safety shut off valve |
| 4 Filter | 9 Gas shut off valve |
| 5 Pressure stabilizer | 10 Burner |

BURNER ELECTRICAL WIRING (carried out y the factory)



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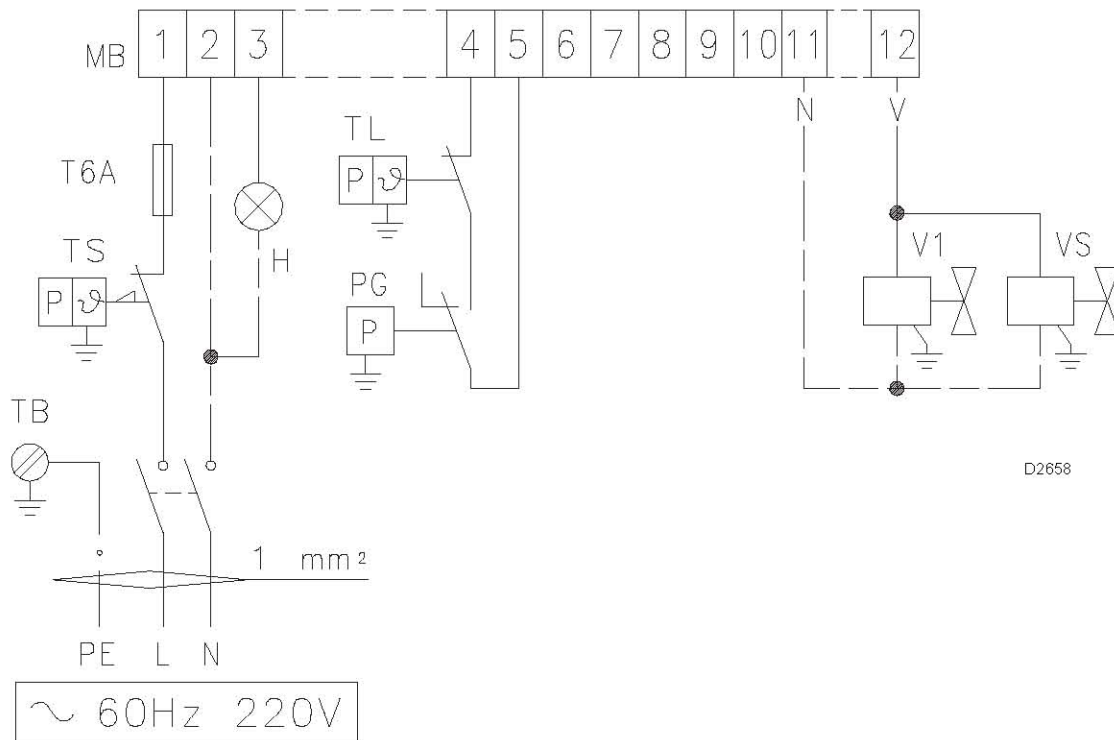
KEY TO LAYOUT

- C** Capacitor
- F1** Protection against radio interference
- MB** Wiring terminal block
- MV** Motor
- RMG** Control box
- PA** Air pressure switch
- SO** Ionisation probe
- TA** Ignition transformer
- TB** Burner earth

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.

ELECTRICAL CONNECTIONS TO THE WIRING TERMINAL BLOCK (to be carried out by the installer)



KEY TO LAYOUT

H Remote lock-out signal
MB Wiring terminal block
PG Min. gas pressure switch
TB Burner earth

TL Limit control device system
TS Safety control device system
V1 Gas shut off valve
VS Gas safety shut off valve

NOTICE

- Wires minimal section 1.5 mm²;
- For continuous operating burners, one stop every 24 hours is obligatory for safety; a suitable switch series connected with adjustment appliances has to be used.
- The electric wiring carried out by the installer must be in accordance with the regulations in force in the country.

FIXING OF THE ELECTRICAL WIRES

All the electrical wires, which have to be connected to the terminal block 3 (fig. 1), shall pass through the fair leads 4 (fig. 1).

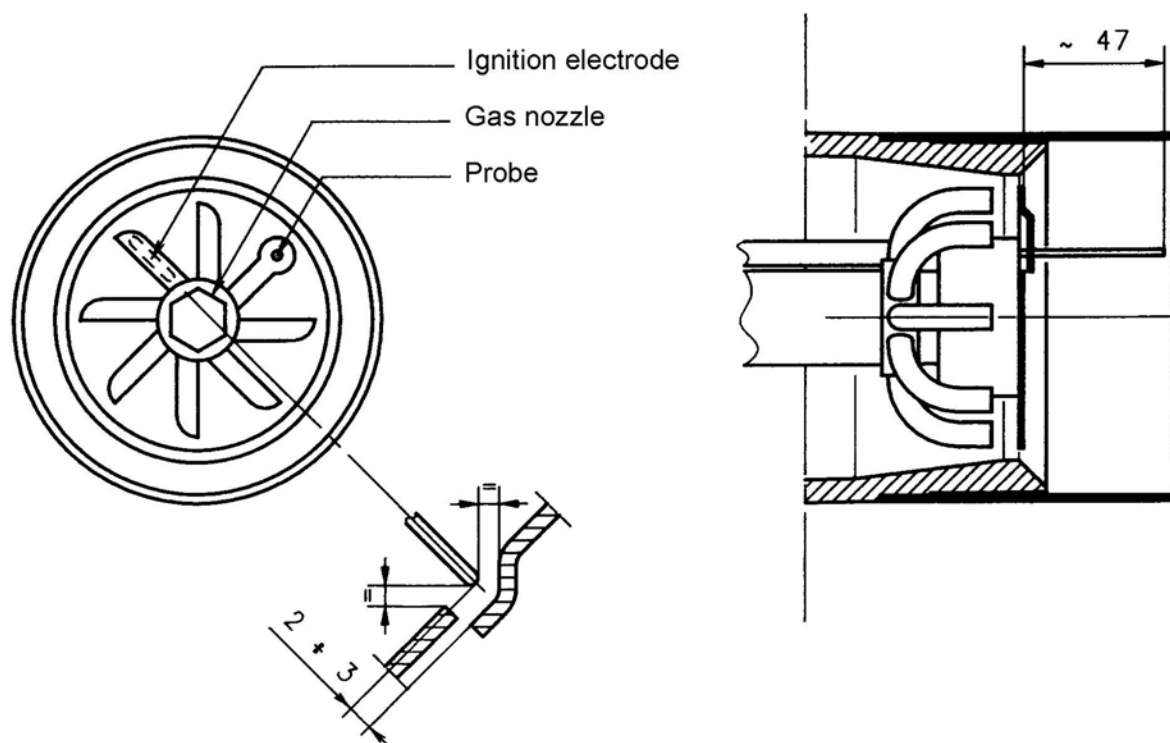
WARNING

- Do not exchange the neutral wire with the phase (avoid the plug-pin connection).
- Carry out the earth connection carefully, accordingly to the regulations in force in the Country.
- Check the stop of the burner by opening the boiler thermostat and check the burner lock-out by disconnecting the cable from the flame detection probe.

NOTE

When closing the burner on its slide-bars, pull towards the outside the cable of the flame detection probe, till to little tension.

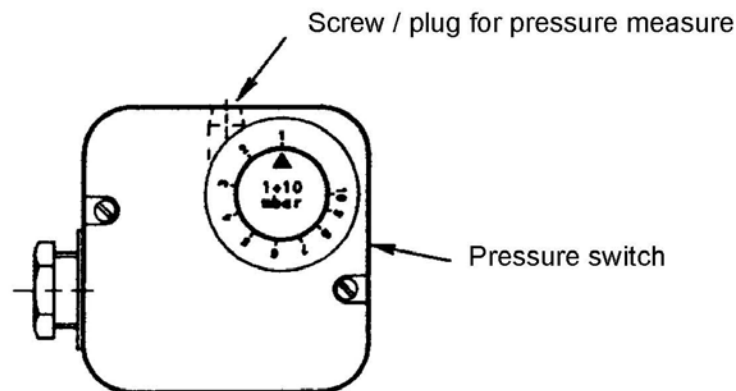
PROBE AND IGNITION ELECTRODE POSITION



START UP

AIR PURGE

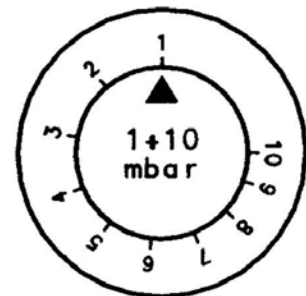
Loosen the screw placed on the minimal gas pressure switch mounted on the gas train.



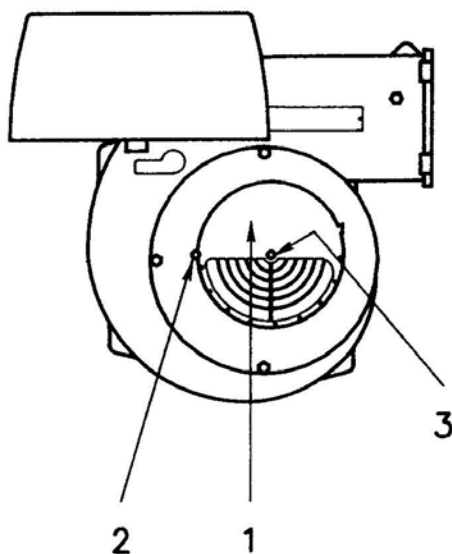
AIR PRESSURE SWITCH 6 (fig. 1)

The air pressure switch setting shall be carried out after having set all other adjustments of the burner and the air pressure switch shall be at its lowest set-point.

When the burner is operating, increase the adjustment pressure by turning-slowly-clockwise the knob till reaching the burner lock-out. Thereafter, turn the knob counterclockwise for 1 mbar and repeat the burner start-up for checking the regularity: if lock-out occurs, turn again the knob counterclockwise for 0.5 mbar.



Adjustment knob



AIR DAMPER ADJUSTMENT

Air flow setting is carried out by turning the air damper 1 after the screws 2 and 3 has been loosened.

When the right adjustment is reached, fully tighten the screws 2 and 3.

COMBUSTION HEAD ADJUSTMENT

Loosen the screw **A** and move the elbow **B** till the rear edge of the manifold **C** coincides with the desired notch, then **tighten the screw A**.

EXAMPLE

Assuming that the burner is installed on a 160 kW boiler with efficiency of 90%, the burner is required to deliver around 180 kW.

By consulting the diagram, for this performance, notch 3 has to be adopted.

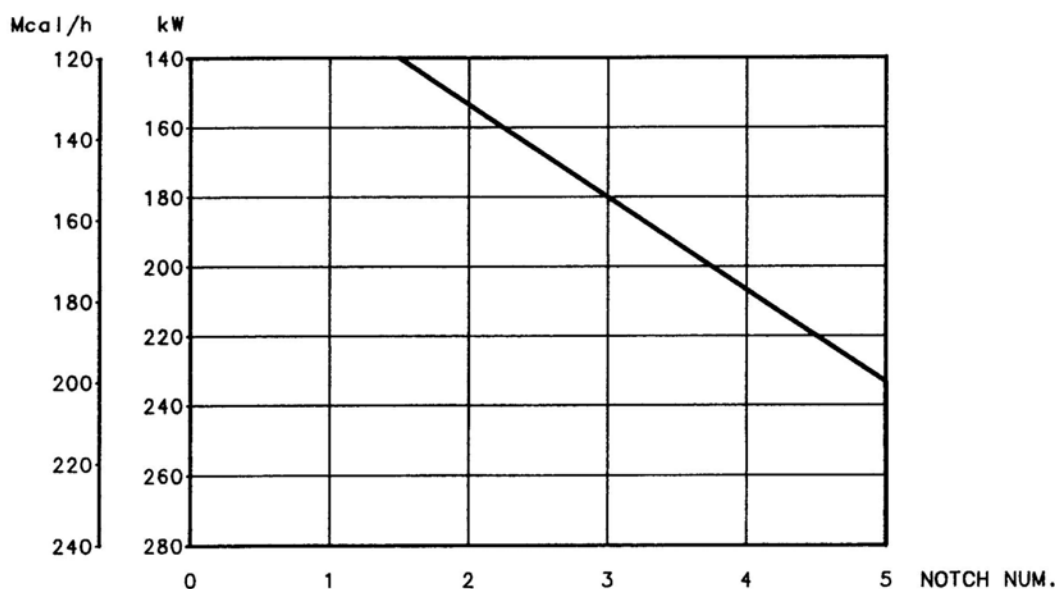
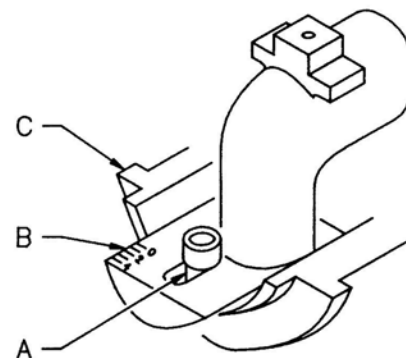


Diagram shows the ideal settings for the combustion head; it is suggested that the combustion head width hasn't to be much increased compared to the diagram, in order to assure a right working of the air pressure switch.

COMBUSTION CHECKS

CO₂

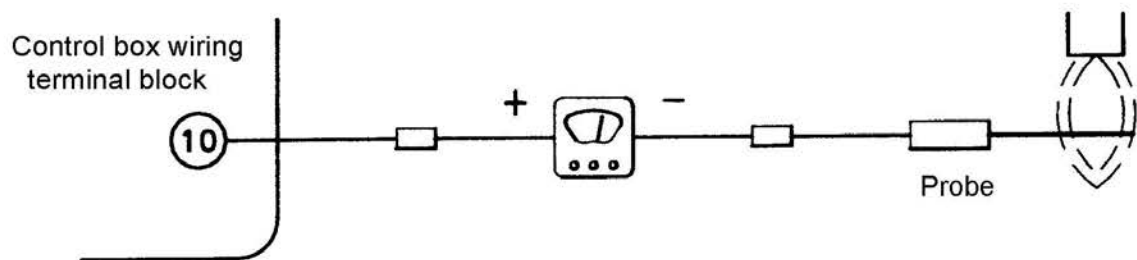
It is suggested that CO₂ hasn't to exceed 10%, in order to avoid the risk that small changes of the adjustments due, for instance, at draught variation, may cause combustion with insufficient air and consequently formation of CO.

CO

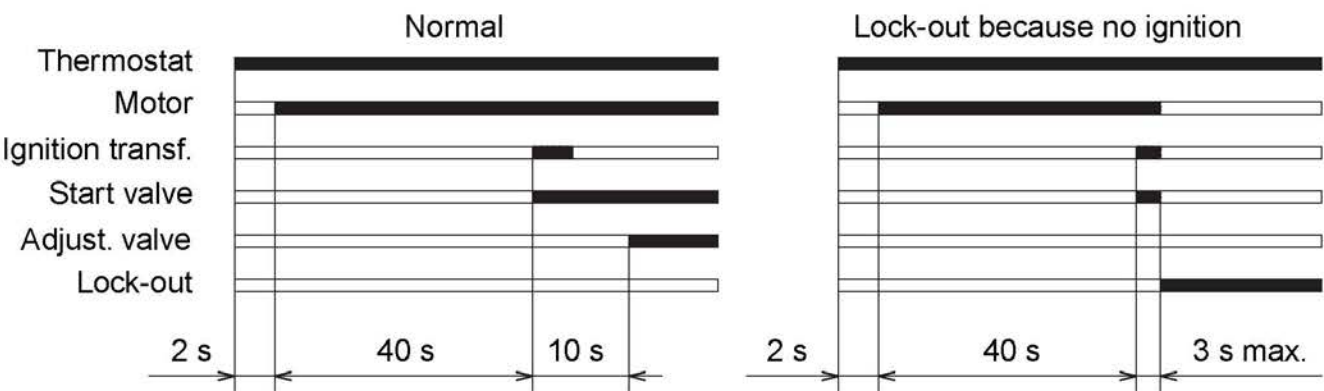
For safety reason the value of 0.1% (one thousand p.p.m.) must not be exceeded.

IONIZATION CURRENT

The minimum current necessary for the control box in operation is 3 μ A. The burner normally supplies an higher current value, so that no check is usually needed.
However, if a measurement of the ionization current is required, it is necessary to disconnect the probe wire and insert a d.c. microamperometer.



BURNER START-UP



D1798

If during operation the flame shuts off, lock-out occurs within 1 sec.

BURNER STARTING DIFFICULTIES AND THEIR CAUSES

- 1 - The burner goes through the purge period normally, the flame ignites, but the burner goes to lock-out by two seconds after the ignition:
 - the ionization probe is earthed, or it is 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 (lower than 3 μ A).
- 2 - The burner goes to lock-out after the pre-purge period, because the flame does not ignite:
 - through the valve flows not much gas (low pressure in the gas pipeline);
 - the valve is defective;
 - the ignition arc is irregular or it has failed;
 - the pipe has not been purged from the air.
- 3 - The burner goes to lock-out during the pre-purge period:
 - the air pressure switch does not change over: it has failed or the air pressure is too much low (combustion head bad set);
 - flame simulation exists or the flame really lights.
- 4 - The burner does not start at the thermostat closing:
 - gas is not supplied;
 - the gas pressure switch does not close: it is incorrectly adjusted;
 - the air pressure switch is changed over to the operational position.
- 5 - The burner repeats the start-up cycle without the lock-out occurs:
 - this particular trouble is caused by the gas pipeline pressure that is very close to the value of the gas pressure switch setting, owing to the sudden pressure decrease the valve opens and actuates, only temporarily, the opening of the pressure switch, there after the valve closes, the motors stops and the pressure increases again, the pressure switch closes and the start-up cycle is repeated and so forth.
To prevent this trouble, the gas pressure switch has to be set at a lower value.

NOTE

If starting difficulties persist after the above-mentioned interventions, before to change the control box, check if short-circuits are present on motor, gas valves, ignition transformer and external signalling lines.

OPERATING FAULTS

LOCK-OUT MAY OCCUR FOR:

- flame failure;
- ionization probe earthed;
- air pressure switch open.

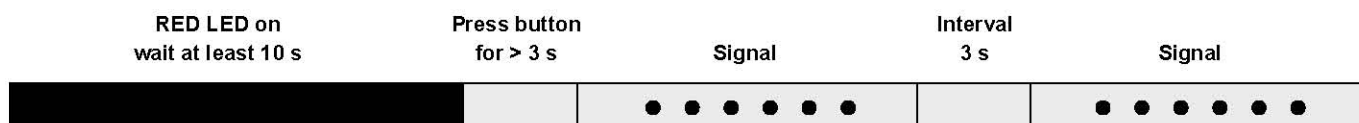
SHUT-OFF MAY OCCUR FOR:

- gas pressure switch open.

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

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 pulses of the LED constitute a signal spaced by approximately 3 seconds. The number of pulses will provide the information on the possible faults, according to the table below:

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.
8 flashes ● ● ● ● ● ● ● ●	– Not used.
10 flashes ● ● ● ● ● ● ● ● ● ●	– Wiring error or internal fault.