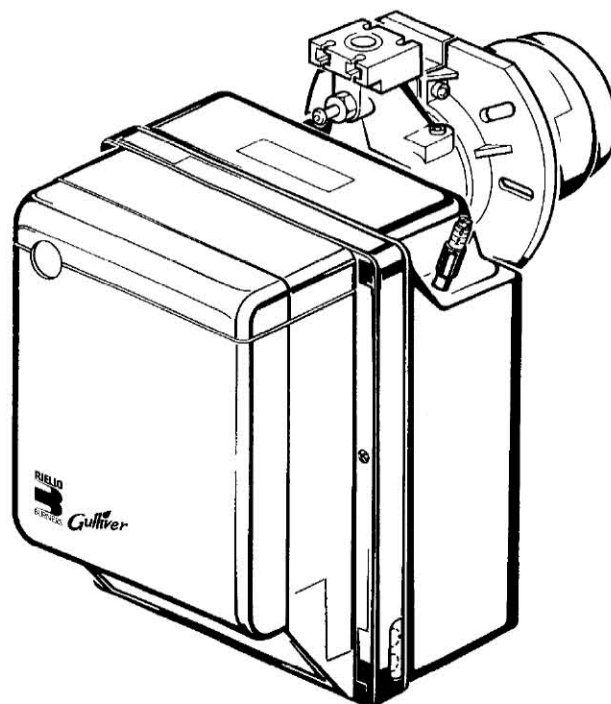


- I** Bruciatori di gas ad aria soffziata
D Gas-Gebläsebrenner
F Brûleurs gaz à air soufflé
GB Forced draught gas burners
GR Πιεστικοί καυστήρες αερίου

Funzionamento monostadio
Einstufiger Betrieb
Fonctionnement à 1 allure
One stage operation
Μονοβάθμιοι



Gulliver



CODICE - CODE ΚΩΔΙΚΟΣ	MODELLO - MODELL - MODELE MODEL - MONTEAO	TIPO - TYP TYPE - ΤΥΠΟΣ
3761150	BS1	911 T1
3761250	BS2	912 T1
3761350	BS3	913 T1
3761450	BS4	914 T1

Dichiarazione del produttore secondo la normativa 1. BImSchV, 1996

RIELLO S.p.A. dichiara che i seguenti prodotti rispettano i valori limite degli NOx imposti dalla normativa 1. BImSchV, 1996, § 7 (2):

Herstellerbescheinigung gemäß 1. BImSchV, 1996

RIELLO S.p.A. bestätigt, daß folgende Produkte, die von der 1. BImSchV, 1996, § 7 (2) geforderten NOx - Grenzwerte einhalten:

Déclaration du producteur selon la directive 1. BImSchV, 1996

RIELLO S.p.A. déclare que les brûleurs suivants respectent les valeurs limites de NOx imposées par la directive 1. BImSchV, 1996, § 7 (2):

Producer declaration according to 1. BImSchV, 1996

RIELLO S.p.A. declares, that the following products comply with the NOx limit values indicated in the 1. BImSchV. 1996 § 7 (2) standard:

Δήλωση κατασκευαστή βάσει του κανονισμού 1. BImSchV, 1996

RIELLO S.p.A. δηλώνει ότι τα ακόλουθα προϊόντα ανταποκρίνονται στα όρια των NOx που επιβάλλονται από τον κανονισμό 1. BImSchV, 1996, παρ. 7(2):

Prodotto - Produktreihe Produit - Product - Προϊόν	Tipo - Typ Type - Τύπος	Modello - Ausführung Modèle - Model - Μοντέλο
Bruciatori di gas ad aria soffiata	911 T1	BS1
Gas-Gebläsebrenner	912 T1	BS2
Brûleurs gaz à air soufflé	913 T1	BS3
Forced draught gas burners	914 T1	BS4
Καυστήρες αερίου με φυσήτήρα		

RIELLO S.p.A.



INDEX

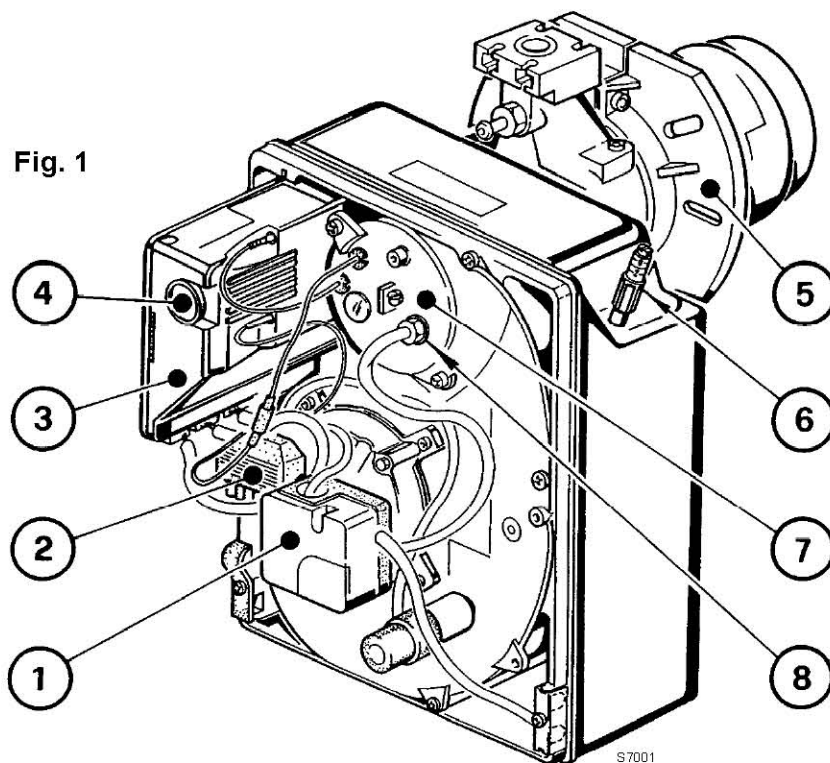
1. BURNER DESCRIPTION	1	3.4 Gas feeding line	5
1.1 Burner equipment	1	3.5 Electrical wiring	6
2. TECHNICAL DATA	2	4. WORKING	7
2.1 Technical data	2	4.1 Combustion adjustment.....	7
2.2 Overall dimensions.....	2	4.2 Combustion check.....	8
2.3 Working fields	3	4.3 Burner start-up cycle.....	9
3. INSTALLATION	4	4.4 Air pressure switch	9
3.1 Boiler fixing	4	5. MAINTENANCE	9
3.2 Probe-electrode positioning	5	6. FAULTS / SOLUTIONS	9
3.3 Gas feeding	5		

1. BURNER DESCRIPTION

One stage gas burner.

- 1 – Pressure switch
- 2 – 6 pole socket for gas train
- 3 – Control box with 7 pole socket
- 4 – Reset button with lock-out lamp
- 5 – Flange with insulating gasket
- 6 – Air damper adjustment assembly
- 7 – Head holder assembly
- 8 – Pressure test point

Fig. 1



- BUWAL approval No.: 100010 (911T1 - 913T1 - 914T1) – 197011 (912T1).
- **Note for Switzerland.**
Swiss provisions, local and cantonal provisions, the provisions of the SVGW authorities for the use of gas, as well as those of the Fire Brigade (VKF), must all be complied with.
- The burner meets protection level of IP 40, EN 60529.
- CE marking according to Gas Appliance directive 90/396/EEC; PIN 0085AQ0409.
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.

1.1 BURNER EQUIPMENT

- Flange with insulating gasket N° 1
- Screw and nut for flange
- Capacitor

- Screws and nuts for flange to be fixed to boiler. . . N° 4
- 7 pin plug

2. TECHNICAL DATA

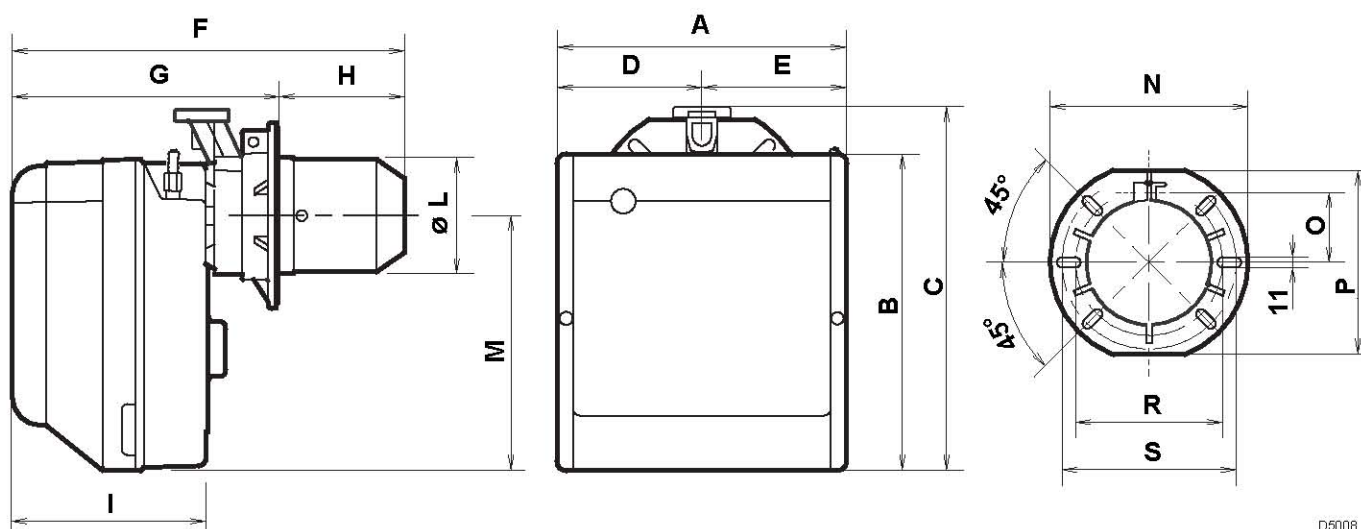
2.1 TECHNICAL DATA

TYPE		911 T1	912 T1	913 T1	914T1
Thermal power (1) as EN 267	kW	16 – 52	35 – 91	65 – 189	110 – 246
	Mcal/h	13.8 – 44.7	30.1 – 78.2	55.9 – 162.5	94.6 – 211.6
Thermal power (1) as LRV 92	kW	22 – 49	40 – 88	65 – 180	113 – 250
	Mcal/h	18.9 – 42.1	34.4 – 75.7	55.9 – 154.8	97.2 – 215
Natural gas (Family 2)		Net heat value: 8 – 12 kWh/Nm ³ = 7000 – 10,340 kcal/Nm ³			
		Pressure: min. 20 mbar – max. 100 mbar			
Electrical supply		Single phase, 230V ± 10% ~ 50Hz			
Motor	Run current 0.64A	Run current 0.67A	Run current 1.4A	Run current 2A	
	2750 rpm – 289 rad/s				
Capacitor	4 µF	4 µF	6.3 µF	8 µF	
Ignition transformer	Primary 230V / 0.2A – Secondary 8 kV / 12 mA				
Absorbed electrical power	0.15 kW	0.18 kW	0.35 kW	0.53 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			IT - AT - DK	CH	GB	DE	FR	NL	BE	IE
GAS CATEGORY			I12H3B/P	I2H	I12H3P	I12ELL3B/P	I12Er3P	I12L3B/P	I2E(R)B, I3P	I12H3P
GAS PRESSURE	G20	H	20	20	20	–	–	–	–	20
	G25	L	–	–	–	20	–	25	–	–
	G20	E	–	–	–	20	20/25	–	20/25	–

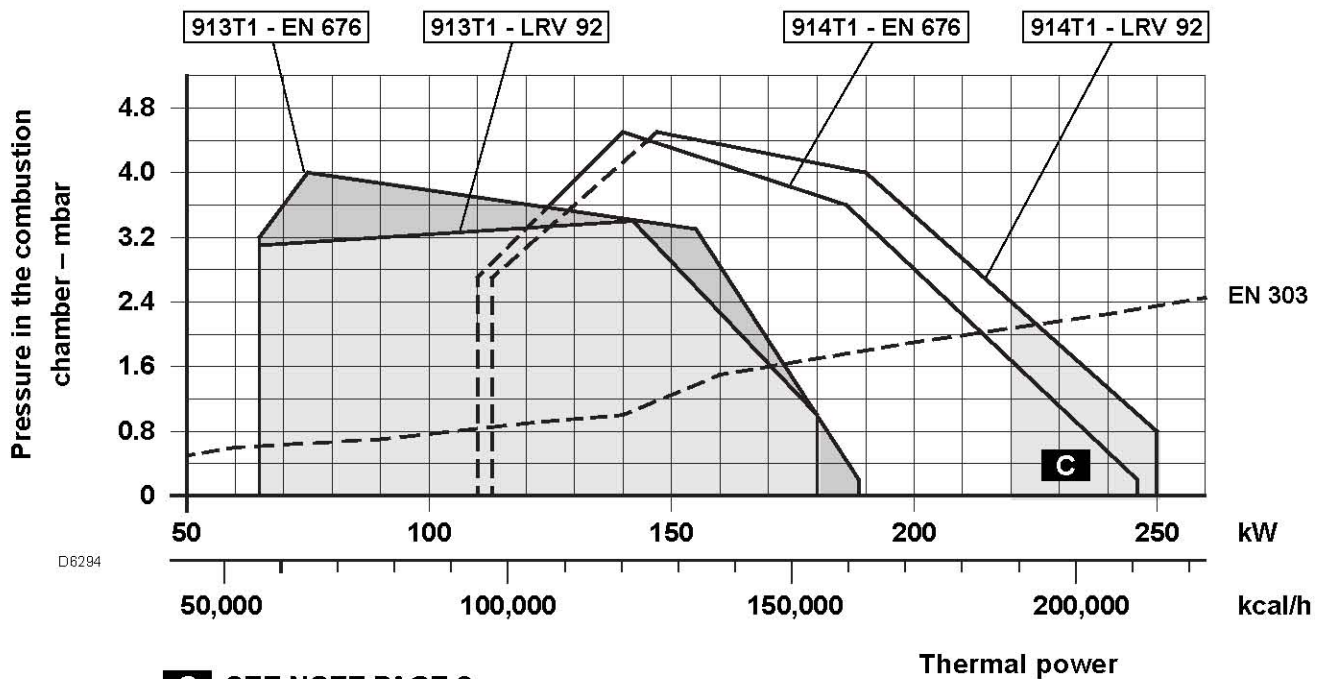
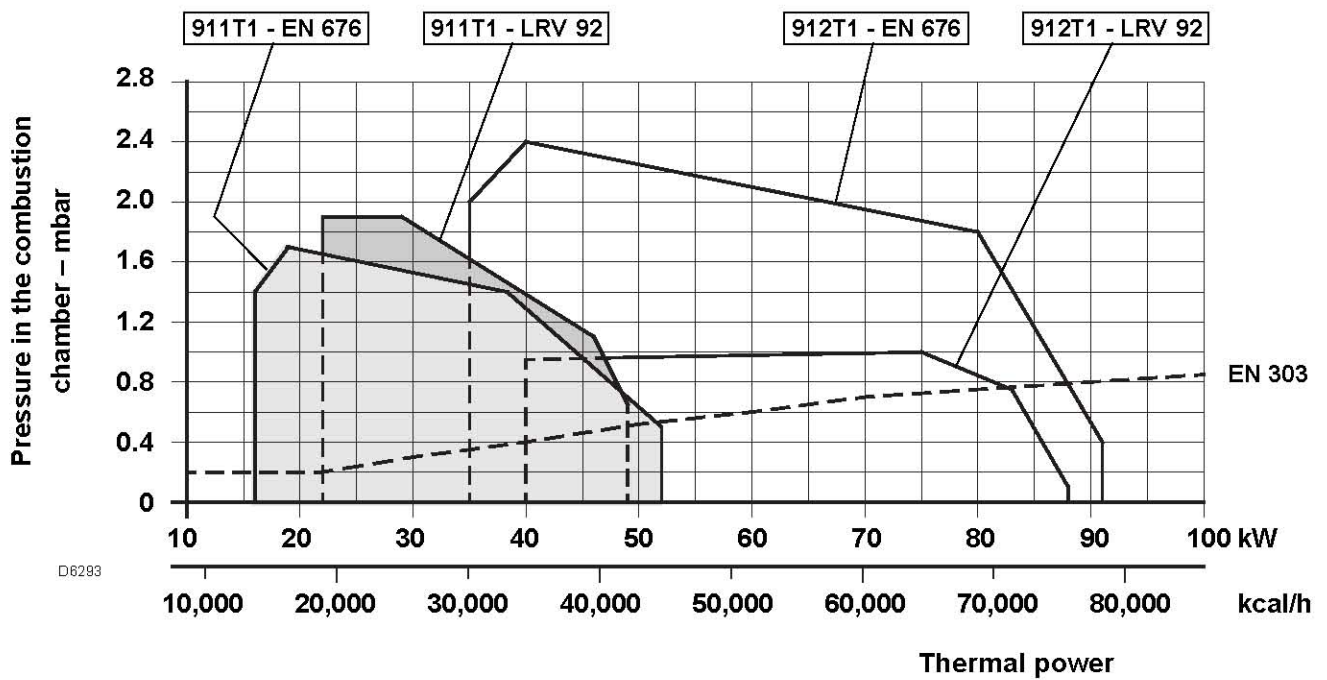
2.2 OVERALL DIMENSIONS



D5008

TYPE	A	B	C	D	E	F	G	H	I	L	M	N	O	P	R	S
911T1	234	254	295	122.0	112.0	346	230 – 276	116 – 70	174	89	210	192	66	167	140	170
912T1	255	280	325	125.5	125.5	352	238 – 252	114 – 100	174	106	230	192	66	167	140	170
913T1	300	345	391	150.0	150.0	390	262 – 280	128 – 110	196	129	285	216	76.5	201	160	190
914T1	300	345	392	150.0	150.0	446	278 – 301	168 – 145	216	137	286	218	80.5	203	170	200

2.3 WORKING FIELDS



TEST BOILER

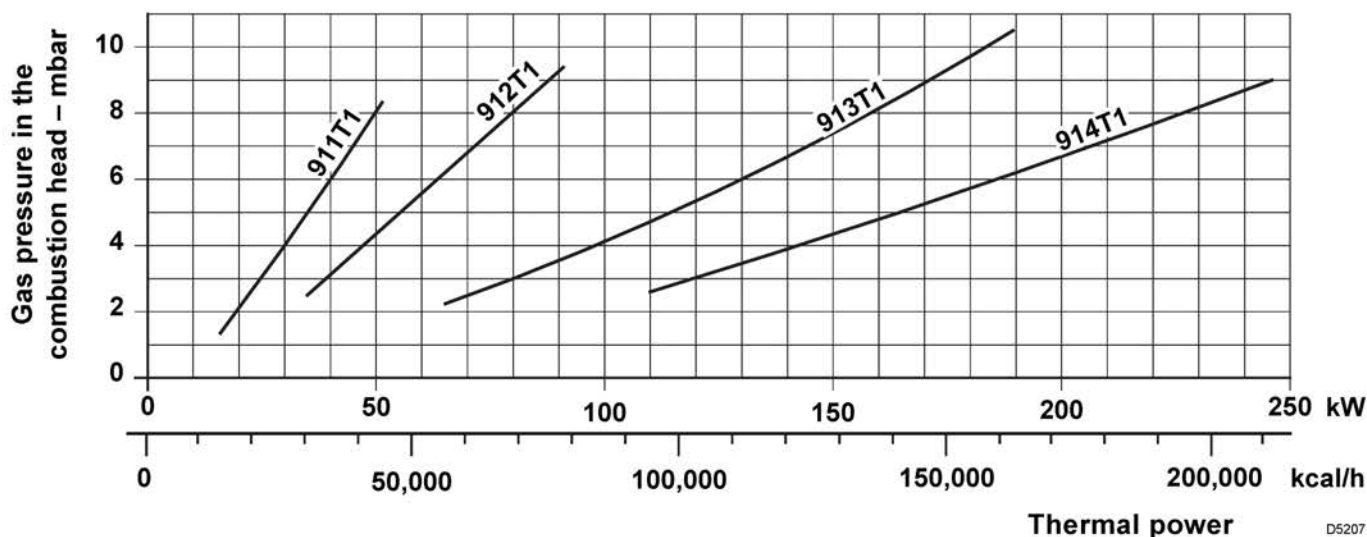
The working field has been defined according to EN 676 and LRV 92 standards.

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 9.3 mbar, relatively to 912T1 model, is measured (M2, see chapter 3.4, page 5) with the combustion chamber at 0 mbar using gas G20 with a net heat value of 10 kWh/Nm³ (8.570 kcal/Nm³).

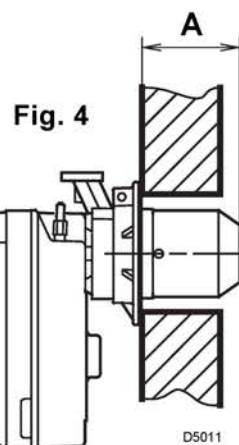
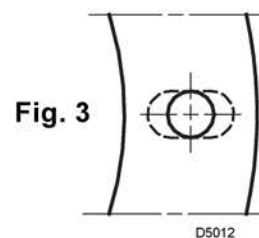
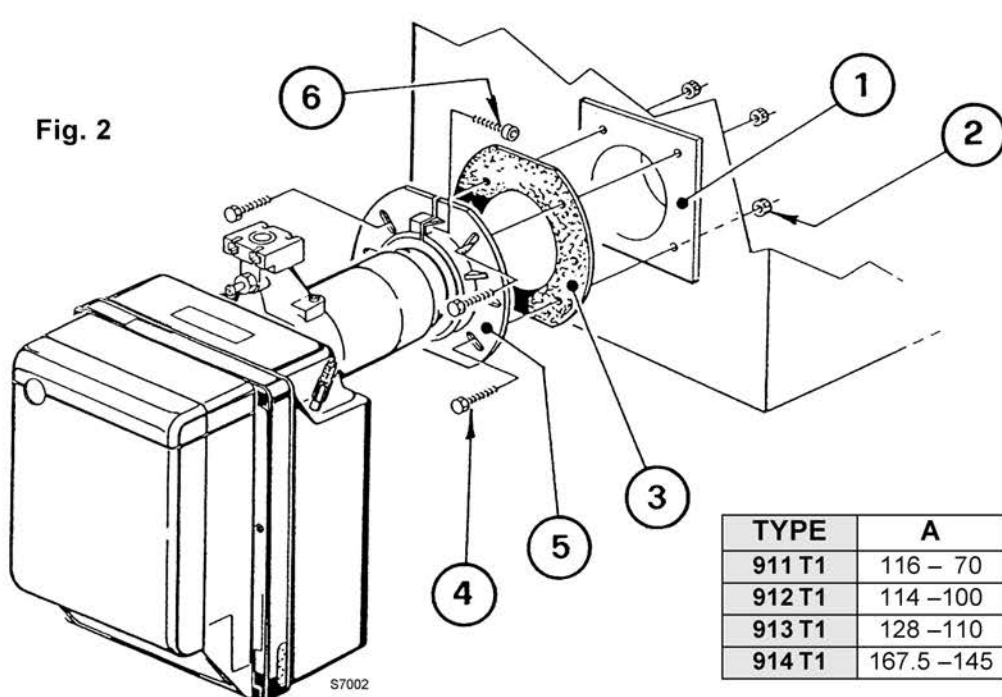


3. INSTALLATION

3.1 BOILER FIXING

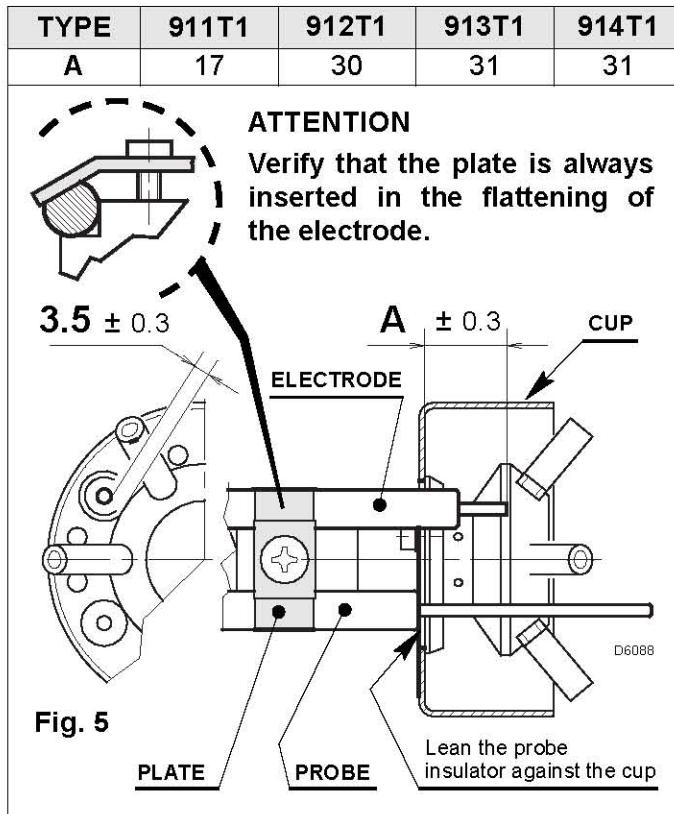
- ♦ Widen, if necessary, the insulating gasket holes (3) (see fig. 3).
- ♦ Fix the flange (5) to the boiler door (1) using four screws (4) and (if necessary) the nuts (2) **interposing the insulating gasket (3)** but keep unloosening one of the two upper screws (4) (see fig. 2).
- ♦ Put on the flange pos. 5 the burner combustion head, tighten the flange with the screws pos. 6 and lock the loose screw pos. 4.

N.B.: The burner can be fixed with the variable dimension (A) (see fig. 4). Anyway, make sure that the combustion head crosses completely the boiler door thickness.



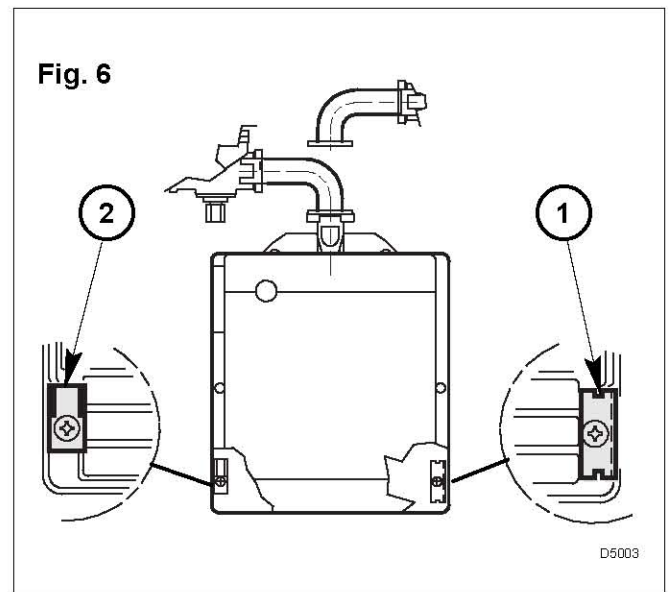
TYPE	A
911 T1	116 – 70
912 T1	114 – 100
913 T1	128 – 110
914 T1	167.5 – 145

3.2 PROBE - ELECTRODE POSITIONING



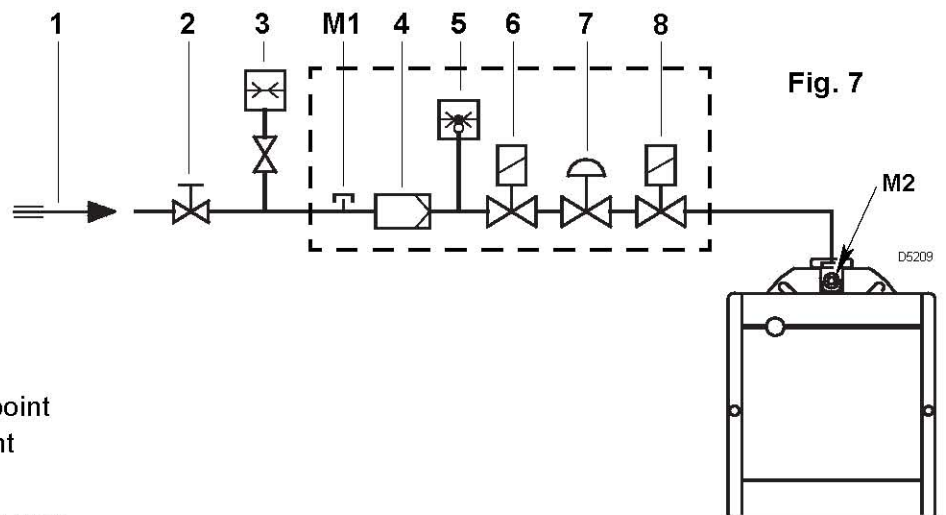
3.3 GAS FEEDING

According to the gas-train cables position on the right or left side of the burner, reverse both the closing plate (1) and the cable wrench (2) (see fig. 6).



3.4 GAS FEEDING LINE

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



GAS TRAIN ACCORDING TO EN 676

GAS TRAIN		MATCHED BURNER	CONNECTIONS		USE
TYPE	CODE		INLET	OUTLET	
MBDLE 055 D01	3970570	BS1	Rp 1/2	Flange 1	Natural gas and LPG
MBDLE 403 B01	3970545	BS1	Rp 1/2	Flange 1	Natural gas ≤ 40/45kW and LPG
MBDLE 405 B01	3970546	BS1	Rp 1/2	Flange 1	Natural gas and LPG
MBDLE 405 B01	3970547	BS2	Rp 3/4	Flange 2	Natural gas and LPG
MBDLE 407 B01	3970544	BS2	Rp 3/4	Flange 2	Natural gas and LPG
MBDLE 407 B01	3970548	BS3 - BS4	Rp 3/4	Flange 3	Natural gas ≤ 150kW and LPG
MBDLE 410 B01	3970549	BS3 - BS4	Rp 1 1/4	Flange 3	Natural gas and LPG
MBDLE 412 B01	3970550	BS3 - BS4	Rp 1 1/4	Flange 3	Natural gas

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

3.5 ELECTRICAL WIRING

230V ~ 50Hz

WARNING DO NOT EXCHANGE NEUTRAL WITH PHASE

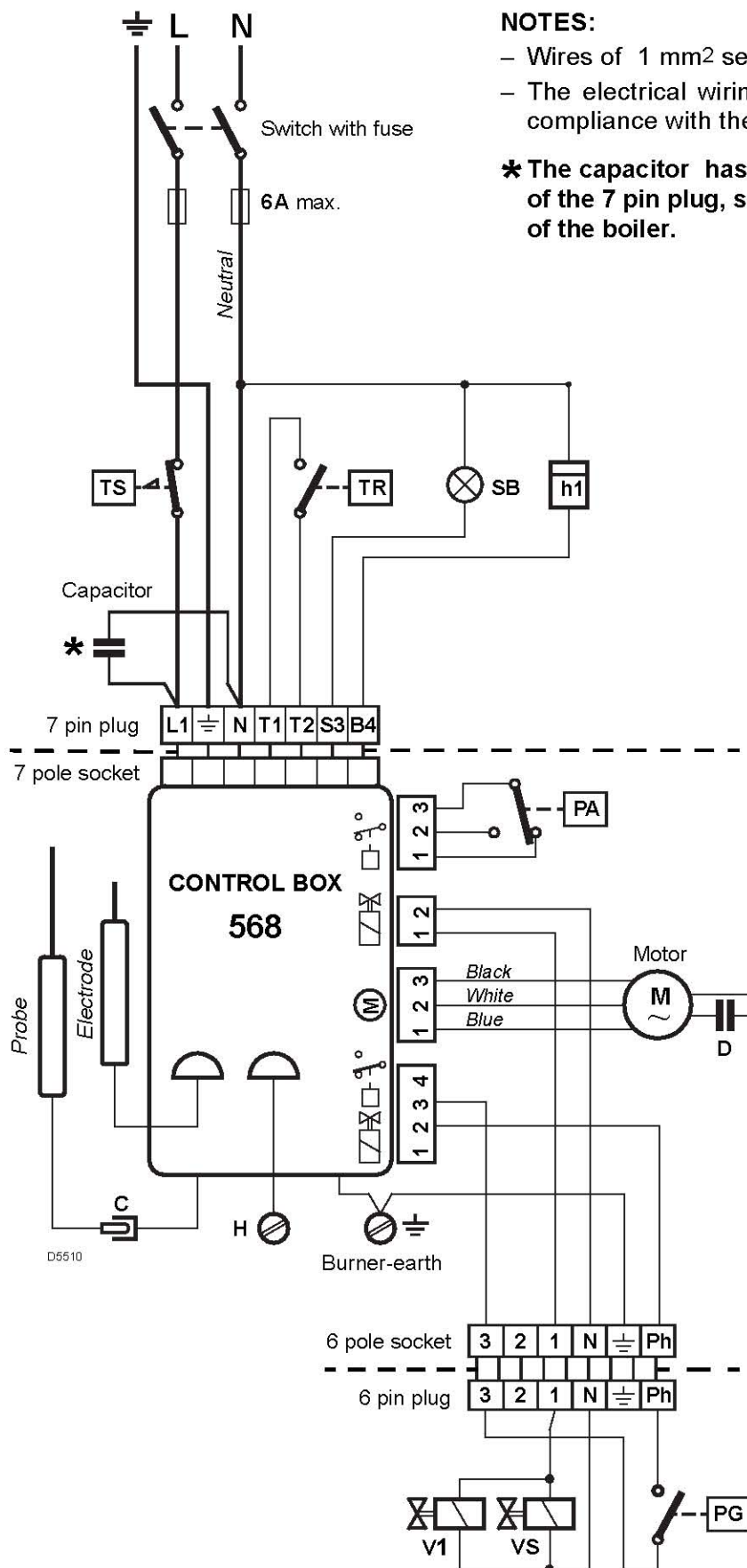
NOTES:

- Wires of 1 mm² section.
- The electrical wiring carried out by the installer must be in compliance with the rules in force in the country.

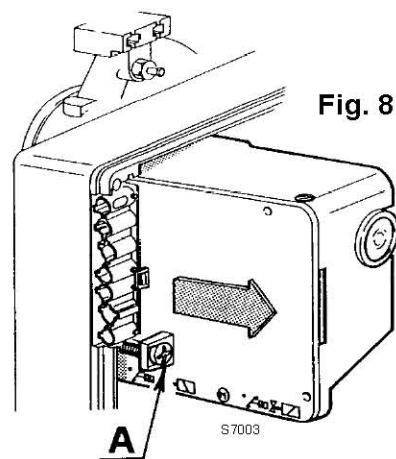
* The capacitor has to be connected to the L1 and N clamps of the 7 pin plug, supplied with the burner, or the 7 pin plug of the boiler.

TESTING:

Check the shut-down of the burner by opening the thermostats, the lock-out and the connector (C) inserted in the red cable of the probe placed outside of the control box.



- C – Connector - ionization probe
- D – Capacitor
- H – Earthing screw
- h1 – Hour counter
- PA – Air pressure switch
- PG – Minimum gas pressure switch
- SB – Lock-out lamp (230V - 0.5A max.)
- TR – Regulating thermostat
- TS – Limit thermostat with manual resetting
- VS – Safety valve
- V1 – Adjusting valve



To remove the control-box from the burner, loosen the screw (A, fig. 8) after removing all components, the 7 pin plug, the connector (C), the high tension cables and the earth wire (H).

In case of disassembly of the control box, retighten the screw (A) with a torque wrench setting of 1 – 1.2 Nm.

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.

COMBUSTION HEAD SETTING

It leaves the factory set for the minimum output.

It depends on the output of the burner and is carried out by rotating clockwise or counter-clockwise the setting screw (6) until the set-point marked on the regulating rod (2) is level with the outside plane of the head assembly (1) (see fig. 9).

NOTE

The diagram is orientative; to assure a good working of the burner, we suggest to adjust the combustion head according to the boiler.

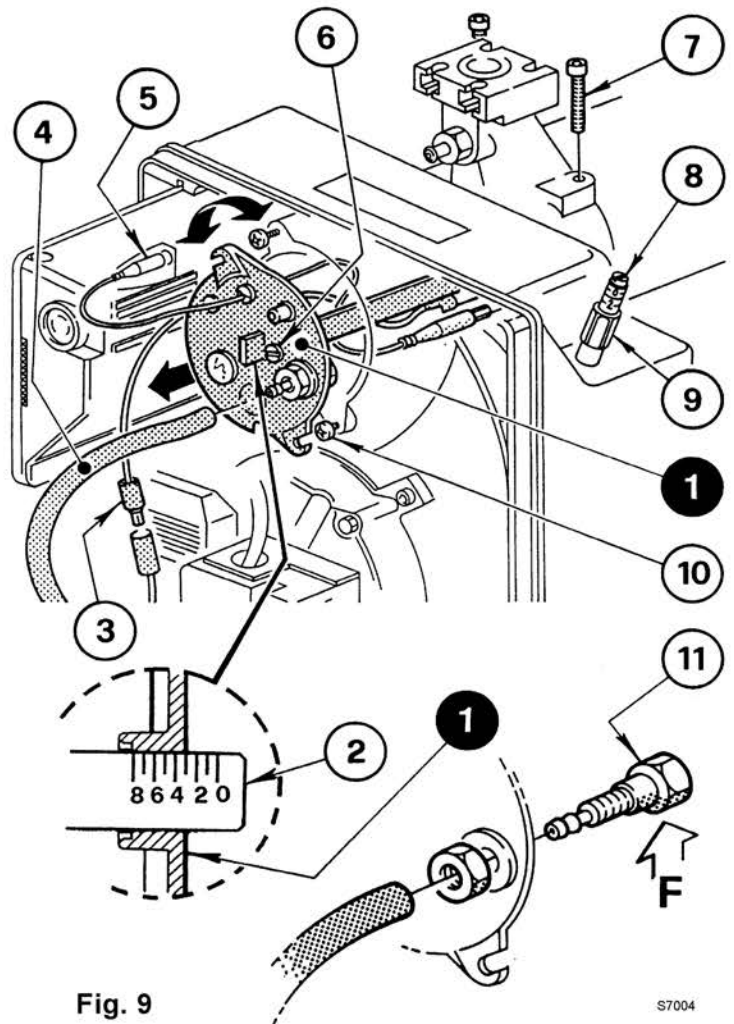


Fig. 9

S7004

HEAD ASSEMBLY REMOVING

To remove the head assembly, carry out the following operations:

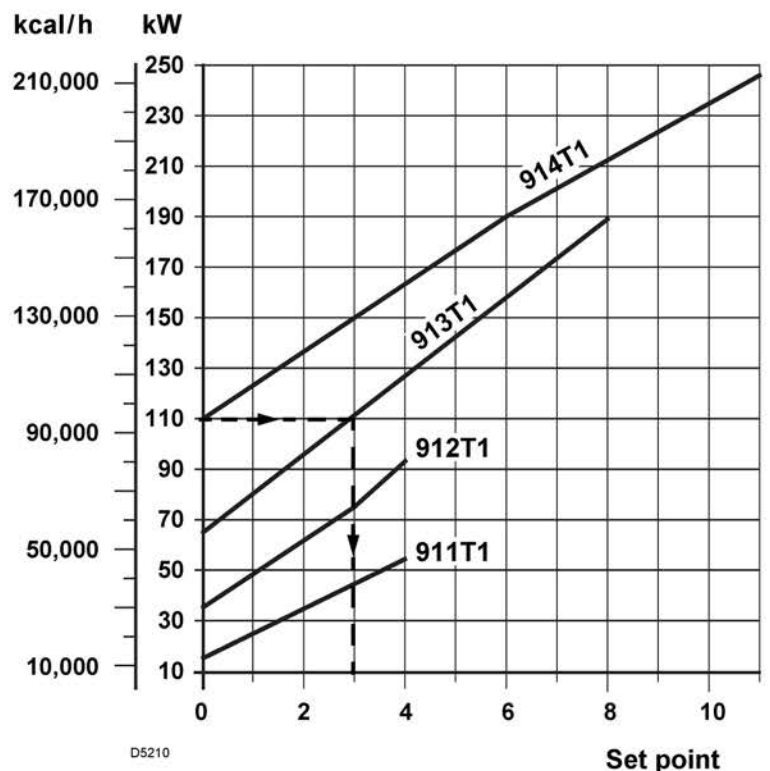
Remove the head-older assembly (1), after taking away the screws (7), disconnect the connections (3 and 5), extract the small tube (4) and loose the screws (10).

Do not modify the setting position of the bracket-elbow during the disassembly.

REASSEMBLY OF THE HEAD SYSTEM

WARNING

- During the reassembly of the system, tighten the screws (7) completely (*without locking them*); then lock them with a torque wrench setting of 3 - 4 Nm.
- Control that, during the working, there are not gas losses coming from the screws.
- If casually the pressure test point (11) loses, fix correctly and be sure that the hole (F), placed in the external side of the head-assembly (1) turns towards the lower part.



D5210

In the sketch at page 7, fig. 9 the combustion head is set for an output of 110 kW, with reference to the BS3 burner type 913T1.

The set point 3 marked of the regulating rod is at the same level with the outside plane of the head-assembly as indicated in the diagram.

Example: The BS3 burner type 913T1 is installed in a 100 kW boiler.
The burner will have to deliver about 110 kW, considering an efficiency of 90%.
The diagram indicates, that for this efficiency the adjustment has to be effected on the set-point 3.

AIR DAMPER ADJUSTMENT (Fig. 9, page 7)

It leaves the factory set for the minimum output.

To vary the setting adjust the screw (8) after loosing the nut. (9).
When burner shuts down the air damper automatically closes till a max. chimney depresseure of 0.5 mbar.

NOTE:
DO NOT CARRY OUT THE FIRST IGNITION WITH THE AIR DAMPER LOWER THAN SET POINT 1.

C In the BS4 model type 914T1, in order to guarantee the working with an output of 220 - 250 kW, remove the blank deadening to free the supplementary slits of the air inlet on the cover (see fig. 10).

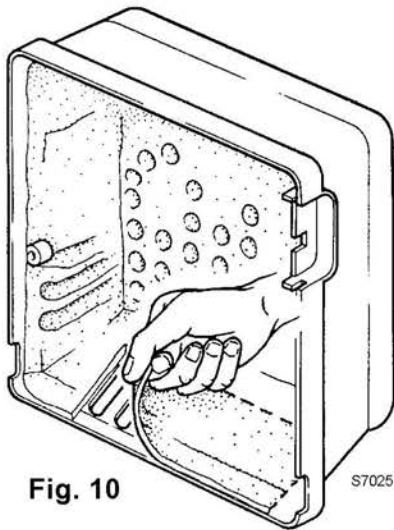


Fig. 10

4.2 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	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 necessary for the control box operation is 5 μ A.
The burner normally supplies a higher current value, so that no check is needed. Anyway, if you want to measure the ionization current, you have to open the connector (C) (see electrical scheme page 6) fitted on the wire and insert a microammeter. (See fig. 11).

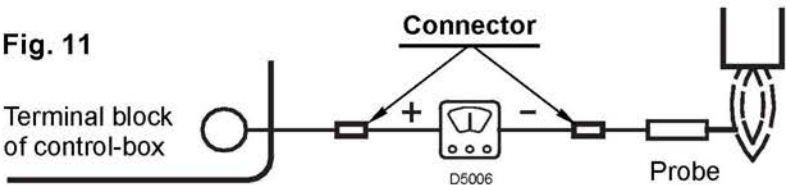


Fig. 11

4.3 BURNER START-UP CYCLE



A Lock-out is indicated by a lamp on the control box (4, fig. 1, page 1).

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

4.4 AIR PRESSURE SWITCH

Adjust the air pressure switch after having performed all other burner adjustments with the air pressure switch set to the start of the scale.

With the burner operating at the required power, slowly turn knob clockwise until burner locks out.

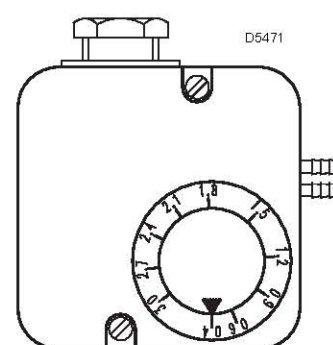
Then turn the knob anti-clockwise by about 20% of the set point and subsequently check to see if burner has started correctly.

If the burner locks out again, turn the knob anti-clockwise a little bit more.

Attention:

As a rule, the air pressure switch must prevent the air pressure from lowering below 80 % of the adjustment value as well as preventing the CO in the fumes from exceeding 1 % (10,000 ppm).

To check this, insert a combustion analyser into the chimney, slowly close the fan suction inlet (*for example with cardboard*) and check that the burner locks out, before the CO in the fumes exceeds 1 %.



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 (pos. 4, 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	POSSIBLE CAUSES	SOLUTION
The burner will not start when the adjustment thermostat closes.	Lack of electrical supply.	Check presence of voltage in the L1 - N clamps of the 7 pin plug.
		Check the condition of the fuses.
		Check that thermostat of max. is not lock out.
	Lack of gas.	Check the manual cock opening.
		Check that the valves change over to the opening position and there are not short circuits.
	The gas pressure switch does not close its contact.	Adjust them.
The burner runs normally in the prepurge and ignition cycle and locks out after about 3 seconds.	The connections in the control box are wrongly inserted.	Check and connect all the plugs.
	The air pressure switch is changed over to the operational position.	Replace the pressure switch.
	Phase and neutral connection is inverted.	Invert them.
	The earth connection lacks or is inefficient.	Make the earth connection efficient.
	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 the earth.	Check the right position and if necessary set it according to the instructions of this manual.
		Reset the electrical connection.
The burner starts with an ignition delay.	Replace the faulty connection.	
	The ignition electrodes is wrongly positioned.	Adjust it according to the instructions of this manual.
	Air output is too high.	Set the air output according to the instructions of this manual.
The burner locks out after the prepurge phase due to flame-failure.	Valve brake is too close with insufficient gas output.	Adjust it
	The solenoid valves is passing too little gas.	Check the pressure in the network and/or adjust the solenoid valve according to the instructions of this manual.
	The solenoid valves are defective.	Change them
	The ignition arc is irregular or has failed.	Check the right insertion of the connectors.
		Check the right position of the electrode according to the instructions of this manual.
	The pipe has not been purged from the air.	Carry out a complete breathing of the line of gas-supply.

FAULTS	POSSIBLE CAUSES	SOLUTION
The burner locks out during the prepurge phase.	The air pressure switch does not change over to the operational position.	The pressure switch is faulty, change it.
		The air pressure is too low, (the head is bad adjusted).
	The flame exists.	Faulty valves: replace them.
	The pressure test point (pos. 11, fig. 9, page 7) is badly positioned.	Place it in the right position according to the instructions of this manual on page 7, chapter 4.1.
The burner continues to repeat the starting cycle without going on lock-out.	The gas pressure in the gas-mains lies very close to the value to which the gas pressure switch has been set. The sudden falling-off pressure at the opening of the valve causes the opening of the pressure switch. However this only temporarily, because the valve immediately closes again, so then does the pressure switch, because the pressure builds-up again, causing the cycle to be repeated over and over.	Lower and set the pressure switch.

OPERATING FAULTS

Burner lock-out due to :

- Flame failure
- Earth probe
- Air pressure switch opening

Burner shut down due to :

- Gas pressure switch opening.