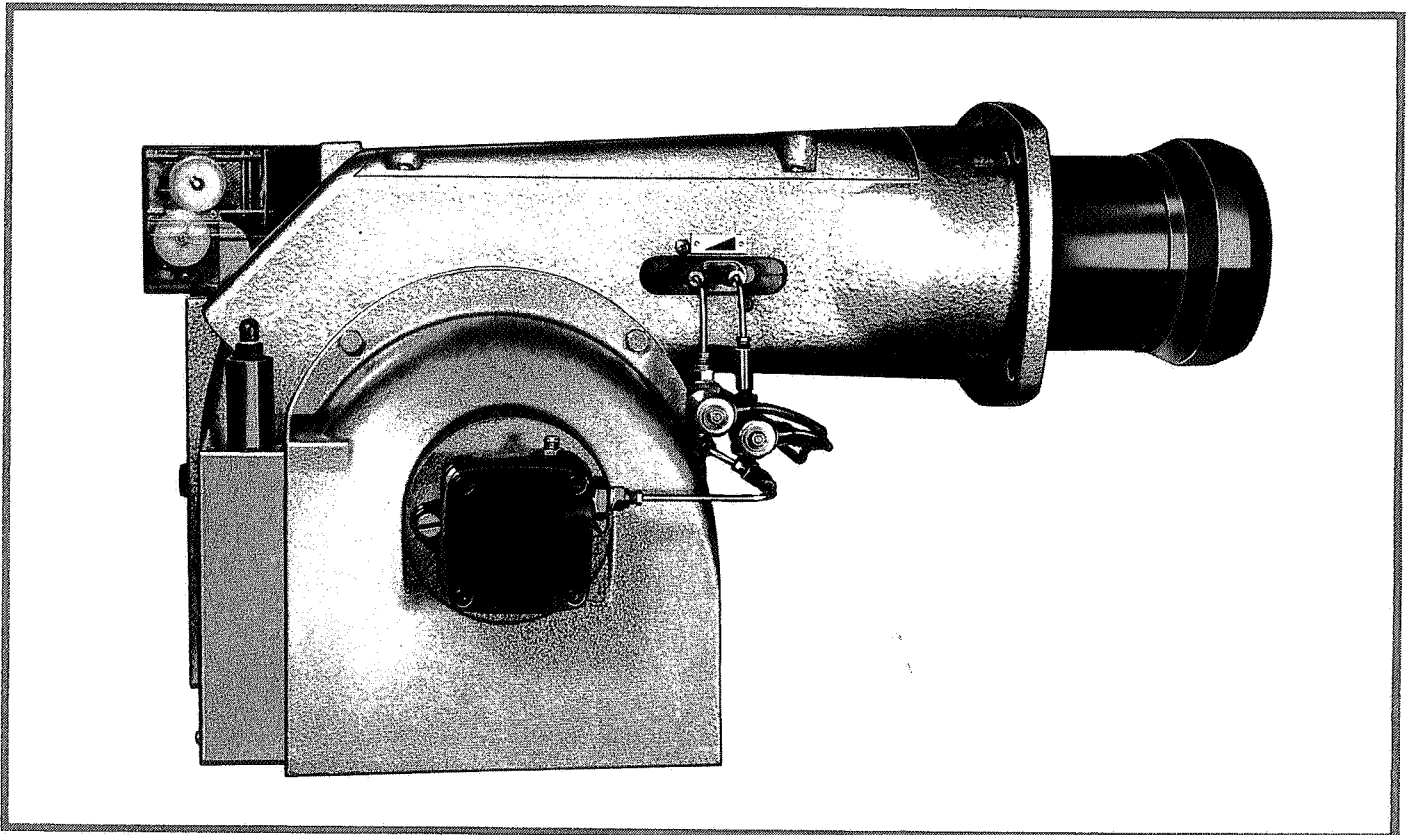


## automatic oil burners

MODEL

**C4**  
**23**<sub>H/L</sub>



The Nu-way CL4/23 H/L pressure jet burner is designed to meet the requirements of all international markets and has a maximum output of 732 kW (625,000 kcal/h = 2,500,000 Btu/h). Available for high/low operation only, it is able to fire at reduced thermal output, appliances having resistances as listed under the burner selection chart. The units can also fire appliances having a maximum draught in the combustion chamber of 125 Pa (12mm wg = 0.5 in wg).

### FUEL

Light distillate oil 1.0–5.5 cSt at 37.8°C (28-40 seconds Redwood No 1 at 38°C).

### FUEL SYSTEM

Suitable for single pipe gravity or two pipe systems. Twin nozzle operation with turndown of 1.5:1 up to 295 kW and 2.0:1 above. Fuel filter and flexible oil pipe; fuel connection ¼" BSP female thread.

### CONSTRUCTION

Monobloc metric design using fasteners to ISO standards. Designed for flange mounting. Fan and inner assembly accessible by removal of top cover plate. Adjustable burner head maintains high air velocity and gives maximum combustion efficiency throughout burner range.

### AIR CONTROL

Hydraulically operated damper for high/low operation. Burner fitted with patented air control device producing smooth starting conditions.

### CONTROLS

Flame supervision by photo-electric cell with sequence controller to comply with relevant standards. The CL4/23H/L burner may be controlled by suitable thermostats, time switches, frost thermostats, etc.

### APPROX. WEIGHT

36 Kg.

### ELECTRICAL DATA

	1 PHASE	3 PHASE
Main Supply (V) ± 10%	230	415
Frequency (HZ)	50	50
Motor (W)	750	750
(HP)	1.0	1.0
	2800 rev/min permanent capacitor	2850 rev/min
Burner Start Current (A)	22	9
Burner Run Current (A)	4.5	1.8

Ignition by direct spark from 10 kV 30 mA transformer, secondary winding centre earth connected.

# NU-WAY

## SERVICE CENTRES

### **BELFAST**

Boucher Centre, 69 Boucher Rd.,  
Balmoral Ind. Estate, Belfast BT12  
Tel: Belfast 668977

### **DROITWICH**

Vines Lane, Droitwich WR9 8NA  
Tel: (0905) 772331

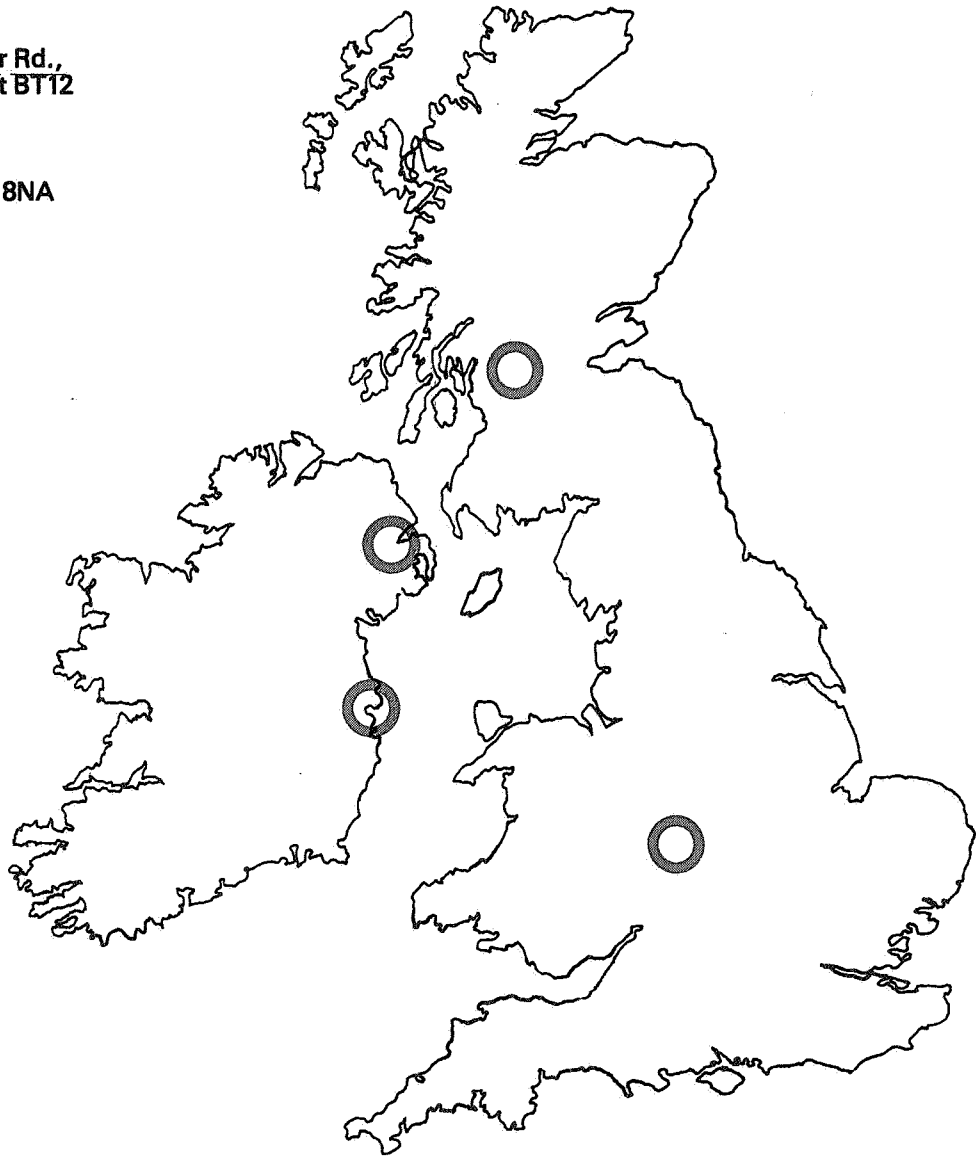
### **EAST KILBRIDE**

7 Carron Place  
Kelvin Industrial Estate  
Scotland G75 0YL  
Tel: East Kilbride 35381-2

## DISTRIBUTORS

### **DUBLIN**

Hevac Ltd.,  
Ballymount Road  
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Co. Dublin  
Tel: Dublin 519411



**Nu-way Limited**  
**Droitwich, WR9 8NA, England**

Telephone: Droitwich (0905) 772331  
Telex: 338551 Cables: JASNU DROITWICH

*Nu-way policy is one of continuous improvement. The right to change prices and specifications without notice is reserved.*

### **SAFETY**

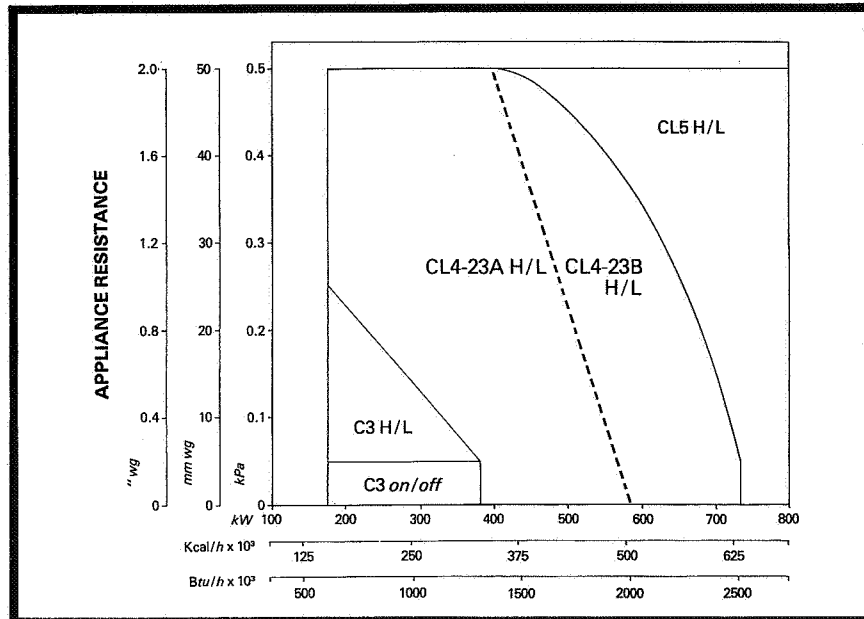
The burner must be operated and serviced in accordance with the procedures detailed within this handbook.

# NU-WAY

## BURNER DATA

Burner model	Minimum Burner Capacity			Maximum Burner Capacity			Diffuser dia. (mm)	Minimum Burner Throughput *			Maximum Burner Throughput *			Nozzle spray angle
	kW	kcal/h x 10 <sup>3</sup>	Btu/h x 10 <sup>3</sup>	kW	kcal/h x 10 <sup>3</sup>	Btu/h x 10 <sup>3</sup>		kg/h	Ltrs/h	US g/h	kg/h	Ltrs/h	US g/h	
CL4 (A) High/Low	176	151	600	381	328	1300	120	13.9	16.7	4.4	30.0	35.8	9.45	60°
CL4 (B) High Low	382	329	1305	732	625	2500	100	30.2	36.0	9.5	57.8	69.0	18.2	60°

## BURNER OUTPUT

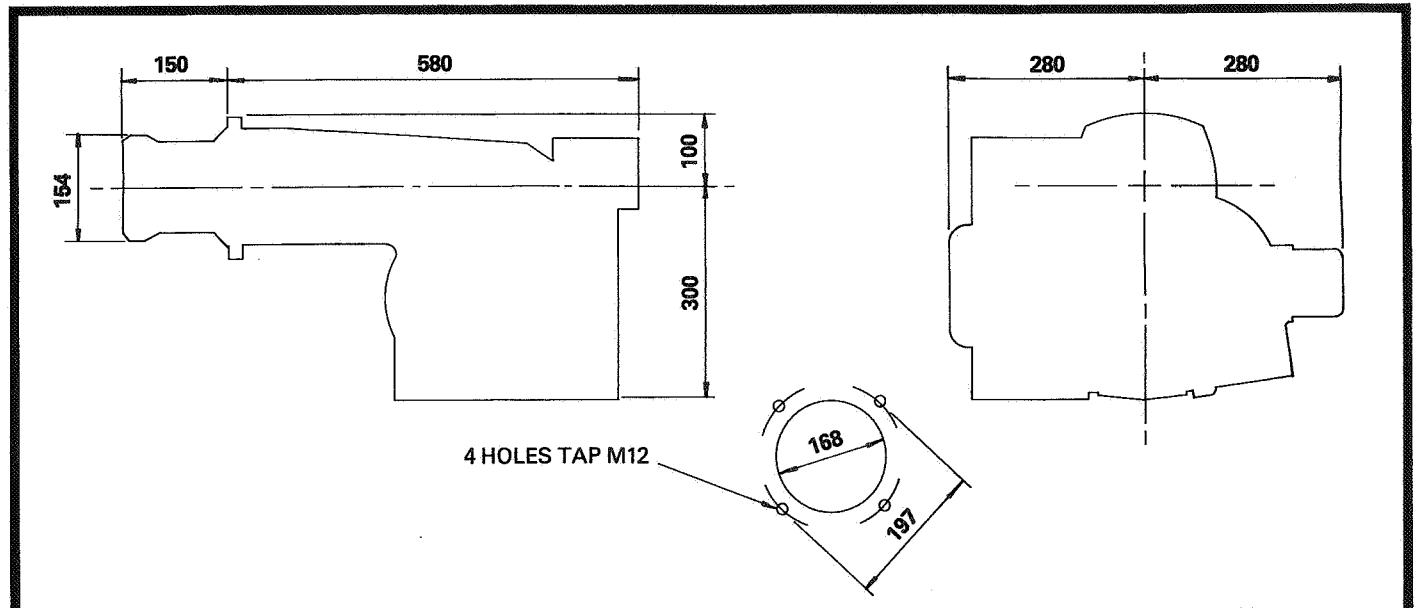


## Notes

- Pump pressure of 1250 kPa (12.7 kg/cm<sup>2</sup> = 180 p.s.i.) is factory-set standard.
  - Turndown on units is 1.5 = 1 up to 293 kW (250,000 kcal/h = 1,000,000 Btu/h) and 2:1 above.
  - When using kerosene fuel (28 secs Redwood No 1 = 1.4 cSt — both at 38°C) the working pressure should be reduced to 1,000 kPa (10.2 kg/cm<sup>2</sup> = 145 p.s.i.).
- \* Based on calorific value of 10.6 kW/litre (43,100 Btu/kg = 137,500 Btu/US gal).

Burner selection graph is for CL423 H/L burner only. For details of other burners see relevant data.

## DIMENSIONS



## INSTALLATION

**Flue** The top of the chimney should be above all roofs with in a radius of 10m.

Ensure that the flue pipe from the appliance finishes flush with the inside wall of the chimney.

When installed on appliances with draught in combustion chamber, the draught should not exceed 125 Pa (12mm wg : 0.5 in wg). However it is recommended that the burner is set to operate under a draught of 12.5 Pa (1.25mm wg : 0.05 in wg) or at a figure shown in appliance manufacturers instruction manual. If necessary a draught stabiliser should be fitted in a suitable position to maintain the above figures.

**Boilerhouse Ventilation** It is most important that the boilerhouse has an adequate supply of fresh air for both ventilation and combustion purposes. (.004m<sup>2</sup>/litre : 0.2ft<sup>2</sup>/imp gph).

**Fuel Supply** (and, where fitted, return) pipes should consist of metal tube (never galvanised steel), the final connection to the burner pump inlet port being made with the length of flexible pipe supplied with the burner. Joints should be made with compression fittings, not by soldering.

When a gravity feed is used, the maximum head should not exceed 4m (equivalent to a pressure of 35 kPa).

On installations where the fuel tank is situated below the level of the burner the maximum suction permitted can be determined from tables in oil pump manufacturers' chart. On multiple appliance applications individual suction pipes must be used from the tank, with a suitably sized common return. It is recommended that suitably spring loaded non-return valves are fitted in suction and return lines (see pump detail). Both should be in vertical lines - suction as near to tank outlet as possible - return as near to pump outlet as possible.

Note that the pump is factory set for single pipe installation. If it is to be used in a two pipe system, plug (supplied with the burner) must be inserted as shown in the sketch, (see oil pump manufacturers details). The return pipe is to be connected to return port, (see oil pump manufacturers details).

With two pipe installation systems it is essential that the return pipe is not obstructed in any way, eg. by a plug, closed valve, etc. Any obstruction may damage the pump.

**Pump Priming** Remove the vent plug, connect purge port to suitable container and bleed until air free oil flows, then fit pressure gauge to port.

For further details of oil line systems and pump facilities see oil pump information sheet.

On single pipe (gravity fed) systems, the pump should be primed under gravity from the tank and not by running the pump mechanically.

If a two-pipe system is used, the suction line may require priming before energising the pump mechanically.

The pump may need bleeding also, in the event the oil storage tank is allowed to drain completely.

**Electricity Supply** Connect burner to electricity supply, Thermostats, time switches, etc., as appropriate. Check to ensure fuses are of correct rating.

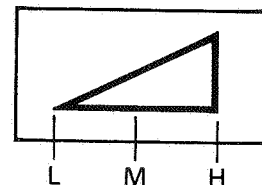
## INTRODUCTION

There are two atomising nozzles arranged vertically above each other, controlled by two magnetic valves. The top nozzle only sprays on low flame whilst both nozzles spray together on high flame. The air inlet control is operated by a hydraulic ram, which is internally spring loaded to the low flame position and hydraulically extended for high flame. Manual adjustment screws facilitate air control setting (see Fig. 10). At commencement of the firing cycle, there is a pre-purge with forced air and ignition. After a time delay, the low flame magnetic valve is energised and allows oil to flow to the low flame (top) nozzle. Burner lights on low flame. After a further delay the high flame magnetic valve is energised, allowing oil to flow to the high flame nozzle and operate the high flame air control to the high flame position.

During the running cycle the high flame magnetic valve is energised via the high/low controlling instrument, but is always de-energised at each burner start, thus giving a low flame light up. On reaching operating temperature the controlling thermostat will open and the sequence controller will shut-off the motor and close magnetic valve/s. A limit instrument (hand reset) is normally fitted to the appliance also.

## PRE-FIRING CHECK AND INITIAL SETTING

Diffuser plate setting



NOTE: L M H shown for illustration purposes only.

To determine burner setting the following instruction should be carried out:

- 1) Remove nozzle assembly by taking off cover and carrying out instructions shown in maintenance photograph (Figs. 3 & 5).
- 2) Check or fit nozzles of correct size for appliance.
- 3) Check electrode setting is as sketch (Fig. 11).
- 4) Replace nozzle assembly.

**Important:** Always ensure the four support legs on the electrode bracket are correctly adjusted to locate the inner assembly centrally in the flame tube.

- 5) The setting of the burner diffuser plate, which has an adjustment of 20mm, is carried out by loosening retaining screw (covered by plastic cover) between the oil inlet pipes and sliding to desired position. This screw must be firmly secured when setting is completed, (replace plastic cover).

## CL4/23 H/L—A Size

- A) 176-234 kW (150,000 - 200,000 kcal/h : 600,000 - 800,000 Btu/h) adjust to position 'L' in sketch (diffuser fully back). Air control slightly open low flame - ½ open high flame.
- b) 234-293 kW (200,000 - 250,000 kcal/h : 800,000 - 1,000,000 Btu/h) adjust to position 'M' in sketch (diffuser mid-position). Air control slightly open low flame - fully open high flame.
- c) 293-381 kW (250,000 - 325,000 kcal/h : 1,000,000 - 1,300,000 Btu/h) adjust to position 'H' in sketch (diffuser fully forward). Air control ⅓rd open low flame - fully open high flame.

## CL4/23 H/L—B Size

- a) 381-498 kW (325,000 - 425,000 kcal/h : 1,300,000 - 1,700,000 Btu/h) adjust to position 'L' in sketch (diffuser fully back). Air control slightly open low flame - ½ open high flame.
- b) 498-615 kW (425,000 - 525,000 kcal : 1,700,000 - 2,100,000 Btu/h) adjust to position 'M' in sketch (diffuser mid-position). Air control slightly open low flame - fully open high flame.
- c) 615-732 kW (525,000 - 625,000 kcal/h : 2,100,000 - 2,500,000 Btu/h) adjust to position 'L' in sketch (diffuser fully forward). Air control ⅓rd open low flame - fully open high flame.

## GENERAL

The air control should be used as a final adjustment with the diffuser set in the appropriate position. Obviously adjustments to both settings will be necessary to cater for all appliances. Optimum combustion results are obtained by using the maximum air pressure available across the diffuser plate and adjusting air damper to obtain acceptable CO<sub>2</sub> and smoke values.

## OPERATION

Set the appliance high/low instrument to the required operating temperature (or pressure). Set the on/off instrument to a temperature some 5°C above this. Set the limit instrument 5°C above the on/off instrument setting.

Ensure air control and diffuser are set as described in pre-firing check.

Switch normal/low flame switch to 'Low Flame' position (located in/on panel). To start burner turn main isolating switch to 'ON'. Move burner ON/OFF switch to 'ON' position (located on side of panel).

Check that fan motor rotates in direction of arrow i.e. clockwise viewed from motor shaft end.

At commencement of firing sequence there is a pre-purge period during which the ignition and motor are switched on. At the end of this period the low flame magnetic oil valve opens and the burner lights on low flame.

After a fixed delay period with the burner working on low flame, the ignition is switched off automatically.

If during start up, the flame fails to be established, the photo resistor will not receive the proper signal and the burner will shut down, the LOCK-OUT lamp on the control box being automatically illuminated.

The oil pump pressure should be adjusted if necessary to

the requirements indicated for the burner or the appliance manufacturers recommendations, (for adjustment procedure see pump manufacturers details).

With the burner held in the Low Flame position adjust the air settings to give visible clean combustion. Check that the photo resistor reacts to loss of flame by removing from the burner and excluding all light. The burner will travel to the Lock-Out condition, the sequence depending on type of control fitted (see a or b following). Reset the burner by pushing in and releasing the button on the control box. Switch to 'NORMAL' operation. After the initial light up on low flame the burner will go automatically to high flame within 10-20 seconds.

Adjust the diffuser and air control high flame stop, to give clean combustion. When normal running conditions are obtained, check by means of combustion testing equipment for acceptable combustion figures on high and low flame.

NB Under normal circumstances CO<sub>2</sub> figures of 10-12% high flame and 9-11% low flame, should be achieved with acceptable smoke numbers (or figures specified by appliance manufacturer). If appliance manufacturers specify combustion performance their recommendations should be followed.

The burner operating sequence may vary depending on the type of control box fitted:

### a) Spark Restoring Control

When the flame is extinguished during normal running, both magnetic oil valves will close immediately and ignition will be restored for a trial restart. After a delay of approximately 5-10 seconds, the low flame magnetic valve will be energised and fuel released to the combustion chamber in an attempt to re-light on low flame. If burner fails to light the control will travel to lock-out within approximately 10-15 seconds.

### b) Cyclic Control (non-spark restoring).

The sequence of this box will give an air pre-purge period of up to 30 seconds where ignition and motor are energised simultaneously at the start of the pre-purge. The low flame magnetic valve will then be energised resulting in low flame light up. If the flame is not established within 5 seconds the control will travel to lock-out.

NB The pre-purge period may vary depending on the type of control box used.

If the flame is extinguished during normal running the photo resistor will react within 1 second giving burner shut-down. There will then be a short natural ventilation period before a re-start is attempted.

## FAULT FINDING

**Motor fails to start.** Check that power is available to the burner and that the motor overloads have not tripped. Check all fuses in the supply to the burner. Check that the contacts of control and safety limits thermostats on the appliance, time switches, etc., are closed and therefore calling for heat.

**Motor starts but burner will not light.** If the flame is not established the burner will stop and 'lock-out' after a preset safety period. A warning light will be illuminated on the control box. The manual reset button, mounted on the sequence controller, should not be operated until at least 30 seconds after the burner has been 'locked-out'.

Check that air setting is correct.

Ascertain whether oil is being sprayed by the nozzle. If oil is passing through nozzle, check that there is an arc at the electrodes. Check all connections including high voltage leads, with mains switched off.

Check electrode gap and correct if necessary (see electrode setting sketch).

Ensure that electrodes are not short circuited and that their insulators are not cracked or soiled.

If there is no oil spray check that there is an oil supply to the burner (including tank) and that all isolating valves are open. Check that nozzle is not blocked and that atomisation is correct. Ensure that all filters are able to pass oil. Check that the magnetic valve opens. Check that fuel pressure delivered by the pump is correct. The nozzles should be replaced after approximately 2000 hours operation.

**Unstable pump pressure.** Check that the pump has been correctly primed by disconnecting return pipe from pump (on two-pipe systems); air-free fuel should flow out when the pump is run. On single pipe systems remove the purge plug to ascertain that air-free oil flows out (do not run motor).

On installations where the burner pump has to lift fuel from the tank check that all pipework and connections on the suction side are free of leaks and that there are no blockages. Also check internal by-pass plug is fitted to pump, that suitable spring loaded non-return valves are fitted and that there is a return line to the tank. On suction lift installations check that all pipework is as recommended under oil pump details.

**Burner fires then locks-out.** Check that photo-resistor is clean and correctly located. Check air damper and burner head setting are correct and re-adjust as necessary.

**Flame unstable.** Check for fuel supply fault, eg. partial blockage of fuel supply pipe, nozzle atomisation coarse.

**Burner will not change to high flame.** Check the settings and operation of the H/L thermostat (or pressure switch) - H/L magnetic valve failing to open. Faulty valve, no high flame signal from control box, or high flame switch not in correct operating position.

**Flame failure on changing to high flame** (or small "spark" high flame). High flame nozzle blocked / excess air condition.

**Large smoky flame on changing to high flame.** Air shutter sticking in the low flame position. The diffuser has not been adjusted to allow sufficient air to pass. Check high flame nozzle.

**Burner will not change to low flame** (except on initial start). Check setting and operation of H/L control instrument.

**Burner starts on high flame** Faulty control unit / high flame magnetic valve.

**Burner locks-out without attempting to light.** If photo cell detects light during pre-purge period, burner will lock-out or fail safe; cause could be leaking solenoid, illumination from combustion chamber, faulty photo-resistor, extraneous light illuminating photo-resistor, etc.

## MAINTENANCE

Before carrying out any work on the burner ensure that the incoming electricity supply to the burner is switched OFF.

**Filters.** A filter is fitted within the pump. To gain access remove pump end-plate as illustrated (see pump manufacturers details). Withdraw filter and clean it in paraffin, or similar solvent. Replace filter and pump end-plate.

A filter should also be fitted in the fuel supply pipe. If fitted with a disposable element this should be replaced at least once per year, the frequency depending on the needs of the installation and the cleanliness of the fuel.

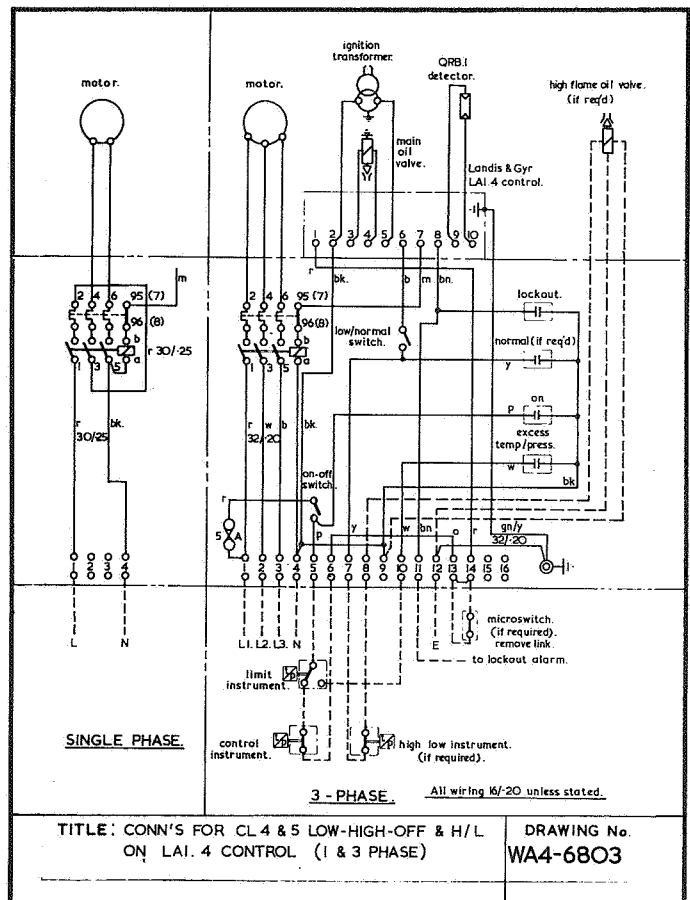
If the filter has a re-usable element this should be cleaned at suitable intervals.

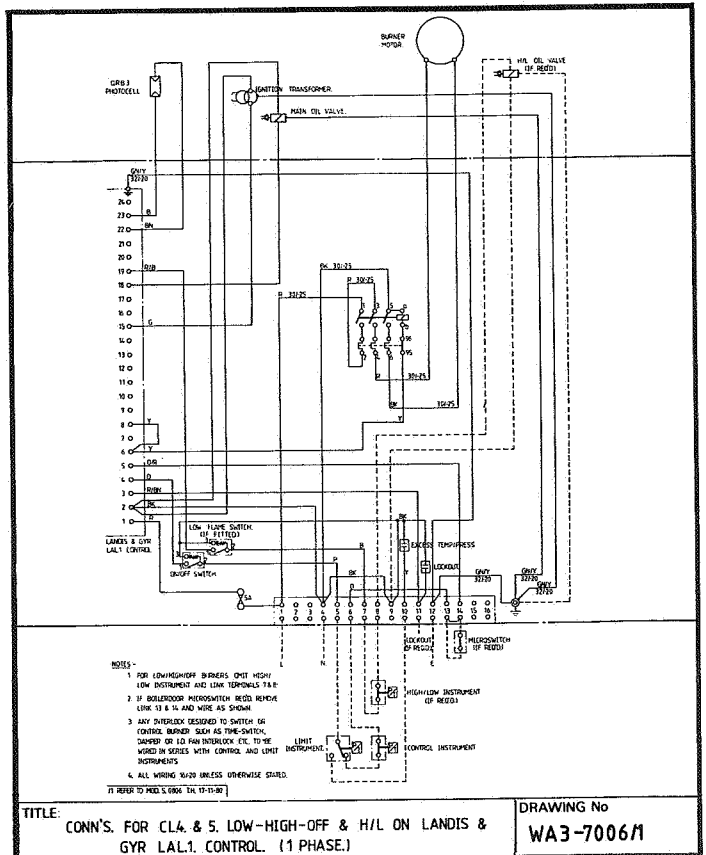
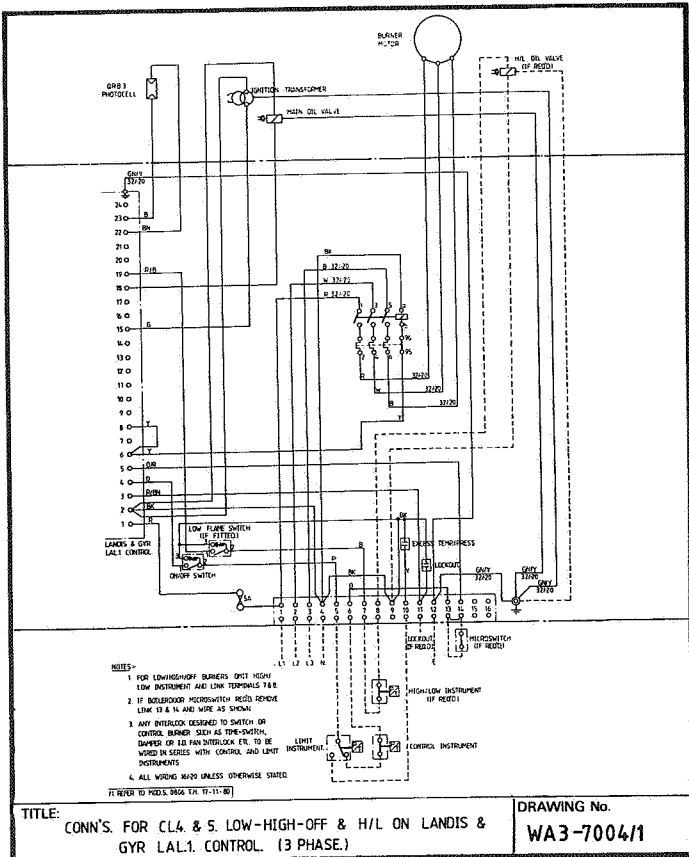
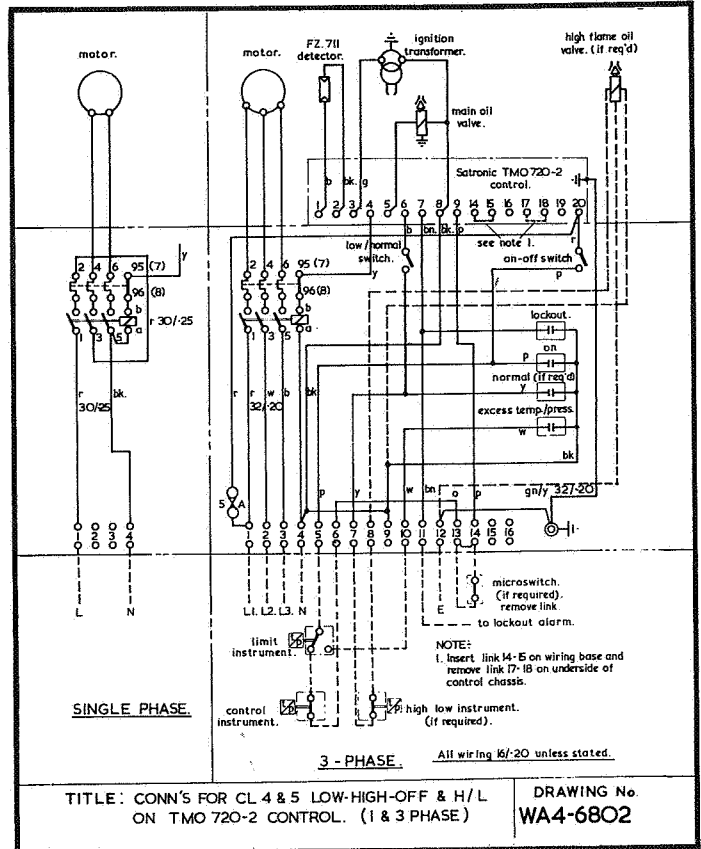
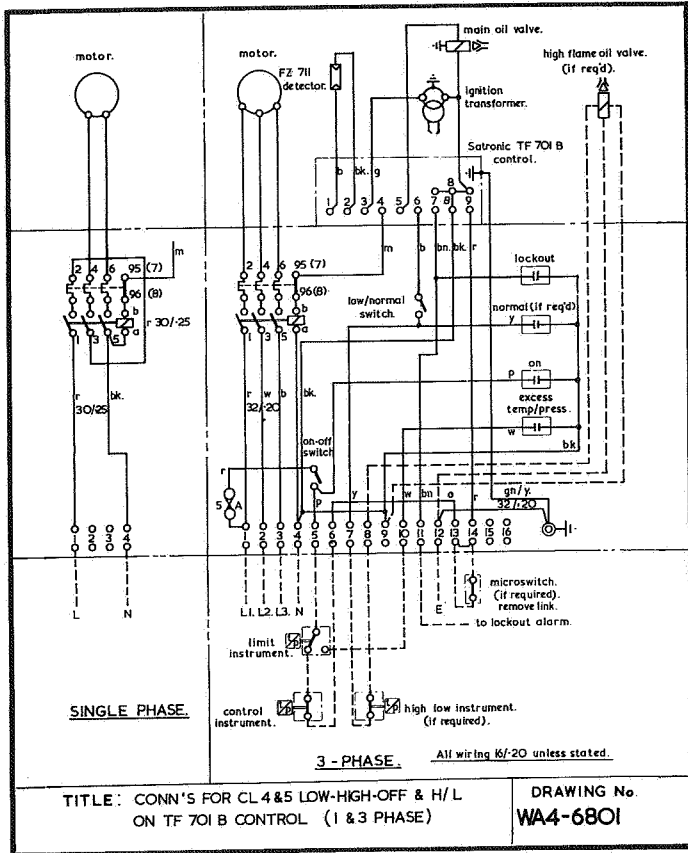
It will be necessary to remove air from system after the above operations by bleeding the pump.

**Motor** The motor requires no maintenance : it has bearings which are factory lubricated for the life of the motor.

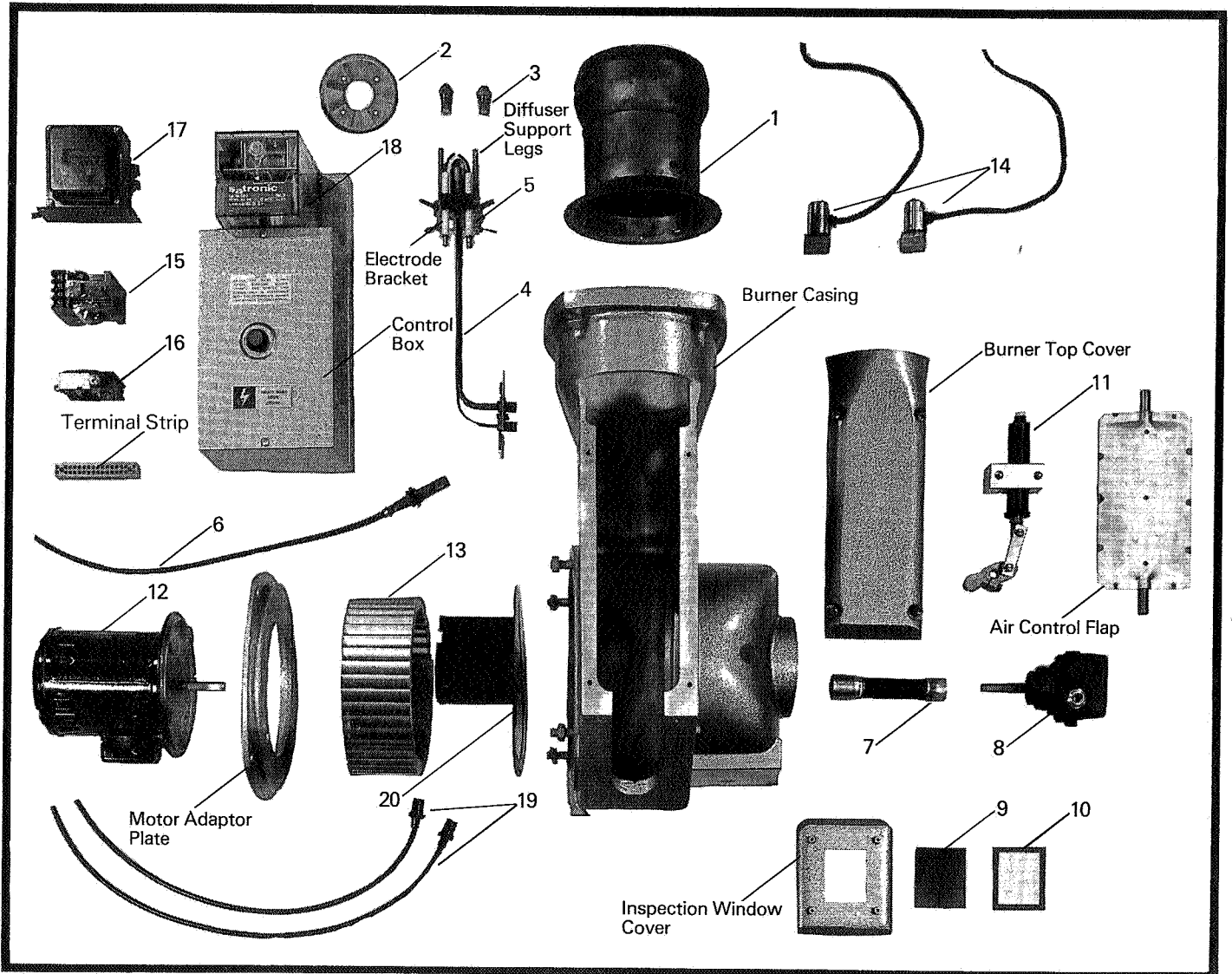
**Fan** If the fan is damaged or becomes loose on the motor shaft access can be obtained by removal of air inlet casting.

Correct position of fan is such that a clearance of approximately 3mm exists between blade of air control device and backplate of fan.





# NU-WAY



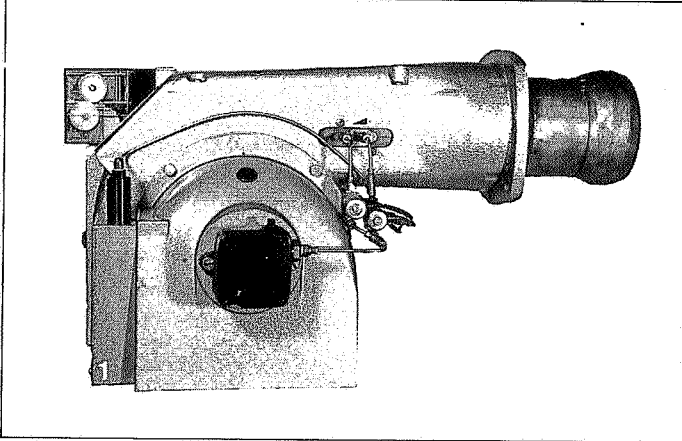
Illus Ref.	Part Number	Description
1	N04-240Q N04-241D	Burner Flame Tube (156 projection) Burner Flame Tube (300 projection)
2	P04-078M P04-077C	Diffuser Plate 120 mm ('A' size) Diffuser Plate 100 mm ('B' size)
3		Nozzles x 2 ( state make, size & angle)
4	N04-239 B N04-239B	Inner Assembly (for 156 projection-please specify)
5	P04-083T	Electrodes Pair
6	C31-021M C31-017R C31-012L	Photo Resistor FZ 711B (TF701 & TMO720-2 controls) Photo Resistor QRB3 (LAI4 & LAL1.25 controls) Photo Resistor LD (BHO 15)
7	G03-009Q	Pump Coupling 190 mm
8	E02-043Y	Oil Pump Danfoss RSA 60
9	G16-007S	Inspection Window
10	G09-003Q	Gasket for Inspection Window
11	E19-001X	Hydraulic Plunger
12	A09-013Y A09-014Z	Motor 750W (1 HP) 2800 rpm 220/240V 1 phase Motor 750W (1 HP) 2850 rpm 400/440V 3 phase

Illus Ref.	Part Number	Description
13	D09-009J	Fan Impellor 225 Ø
14	E01-028Y	Magnetic Oil Valves 220/240V
15	C56-003D	Contractor Danfoss C10 220/240V 1 phase 50Hz
16	C55-038E C55-036U	Overload 4-6.2A 220/240V 1 phase 50Hz Overload 1.8-2.8A 380/440V 3 phase 50Hz
17	C03-012Z	Transformer 30MA Danfoss
18	C21-053T C21-066Y C21-073X C21-106VW C21-079D	Controller Satronic TF701 Controller Satronic TMO720-2 Controller Landis & Gyr LAI4 Controller Landis & Gyr LAL1.25 Controller Danfoss BHO 15
19	B09-131F	Pair of Electrode Leads Plus Connectors (450 mm)
20	N04-038V	Air Inlet Scoop
21	E03-013K	Filter Complete (Not Illustrated)
22	E03-025P	Filter Element Only (Not Illustrated)
23	E05-028U	Flexible Oil Pipe (Not Illustrated)

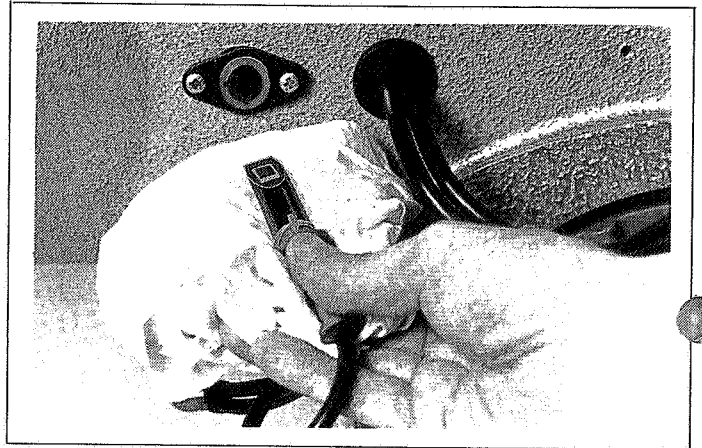


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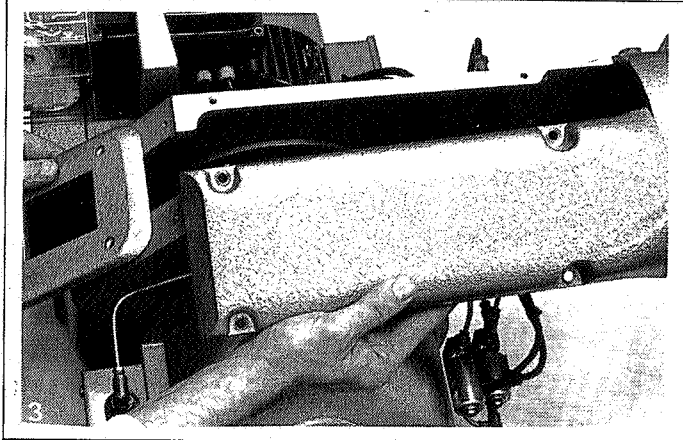
## MAINTENANCE



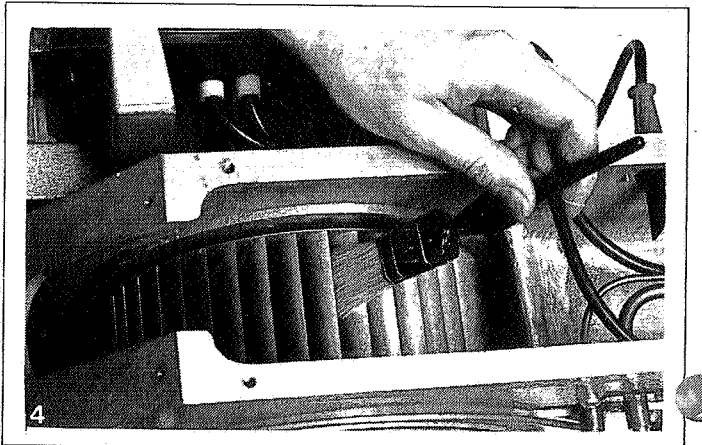
General View of burner. The adjustable inner assembly with setting scale is clearly shown with magnetic oil valves positioned below. The air control adjustment is contained inside the cover on the left hand side of the air inlet.



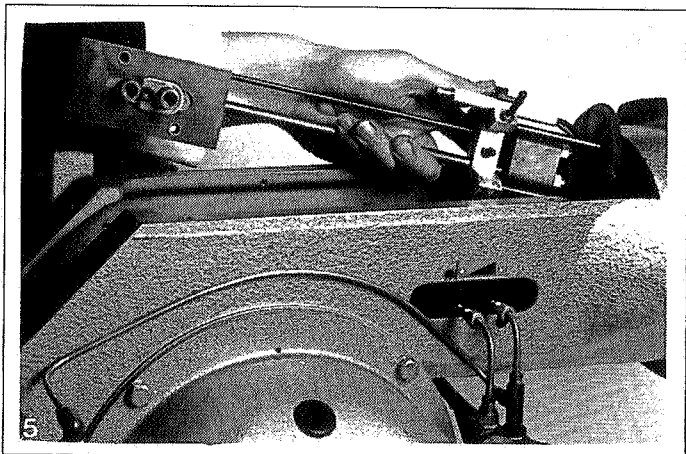
The photo resistor is removed from burner for cleaning. Do not touch cell window with the fingers and use only a clean dry cloth. Ensure viewing face points towards burner combustion head when replacing.



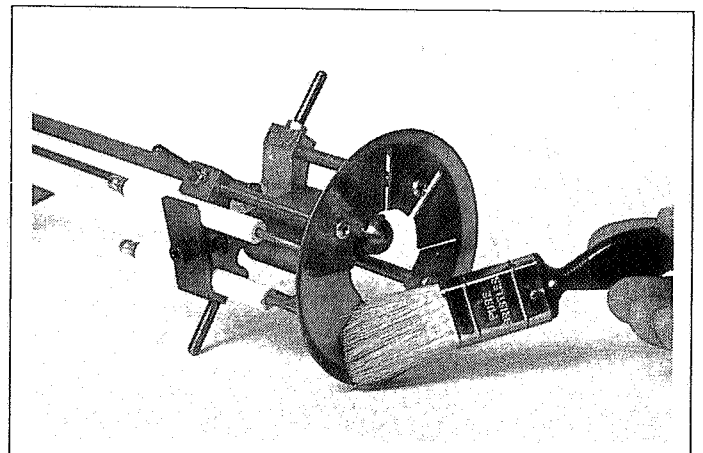
Remove top cover by undoing four screws. It may also be necessary to slacken the four screws on the inspection window cover. To gain complete access to the fan it is advisable to remove the latter item.



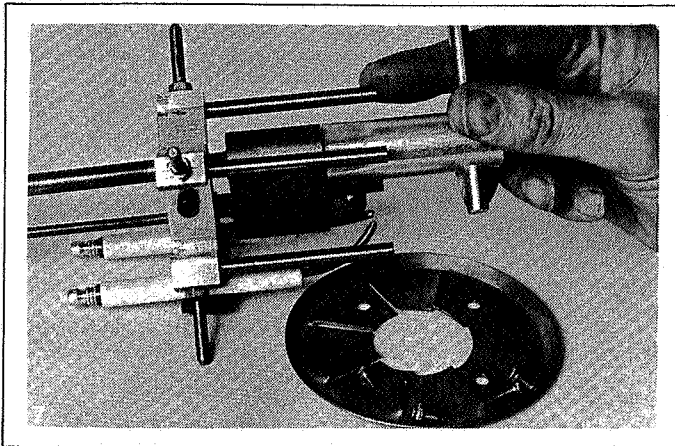
Cleaning the fan runner : use a stiff brush.



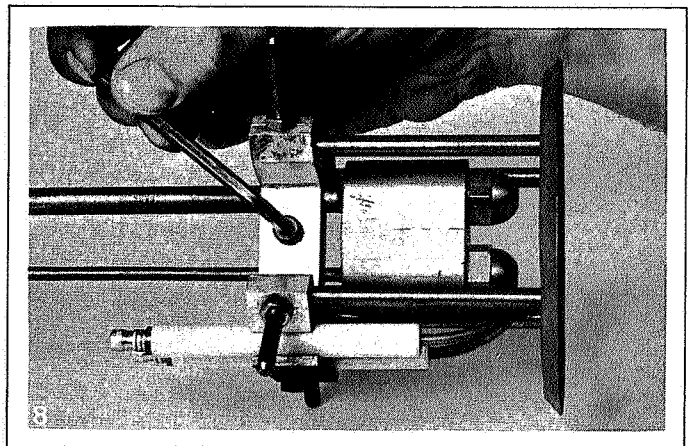
For nozzle assembly withdrawal, the top cover must be removed. The electrode H T connectors must then be disconnected, the photo resistor removed and the tubing nuts retaining the inner assembly disconnected. After undoing the two outer retaining screws the assembly can be lifted clear. **DO NOT REMOVE OR ADJUST CENTRAL SCREW** as this locates diffuser assembly.



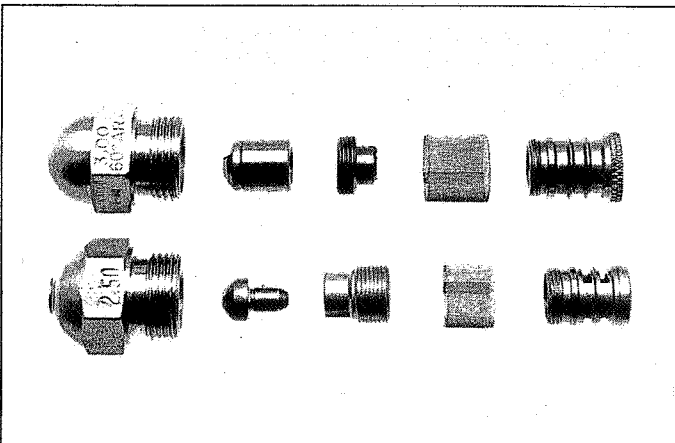
The air diffuser should be cleaned using a stiff brush.



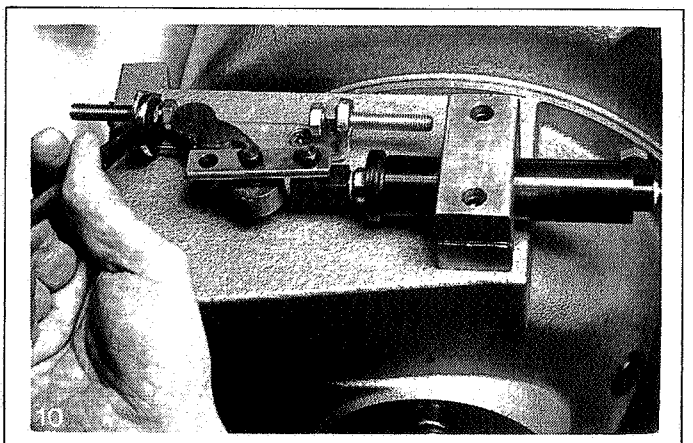
It is necessary to dismantle the diffuser from the nozzle assembly before nozzle removal, by undoing four retaining screws. To facilitate removal and fitting of nozzle, the electrode bracket may be moved (see following photograph). Nozzles are removed using a nozzle spanner. Fit nozzle by hand using a spanner only for final tightening. Re-assemble diffuser and check in correct position.



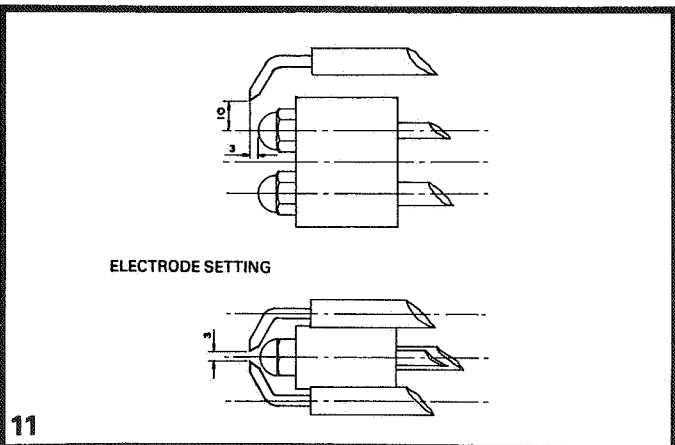
Set nozzle/diffuser gap by loosening cap head screw and sliding diffuser assembly to correct position. Re-lock screw when set.



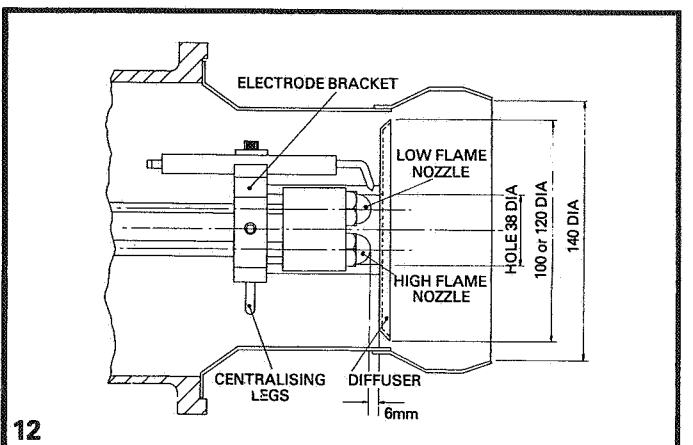
Dismantle nozzle itself to enable internal filters to be cleaned. Do not use any metal or wood to remove deposits. Wash in solvent. Wipe off any remaining dust using a clean lint-free rag. Illustration shows correct assembly for (above) Monarch and (below) Steinen nozzles. Replace after 2000 hours operation.



Air control adjustment. To obtain access undo two retaining screws holding cover in situ. Replace after adjustment is completed.



Electrode setting.



Adjustable burner head arrangement.

## OIL PUMP MANUFACTURERS DETAILS The information covers the Danfoss RSA pump only

### Danfoss RSA60 pump

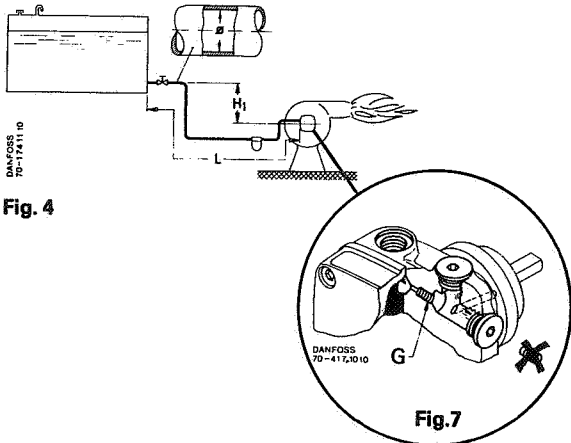
Viscosity range : 1.3-18.0 mm<sup>2</sup>/s (cSt) at 20°C.  
 Speed RSA 28 : 2400-3600 min (rev/min)  
 Speed RSA 40, 60 : 1400-3600 min (rev/min)  
 Pressure range : 5.5-12.0 bar (p<sub>g</sub>) (kp/cm<sup>2</sup>)  
 (1.3-1.8 mm<sup>2</sup>/s)  
 5.5-21.0 bar (p<sub>g</sub>) (kp/cm<sup>2</sup>)  
 (1.8-18.0 mm<sup>2</sup>/s)  
 Factory setting : 10 bar (p<sub>g</sub>) (kp/cm<sup>2</sup>)

**Connections (Fig. 1)**  
 The pump to be connected as follows:  
 1-pipe systems at open bypass (G - Fig. 7).  
 2-pipe systems at closed bypass (G - Fig. 8).  
 E = Nozzle line 1/8" in BSP. RSA can be used for both one- and multistage operation with a solenoid valve in the nozzle line.

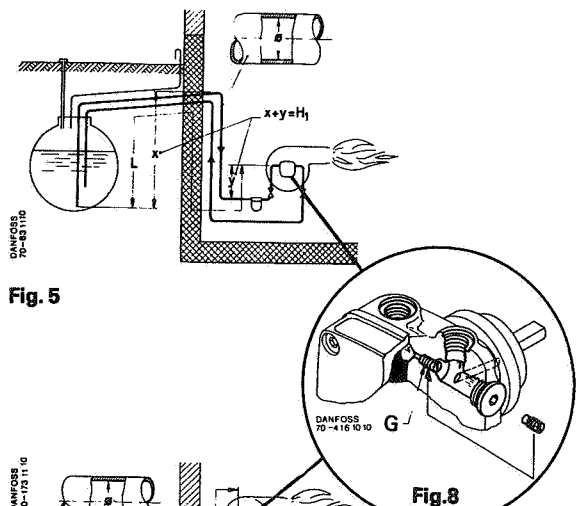
K = Suction line 1/4" in BSP  
 B = Return line 1/4" in BSP  
 M = Pressure gauge connection, venting, 1/8" in BSP

One pipe system to be used only when there is a positive pressure in the suction line.

Two pipe systems to be used when a vacuum may occur in suction line.



		RSA 60 2800 min <sup>-1</sup>		
H		ø8 mm	ø10 mm	ø12 mm
1.8 mm <sup>2</sup> /s (cSt)	4.0	96	100	100
	3.5	90	100	100
	3.0	84	100	100
	2.5	77	100	100
	2.0	71	100	100
	1.5	65	100	100
4.3 mm <sup>2</sup> /s (cSt)	4.0	43	100	100
	3.5	40	99	100
	3.0	38	93	100
	2.5	35	86	100
	2.0	32	79	100
	1.5	30	73	100



H	1.8 mm <sup>2</sup> /s (cSt)				4.3 mm <sup>2</sup> /s (cSt)			
	ø4 mm	ø6 mm	ø8 mm	ø10 mm	ø4 mm	ø6 mm	ø8 mm	ø10 mm
4.0	100	100	87	100	56	100	44	100
3.5	100	100	76	100	48	100	38	100
3.0	100	100	64	100	40	100	32	100
2.5	100	100	52	100	33	100	26	100
2.0	79	100	40	100	25	100	20	100
1.5	55	100	28	100	18	88	14	70
1.0	31	100	16	79	10	50	8	40
0.5	7	36	4	18	2	12	2	9

		RSA 60 2800 min <sup>-1</sup>		
H		ø8 mm	ø10 mm	ø12 mm
1.8 mm <sup>2</sup> /s (cSt)	-0.0	47	100	100
	-0.5	41	100	100
	-1.00	34	85	100
	-1.50	28	70	100
	-2.0	22	55	100
	-2.5	16	40	83
4.3 mm <sup>2</sup> /s (cSt)	-0.0	21	53	100
	-0.5	19	47	97
	-1.0	16	40	83
	-1.5	13	33	70
	-2.0	11	27	56
	-2.5	8	20	42

Dyserkapacitet		1.6-2.25		2.5-4.0		4.5-6.3		7.1-10.0	
Nozzle capacity		1.6-2.25		2.5-4.0		4.5-6.3		7.1-10.0	
Düsen-durchsatz		1.6-2.25		2.5-4.0		4.5-6.3		7.1-10.0	
Débit au		1.6-2.25		2.5-4.0		4.5-6.3		7.1-10.0	
gicleur		1.6-2.25		2.5-4.0		4.5-6.3		7.1-10.0	
Munstycks-		1.6-2.25		2.5-4.0		4.5-6.3		7.1-10.0	
kapacitet		1.6-2.25		2.5-4.0		4.5-6.3		7.1-10.0	
Verstücker-		1.6-2.25		2.5-4.0		4.5-6.3		7.1-10.0	
kapacitet		1.6-2.25		2.5-4.0		4.5-6.3		7.1-10.0	
kg/h	kg/h	kg/h	kg/h	kg/h	kg/h	kg/h	kg/h	kg/h	kg/h

**Fig. 6**

These instructions are provided for the benefit of the operator and are intended to be of assistance in making minor adjustments and providing the burner with proper maintenance, cleaning and lubrication. Additional information can be obtained through your installer or from the manufacturer.

### FUEL

The unit is designed to burn light distillate oil 1.0—5.5 cSt at 37.8°C (28-40 secs Redwood No 1 at 38°C). Do not attempt to use petrol, or any oil which may contain traces of petrol.

### BOILERHOUSE VENTILATION

It is most important that the boilerhouse has an adequate supply of fresh air for both ventilation and combustion purposes.

### PUMP BLEEDING

If the fuel tank is allowed to drain completely it will be necessary to bleed the oil pump free of air by slackening the plug in the pressure gauge port allowing oil to run through until air free. (See pump instructions.)

### OIL FILTRATION-SEDIMENT REMOVAL

There is an oil strainer inside the body of the fuel pump and a separate oil filter between the oil pipe from the tank and the oil burner. The oil strainer should be removed and cleaned with paraffin during the pre-season check-up. At the same time the oil filter cartridge should be replaced or cleaned, as appropriate for the type fitted. Bleed fuel pump free of air, as described above, to remove any trapped air.

Draw off any accumulation of water or sediment in the fuel tank by opening the sludge cock in the tank bottom, immediately before any new delivery of fuel. Do not run the burner while the tank is being refilled and, if possible, do not restart for one hour after refilling is concluded.

### NOZZLE CLEANING

Nozzles cleaned as required see maintenance photographs. Replace after 2000 hours service.

### STARTING AND STOPPING

Start the burner by setting the thermostat pointer to a figure which is higher than the room or water temperature. Stop the burner by setting the thermostat to a point below this temperature.

The burner may set itself in the 'Safety Lock-out' position — this will occur if the burner stops for any reason other than the action of the thermostat — and must then be

restarted by pressing the reset button on the flameguard/sequence control. Ask your installer to instruct you in the proper method of resetting. If frequent resetting becomes necessary, call the service engineer whose name and address should be inserted below.

Do not attempt to start the burner when the fire-box may be full of oil vapour. It is desirable to allow the furnace to cool for about 5-10 minutes before resetting the control to restart the burner from the 'Lock-out' position.

### EMERGENCY STOP

The burner can be stopped in emergency by opening the wall switch provided on the line between the burner and the electric supply. The installer must identify this switch.

### CHECKING BURNER OPERATION

Inspect burner flame periodically. If it becomes lopsided or smokey, call a service engineer.

When cleaning the room housing the heater unit, always switch off the burner to reduce the amount of dust and lint drawn in through the air inlet.

### SUMMER CARE, AUTUMN RESTART

During the summer months, or whenever heat is not required over a considerable period, the wall switch may be opened. To restart the burner it is only necessary to close this switch.

At the close of the heating season have the furnace cleaned and flues swept. See that the complete burner plant, especially the electric ignition system, nozzle, oil filter etc., is checked over and cleaned by a competent service engineer.

### PREVENTIVE MAINTENANCE

Consult your heating engineer for advice on regular preventive maintenance intervals. It is not possible to recommend a service interval for universal use since operating conditions vary widely from installation to installation.

### CAUTION

Never burn rubbish or refuse in the heater fire-box. Never leave waste paper or rags lying around near the burner or the heater.

INSTALLER.....

FOR SERVICE TELEPHONE .....

NAME.....

NIGHTS, SUNDAYS OR HOLIDAYS .....

ADDRESS.....

TELEPHONE .....