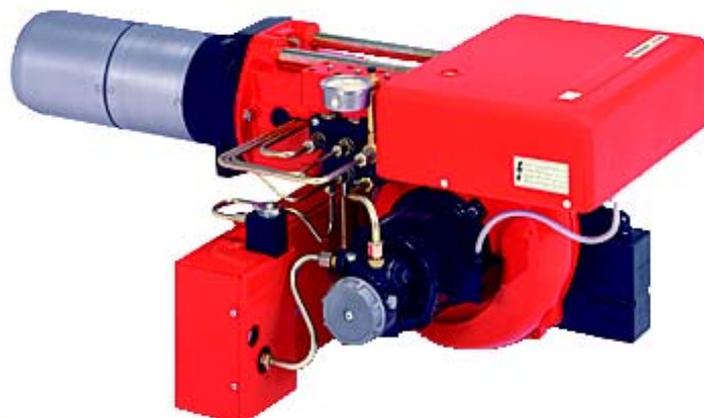


**GB** **Heavy oil burner**

Two-stage operation



CODE	MODELE - MODEL	TYPE
3433823	PRESS 30 N/ECO	626 T
3433824	PRESS 30 N/ECO	626 T

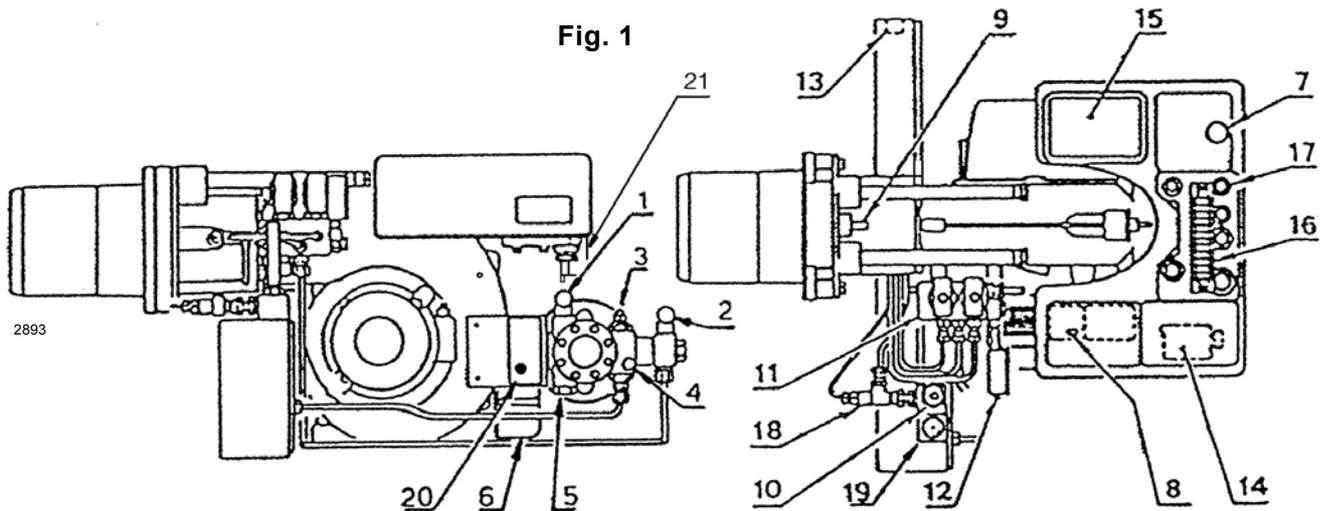
# INDEX

<b>1. BURNER DESCRIPTION . . . . .</b>	<b>1</b>	<b>4. OPERATION . . . . .</b>	<b>6</b>
1.1 Equipment . . . . .	1	4.1 Choice of nozzles . . . . .	6
<b>2. TECHNICAL DATA . . . . .</b>	<b>2</b>	4.2 Pump pressure . . . . .	6
2.1 Technical data . . . . .	2	4.3 Combustion head adjustment . . . . .	6
2.2 Dimensions . . . . .	2	4.4 Air damper motor adjustment . . . . .	6
2.3 Field of operation . . . . .	2	4.5 Air pressure switch . . . . .	7
<b>3. INSTALLATION . . . . .</b>	<b>3</b>	4.6 Atomisation temperature adjustment . . . . .	7
3.1 Fuel oil supply systems . . . . .	3	4.7 Start-up programme . . . . .	9
3.2 Electrical system . . . . .	4	4.8 Ecological oil burners . . . . .	9
3.3 Electrical connections . . . . .	5	4.9 Emulsified fuel oil operation . . . . .	9
		4.10 Start-up programme diagnostic . . . . .	10
		4.11 Operating fault diagnostic . . . . .	10

## 1. BURNER DESCRIPTION

Two-stage operation fuel-oil burner.

- The burner corresponds with IP 40 grade of protection in accordance with EN 60529.
- Burner with CE marking in conformity with EEC directives: CEM 89/336/EEC, Low Voltage 73/23/CEE, Machines 98/37/EEC and Yield 92/42/EEC.
- In conformity with the Yield Directive 92/42/EEC, the application of the burner to the boiler, adjustment and testing must be carried out in compliance with the said boiler's instruction manual, including the checking of the CO and CO<sub>2</sub> concentration in the fumes, their temperature and the average temperature of the boiler water.



- |   |                                      |
|---|--------------------------------------|
| 1 - Suction fitting                                 | 12 - Manometer with protection valve |
| 2 - Return fitting                                  | 13 - Adjustment thermostat           |
| 3 - Pump pressure adjustment screw                  | 14 - Pre-heater contact maker        |
| 4 - Manometer fitting (G1/8)                        | 15 - Transformer                     |
| 5 - Vacuumer fitting (G1/2)                         | 16 - Terminal board                  |
| 6 - Air damper opening motor                        | 17 - Cable glands                    |
| 7 - Control box reset button and lock-out indicator | 18 - Antigas valve                   |
| 8 - Fan overload cutout reset                       | 19 - Thermometer                     |
| 9 - Regulating screw for combustion head            | 20 - Pump motor starter with reset   |
| 10 - Double filter                                  | 21 - Air pressure switch             |
| 11 - Valve group                                    |                                      |

### 1.1 EQUIPMENT

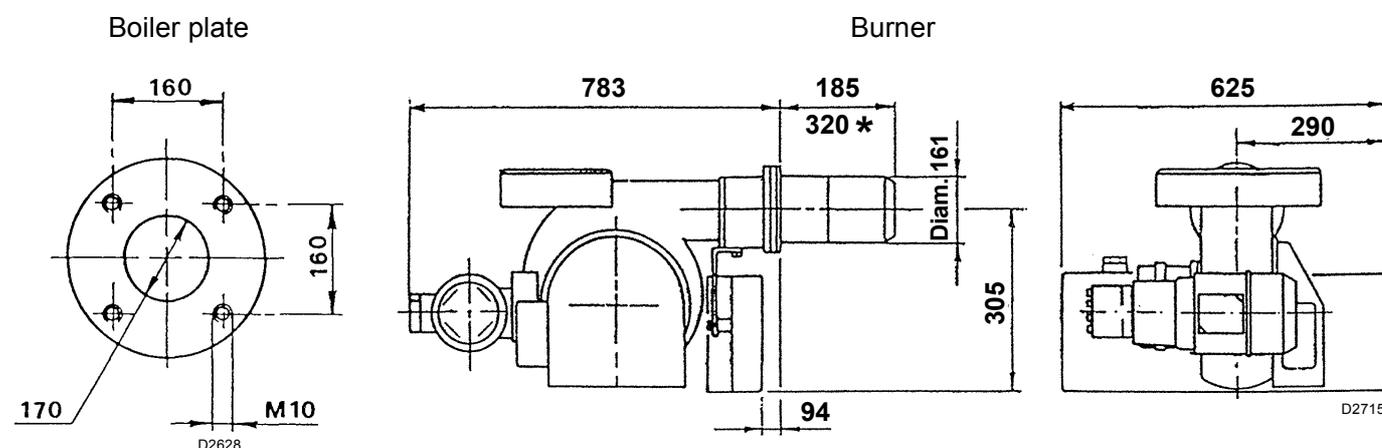
Flexible tubes . . . . .	No. 2	Nipples . . . . .	No. 2
Gaskets . . . . .	No. 2	Screws . . . . .	No. 4
Flange shield . . . . .	No. 1	Nozzles . . . . .	No. 2
Guide extensions (for the lengthened head version) . . . . .	No. 2	Gasket . . . . .	No. 1
Fitting for emulsified fuel oil emulsified (see page 9) . . . . .	No. 1		

## 2. TECHNICAL DATA

### 2.1 TECHNICAL DATA

TYPE	626 T
Thermal power - Capacity	85/171 - 342 kW - 7.5/15 - 30 kg/h
Fuel	Oil with max. viscosity at 50° C 115 sq.mm (15° E)
Power supply	Three-phase, 230V ± 10% ~ 50Hz without neutral 400V ± 10% ~ 50Hz with neutral
Motor 230V - 400V	Fan: 2.4A - 1.4A Pump: 2.1A - 1.2A
Ignition transformer	Primary 2 A - Secondary 2 x 6.5 kV - 35 mA
Heaters	2.8 kW
Intake electrical power	4.1 kW
Pump	60 kg/h at 20 bar

### 2.2 DIMENSIONS



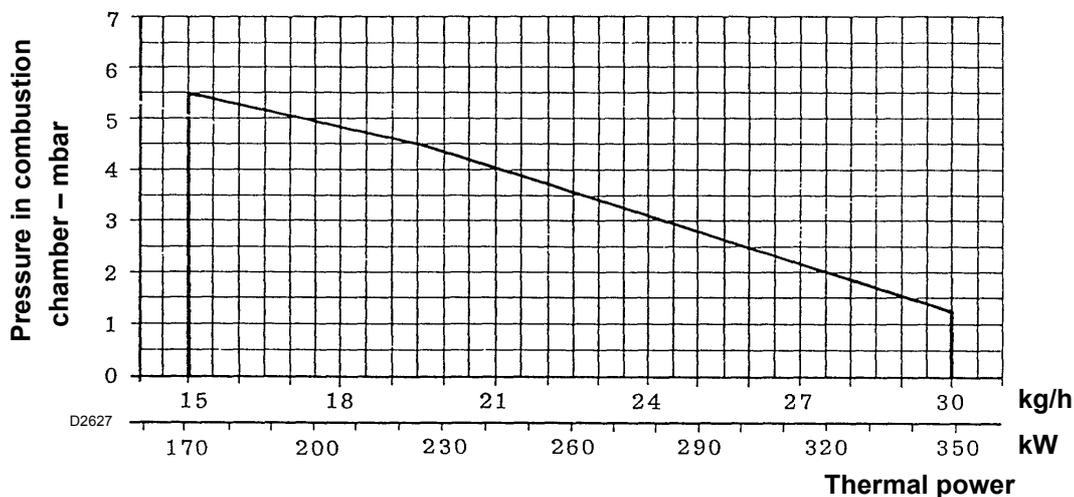
#### NOTE

The weight of the rear part of the pumping assembly exerts flexure stress on the guides; you are advised to hold the burner while it is being extracted so as not to damage the flame disc and the said guides.

\* For elongated - head version.

Use the pin extensions provided as accessories when pulling the burner back.

### 2.3 FIELD OF OPERATION (2 functioning nozzles)



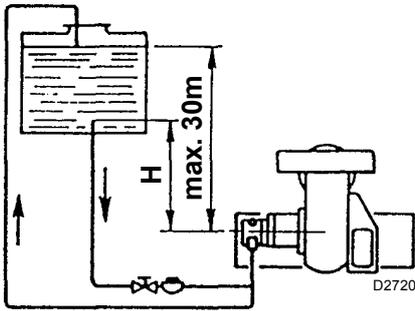
When the burner operates with only one nozzle, the pressurisation conditions are better and no problems arise. Minimal flow rate with one only nozzle: 7.5 kg/h - 85 kW.

### 3. INSTALLATION

#### 3.1 FUEL OIL SUPPLY SYSTEMS

##### GRAVITY SYSTEM

For light oil with max. viscosity 7°E at 50°C.



##### Pump priming:

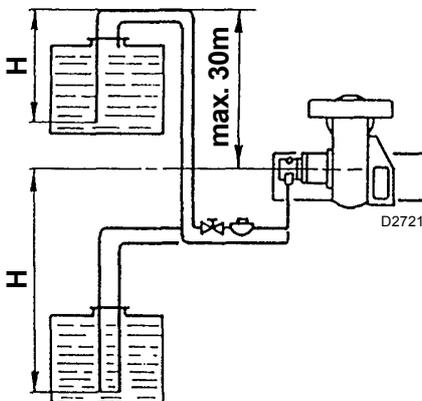
loosen the tap from the vacuumeter fitting (5, fig. 1) and wait for the fuel to flow out.

H: Difference in height  
L: Length of the suction tube

H metres	L metres	
	Diam. 3/4"	Diam. 1" gas
0	5	10
0.5	8	15
1	11	20
1.5	14	25
2	17	30

##### SUCTION SYSTEM

For light oil with max viscosity 7°E at 50°C.



##### Not advised. To be used only in case of previously existing system.

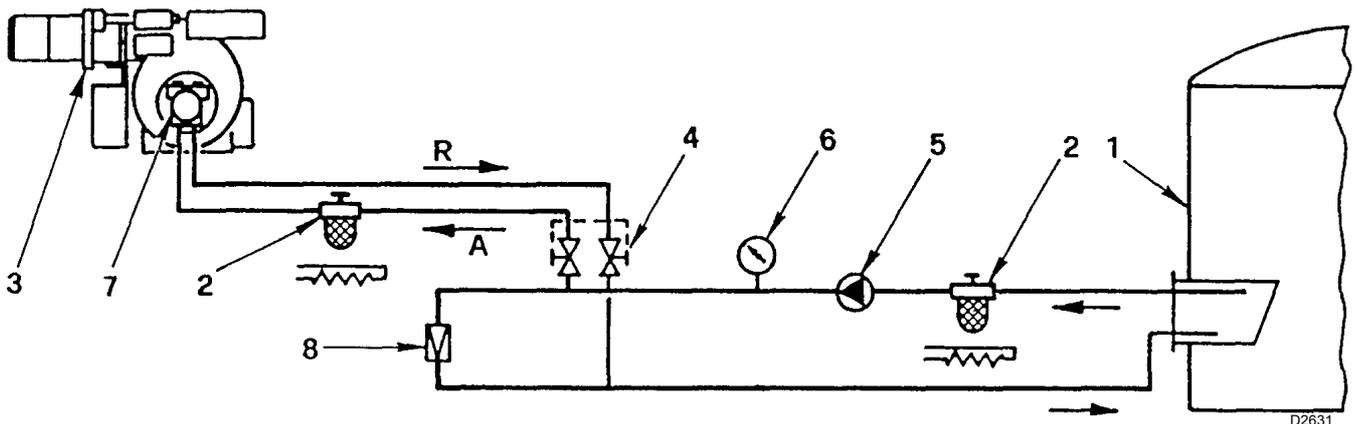
Never exceed the max. vacuum of 0.5 bar (38 cm Hg) measured at the vacuumeter fitting (5, fig. 1).

The pipes should be perfectly airtight. When the tank is placed below of the burner level, the return pipe should arrive at the same level as the suction pipe. In this case the foot valve is not required.

H metres	L metres	
	diam. 1" gas	diam. 1 1/4"
0	24	45
0.5	21	40
1	18	35
1.5	15	30
2	12	25
2.5	9	20
3	6	15

##### LOOP SYSTEM (max loop system pressure 3 bar)

For heavy oil with viscosity up to 20°E / 50°C.



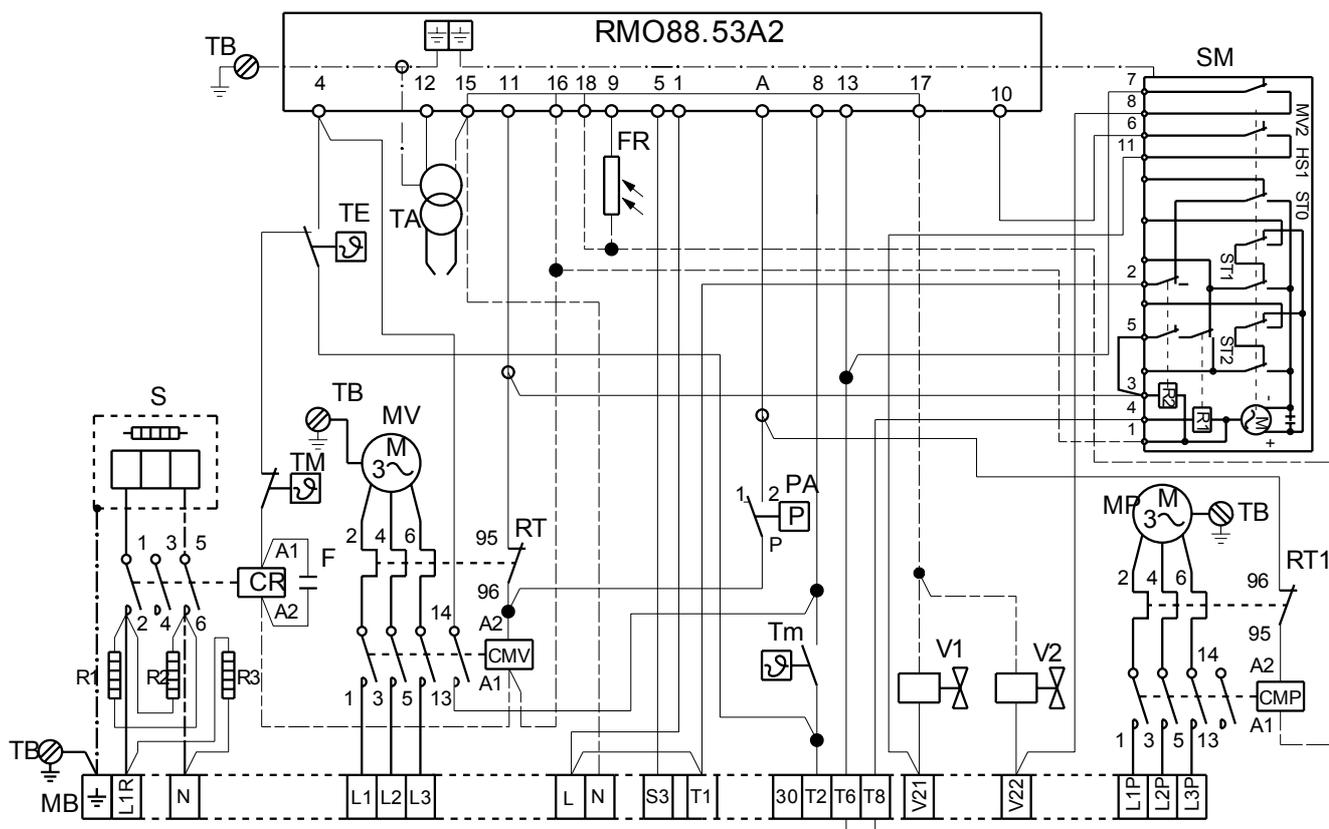
- 1 - Tank (heated for heavy oil)
- 2 - Filter (with resistor for oil > 7°E / 50°C)
- 3 - Burner
- 4 - Burner cut-out gate valves (coupled)

- 5 - Transfer pump
- 6 - Control manometer
- 7 - Burner pump
- 8 - Pressure adjuster

**Important note:** to allow the fuel to flow properly, all the pipes have to be properly sized, insulated and heated (electrically or by means of steam or hot water).

**Warning:** before using the burner, make sure that there is no obstruction in the return pipe, any obstruction may damage the sealing of the pump.

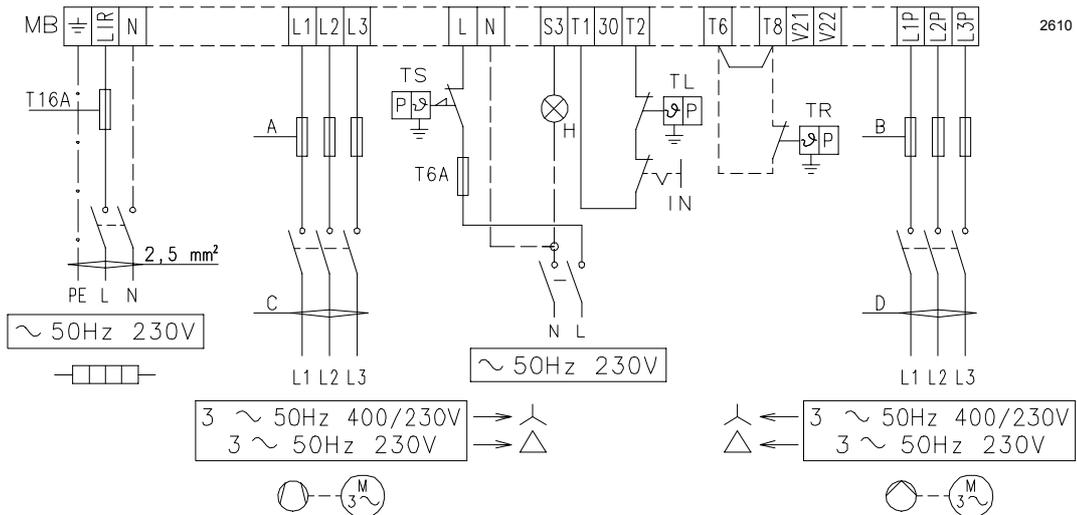
### 3.2 BURNER ELECTRICAL SYSTEM (made in the factory)



2598

- |                                     |  |
|-------------------------------------|--|
| <b>CMP</b> Pump motor contact maker | <b>RT</b> Fan motor thermal relay                            |
| <b>CMV</b> Fan motor contact maker  | <b>RT1</b> Pump motor thermal relay                          |
| <b>CR</b> Pre-heater contact maker  | <b>S</b> Pre-heater tank                                     |
| <b>F</b> Suppressor                 | <b>SM</b> Servomotor   |
| <b>FR</b> photocell                 | <b>TA</b> Ignition transformer                               |
| <b>MB</b> Burner terminal strip     | <b>TB</b> Burner earth                                       |
| <b>MP</b> Pump motor                | <b>TE</b> Regulation thermostat and start-up enabling signal |
| <b>MV</b> Fan motor                 | <b>Tm</b> Minimum contact thermostat                         |
| <b>PA</b> Air pressure switch       | <b>Tm</b> Maximum contact thermostat                         |
| <b>R1</b> Spray holder resistor     | <b>V1</b> First stage valve                                  |
| <b>R2</b> Pump resistor             | <b>V2</b> Second stage valve                                 |
| <b>R3</b> Valve assembly resistor   |  |
| <b>RMO</b> Electrical control box   |  |

### 3.3 ELECTRICAL CONNECTIONS TO THE TERMINAL STRIP (to be made by the installer)



**NOTE**

Wire cross-section: min. 1 sq. mm.  
 (Unless otherwise required by local standards and legislation).

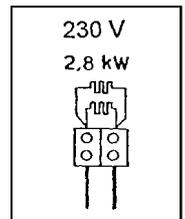
- IN** Manual switch
- MB** Burner terminal strip
- H** Lock-out signal
- TL** Limit remote control
- TR** Adjustment remote control
- TS** Safety remote control

	230V	400V
A Ampere	10	6
B Ampere	6	4
C sq.mm	1.5	1.5
D sq. mm	2.5	1.5

**TWO STAGE OPERATION**

It is achieved by means of the remote control device connected to terminals 5-6 (removing the jumper), that controls the second valve.

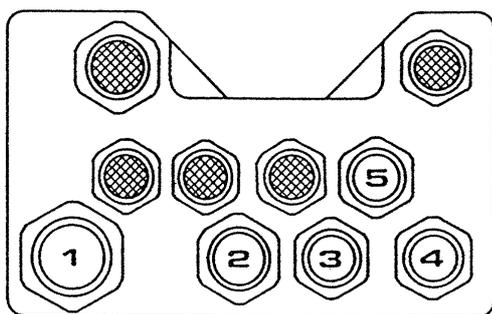
**RESISTOR CONNECTIONS PRE-HEATER**



D2634

**FASTENING OF THE ELECTRICAL WIRES**

All the wires to be connected to the terminal strip (16, fig. 1) shall pass through the appropriate cable entries (17, fig. 1), see the figure below.



D2635

- 1** - Single phase pre-heated resistor power supply: .....cable entry Pg 21
- 2** - Three-phase power supply: .....cable entry Pg 16
- 3** - Single phase power supply and safety thermostat: .....cable entry Pg 13.5
- 4** - Control thermostat: .....cable entry Pg 13.5
- 5** - 2<sup>nd</sup> stage thermostat: .....cable entry Pg 13.5

Any other signals or controls can be connected to the burner terminal strip by pushing out the metal disc in the pre-sheared holes and inserting a common cable entry for the passage and the clamping of the leads. To ensure the IP 40 degree of protection in compliance with EN 60529 close any unused cable entries with appropriate discs.

**NOTES**

- Make a safe earth connection.
- Verify the burner stop by opening the boiler thermostat and the burner lock-out by darkening the photocell.

## 4. OPERATION

### 4.1 CHOICE OF NOZZLES

#### Recommended nozzles:

- Monarch F 80 H0.

### 4.2 PUMP PRESSURE

#### Recommended pressure:

- Fluid oil: 20 bar
- Heavy oil: 25 bar

Rated deliveries of the nozzles are indicated on the above list and refer to a light oil (viscosity from 3 to 5°E at 50° C pre-heated at 100°C). The actual flow rate may vary by ± 5% compared with the rated flow rate.

In values in between those indicated in the tables are required, the pump pressure could be changed or the composition of the nozzles varied.

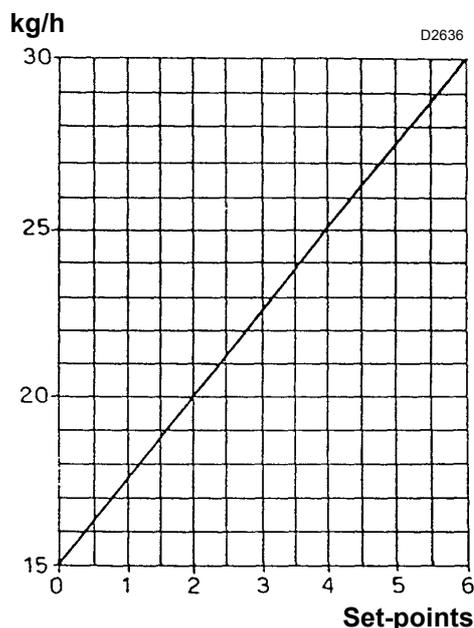
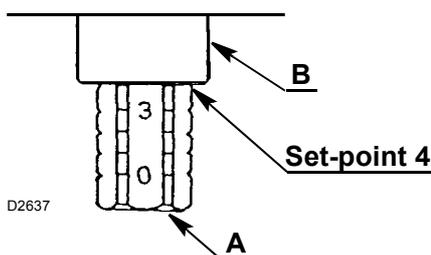
The pump leaves the factory set at 20 bar.

Nozzle GPH (45° - 60°)	20 bar kg/h	25 bar kg/h
1.25 + 1.25	15.00	17.00
1.50 + 1.50	18.00	20.30
1.75 + 1.75	21.00	23.80
2.00 + 2.00	24.00	27.10
2.25 + 2.25	27.00	30.50
2.50 + 2.50	30.00	—

### 4.3 COMBUSTION HEAD ADJUSTMENT

Turn the screw **A**, fig. 2 till the set-point, detected from the diagram, is in the line with the washer **B**, fig. 2.

Fig. 2



### 4.4 ADJUSTMENT OF THE AIR DAMPER MOTOR

#### STOP - Blue lever

This lever leaves the factory vertically positioned and corresponds to the air damper fully closed.

A partial opening of the air damper might be obtained by moving this lever leftwards (+ on the plate).

The new position of the air damper is detectable when the burner stops.

Do not exceed the position of the orange lever for the 1<sup>st</sup> stage.

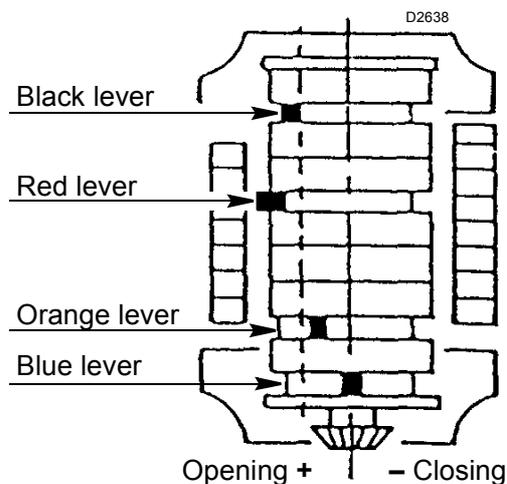
#### 1<sup>st</sup> STAGE - Orange lever

The orange lever controls the air damper position for the first flame, it is adjustable both for opening and closing.

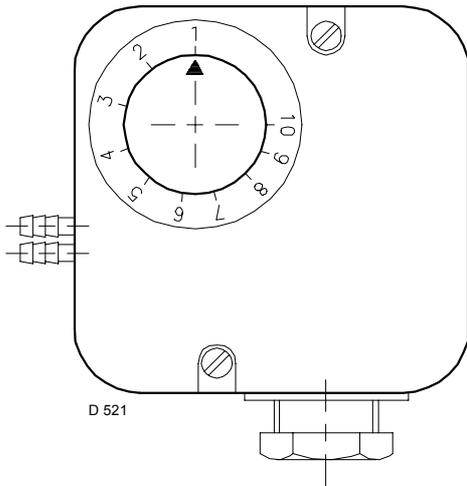
#### 2<sup>nd</sup> STAGE - Red and black levers

The red lever controls the air damper position for the second flame, it is adjustable both on closing and opening.

The black lever controls the opening of the second oil valve and it must always be slightly before the red lever, but never the first stage orange one.



## 4.5 AIR PRESSURE SWITCH



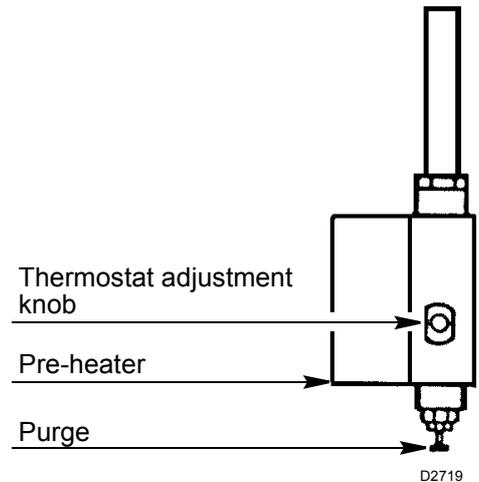
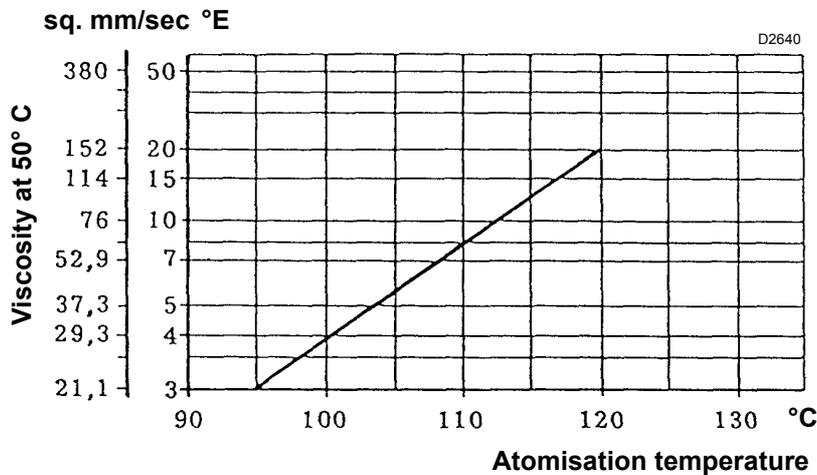
Carry out the regulation of the air pressure switch after carrying out all the other regulations of the burner with the air pressure switch regulated at the beginning of the scale.

With the burner operating at the MIN power increase the pressure of the adjustment by slowly turning the appropriate knob clockwise until the burner locks out. Then turn the knob counterclockwise to a value equal to about 20% of the regulated value and then check the correct start up of the burner. If the burner locks out again turn the knob a bit further in a counterclockwise direction.

## 4.6 ATOMISATION TEMPERATURE ADJUSTMENT

### Control thermostat - minimum value - maximum value

**Adjustment thermostat** prevents the burner start up if the fuel temperature has not reached the value required for a better atomisation as indicated in the diagram below.



### Example

Fuel oil with viscosity of 7 °E at 50 °C is pre-heated to approximately 110 °C.

The thermostat has to be generally set at a value higher than the required one (120°C indicated on the knob to get approximately 100°C at the nozzles).

The value has to be read after some minutes of operation and later the necessary adjustments carried out.

**Minimum value contact thermostat** intervenes by stopping the burner if the fuel temperature falls below the value necessary for better combustion.

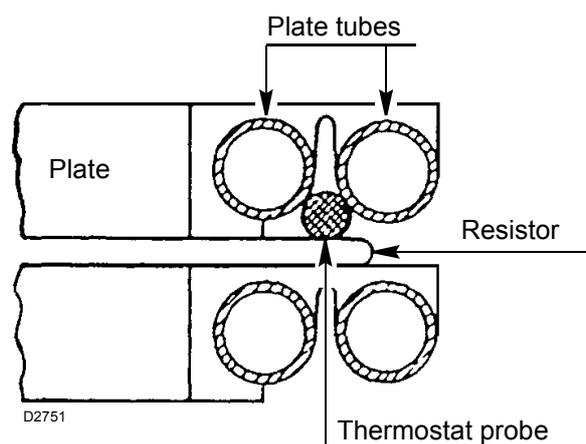
**Maximum value contact thermostat** switches off the resistors when in case of failure of the adjustment thermostat, the temperature increases inside the pre-heater. In case of abnormal cut ins ,check the control thermostat the resistor in contact with the said thermostat probe are operation properly.

## IMPORTANT NOTES

If the pre-heater thermostat or the resistor in contact with the probe is to be replaced, the probe has to be positioned in contact with the resistor and with the pipes of the last aluminium plate, after loosening of the fixing screws of the aluminium plate pack. See drawing opposite.

If, during the operation exceptional differences or temperatures that peak too high should be detected, verify the continuity of the resistor, using an ohmmeter, contacting the temperature probe (value approximately 35 Ohm).

Only use filters marked with a recognizable printing on the screwing hexagon.



## NOTES

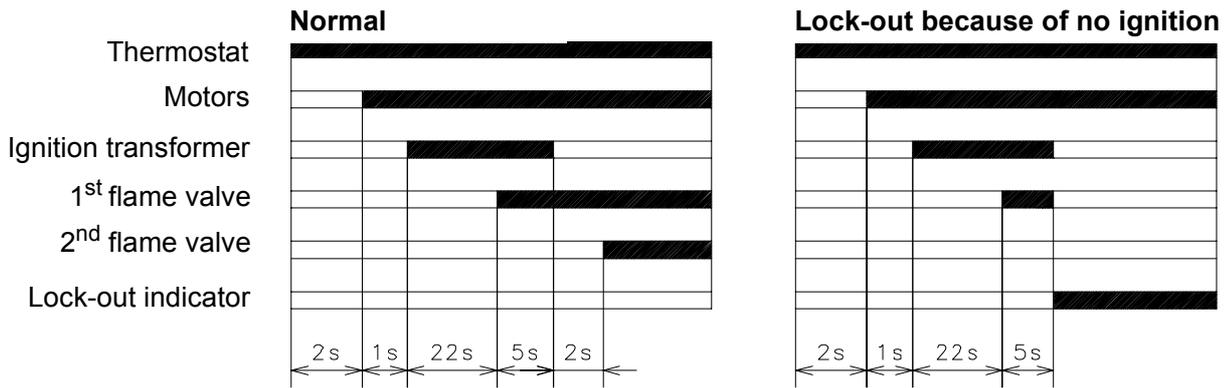
- The pre-heater might be fitted with a second thermostat of maximum value.  
This thermostat can be used as a switch on an external contact maker to cut off current to the pre-heater in case of excess temperature (Kit code no. 3000800).
- Resistor **R** on the nozzle-holder is wired to the supply line of the pre-heater (see pag. 4).  
When the burner is off, the pre-heater supply line shall remain fed.  
Should the pre-heater line be turned off, the fuel must be pre-heated for approximately 30 minutes before the burner start-up. On the contrary, the nozzle-holder resistor must be supplied with an independent single-phase line, protected by a 1A fuse.  
This line shall never be switched off, when the burner is off.
- Before the burner start-up, verify that the pump is filled of fuel in order to avoid it running empty for too long.
- Filter cleaning:  
periodically clean the filters in order to avoid malfunctioning in burner operation.
- Supply line filter:  
positioned on the suction line, it causes the increase of the vacuum in the pump with the consequent flow of gas and noise. Do not exceed the vacuum of 38 cm Hg (5 m W.c.) at the vaccumeter attachment (5, fig. 1).
- Pre-heater filter (10, fig. 1):  
positioned in the delivery line, it causes a decrease of the atomising pressure which can be checked on the manometer (12, fig. 1).

## MANOMETER PROTECTION VALVE

After atomising pressure check, it is recommended to cut off the manometer (12, fig. 1) to avoid pressure shocks that it might be subjected to at every burner starting.

Close protection valve when the burner is not operation and the manometer indicates 0 bar.

## 4.7 BURNER START-UP PROGRAMME



2894

### Motor lock-out

It is caused by the thermal motor overload relay if there is an overload or no phase.

## 4.8 ECOLOGICAL OIL BURNERS

### WARNING

The transition from normal fuel oil to ecological fuel oil requires:

- The tank to be emptied of normal fuel oil.
- Cleaning of the tank and the pipes that carry the fuel oil to the burner.
- Application of a filter if there is not one already on the burner fuel line with a filtering grade of 0.3 mm maximum.

If this is not done, Riello S.p.A. declines all liability if the burner fails to work properly or wears out prematurely.

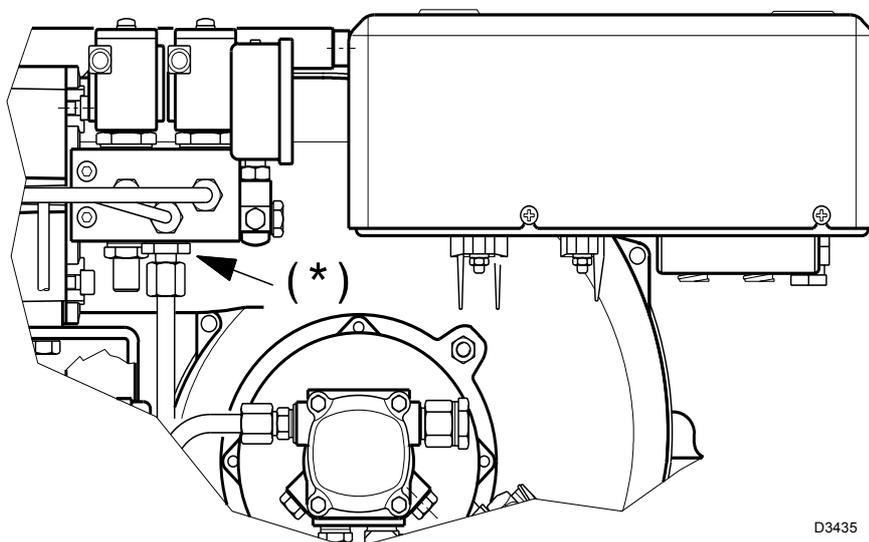
### NOTES

These burners are the result of careful study that allows them to be used with ecological fuels as well; oils, that in certain temperature and speed conditions, are particularly aggressive for the vital parts of the burner.

The objective has been achieved with the reduction of the transiting speed in some of the parts and an appropriate choice of materials (in particular surface treatments) as well as a redefinition of the backlashes and coupling tolerances.

The burners for ecological oils are very different from normal fuel oil burners because they have a separate pump (worked by its own motor at 1400 rpm) and the fact there is double filtration between pump and nozzle.

## 4.9 EMULSIFIED FUEL OIL OPERATION



### WARNING

In emulsified fuel oil it is necessary to change the fitting on the burner (\*) with the one supplied with it.

D3435

## 4.10 START-UP PROGRAMME DIAGNOSTIC

During the start-up programme, the indications are shown in the following table:

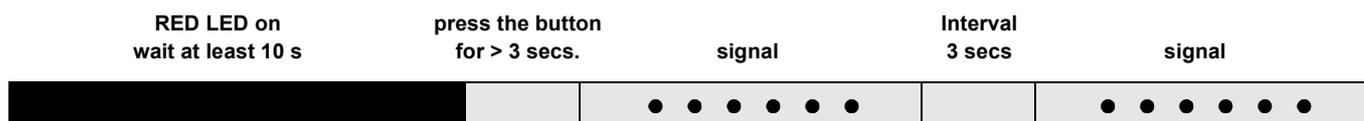
COLOUR CODE TABLE	
Sequences	Colour code
Preventilation	●●●●●●●●●●
Ignition phase	●○●○●○●○●○●
Operation with flame ok	□□□□□□□□□□
Operation with weak flame	□○□○□○□○□○□
Electrical supply lower than ~ 170V	●▲●▲●▲●▲●▲●
Lock-out	▲▲▲▲▲▲▲▲▲▲
Extraneous light	▲□▲□▲□▲□▲□▲
<b>Key:</b>	○ Off      ● Yellow      □ Green      ▲ Red

## 4.11 OPERATING FAULT DIAGNOSTIC

The control box has a self-diagnostic system by which it is possible to simply identify the possible causes of malfunctioning (signal **RED LED**).

To use this function, wait at least ten seconds from the moment the control box is placed in safety mode, 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 with intervals of approximately three seconds.

The number of pulses will provide the information on the possible faults, as per the table below:

SIGNAL	PROBABLE CAUSE
2 blinks ● ●	No stable flame is detected in the safety time: – photocell fault; – oil valve fault; – neutral/phase reversal; – faulty ignition transformer – poor burner regulation (insufficient fuel oil).
3 blinks ● ● ●	Min. air pressure switch (if installed) does not close: – air pressure switch faulty; – air pressure switch not regulated; – max. air pressure switch triggered (if installed).
4 blinks ● ● ● ●	Min. air pressure switch (if installed) does not open or light in the chamber before ignition: – air pressure switch faulty; – air pressure switch not regulated.
7 blinks ● ● ● ● ● ● ●	Loss of flame during operation: – burner not regulated (insufficient fuel oil); – oil valve fault; – short circuit between photocell and earth.
8 blinks ● ● ● ● ● ● ● ●	– Not used.
10 blinks ● ● ● ● ● ● ● ● ● ●	– Wiring error or internal fault.



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