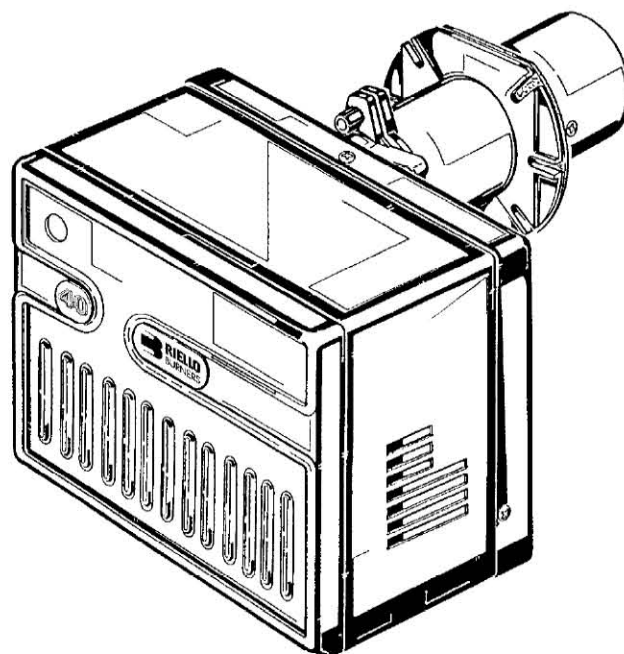


- D Gas-Gebläsebrenner**
- F Brûleur gaz à air soufflé**
- GB Forced draught gas burner**
- NL Gasventilatorbranders**
- E Quemador de gas de aire soplado**

Einstufiger Betrieb
Fonctionnement à 1 allure
One stage operation
Eentrapsbranders
Funcionamiento de una llama



RIELLO 40

CODE - CÓDIGO	MODELL - MODELE - MODEL MODELO	TYP - TYPE TIPO
3756435	FS10	564 T30

INDEX

1. BURNER DESCRIPTION	1	4. WORKING	6
1.1 Burner equipment	1	4.1 Combustion adjustment	6
2. TECHNICAL DATA	2	4.2 Combustion head setting	6
2.1 Technical data	2	4.3 Air damper setting	7
2.2 Overall dimensions	2	4.4 Combustion check	7
2.3 Working field	2	4.5 Air pressure switch	7
3. INSTALLATION	3	4.6 Burner start-up cycle	8
3.1 Boiler fixing	3	4.7 Start-up cycle diagnostics	8
3.2 Probe-electrode positioning	4	4.8 Resetting the control box and using diagnostics	9
3.3 Gas feeding line	4	5. WARNINGS	
3.4 Electrical wiring	5	to avoid burnout or bad combustion of the burner	10
3.4.1 Standard electrical wiring	5	6. MAINTENANCE	10
3.4.2 Electrical wiring with gas leak control device	6	7. FAULTS / SOLUTIONS	11

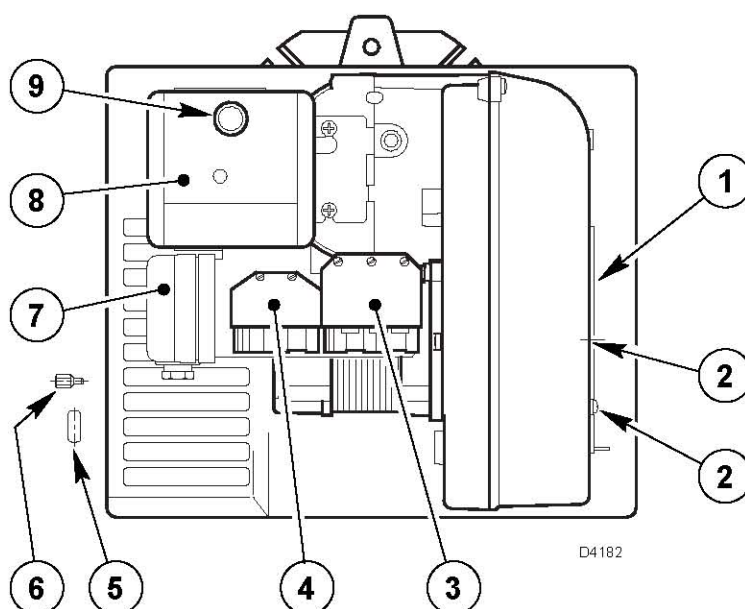
1. BURNER DESCRIPTION

Gas burner with one stage working.

- CE marking according to Gas Appliance Directive 90/396/EEC; PIN **0063AP6680**.
According to Directives: EMC 89/336/EEC, Low Voltage 73/23/EEC and Efficiency 92/42/EEC.
- The burner meets protection level of IP 40, EN 60529.
- Gas train according to EN 676.

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

Fig. 1



NOTES

- The cable grommet (5) supplied with the burner, must be fitted to the same side of the gas train.
- After having installed the burner verify the access to the fixing screws of the cover.
If necessary replace them with the fixing screws (6, fig. 1) supplied as equipment.

1.1 BURNER EQUIPMENT

Insulating gasket	No. 1	Screws and nuts for flange to be fixed to boiler ...	No. 4
Cable grommet	No. 1	Screws for fixing the cover	No. 3
Hinge	No. 1	7 pin plug	No. 1

2. TECHNICAL DATA

2.1 TECHNICAL DATA

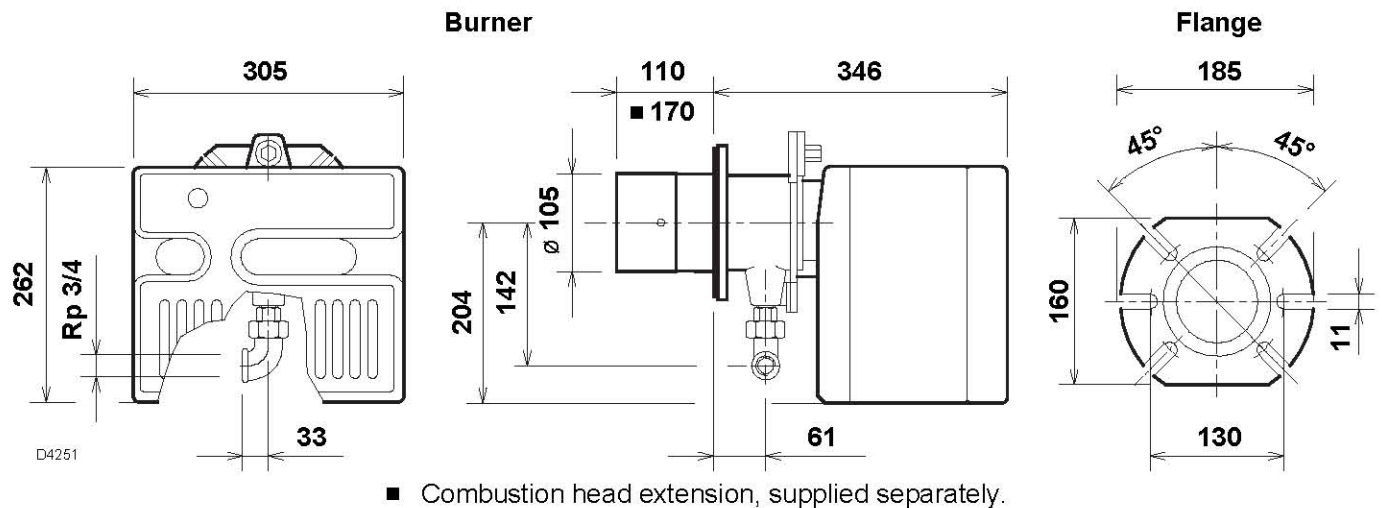
Thermal power (1)	42 – 116 kW - 36,000 – 100,000 kcal/h
Natural gas (Family 2)	Net heat value: 8 – 12 kWh/Nm ³ - 7,000 – 10,340 kcal/Nm ³
	Pressure: min. 16 mbar - max. 100 mbar
Electrical supply	Single phase, 230V ± 10% ~ 50Hz
Motor	230V / 0.7A
Capacitor	4 µF
Ignition transformer	Primary 230V / 1.8A - 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.

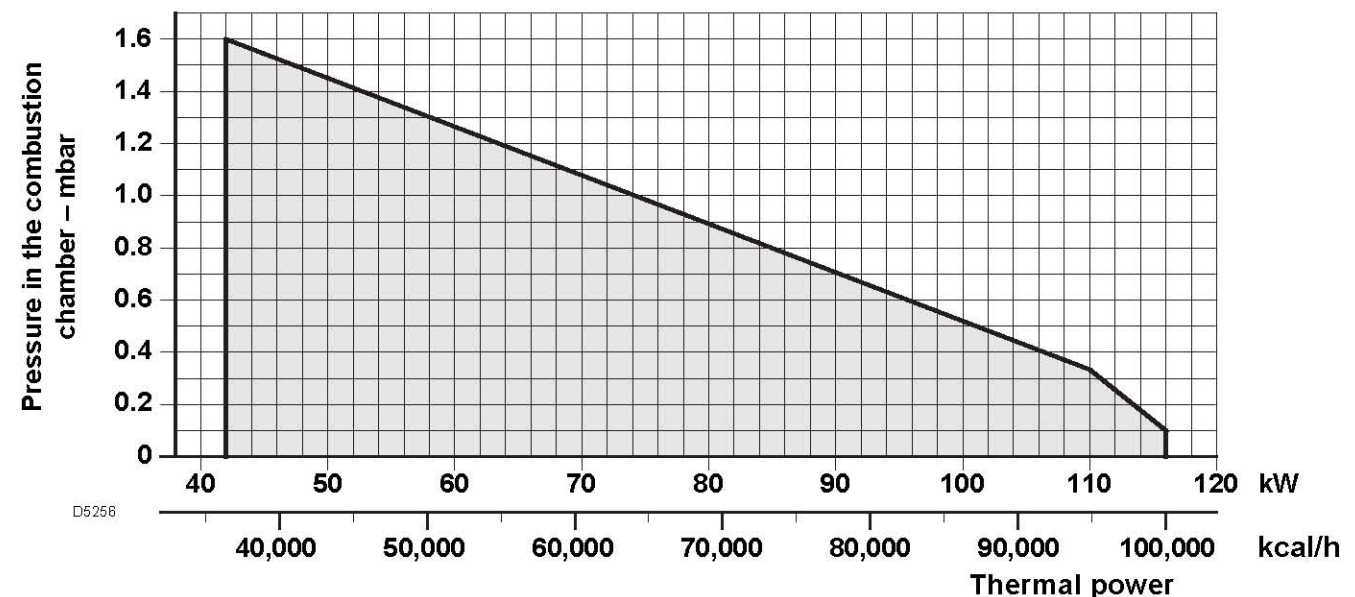
For gas family 3 (LPG) ask for separate kit.

COUNTRY	DE	AT	FR	ES - GB - IE	LU	NL
GAS CATEGORY	II2ELL3B/P	II2H3B/P	II2Er3P	II2H3P	II2E3B/P	II2L3B/P

2.2 OVERALL DIMENSIONS



2.3 WORKING FIELD (as EN 676)



TEST BOILER

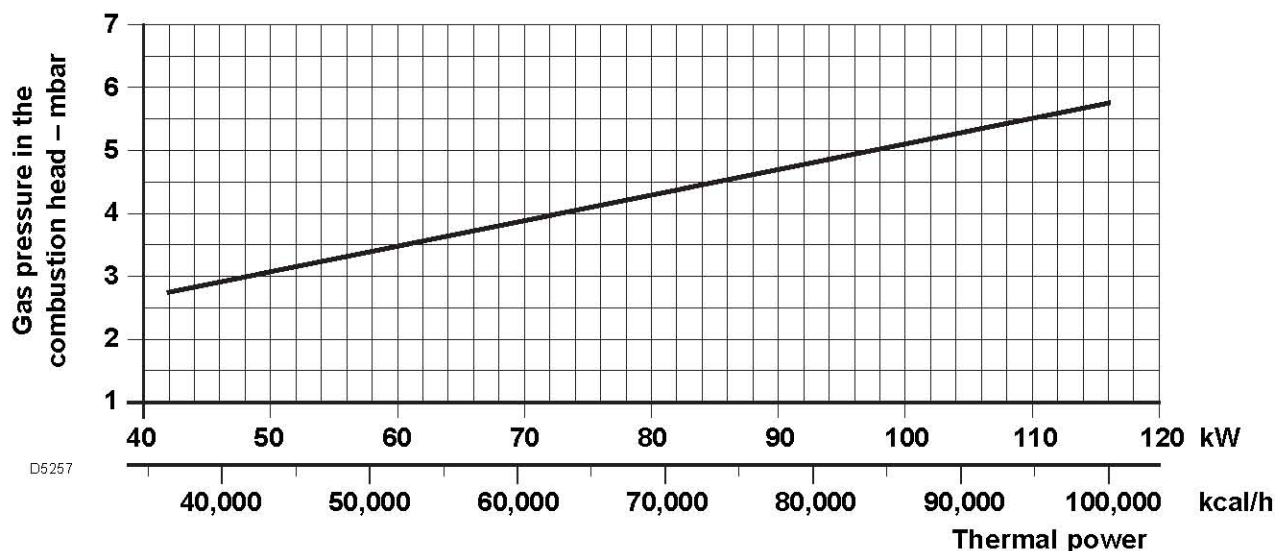
The working field has been defined according to EN 676 standard.

COMMERCIAL BOILERS

The burner-boiler matching is assured if the boiler conforms to EN 303 and the combustion chamber dimensions are similar to those shown in the diagram EN 676. For applications where the boiler does not conform to EN 303, or where the combustion chamber is much smaller than the dimensions given in EN 676, please consult the manufacturers.

CORRELATION BETWEEN GAS PRESSURE AND BURNER OUTPUT

To obtain the maximum output, a gas head pressure of 5.8 mbar is measured (M2, see chapter 3.3, page 4) 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.

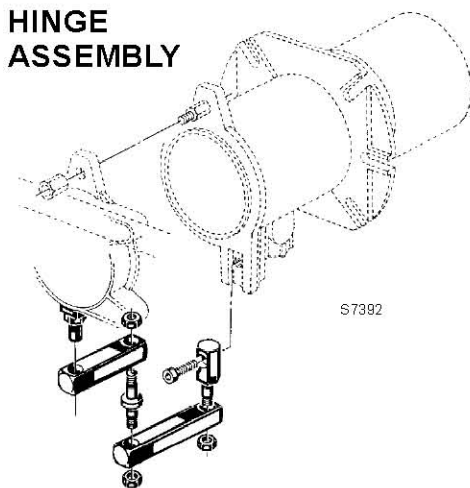
3.1 BOILER FIXING

IMPORTANT

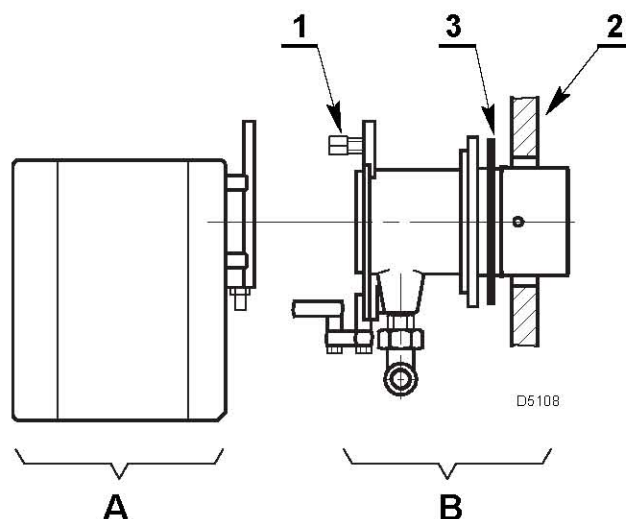
Boiler door must have a max. thickness of **90 mm**, refractory lining included.

If thickness is greater (**max. 150 mm**), a combustion head extension must be fitted, which is supplied separately.

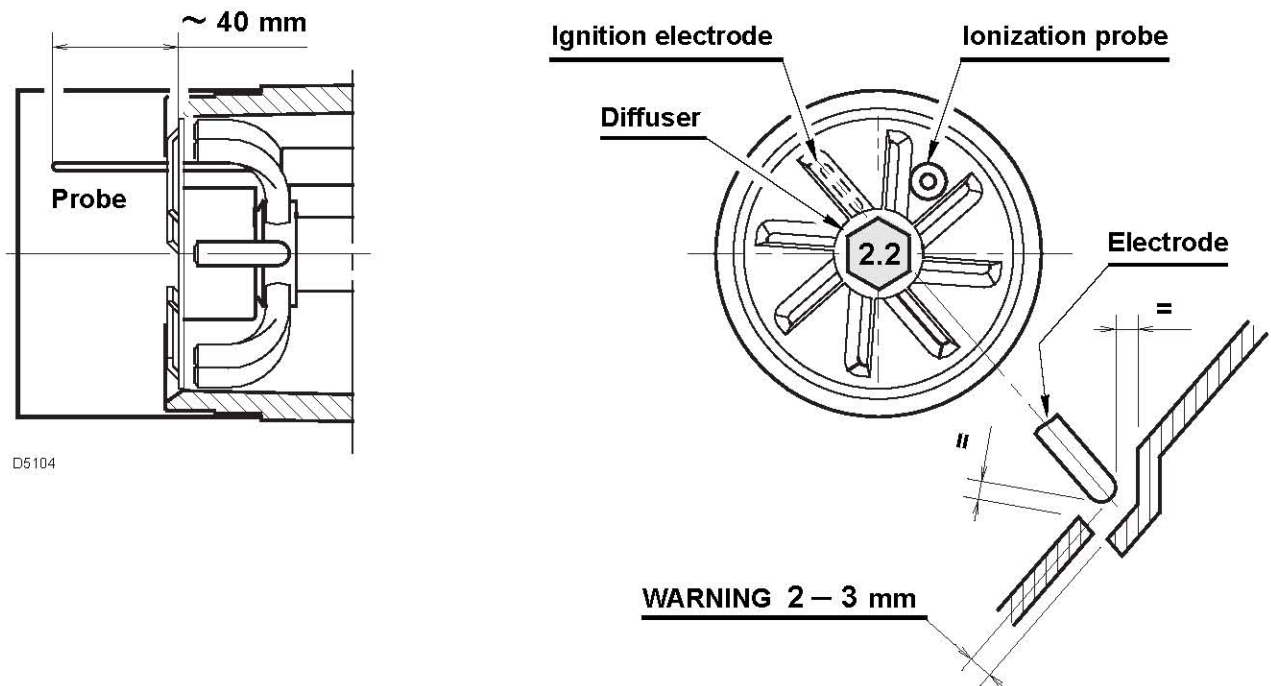
HINGE ASSEMBLY



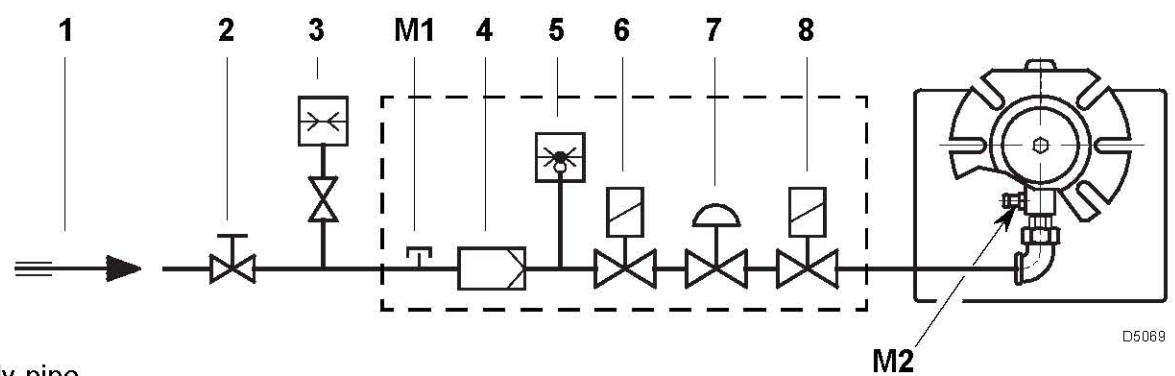
- Separate the combustion-head assembly from the burner body by removing nut (1) and removing group (A).
- Fix the head assembly group (B) to the boiler (2) insert the supplied insulating gasket (3).



3.2 PROBE - ELECTRODE POSITIONING



3.3 GAS FEEDING LINE



- 1 – Gas supply pipe
- 2 – Manual cock (supplied by the installer)
- 3 – Gas pressure gauge (supplied by the installer)
- 4 – Filter
- 5 – Gas pressure switch
- 6 – Safety valve
- 7 – Pressure governor
- 8 – Adjustment valve

M1 – Gas-supply pressure test point
M2 – Pressure coupling test point

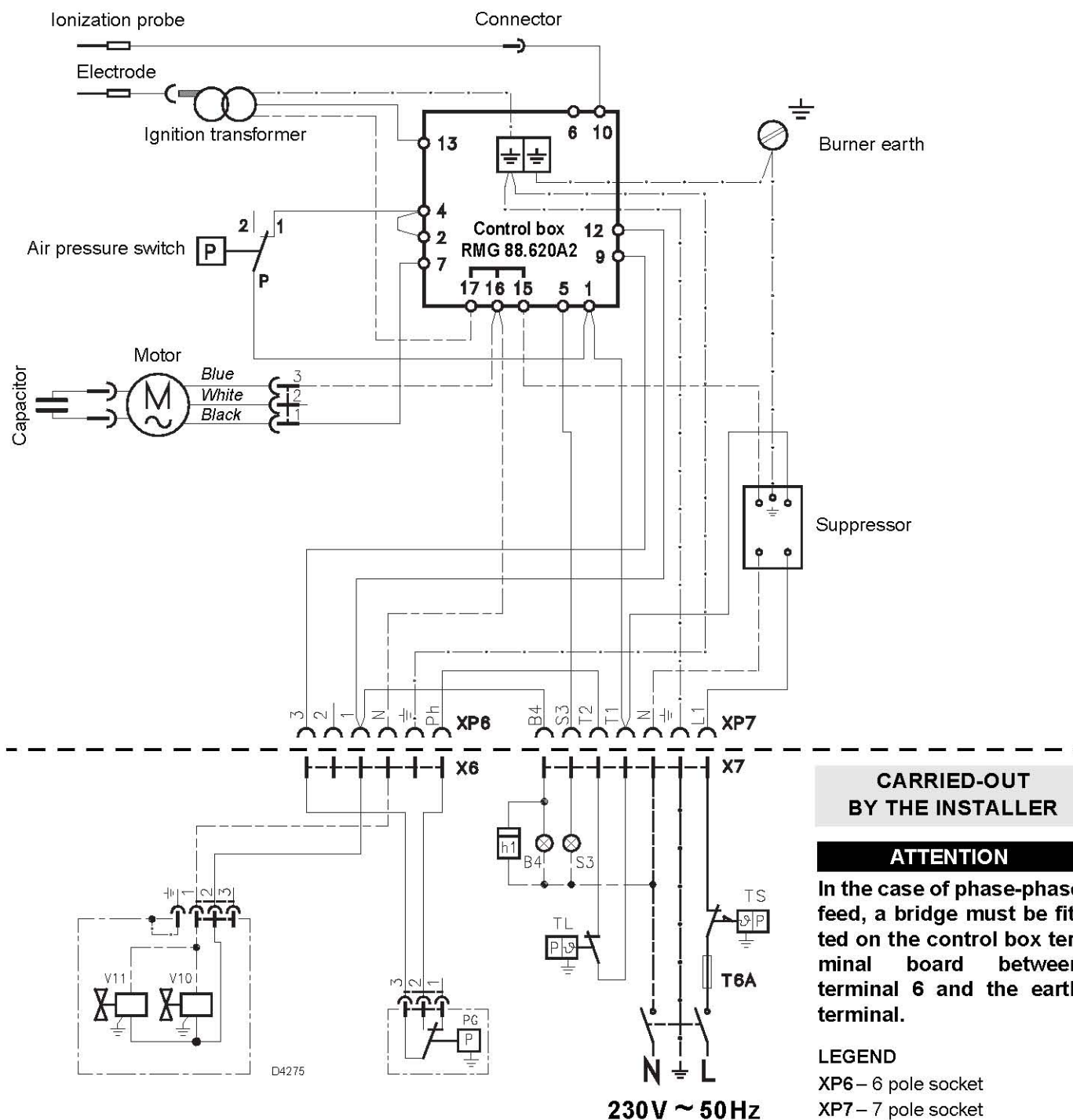
GAS TRAIN ACCORDING TO EN 676

GAS TRAIN		CONNECTIONS		USE
TYPE	CODE	INLET	OUTLET	
MBDLE 405 B01	3970530	Rp 1/2	Rp 3/4	Natural gas ≤ 80 kW and LPG
MBDLE 407 B01	3970531	Rp 3/4	Rp 3/4	Natural gas and LPG

The gas train is supplied separately, for its adjustment see the enclosed instructions.

3.4 ELECTRICAL WIRING

3.4.1 STANDARD ELECTRICAL WIRING



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.

**CARRIED-OUT
BY THE INSTALLER**

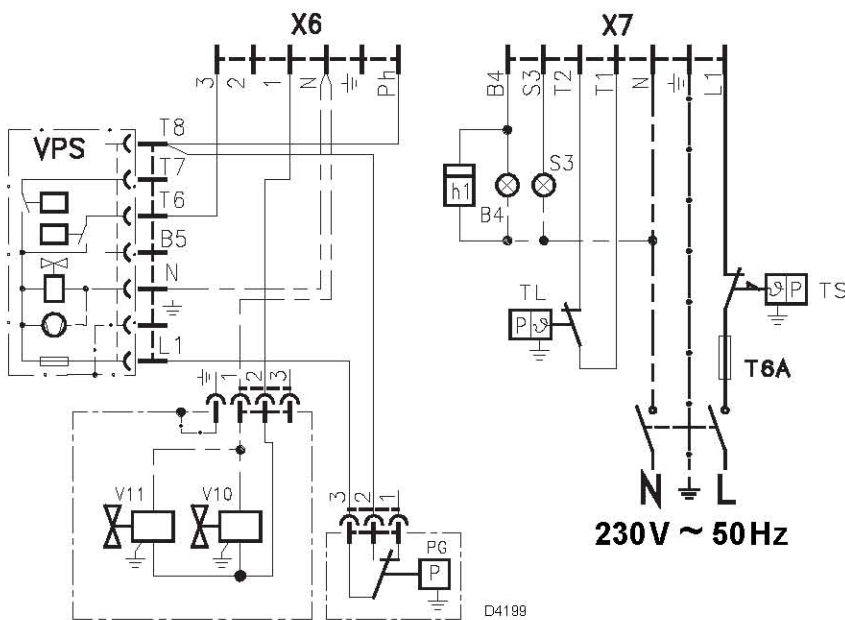
ATTENTION

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
- PG – Minimum gas pressure switch
- S3 – Remote lock-out signal (230V - 0.5 A max.)
- T6A – Fuse
- TL – Limit thermostat
- TS – Safety thermostat
- V10 – Safety valve
- V11 – Adjustment valve

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



**CARRIED-OUT
BY THE INSTALLER**

LEGEND

- X6 – 6 pin plug
- X7 – 7 pin plug
- B4 – Working signal
- h1 – Hour counter
- PG – Minimum gas pressure switch
- S3 – Remote lock-out signal (230V - 0.5 A max.)
- T6A – Fuse
- TL – Limit thermostat
- TS – Safety thermostat
- V10 – Safety valve
- V11 – Adjustment valve

4. WORKING

4.1 COMBUSTION ADJUSTMENT

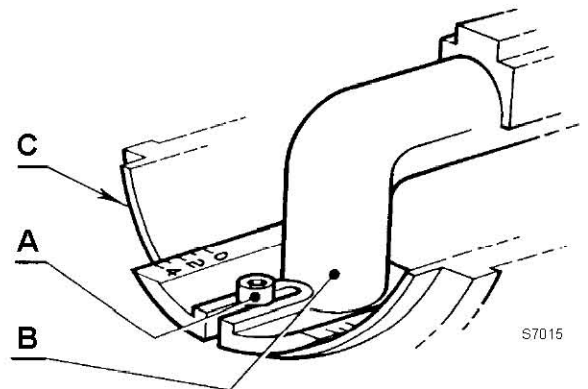
In conformity with Efficiency Directive 92/42/EEC the application of the burner on the boiler, adjustment and testing must be carried out observing the instruction manual of the boiler, including verification of the CO and CO₂ concentration in the flue gases, their temperatures and the average temperature of the water in the boiler.

To suit the required appliance output, choose the proper setting of the combustion head, and the air damper opening.

4.2 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.

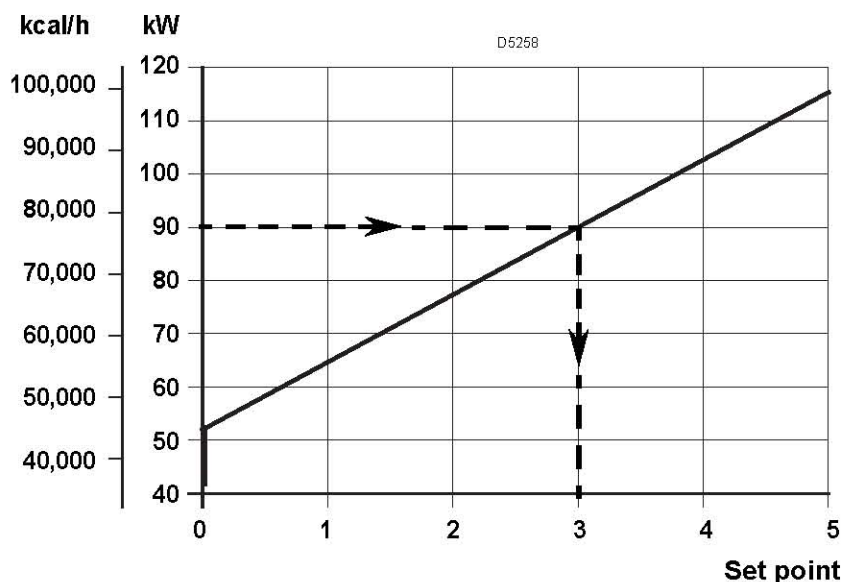
Tighten the screw (A).



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 position 0*).



4.3 AIR DAMPER SETTING

The regulation of the air-rate is made by adjusting the air damper (1), after loosening the screws (2).

When the optimal regulation is reached, **screw tight the screws (2)**.

4.4 COMBUSTION CHECK

It is advisable to set the burner according to the type of gas used and following the indications of the table:

EN 676		AIR EXCESS: max. output $\lambda \leq 1.2$ – min. output $\lambda \leq 1.3$			
GAS	Theoretical max. CO ₂ 0 % O ₂	Setting $\lambda = 1.2$	CO ₂ % $\lambda = 1.3$	CO mg/kWh	NO _x mg/kWh
G 20	11.7	9.7	9.0	≤ 100	≤ 170
G 25	11.5	9.5	8.8	≤ 100	≤ 170
G 30	14.0	11.6	10.7	≤ 100	≤ 230
G 31	13.7	11.4	10.5	≤ 100	≤ 230

IONIZATION CURRENT

The minimum current necessary for the control box operation is 3 μ A.

The burner normally supplies a higher current value, so that no check is needed. However, if you want to measure the ionization current, you must open the connector fitted to the red wire and insert a microammeter.

4.5 AIR PRESSURE SWITCH

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 shuts down. Now reduce the value by one set point, turning the dial anti-clockwise. Check for reliable burner operation, if the burner shuts down, reduce the value by a half set point.

Attention:

To comply with the EN 676 standard, the air pressure switch must operate when the CO value exceeds 1% (10,000 ppm). To check this, insert a combustion analyser in the flue, slowly reduce the burner air setting and verify that the burner shuts down by the action of the air pressure switch before the CO value exceeds 1%.

TECHNICAL DATA

TYPE		569T30
Thermal output		81 – 218 kW – 69,700 – 187,500 kcal/h
Gas (Family 2)	Net heat value	8 – 12 kWh/m ³ – 7,000 – 10,340 kcal/m ³
	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

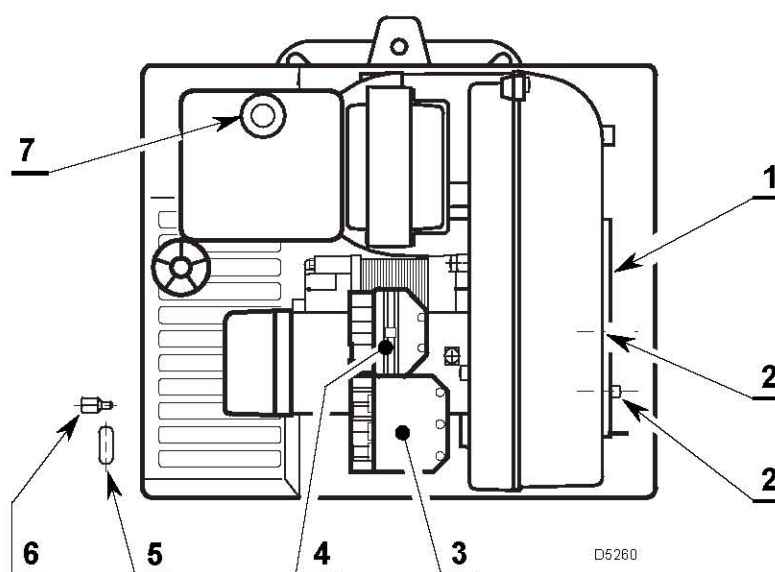
For gas family 3 (LPG) ask for separate kit.

COUNTRY	FR	GB - IE	DK - AT - GR - SE	DE	LU	NL
GAS CATEGORY	I12Er3P	I12H3P	I12H3B/P	I12ELL3B/P	I12E3B/P	I12L3B/P

- ◆ CE marking according to Gas Appliance Directive 90/396/EEC; PIN 0063AP6680.
- ◆ According to directives: EMC 89/336/EEC, Low Voltage 73/23/EEC, Machines 98/37/EEC and Efficiency 92/42/EEC.
- ◆ Gas train according to EN 676.

Fig. 1

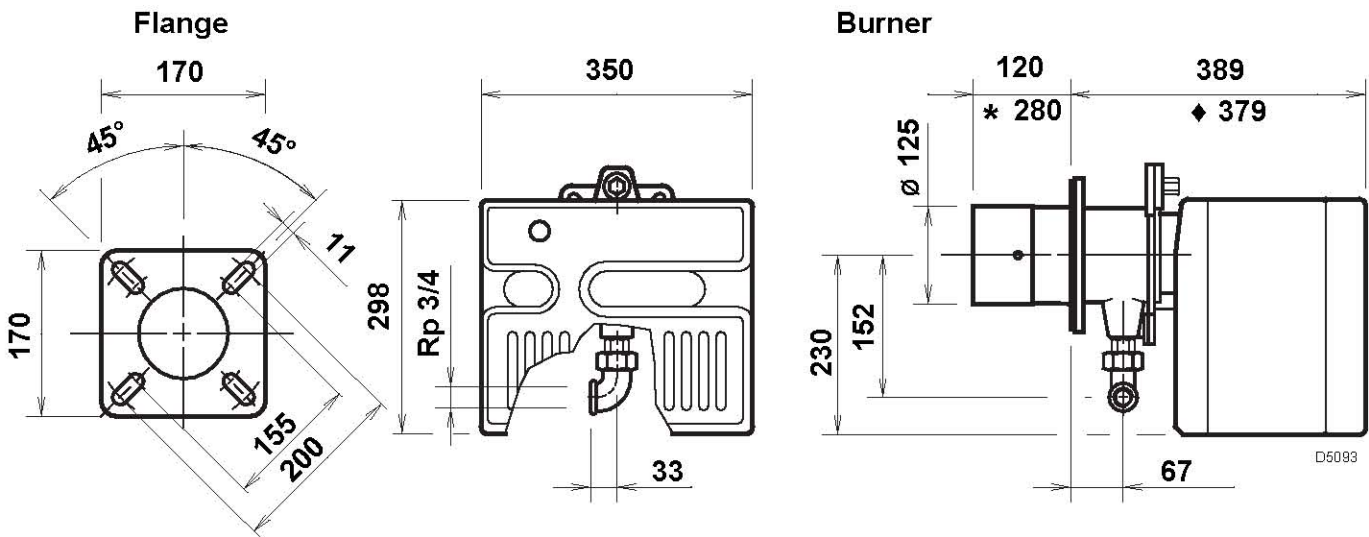
- 1 – Air-damper
- 2 – Screws for fixing the air-damper
- 3 – 7 pole electrical controls plug and socket
- 4 – 6 pole gas-train plug
- 5 – Grommet
- 6 – Screw for fixing the cover
- 7 – Lock-out lamp and reset button



NOTES

- The grommet (5) supplied with the burner, must be fitted to the same side of the gas train.
- After having installed the burner verify the access to the fixing screws of the cover. If necessary replace them with the fixing screws (6) fig. 1 supplied as equipment.

OVERALL DIMENSIONS



* Length available using an extended head kit.

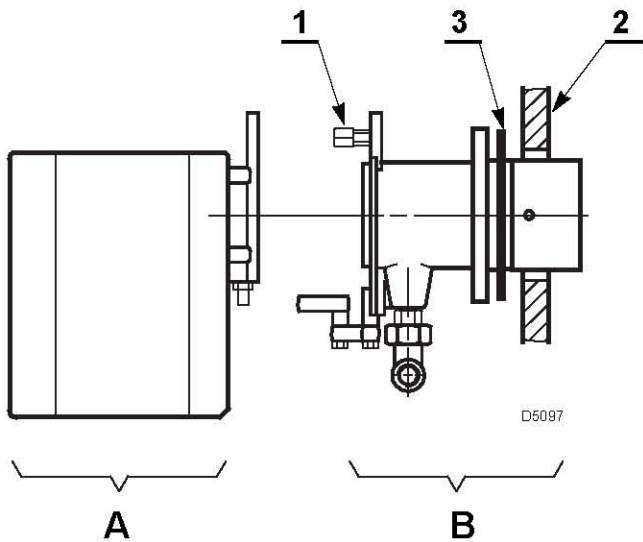
◆ Length available using a separate kit.

EQUIPMENT

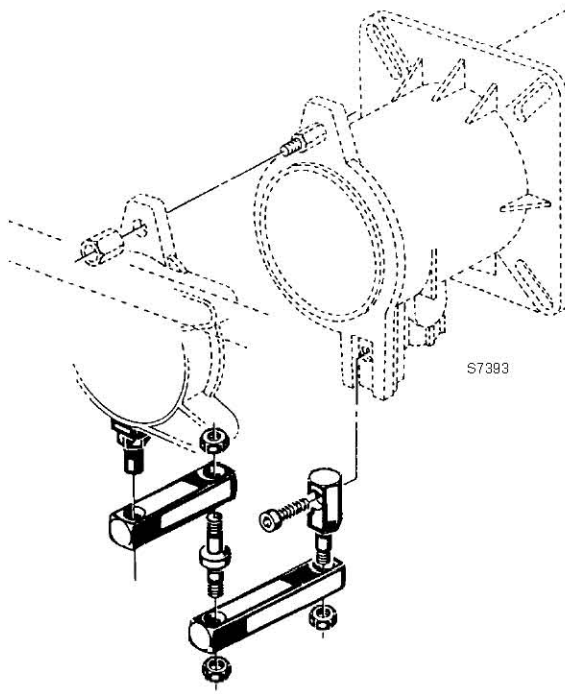
Quantity	Description
4	Screws with nuts
1	Insulating gasket
3	Screws for fixing the cover
1	Grommet
1	Hinge
1	7 pin plug

BOILER FIXING

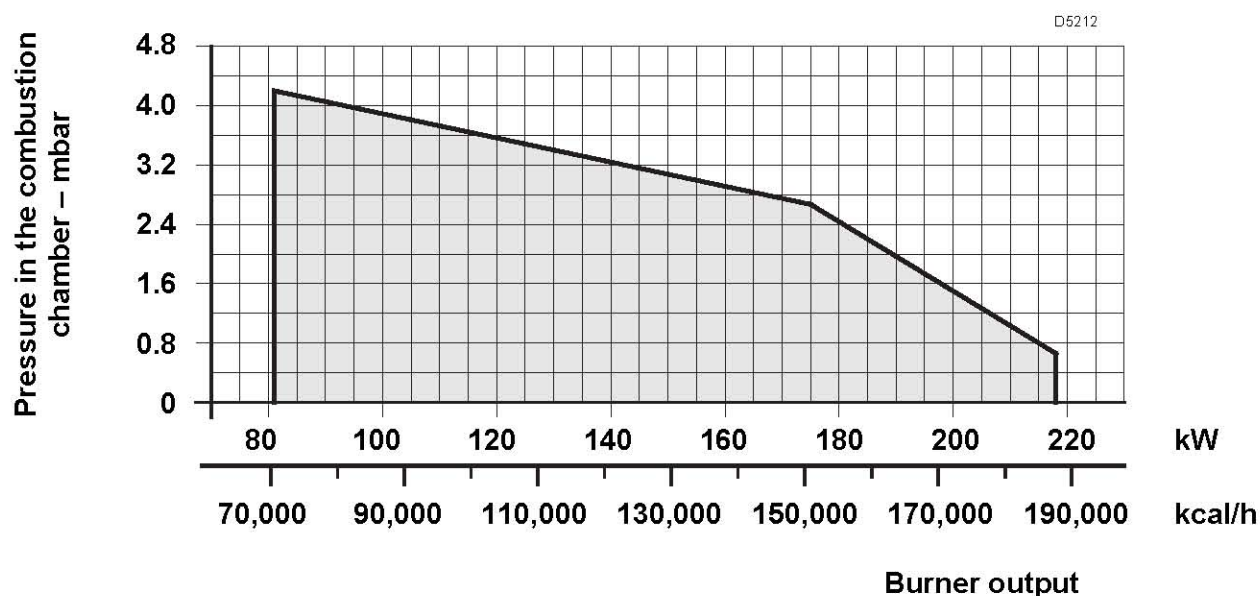
Separate the combustion-head assembly from the burner body by removing nut (1) and removing group (A).
Fix the head assembly group (B) to the boiler (2) insert the equipped insulating gasket (3).



HINGE ASSEMBLY



WORKING FIELD



TEST BOILER

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

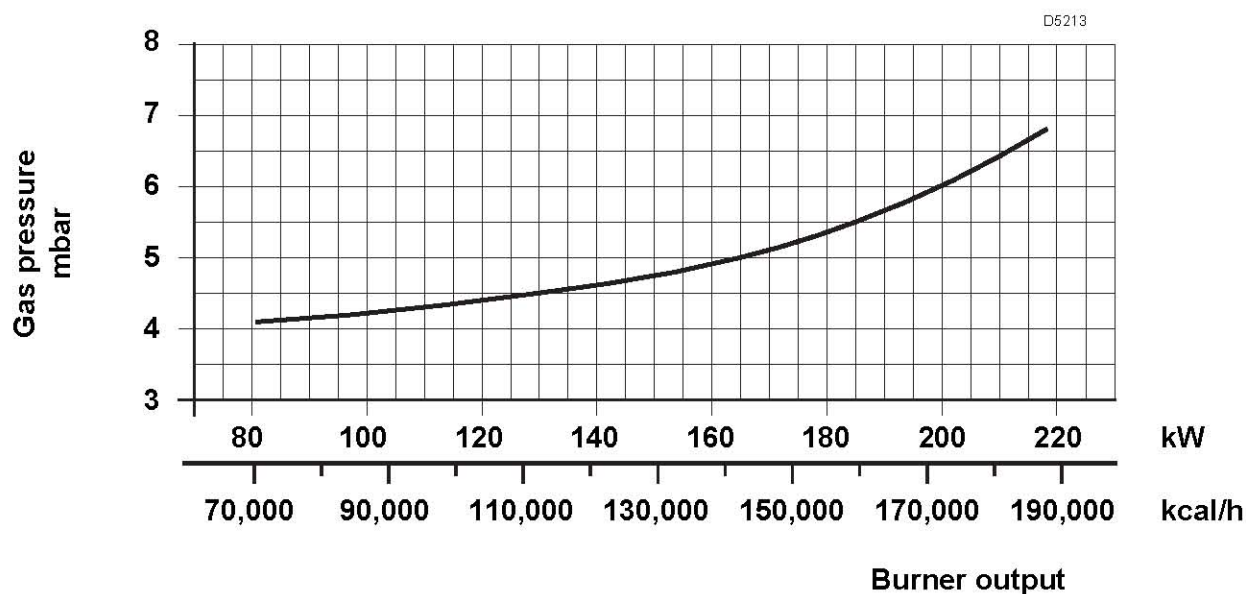
COMMERCIAL BOILERS

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.

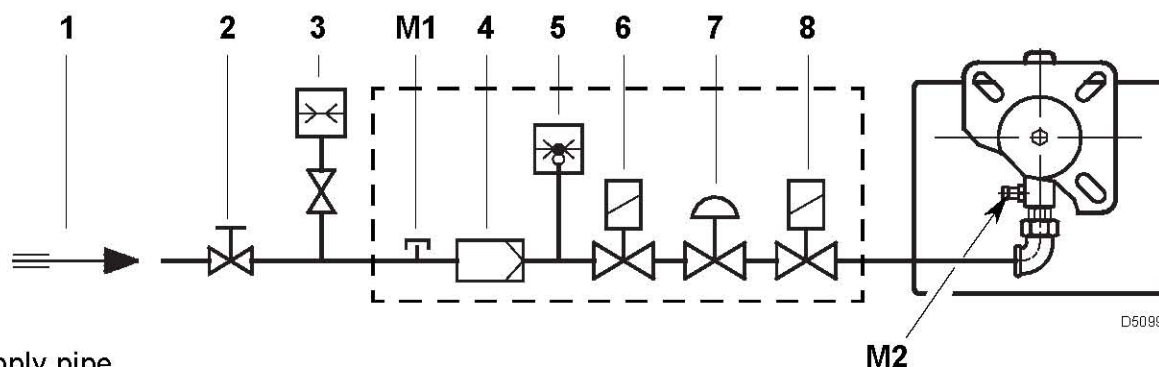
For applications where the boiler is not according to EN 303, or where the combustion chamber dimensions differ from those shown in EN 676, please consult the manufacturers.

CORRELATION BETWEEN GAS PRESSURE AND BURNER OUTPUT

To obtain the maximum output, a gas head pressure of 6.8 mbar is measured with the combustion chamber at 0 mbar using gas G20 with a net heat value of 10 kWh/m³ (8,570 kcal/m³).



LINE OF GAS-SUPPLY



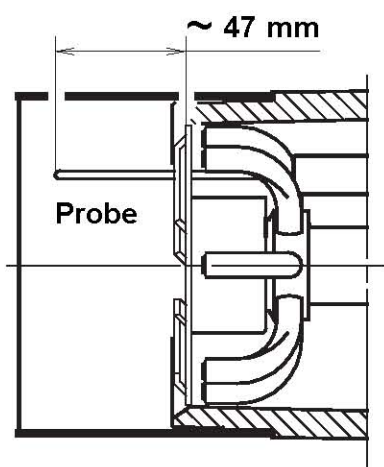
- | | | | |
|---|--|----|----------------------------------|
| 1 | - Gas supply pipe | 7 | - Pressure governor |
| 2 | - Manual cock (<i>charged to the installer</i>) | 8 | - Adjusting valve |
| 3 | - Gas pressure gauge (<i>charged to the installer</i>) | M1 | - Gas-supply pressure test point |
| 4 | - Filter | M2 | - Pressure coupling test point |
| 5 | - Gas pressure switch | | |
| 6 | - Safety valve | | |

GAS TRAIN ACCORDING TO EN 676

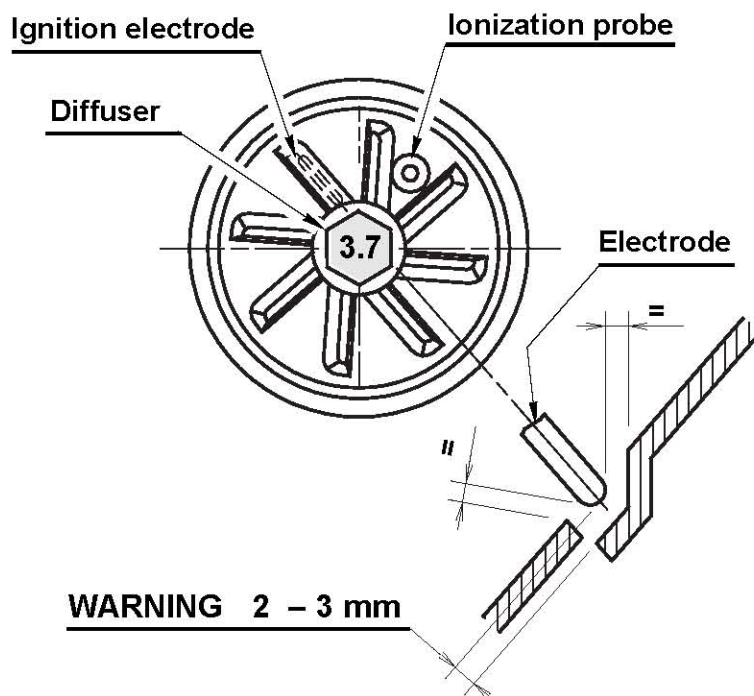
MULTIBLOC	CONNECTION		EMPLOY
	GAS TRAIN	BURNER	
MBDLE 407 B01	Rp 3/4	Rp 3/4	Natural gas $\leq 180\text{kW}$ and LPG
MBDLE 410 B01	Rp 3/4	Rp 3/4	Natural gas and LPG

The gas train is supplied separately, for its adjustment see the enclosed instructions.

POSITIONING ELECTRODE-PROBE

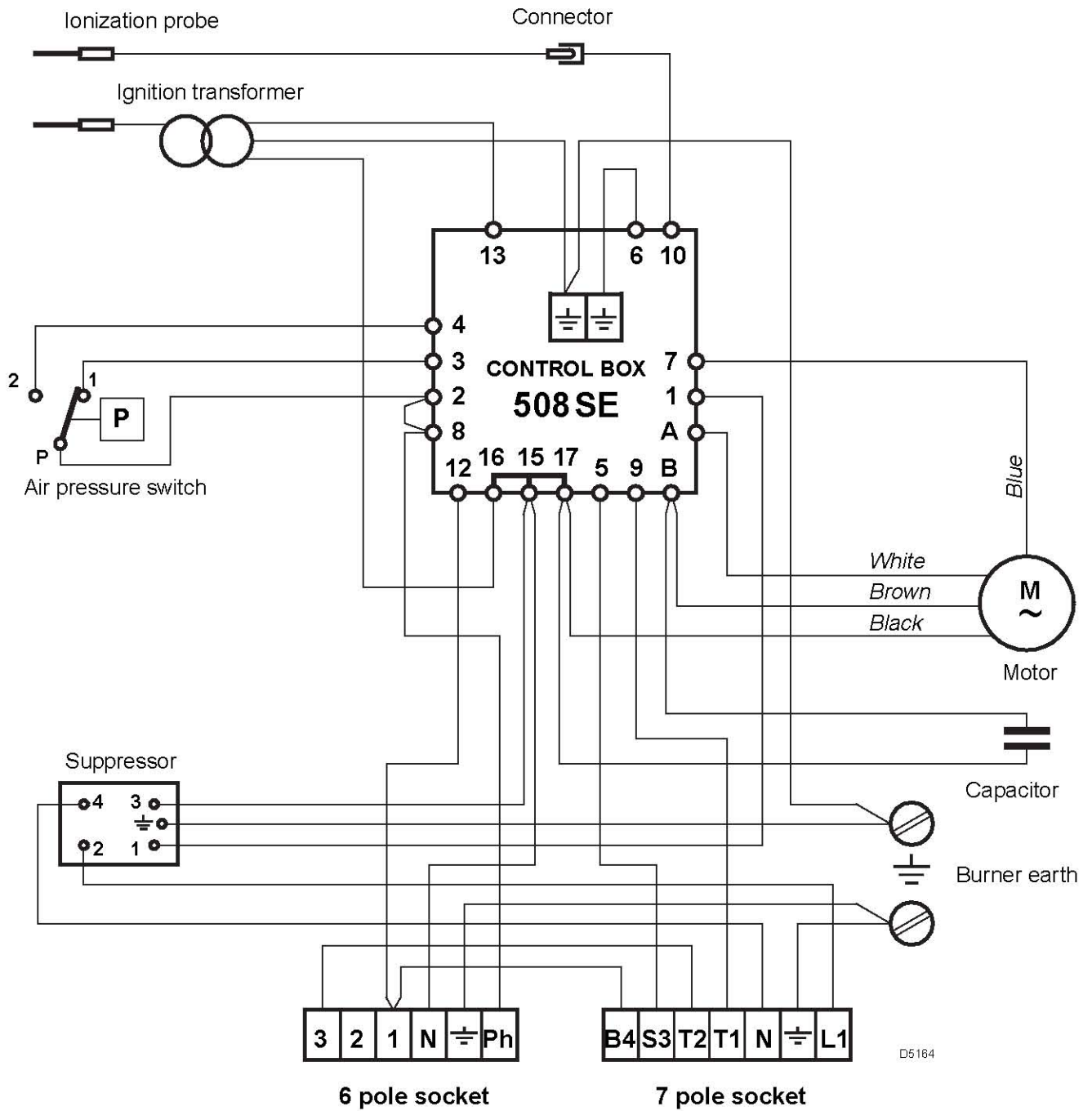


D5104



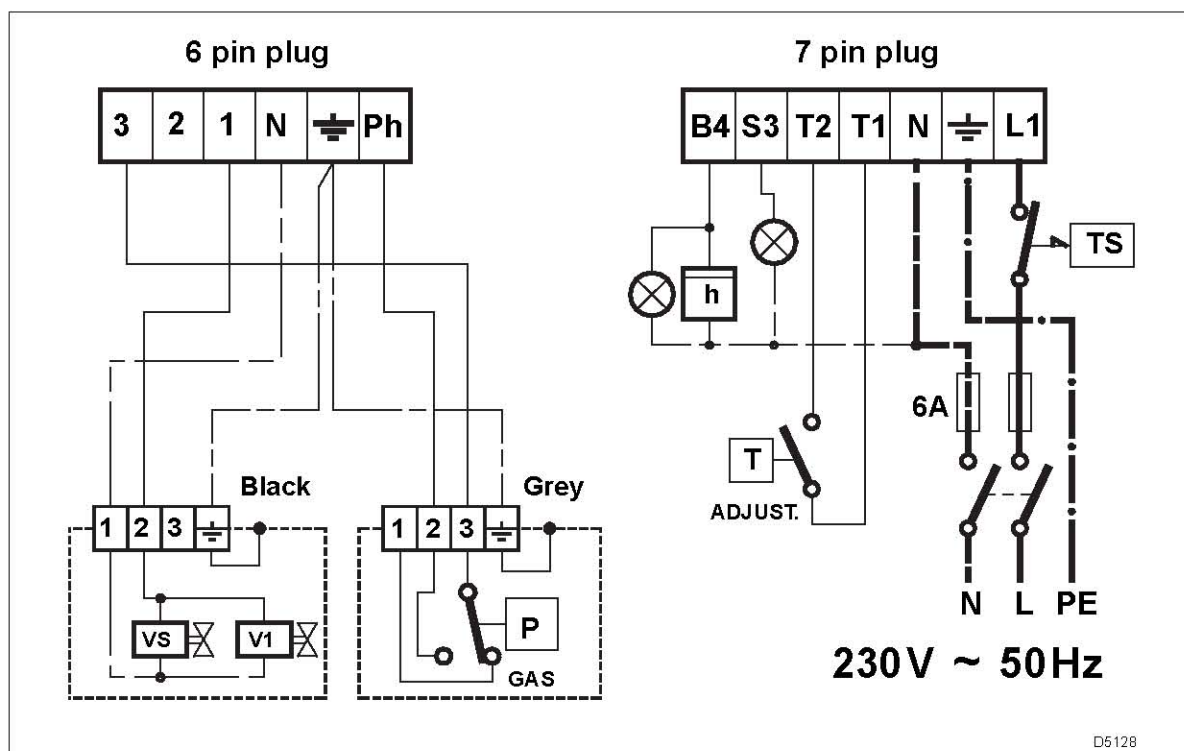
ELECTRICAL WIRING

(carried out in the factory)



D5164

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



NOTES

- Do not exchange the neutral with the phase and connect exactly the above wiring.
- Wire of 1 mm² 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

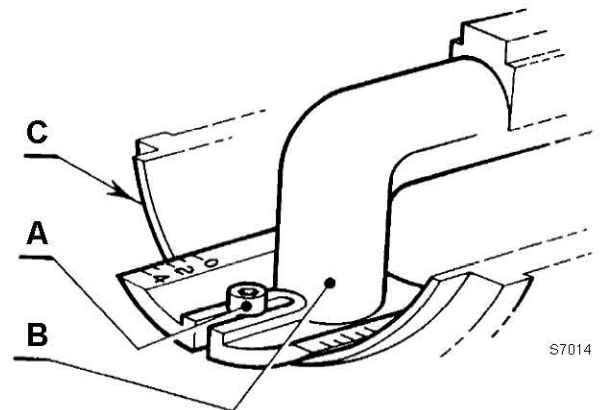


When flame-failure occurs during working, shut down takes place within one second.

COMBUSTION-HEAD ADJUSTMENT

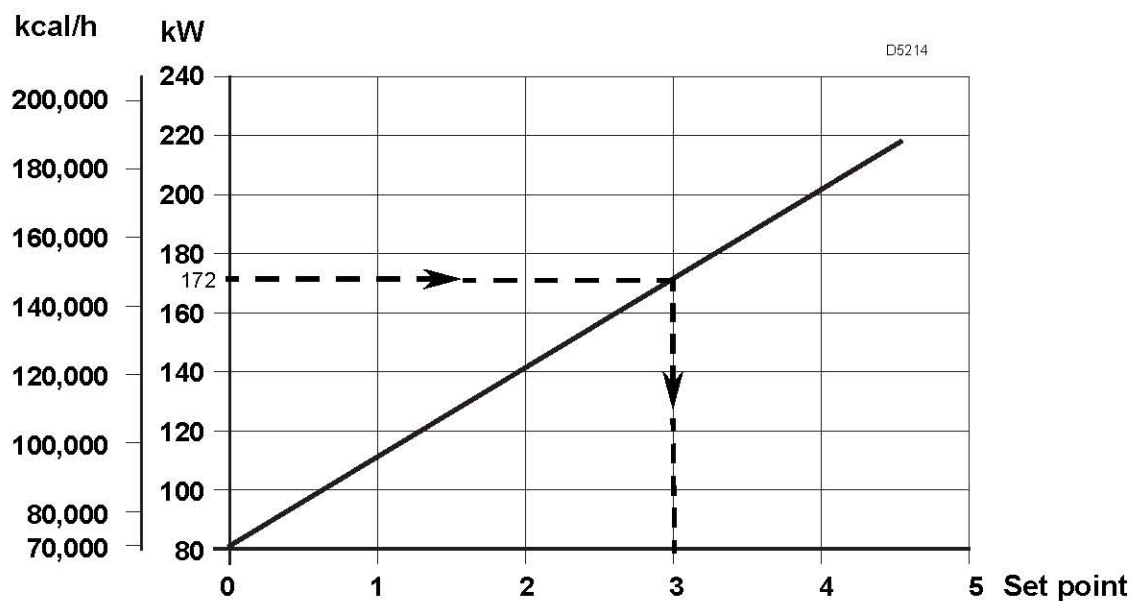
Loose the screw (A), move the elbow (B) so that the rear plan of the coupling (C) coincides with the set point.

Tight the screw (A).



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 ADJUSTMENT

In conformity with Efficiency Directive 92/42/EEC the application of the burner on the boiler, adjustment and testing must be carried out observing the instruction manual of the boiler, including verification of the CO and CO₂ concentration in the flue gases, their temperatures and the average temperature of the water in the boiler.

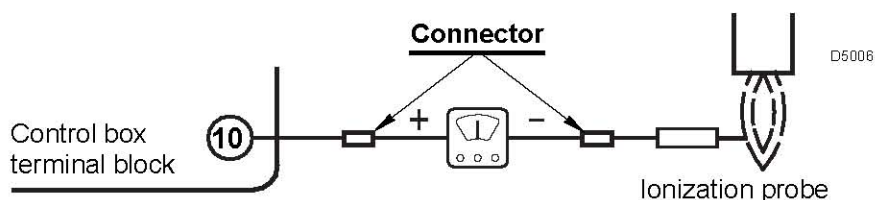
It is advisable to set the burner according to the type of gas used and following the indications of the table:

EN 676		AIR EXCESS: max. output $\lambda \leq 1.2$ – min. output $\lambda \leq 1.3$			
GAS	Theoretical max. CO ₂ 0 % O ₂	Setting CO ₂ %		CO mg/kWh	NO _x mg/kWh
		$\lambda = 1.2$	$\lambda = 1.3$		
G 20	11.7	9.7	9.0	≤ 100	≤ 170
G 25	11.5	9.5	8.8	≤ 100	≤ 170
G 30	14.0	11.6	10.7	≤ 100	≤ 230
G 31	13.7	11.4	10.5	≤ 100	≤ 230

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.

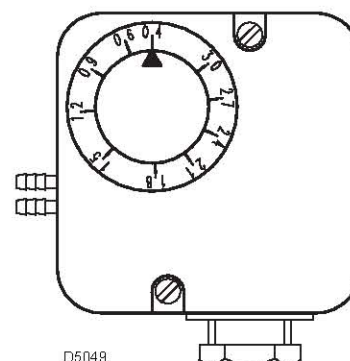


AIR PRESSURE SWITCH

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 shuts down. Now reduce the value by one set point, turning the dial anti-clockwise.

Check for reliable burner operation, if the burner shuts down, reduce the value by a half set point.



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 μA</i>).
	The gas pressure switch is set too close to its working-pressure.
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.
The burner does not pass through the pre-purge period and the control box goes to lock-out.	The air pressure switch does not change over: it has failed or the air pressure is too low (<i>combustion head bad set</i>).
	Flame simulation exists (<i>or the flame really lights</i>).
The burner does not start at the thermostat closing.	Gas is not supplied.
	The gas pressure switch does not close its contact due to incorrect setting or a faulty switch.
	The air pressure switch is changed over to the operational position.
The burner continues to repeat the starting cycle without going on lock-out.	This concerns a very particular irregularity, caused by the fact that the gas pressure in the gas-mains lies very close to the value to which the gas pressure switch has been set.
	As a result of this, the sudden falling-off of pressure at the opening of the valves causes the opening of the pressure switch.
	However this only temporarily, because the valves immediately close again, so then does the pressure switch, because the pressure builds-up again the cycle to be repeated over and over.
	This can be remedied by lowering the setting of the pressure switch.

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

The burner shuts-down if the gas pressure switch opens.

WARNINGS TO AVOID BURNOUT OR BAD COMBUSTION OF THE BURNER

- 1 – When the burner is stopped, the smoke pipe must be opened and effect a natural draught in the combustion chamber. If the smoke pipe is closed, the burner must be drawn back till the extraction of blast tube from the furnace. Before operating in this way take the voltage off.
- 2 – The place, where the burner works, must have same openings suitable for the passage of air necessary for combustion. To be sure about this, you have to control CO₂ and CO in the exhaust gases with all the windows and doors closed.
- 3 – If in the place, where the burner works, there are air-breathings, check the existence of air-input openings with dimensions suitable for the necessary air-exchange. In any case check that, when the burner is stopped, the air-breathings do not draw warm smokes from pipes through the burner.