Newtronic 2RS, 3RS & 4RS

ROCA
BAXI GROUP

E

Quemadores de gasóleo

Instrucciones de Instalación
Montaje y Funcionamiento
para el **INSTALADOR**

D

Öl-Gebläsebrenner

Installations-, Montage-
und Betriebsanleitung
für den **INSTALLATEUR**

GB

Light oil burners

Installation, Assembly,
and Operating Instructions
for the **INSTALLER**

I

Bruciatore di gasolio

Istruzioni per l'Installazione,
il Montaggio e il Funzionamento
per l'**INSTALLATORE**

F

Brûleurs fioul

Instructions d'Installation,
de Montage et de Fonctionnement
pour l'**INSTALLATEUR**

P

Queimadores de gasóleo

Instruções de Instalação,
Montagem e Funcionamento
para o **INSTALADOR**

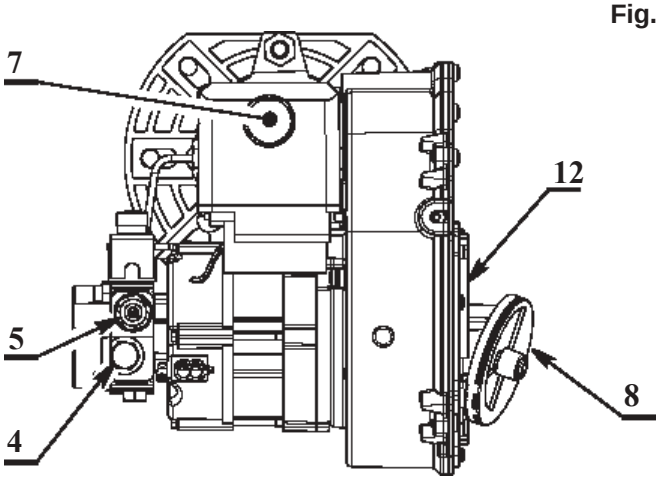
INDEX

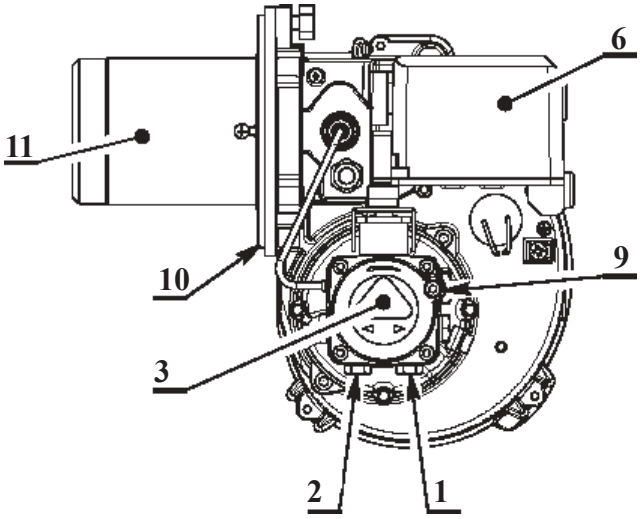
1. BURNER DESCRIPTION

Single-stage Oil Burner.

- These burners are certified to comply with the essential requirements of the Electromagnetic Compatibility Directive 89/336/EEC and the Energy Efficiency Directive 92/42/EEC, and are therefore permitted to carry the CE mark.
- CE Reg. No.....according to 92/42/EEC.

Fig. 1





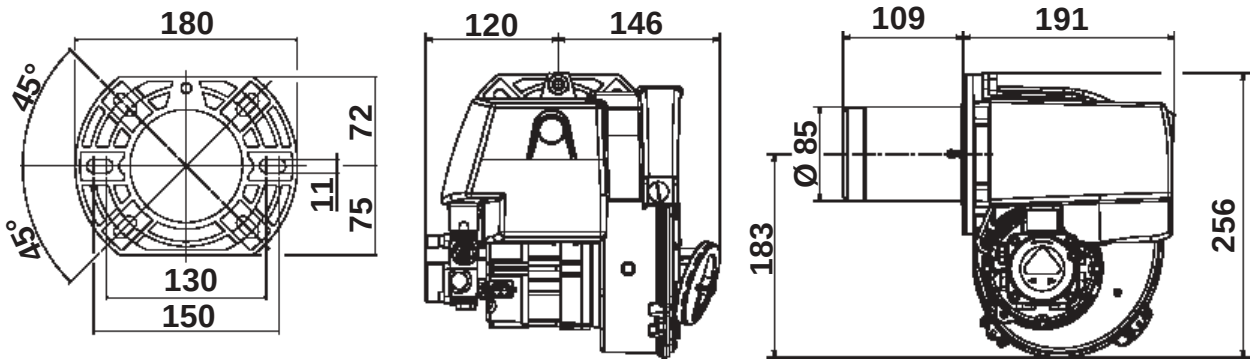
1 – Return
2 – Suction
3 – Fuel pump
4 – Vacuum gauge connection
5 – Pump pressure regulator
6 – Control box
7 – Reset button with lockout indicator lamp
8 – Air damper
9 – Vacuum gauge connection
10 – Flange with insulating gasket
11 – Blast tube
12 – Air Control Assembly (ACA)

2. TECHNICAL DATA

2.1. TECHNICAL DATA

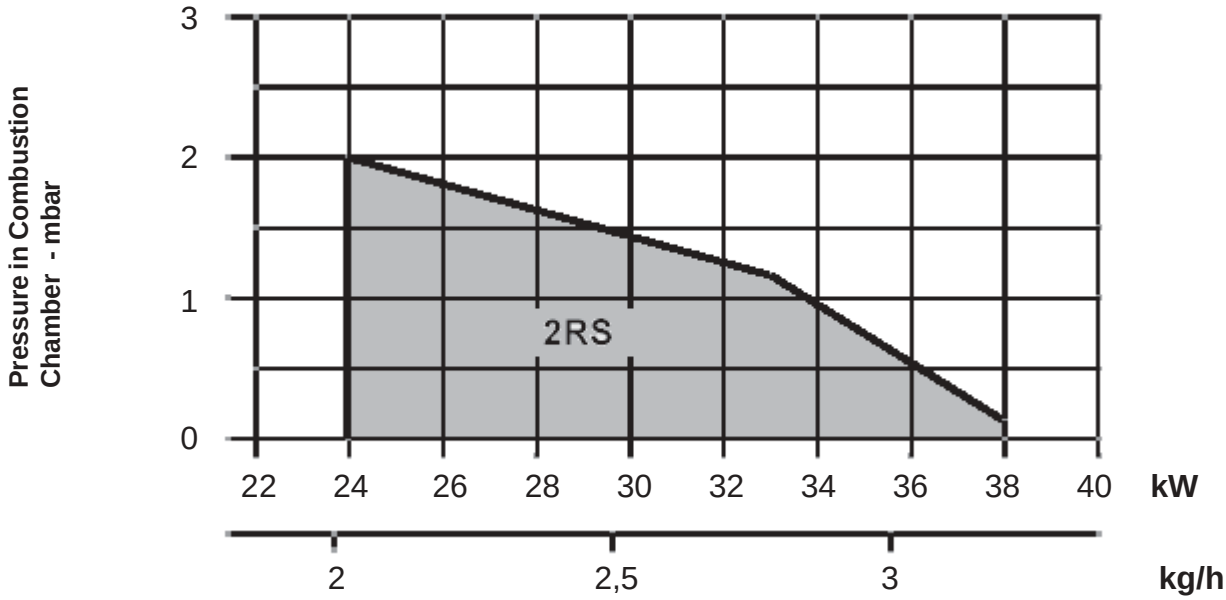
MODEL	Newtronic 2RS, Newtronic 3RS	Newtronic 4RS
Flow rate - Output	2.0 ÷ 3.2 kg/h - 24 ÷ 38 kW	2.8 ÷ 3.9 kg/h - 33.2 ÷ 46.2 kW
Fuel	Oil viscosity 4 ÷ 6 mm^2/s a 20°C (Hi = 11.86 kW/kg)	
Power supply	Single-phase, ~ 50 Hz 230V ± 10%	
Motor	0.75A input - 2,800 r.p.m. - 294 rad/s	
Capacitor	4,5 μf	
Ignition transformer	Secondary 8 kV - 16 mA	
Pump	Pressure: 7 ÷ 15 bar	
Power input	0.15 kW	

2.2 DIMENSIONS

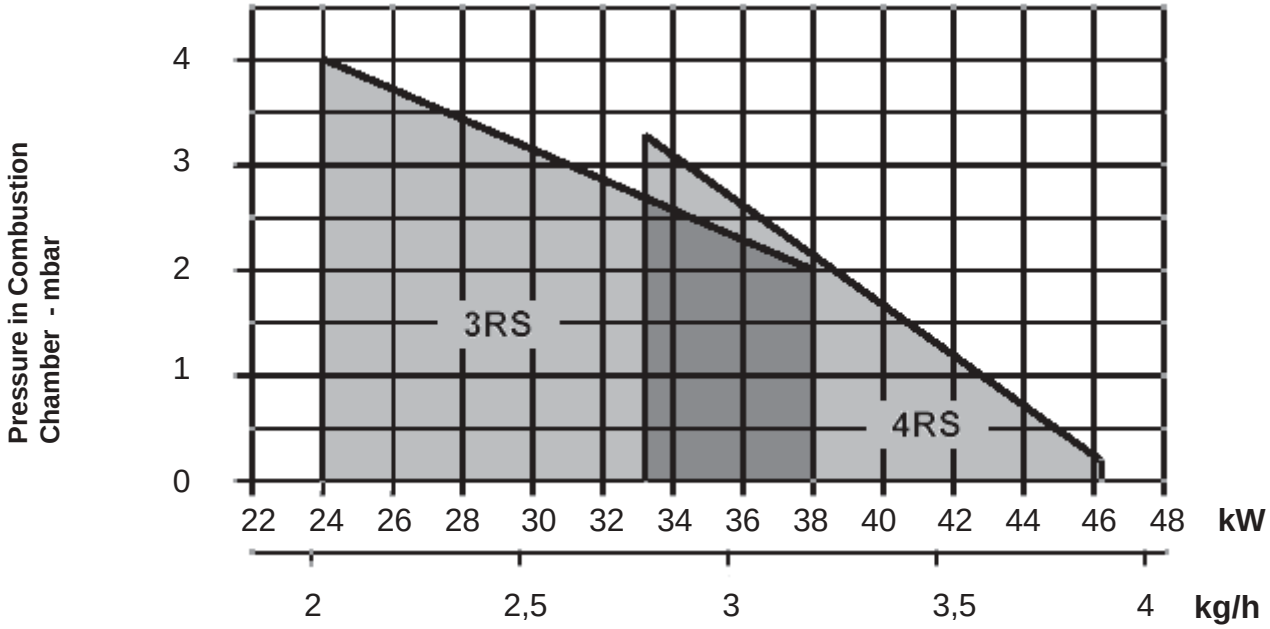


2.3. FIRING RATES (acc. to EN 267)

VERSION WITHOUT BAFFLE



VERSION WITH BAFFLE



3. INSTALLATION

3.1. FIXING TO THE BOILER

- To fasten the flange to the burner, insert the bolt and the two nuts provided in the flange (1). See Fig. 4.
- If necessary, widen the holes in the insulating gasket (2, Figure 5), taking care not to damage it.
- Fix the flange (1) to the boiler door (5, Fig. 6) using the bolts (3) and (*if necessary*) the nuts (4), **interposing the insulating gasket** (2).

Fig. 4

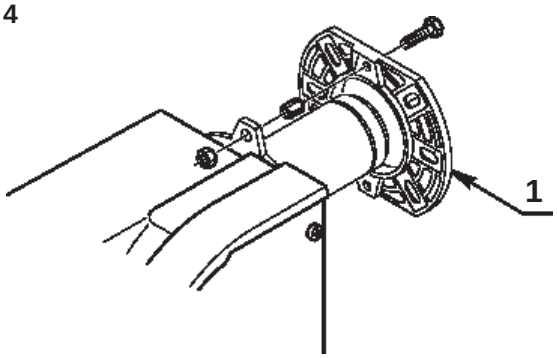


Fig. 5

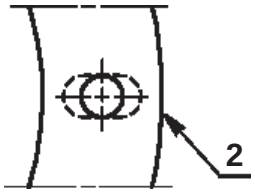
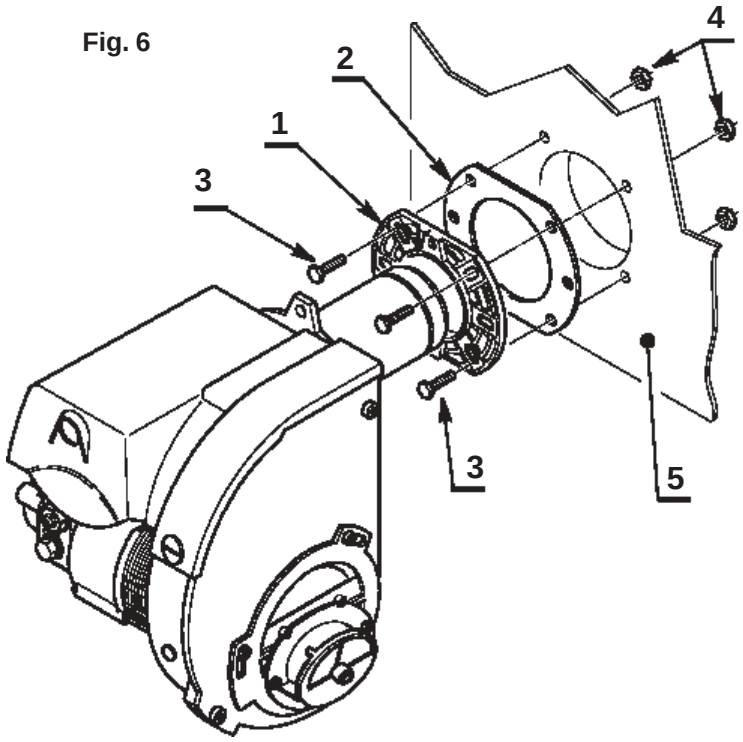


Fig. 6



3.2 HYDRAULIC SYSTEM

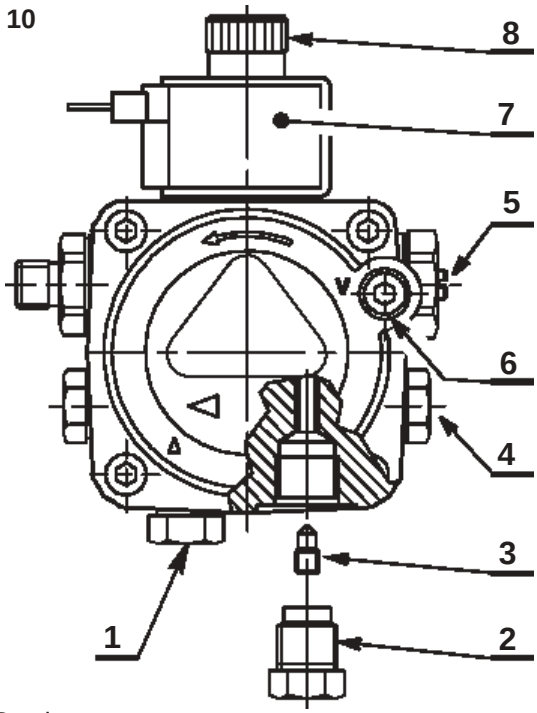
A filter should be installed in the fuel supply line.

PUMP (see Fig. 10)

- The pump has been designed to operate on two-pipe systems.
- Before starting the burner, make sure that the return fuel line is not clogged.
  An excessive back-pressure (= 1 bar) would cause the pump shaft seal to break, with the subsequent loss of fuel inside the burner.
- For single-pipe operation, the return plug (2) should be unscrewed, the by-pass screw (3) removed and then the plug (2) screwed back with a torque of 0.5 Nm.

The pump features a flow pressure regulator (5). The pressure increases if it is turned clockwise and it decreases if it is turned anticlockwise. The indicator sensitivity is about 1 bar per turn.
The pressure is adjustable between 7 ÷ 15 bar.
It is advisable not to loosen the knob (8) and check its tightness periodically for safety reasons.

Fig. 10



1 – Suction
2 – Return
3 – By-pass screw
4 – Pressure gauge conn.
5 – Pressure regulator
6 – Vacuum gauge conn.
7 – Valve
8 – Knob

PRESSURE SINGLE-PIPE SYSTEM (Fig. 11 and 12)

Pressure single-pipe systems display a positive fuel pressure at burner inlet.
Their tank is usually at a higher level than the burner or fuel pumping system external to the burner.
Figure 12 shows a connection with loop circuit under pressure, regardless of the position of the loop feeding tank.

INSTALLATION NOT PERMITTED IN GERMANY

Fig. 11

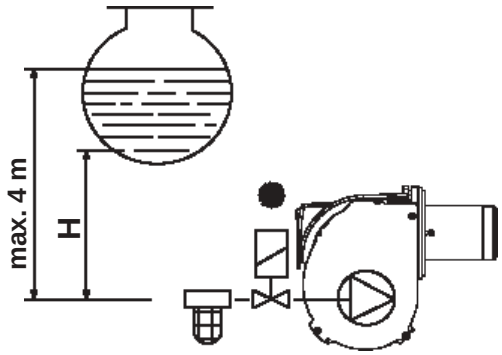
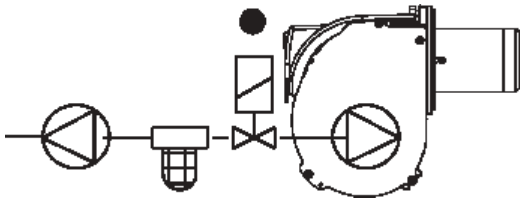


Fig. 12

H m.	L m.	
	Ø ID 8 mm	Ø ID 10 mm
0.5	10	20
1	20	40
1.5	40	80
2	100	60



- **VALID FOR ITALY ONLY:**

Automatic shut-off device according to a circular from the Ministry of the Interior No. 73 of 29/7/71.

The installer must guarantee that the supply pressure does not exceed 0.5 bar.
Above this value, the pump shaft seal is subjected to undue stress.

H = Difference in level; **L** = Max. length of suction line; **Ø ID** = Inside diameter of tubing.

The table in Fig. 11 shows the maximum lengths for fuel supply lines according to the difference in level and the length and size of the fuel line.

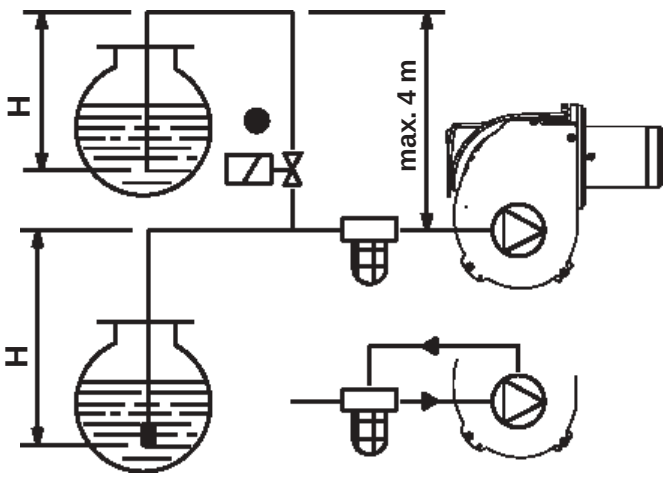
PUMP PRIMING

It is sufficient to loosen the vacuum gauge connection (6, Fig. 10) and wait until oil starts flowing out.

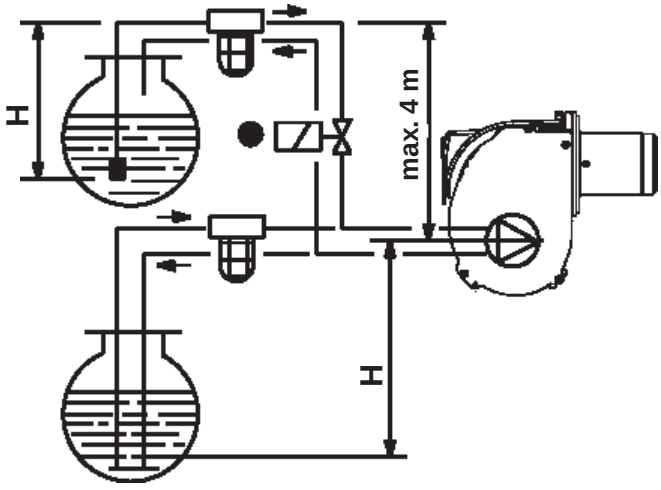
NEGATIVE PRESSURE SYSTEM (Fig. 13 and 14)

These installations present a negative pressure of fuel at burner inlet. In these cases, the tank is usually at a higher level than the burner.

SINGLE-PIPE SYSTEM Fig. 13



TWO-PIPE SYSTEM Fig. 14



● **VALID FOR ITALY ONLY:**
Automatic shut-off device according to a circular from the Ministry of the Interior No. 73 of 29/7/71.

The installer must guarantee that the supply pressure does not exceed 0.4 bar (30 cm Hg).
Above this value, gas is released from the oil.

H = Difference in level;
L = Max. length of suction line;
ID = Inside diameter of tubing

H m.	L m.	
	Ø ID 8 mm	Ø ID 10 mm
0	35	100
0.5	30	100
1	25	100
1.5	20	90
2	15	70
3	8	30
3.5	6	20

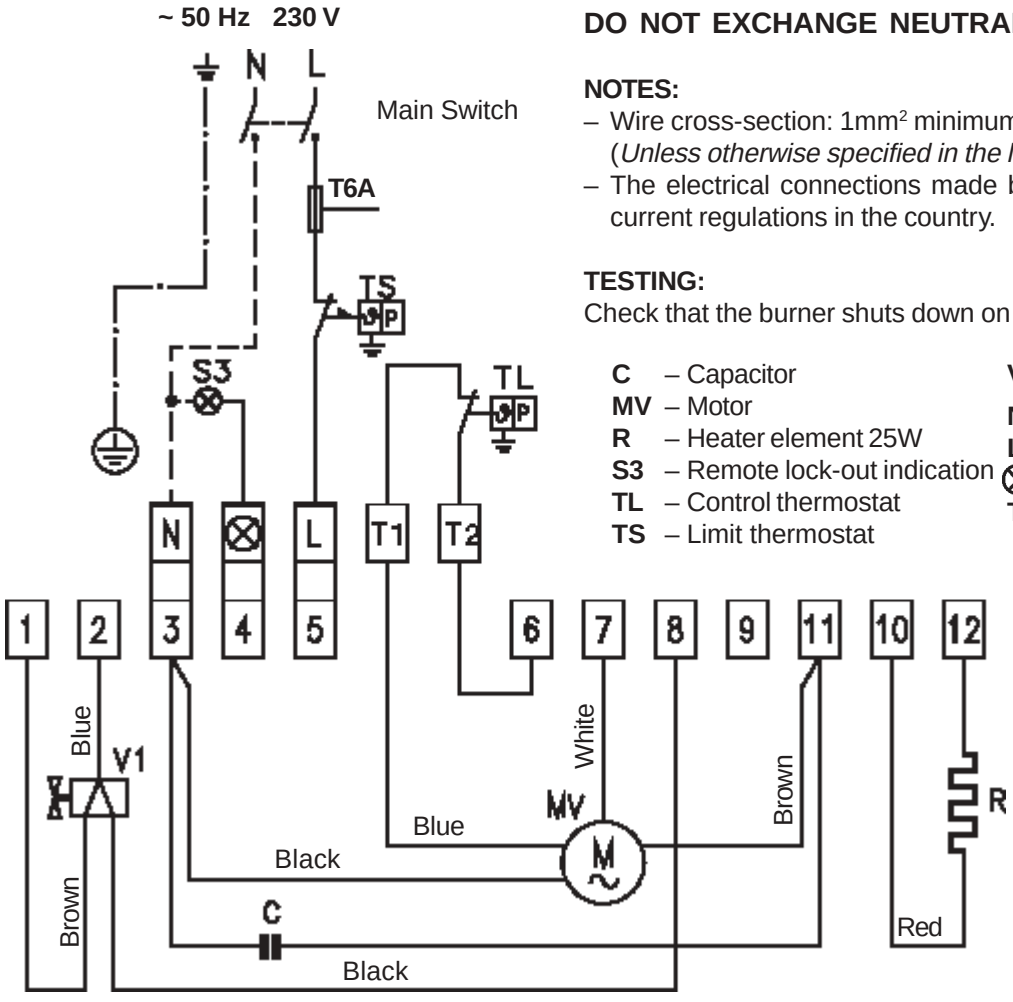
The table in Fig. 13 and 14 shows the maximum lengths for fuel supply lines according to the difference in level and the length and size of the fuel line.

PUMP PRIMING

In systems such as those depicted in Fig. 13 and 14, start the burner and wait until the pump is primed.
Should the burner lock out prior to the arrival of fuel, then wait at least 20 seconds before attempting to start it up again.

In two-pipe negative-pressure systems (Fig. 14), the return line should arrive at the same height as the suction line. In this case, a foot valve is not necessary.
But if the return line arrives above the fuel level, the foot valve is indispensable. The latter solution, however, is not as safe as the preceding one because of the possible lack of leaktightness of the valve.

3.3 CONNECTION SCHEMATIC



WARNING:
DO NOT EXCHANGE NEUTRAL WITH PHASE.

NOTES:
– Wire cross-section: 1mm² minimum.
(*Unless otherwise specified in the local laws or regulations)*
– The electrical connections made by the installer should conform to current regulations in the country.

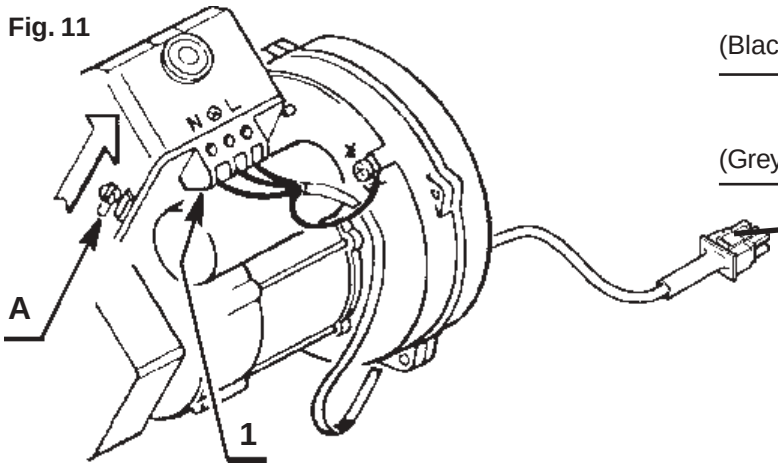
TESTING:
Check that the burner shuts down on opening the thermostats.

C – Capacitor
MV – Motor
R – Heater element 25W
S3 – Remote lock-out indication
TL – Control thermostat
TS – Limit thermostat
V1 – Solenoid valve
N – Neutral
L – Live
⊗ – Lock-out indication
T1, T2 – Limit thermostat Terminals

Control Box 531SE/E
Terminal Strip

CONTROL BOX (Fig. 11)
To withdraw the control box from the burner, remove the screw (A) and pull in the direction of the arrow.

Fig. 11



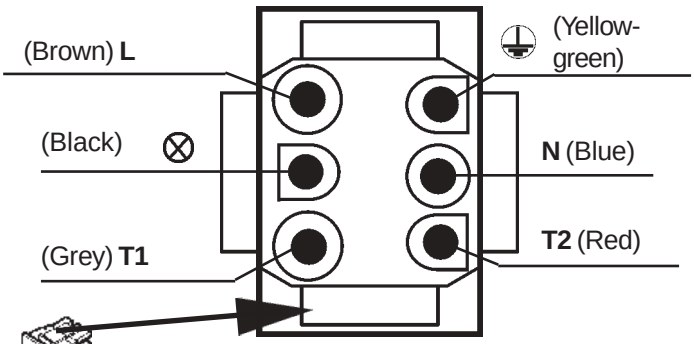
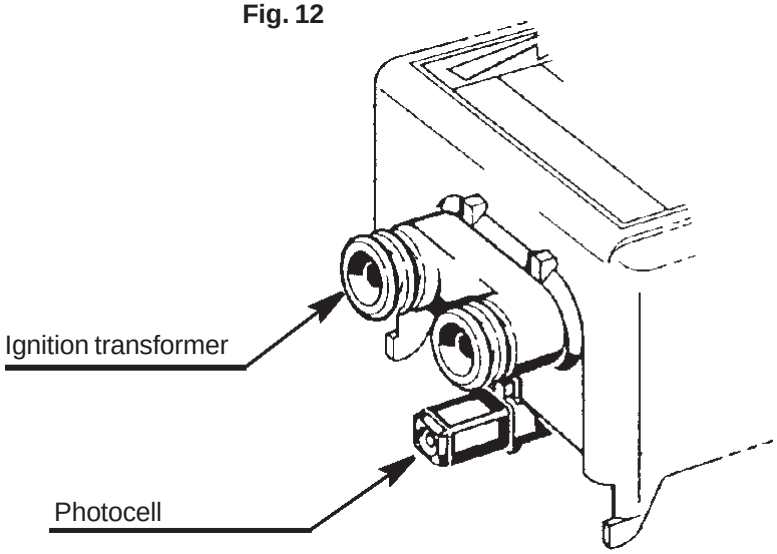


Fig. 12



ACCESS TO THE PHOTOCELL (see Fig. 12)
The photocell is located directly above the control box (under the ignition transformer) on a quick-connect bracket.

4. OPERATION

4.1 COMBUSTION SETTINGS

In conformity with the Energy Efficiency Directive 92/42/EEC, coupling the burner to the boiler, adjustments and testing must be carried out observing the directions laid out in the boiler's Instruction Manual, including checking the concentration of CO and CO_2 in the flue gases, their temperature and the mean temperature of the water in the boiler. Based on the fuel flow rate called for by the boiler, determine: the nozzle, the pump pressure and the air damper opening (see Table below).
The values shown in the tables have been obtained with CEN boilers (acc. to EN 303) and are based on a 12.5% CO_2 at sea level and with an oil temperature of 20 °C.

VERSION WITHOUT BAFFLE												
MODEL	Nozzle		Pump Pressure		Burnout Fuel		Air Damper Adjustment				Air Pressure at Combustion Head	
							CF		BF		CF	BF
	GPH	Spray Angle	CF	BF	CF	BF	ACA*	Damper	ACA*	Regulator	mbar	
			bar		kg/h ± 4%		Index	Index	Index	Index		
2RS	0.50	60°W	14		2.0		1	1.5	1	2	1.3	1.4
	0.60	60°W	12		2.3		1	2.4	1	2.75	1.6	
	0.65	60°W	12		2.5		1	3.2	1	4	2.0	
	0.75	60°W	12		2.9		1	4.1	1	5.5	2.3	2.3
	0.75	60°W	14		3.2		1	5.3	1	10	2.9	2.60

VERSION WITH BAFFLE												
MODEL	Nozzle		Pump Pressure		Burnout Fuel		Air Damper Adjustment				Air Pressure at Combustion Head	
							CF		BF		CF	BF
	GPH	Spray Angle	CF	BF	CF	BF	ACA*	Damper	ACA*	Regulator	mbar	
			bar		kg/h ± 4%		Index	Index	Index	Index		
3RS	0.50	60°W	14		2.0		4	0.6	4	1	1.3	1.4
	0.60	60°W	12		2.3		4	1.4	4	1.5	1.7	
	0.65	60°W	12		2.5		4	1.7	4	1.75	1.9	2.0
	0.75	60°W	12		2.9		4	2.4	4	2.5	2.4	
	0.75	60°W	14		3.2		1	3.1	1	3.5	2.9	
4RS	0.75	60°W	11		2.8		4	2.3	4	2.5	1.9	
	0.85	60°W	12		3.3		4	3.4	4	3.75	2.4	
	1.00	60°W	12		3.9		2	4.4	2	10	3.2	3.0

ACA* = Air Control Assembly

4.1 RECOMMENDED NOZZLES

Delavan, type W; Danfoss, type S.
Spray Angle: **60°** – In most cases.
80° – In case the flame goes out in low-temperature firing conditions.

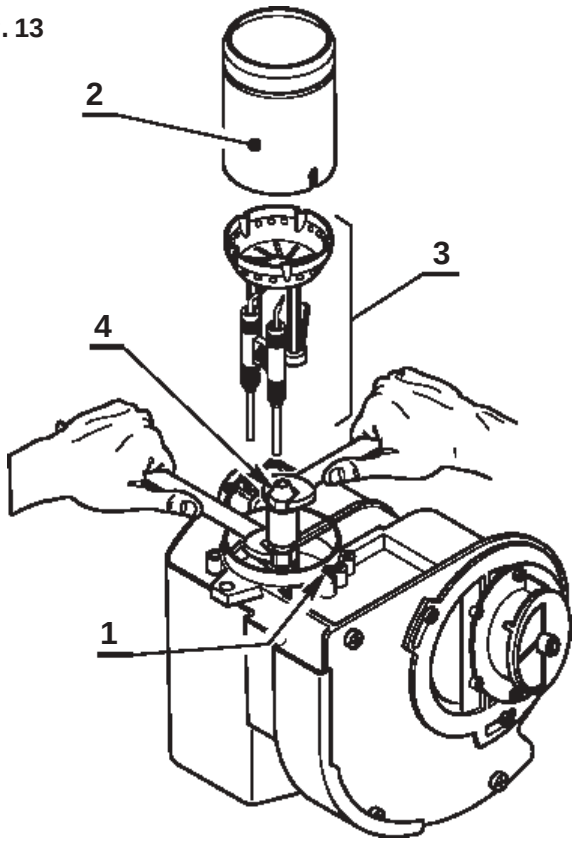
4.3 PUMP PRESSURE

12 bar: The pump is delivered factory-set at this pressure.
14 bar: The flame holds on to the diffuser plate better.
It is, therefore, appropriate for low-temperature firing conditions.

4.4. NOZZLE CHANGEOVER

- Withdraw the burner from the boiler after undoing the flange locknut.
- Place the burner on a supporting base, as shown in Fig.13.
- Loosen the two screws (1) and pull out the blast tube (2).
- Withdraw the electrode/diffuser plate holder assembly (3) from the nozzle holder assembly, after undoing the screw (3, Fig. 14).
- Screw the nozzle (4) on and tighten it as shown in Fig.13.
- Refit all the parts in reverse order to that described above.

Fig. 13



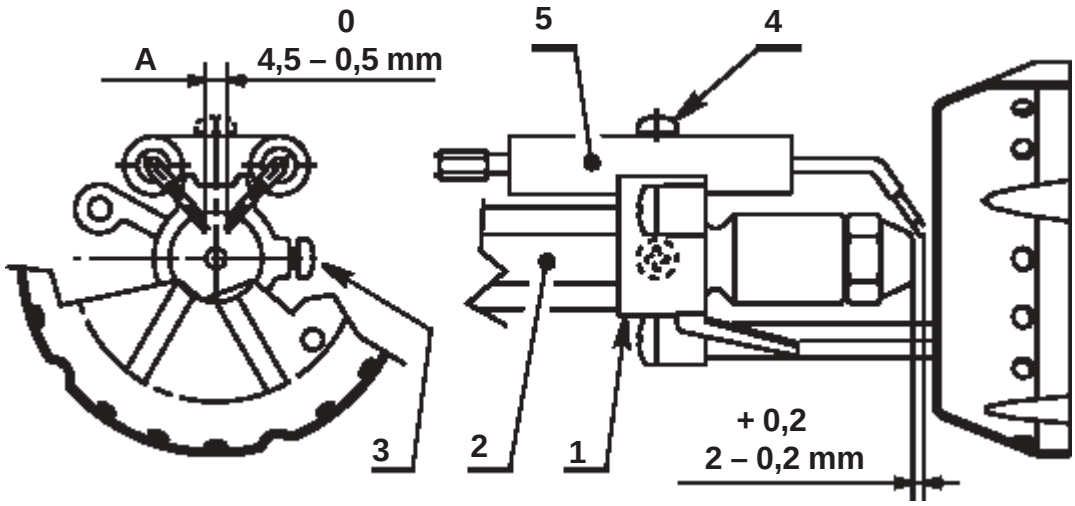
4.5. ELECTRODES SETTING

To gain access to the electrodes, carry out the operations described in chapter "**4.4 NOZZLE CHANGEOVER**".

Note:
The electrode gap A is not adjustable.
In case of malfunction, please ensure that the gap is observed.

For other adjustments, proceed as follows:
- Situate the electrode/diffuser plate holder assembly (1) in the nozzle holder (2) and lock in position with the screw (3).
- If future adjustments were necessary, loosen the screw (4) and move the electrode assembly (5).

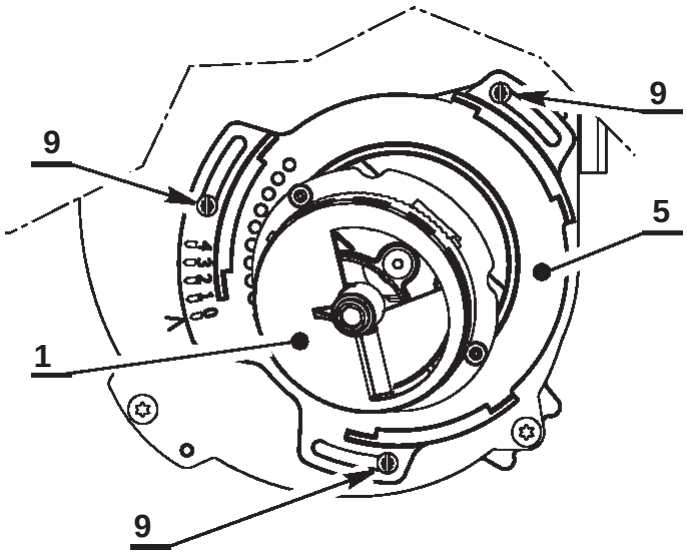
Fig. 14



4.6. AIR FLOW ADJUSTMENT CF/BF (Fig. 15)

CF APPLICATIONS

Fig. 15



AIR DAMPER ADJUSTMENT
This is done by turning the damper (1). If turned clockwise, the air flow is restricted, thus causing the CO_2 value to rise; and vice versa if it is turned anticlockwise.
The settings shown in the tables on page 10 are for guidance only.
Every system has unforeseeable operating conditions: effective nozzle delivery rate, positive or negative pressure in the combustion chamber, excess air supply, etc.
All these conditions may require a different air damper adjustment.

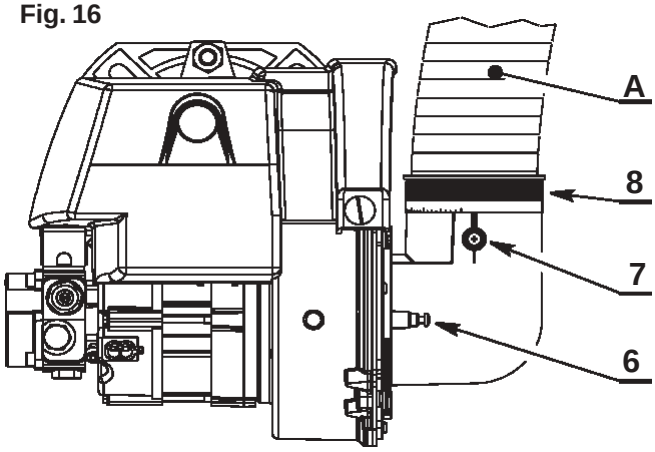
NOTE:
- **Under no circumstances should the air inlet in the damper area be obstructed (1, Fig. 15).**
- **Access to the interior of the air damper suction port (1, Fig. 15) using your fingers or tools is strictly forbidden.**
- Check the position of the air control assembly (ACA) and air damper as shown in the tables on page 7.
- Check the Bacharach Index and the CO_2 level (%).

BF APPLICATIONS

To adjust the air flow, proceed as follows:

- Lock in position by tightening the screw (7) with a torque of 0.8 Nm.
- Loosen the screw (7) and turn the ring (8) until the desired setting is achieved.

Fig. 16

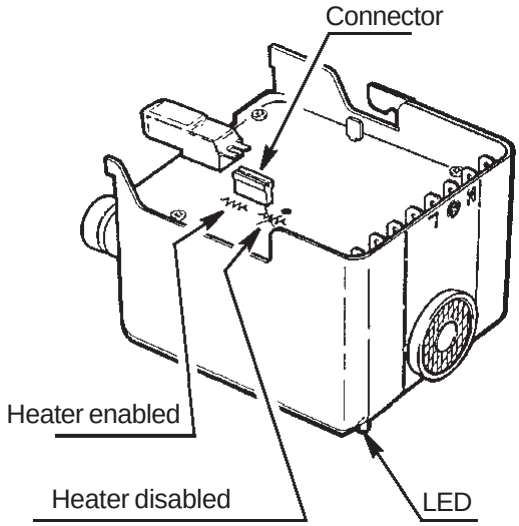


4.7 FUEL HEATING

To assure ignition and regular operation, even with low flow rates or temperatures, the burner features a heater element to warm up the oil at the combustion head.
This heater element is enabled when the thermostats close. Following a time lapse of between one and a half and two and a half minutes -- and depending on the ambient temperature -- the motor starts up. The heater element remains ON and is turned off when the burner shuts down.

NOTE:
If the heater element were to be dispensed with (*during burner setting operations, if the ambient temperature does not call for it, etc.*), take out the connector in the panel of the control box and reconnect it to "**Heater Disabled**" (see Fig. 17_1). In this case, the burner will start up on closing the thermostats.
NOTE:
The pilot light (LED) is 'on' when the heater element is working; and it is 'off' when the heater element is idle or faulty.

Fig. 17



4.8 TROUBLESHOOTING THE FUEL HEATING SYSTEM

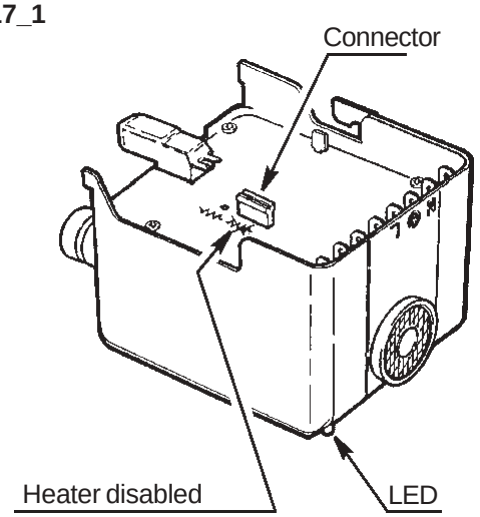
STANDARD BURNER OPERATION

The connector inserted in the control box panel is in the "**Heater Enabled**" position (see Fig. 17). When the thermostat closes, the LED lights up and after two minutes the burner starts up.

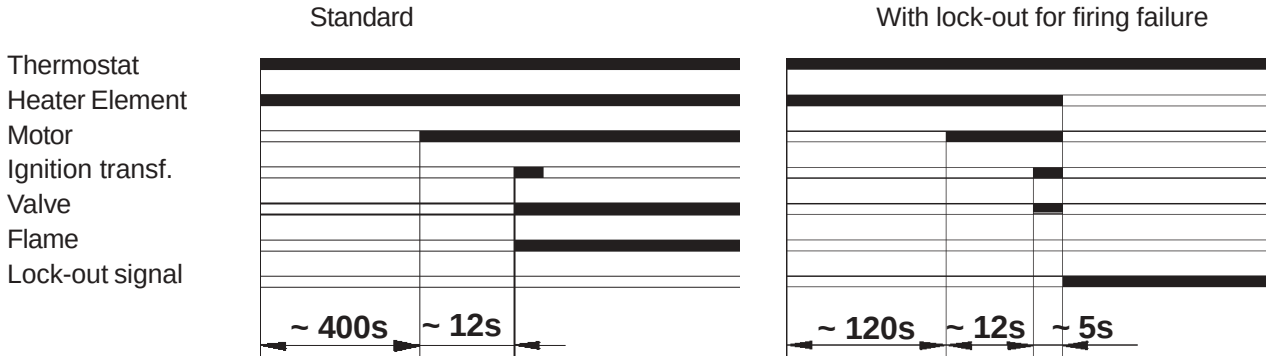
FAULTY BURNER OPERATION

1) If the LED is 'off', it means that the heater element at the nozzle-holder is cut off.
2) If the LED is 'on', but nonetheless the burner motor fails to start, switch the connector to the "**Heater Disabled**" position (see Fig. 17_1).
If the motor starts, it means that the retarder located in the control box is faulty.
3) If the motor fails to start, it means that there is nothing wrong with the retarder, nor with the heater element, but with some other component.

Fig. 17_1



4.9 BURNER START-UP CYCLE



5. MAINTENANCE

The burner requires periodic maintenance, which must be carried out by a qualified technician **in conformity with local laws and regulations**.
Regular maintenance is essential for reliable burner operation, thus avoiding undue fuel consumption and reducing emissions of pollutants.
Before carrying out any cleaning or control operations, always isolate the electricity supply to the burner by turning off the main disconnect switch in the system.

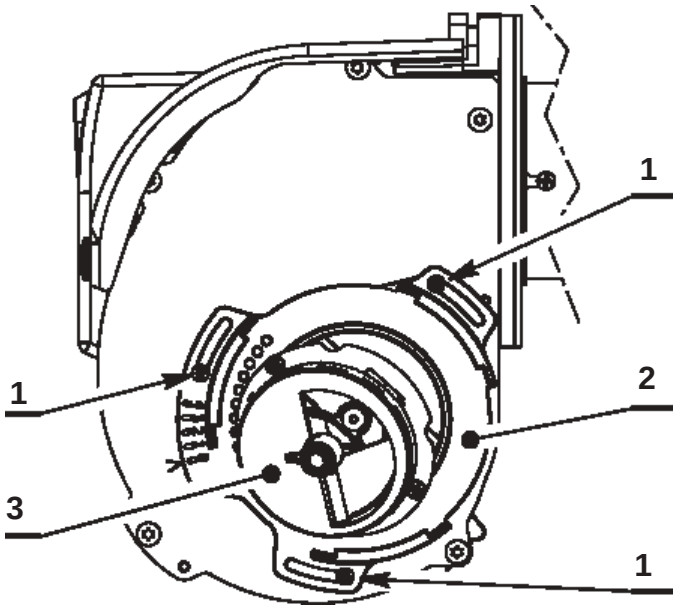
THE BASIC CHECKS TO BE PERFORMED ARE:

- Check that there are no obstructions or restrictions in the fuel supply and return lines.
- Clean the filters in the fuel suction line and in the pump.
- Clean the photocell (see Fig. 12, page 7).
- Check fuel consumption.
- Replace the nozzle (4, Fig. 13, page 8) and check the electrode gap (Fig. 14, page 9).
- Clean the combustion head at the fuel outlet.
- Let the burner run at full output for about ten minutes, properly adjusting all the devices mentioned in this manual. Then carry out a flue gas analysis, and check:

- The temperature of flue gases;
- The CO level (ppm);
- The CO_2 level (%);
- The Smoke Number, measured on the Bacharach scale.

5.1 ACCESS TO THE FAN IMPELLER (See Fig. 18)

Fig. 18



N.B.

- **Carry out the maintenance operations only if necessary, taking great care not to damage or unbalance the impeller during cleaning operations.**
- **Take note of the original position of the air control unit before carrying out any operations.**

Proceed as follows:

- Undo the three screws (1) and detach the air control assembly (2). It is now possible to clean the impeller by vacuuming any dirt or foreign matter that may have deposited there, taking care they do not end up inside the air circuit.
- Refit all the components in reverse order to that described above, re-positioning the air control assembly (2) in its proper location and taking great care as regards the position of the sealing ring.
- Replace the three screws (1), with a torque not greater than 0.8 Nm.

6. TROUBLESHOOTING

The following table contains some causes of problems and the possible solution to a number of faults that might occur and lead to malfunction or abnormal operation of the burner. In most cases, an operating fault causes the indicator lamp, located inside the reset button in the control box, to light up (7, Fig. 1, page 2).

When this indicator lamp lights up, it is possible to re-start the burner after pressing the lockout reset button; then, if ignition is normal, the untimely stoppage of the burner can be attributed to an occasional fault, and in any case without danger. Otherwise, if the safety condition persists, the following table should be consulted.

FAULT	POSSIBLE CAUSE	SOLUTION
The burner does not start on closing the control thermostat	No electricity supply.	Check that the limit thermostat is not locked out.
		Check that the control thermostat is not faulty or damaged.
		Check voltage at terminals L-N in the control box.
		Control box is faulty; replace it.
	Heater element is faulty.	The red LED in the control box is 'off'; check the heater element and, if necessary, replace it.
The burner is in pre-purge all the time.	The photocell is lit by an external source of light.	Remove such source of light.
	The photocell is short-circuited.	Replace the photocell.
The burner performs the pre-purge cycle and locks out without flame.	No flame develops.	Lack of fuel; check the fuel supply line; filter is dirty.
		Ignition electrodes are not properly set; adjust them as directed in this manual.
		Ignition electric arc missing or irregular; replace the control box.
		Nozzle is unsuitable, dirty or worn; replace it.
		The solenoid valve is not energized; replace the coil or the control box.
The burner runs normally in pre-purge and ignition cycles but locks out in the safety time period.	The photocell fails to detect the flame.	Clean it or replace it.
The burner repeats the start-up cycle.	The photocell cannot detect the flame properly.	Clean it or replace it.
	The flame "detaches" from the pilot burner.	Optimize the air/fuel regulation (CO_2).
		Nozzle is unsuitable, dirty or worn; replace it.
		The solenoid valve is not energized; replace the control box, coil or solenoid valve of pump.
		Filters are dirty; clean them or replace them.
The burner starts up with delayed ignition.	The ignition electrodes are not properly set.	Set them as directed in this manual.
	The air/fuel proportion is not right.	Optimize the air/fuel regulation (CO_2).
		Nozzle is unsuitable, dirty or worn; replace it.

WARNING

The manufacturer cannot accept contractual or non-contractual responsibility for any damage to persons, animals or property as a result of errors in the installation and/or burner adjustment, improper or unreasonable use or non observance of the instructions contained in this manual which is delivered together with the burner, or as a result of handling or tampering with by unauthorized personnel.

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