



## Series NLO fully automatic oil burner

MODEL  
**NLO2**  
**NLO3**

The Nu-way NLO2-3 pressure jet burner is a small compact fully automatic burner designed to meet the requirements of all international markets. The burner is fitted with a simple adjustable head to ensure optimum efficiency and fuel economy.

### OPERATION

Single stage (On/Off) operation only.

### FUEL

Light distillate oil Class D (1.5–5.5cSt @ 40°C).

### FUEL SYSTEM

Suitable for single pipe gravity feed or two pipe suction lift systems. A fuel filter is provided, fuel connection ¼" BSP.

### CONSTRUCTION

Monobloc metric design, using fastenings to ISO standards for flange mounting. The burner is fixed to the mounting flange by two screws. This enables the burner to be easily removed for servicing. The fan and inner assembly are accessible by removing the cover plate.

### AIR REGULATION

Air for combustion can be adjusted to give maximum efficiency. A patented air control device is fitted to ensure smooth start conditions.

### CONTROLS

Flame supervision by photo-electric cell with sequence controller.

The burner may be controlled by suitable thermostats, time switches, frost stats, etc.

### OPTIONAL EXTRAS

Fully Closing Air Damper.

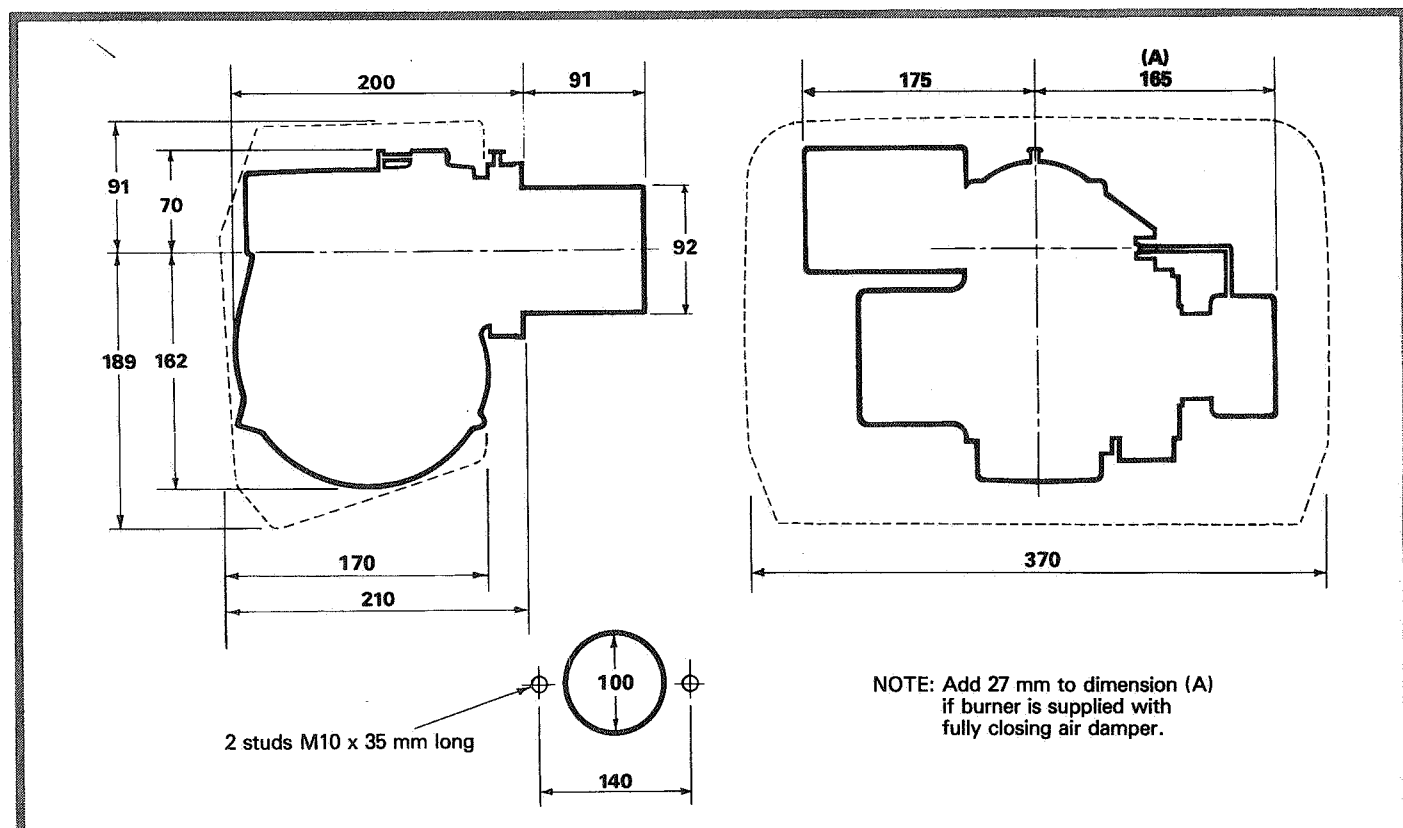
Quickly detachable moulded cover.

### APPROX. WEIGHT

11 kg.

### ELECTRICAL DATA

|                          |                       |
|--------------------------|-----------------------|
| Mains supply (V)         | 220 – 240 + 10% – 15% |
|                          | 1 ph 50 Hz            |
| Burner Motor (W)         | 75                    |
| Motor speed              | 2750 rpm              |
| Burner start current (A) | 1.0                   |
| Burner run current (A)   | 0.7                   |
| Main HRC fuse (A)        | 5.0                   |



## BURNER DATA

| Burner Model | Minimum Burner capacity <sup>‡</sup> |                          |                         | Maximum Burner capacity <sup>‡</sup> |                          |                         | Cone diameter mm | Minimum Burner Throughput* |         | Maximum Burner Throughput* |         | Nozzle Spray Angle <sup>‡‡</sup> |
|--------------|--------------------------------------|--------------------------|-------------------------|--------------------------------------|--------------------------|-------------------------|------------------|----------------------------|---------|----------------------------|---------|----------------------------------|
|              | 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> |                  | Litres/h                   | USgal/h | Litres/h                   | USgal/h |                                  |
| NLO2         | 31.4                                 | 26.9                     | 107.0                   | 75.0                                 | 64.0                     | 256.0                   | 58               | 2.95                       | 0.78    | 7.07                       | 1.87    | 60°                              |
| NLO3         | 54.8                                 | 47.1                     | 187.0                   | 109.6                                | 93.5                     | 374.0                   | 70               | 5.15                       | 1.36    | 10.3                       | 2.73    | 60°                              |

## INSTALLATION

**Flue** The top of the chimney should be above all roofs within a radius of 10 m. If a cowl is fitted, remove it.

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

If draught over the fire exceeds 0.02 kPa (2mm wg: 0.08 in wg) draught stabiliser should be fitted in a position recommended by the appliance maker. Draught over the fire when the burner is operating should be between 0.05 and 0.012 kPa (5.0—1.2mm wg: 0.05—0.2 in wg).

**Fuel Storage and Handling** The provisions of BS.2869 will normally ensure that the fuel will be of adequate performance. As there are Winter and Summer fuel grades and in order to prevent the fuel waxing under sustained cold and exposed conditions, Class D grade of fuel should be stored and supplied to the burner at a minimum temperature of 5°C (41°F), in line with the fuel suppliers recommendations to suit site conditions.

**Fuel Supply** (and, where fitted, return) line should consist of copper tube (NEVER galvanised steel), the final connection to the 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 gravity feed is used (the most common), 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 is 40 kPa (300 mm Hg) and a two-pipe (supply and return) fuel supply system MUST be used.

Note that the pump is factory set for single pipe installation. When using a two-pipe system refer to the appropriate sketch opposite for pump modifications.

**Single Pipe System** On a single pipe (gravity feed) system, the pump should be primed under gravity from the tank and not by running the pump mechanically. To prime the pump remove the purge plug, connect the purge port to a suitable container.

**Two Pipe System** The suction line/pump will require priming before energising the pump mechanically. It is essential to ensure that the return pipe is not obstructed in any way, e.g. by a plug, closed valve, etc. Any obstructions will damage the pump.

The fuel supply line/pump may need bleeding/priming, if the oil storage is allowed to drain completely.

**Electricity Supply** Connect burner to electricity supply, thermostats, time switches etc. as appropriate.

### Notes:

Diffuser diameter is 55mm on all models. (All 20mm i/d)

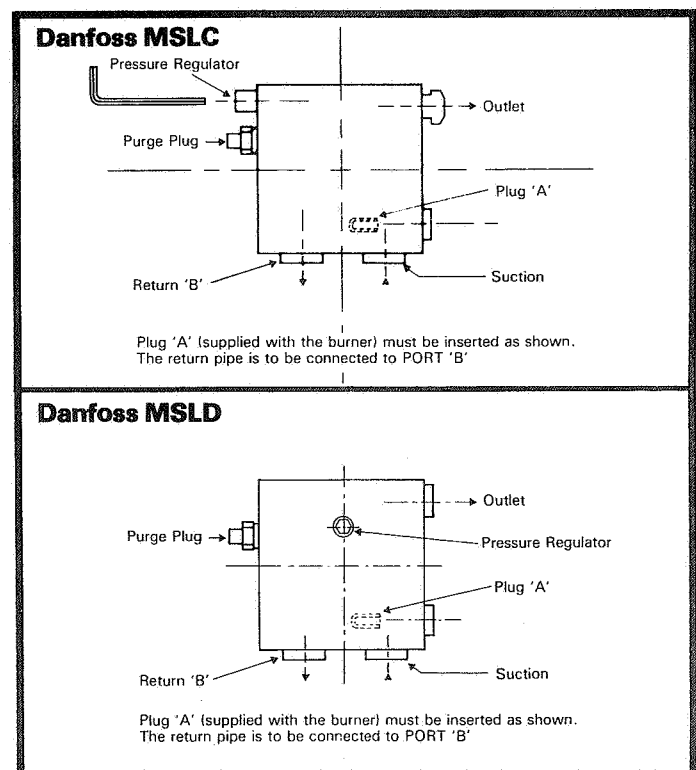
Pump pressure of 1241 kPa (12.7 Kg/cm<sup>2</sup> = 180 psi)

<sup>‡</sup> Ratings are based on negative draught over flame of 0.005 kPa (0.5 mm wg = 0.02 in wg).

<sup>‡‡</sup> Nozzles are Monarch AR or Danfoss S.

\* Based on calorific value of 10.6 kW/litre (137,500 BTU'S/US gal)

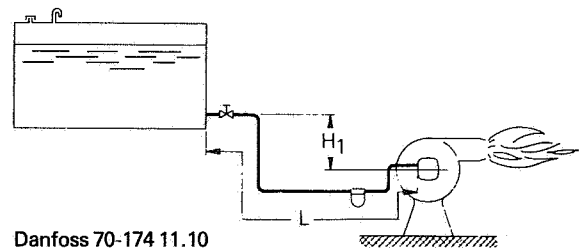
### Modifying a fuel unit to two-pipe from one-pipe installation.



**Important:** When using a two-pipe system it is essential for the return line to go direct to tank without obstruction.

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

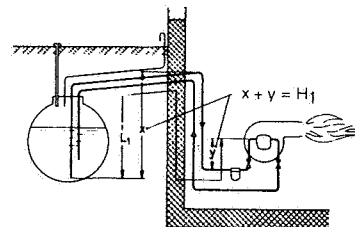
| <b>PUMP — DANFOSS MSLC/MSLD</b>      |   |                |                |   |                |                |   |                |                |
|--------------------------------------|---|----------------|----------------|---|----------------|----------------|---|----------------|----------------|
| <b>FUEL Class D 4.3 cSt @ (20°C)</b> |   |                |                |   |                |                |   |                |                |
| $H_1$                                | Pipe Size I/D                               |                |                |   |                |                |   |                |                |
| m                                    | $\phi 4$<br>mm                              | $\phi 5$<br>mm | $\phi 6$<br>mm | $\phi 4$<br>mm                              | $\phi 5$<br>mm | $\phi 6$<br>mm | $\phi 4$<br>mm                              | $\phi 5$<br>mm | $\phi 6$<br>mm |
| 4,0                                  | 77  | 100            | 100            | 39  | 94             | 100            | 25  | 60             | 100            |
| 3,5                                  | 67  | 100            | 100            | 33  | 82             | 100            | 21  | 52             | 100            |
| 3,0                                  | 56  | 100            | 100            | 28  | 67             | 100            | 18  | 44             | 91             |
| 2,5                                  | 46  | 100            | 100            | 23  | 56             | 100            | 15  | 36             | 74             |
| 2,0                                  | 35  | 86             | 100            | 18  | 43             | 89             | 11  | 27             | 57             |
| 1,5                                  | 24  | 60             | 100            | 12  | 30             | 63             | 8   | 19             | 40             |
| 1,0                                  | 14  | 35             | 72             | 7   | 17             | 36             | 5   | 11             | 23             |
| 0,5                                  | 4   | 9              | 19             | 2   | 4              | 9              | 1   | 3              | 6              |
| Nozzle capacity                      | 1.9–2.7<br>Litres/h<br>0.503–0.713<br>USG/h |                |                | 2.7–4.9<br>Litres/h<br>0.713–1.297<br>USG/h |                |                | 4.9–7.5<br>Litres/h<br>1.297–1.996<br>USG/h |                |                |



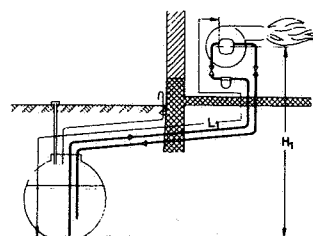
Danfoss 70-174 11.10

**Two-pipe system** — to be used when a vacuum may occur in the suction line.

| <b>PUMP — DANFOSS MSLC/MSLD</b>      |                |                |                 |
|--------------------------------------|----------------|----------------|-----------------|
| <b>FUEL Class D 4.3 cSt @ (20°C)</b> |                |                |                 |
| $H_1$                                | Pipe Size I/D  |                |                 |
| m                                    | $\phi 6$<br>mm | $\phi 8$<br>mm | $\phi 10$<br>mm |
| 4,0                                  | 34             | 100            | 100             |
| 3,5                                  | 32             | 100            | 100             |
| 3,0                                  | 30             | 95             | 100             |
| 2,5                                  | 28             | 89             | 100             |
| 2,0                                  | 26             | 82             | 100             |
| 1,5                                  | 24             | 75             | 100             |
| 1,0                                  | 22             | 68             | 100             |
| 0,5                                  | 20             | 62             | 100             |
| 0,0                                  | 17             | 55             | 100             |
| -0,5                                 | 15             | 48             | 100             |
| -1,0                                 | 13             | 41             | 100             |
| -1,5                                 | 11             | 35             | 85              |
| -2,0                                 | 9              | 28             | 68              |
| -2,5                                 | 7              | 21             | 52              |
| -3,0                                 | 5              | 14             | 35              |
| -3,5                                 | 0              | 8              | 19              |
| -4,0                                 | 0              | 0              | 0               |



Danfoss 70-63 12.10



Danfoss 70-173 12.10



## OPERATION.

To start burner turn main electricity isolating switch and, where fitted, separate burner switch, to ON.

The burner can be stopped in an emergency by opening the electrical switch provided in the line between the burner and the electricity supply.

There is a pre-purge period during which the ignition is switched on. If a magnetic oil valve is fitted the motor will run.

At the end of this period magnetic oil valve (if fitted) opens: if magnetic oil valve is not fitted motor starts. Burner lights.

After a further period the ignition is switched off and the burner continues to run until it is switched off by:-

- (a) the control thermostat contacts opening upon the room or water temperature being reached
- or (b) safety or limit thermostat contacts opening
- or (c) burner is switched off manually.

If, during start up, the flame fails to be established the photocell will detect this and will shut down the burner and the "lock out" lamp in the sequence control box is automatically lit.

If, during normal running, the flame is extinguished the ignition spark is restored within 1 second. If no magnetic oil valve is fitted the motor stops. After 10-15 seconds the motor starts again. If burner fails to light it goes to "lock out" after 10-15 seconds.

If magnetic oil valve is fitted oil is cut off but motor continues to run. After 10-15 seconds oil valve opens and burner attempts to light. If it fails to light burner goes to "lock out" after 10-15 seconds.

The manual reset button, also on the sequence control box, should not be operated until at least 30 seconds after the burner has been "locked out".

## FAULT FINDING.

**Motor fails to start.** Check that power is available to the burner. Check all fuses in the supply to the burner. Check that the contacts of both control and safety limit thermostats on the appliance or in the room are closed, and therefore "calling for heat". If these thermostat contacts are not closed check the thermostat settings.

**Motor starts but burner will not light.** If the flame is not established the burner will be stopped and "locked out" after a safety period of 10-15 seconds: a warning light is illuminated on the sequence control box. The manual reset button on the sequence controller should not be operated until at least 30 seconds after the burner has been "locked out".

Ascertain whether oil is being sprayed by the nozzle.

If oil is passing through nozzle, check that there is a spark at the electrodes. Check all connections including high voltage leads.

Check electrode gap and correct if necessary.

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

If there is no oil spray check that there is an oil supply to the burner and that all valves are open. Check that nozzle is not blocked. Ensure that all filters are able to pass oil. Check that the solenoid valve, if fitted, is open. Check that fuel pressure delivered by the pump is correct.

**Unstable pump pressure.** On two pipe suction lift systems disconnect return pipe from pump; 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.

Check that all pipework and connections on the suction side are free of leaks and that there are no blockages.

**Burner starts, then stops after a short time.** Check that photocell is clean and correctly located. Check air damper setting and re-adjust as necessary. Check for blocked nozzle.

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

**Burner stops after satisfactory running period.** If flame fails during normal running period, the ignition will be switched on again. If the flame is not re-established after a period the burner is stopped and "locked out", and a warning (lock out) light illuminated in the sequence control box.

If the flame is re-established during this period the ignition is switched off and the burner will continue to operate normally.

## MAINTENANCE.

Before carrying out any work on the burner ensure that the electricity and oil supply is switched off.

**Filters.** A filter is fitted within the pump. To gain access remove pump end-plate.

Withdraw filter and clean it in paraffin or other solvent, using a stiff brush.

Replace filter and pump end-plate. Re-prime pump.

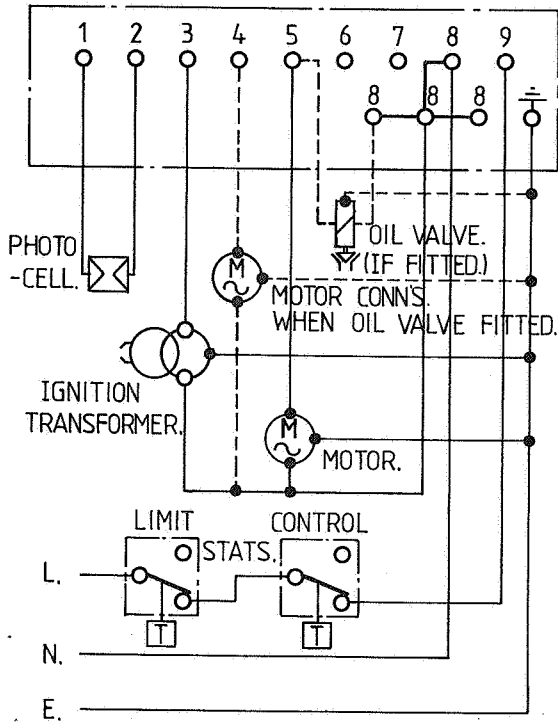
A filter should also be fitted in the fuel supply line. If fitted with a disposable element this should be replaced at least once per year, the frequency depending on the needs of the installation and the cleanliness of the fuel.

If the filter has a cleanable element this should be cleaned, at suitable intervals, in exactly the same way as has been described for the pump filter. Re-prime pump.

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

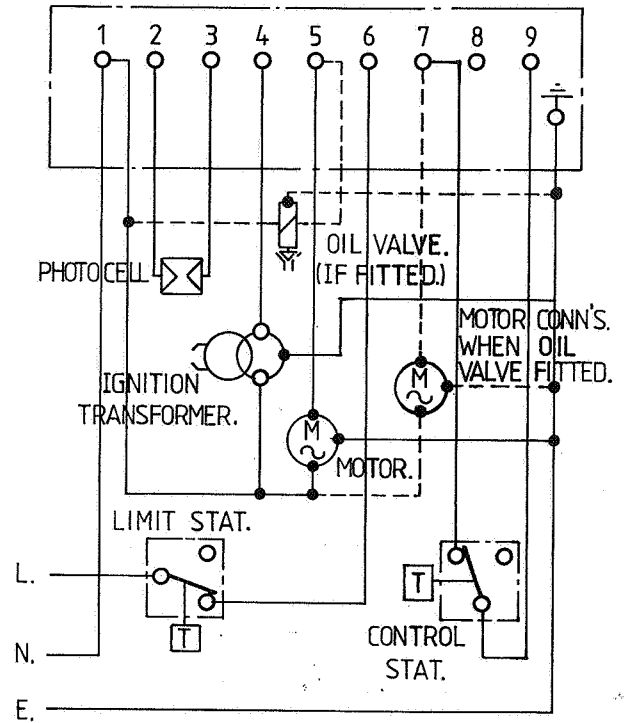
**Fan.** If fan is damaged or becomes loose on the motor shaft the motor must be removed from the burner casing. Do not fit/replace fan.

### SATRONIC TF801B



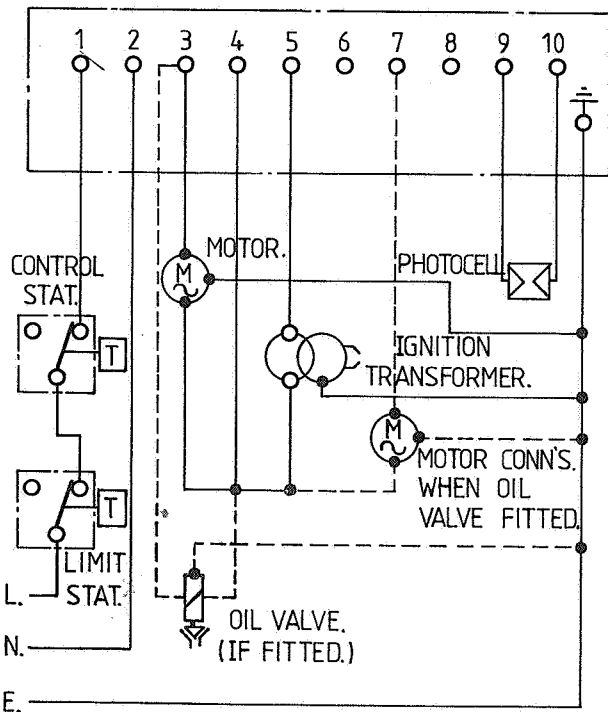
REMOTE LOCKOUT ALARM FROM TERM. 7.

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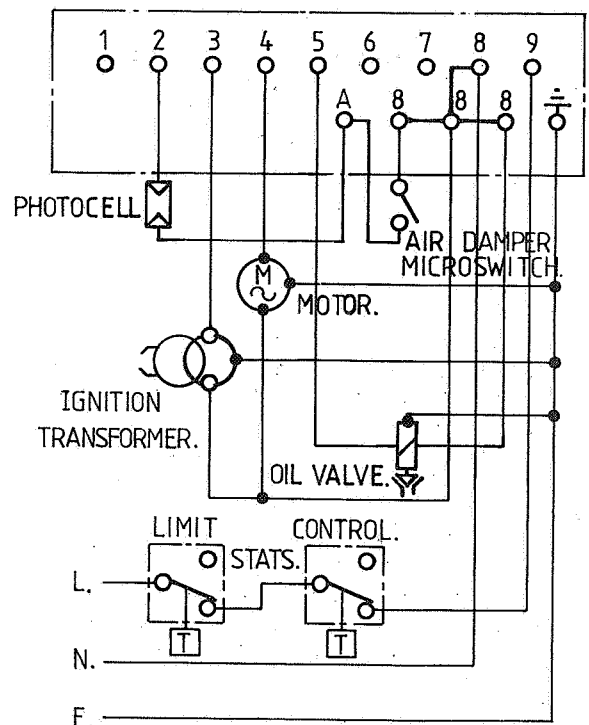
REMOTE LOCKOUT ALARM FROM TERM. 8.

### LANDIS & GYR LAI 4



REMOTE LOCKOUT ALARM FROM TERM. 8.

### SATRONIC TTO 810B

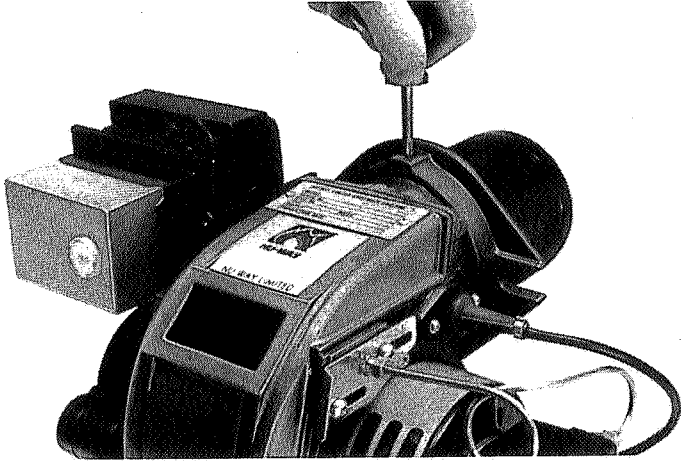


REMOTE LOCKOUT ALARM FROM TERM. 7.

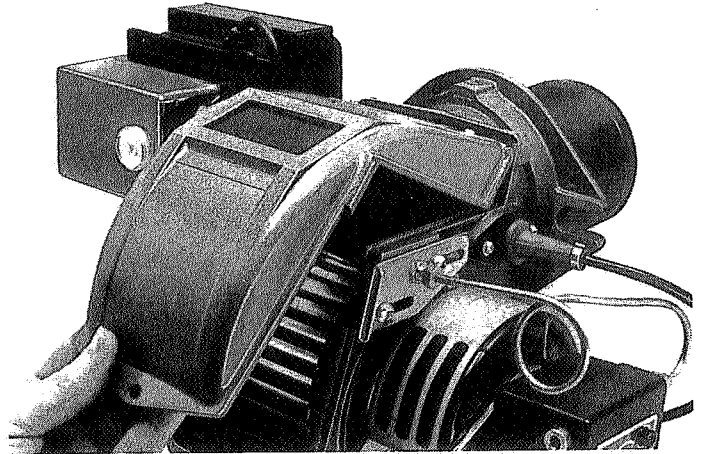
# NU-WAY

## MAINTENANCE

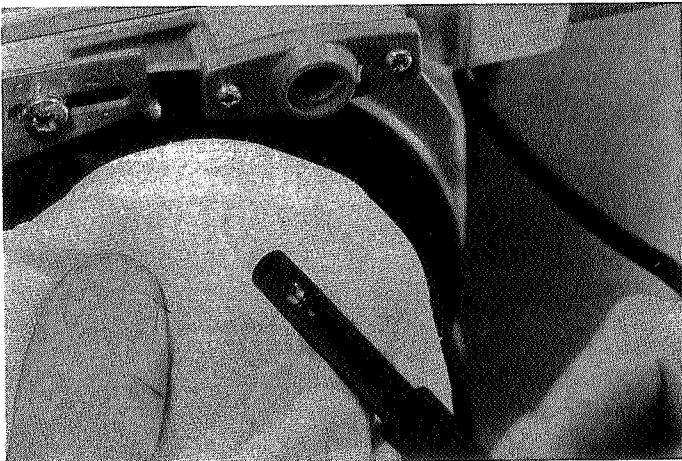
Switch off electricity supply and oil supply to the burner.



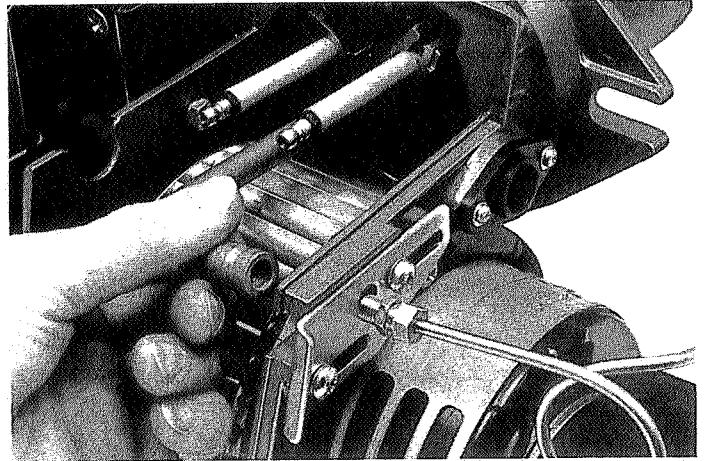
General view of the burner showing one of the fixing screws which secures burner to mounting bracket: latter is bolted to boiler front plate. Sequence control box is to left of burner casing and is secured in position by a single screw adjacent to the reset button.



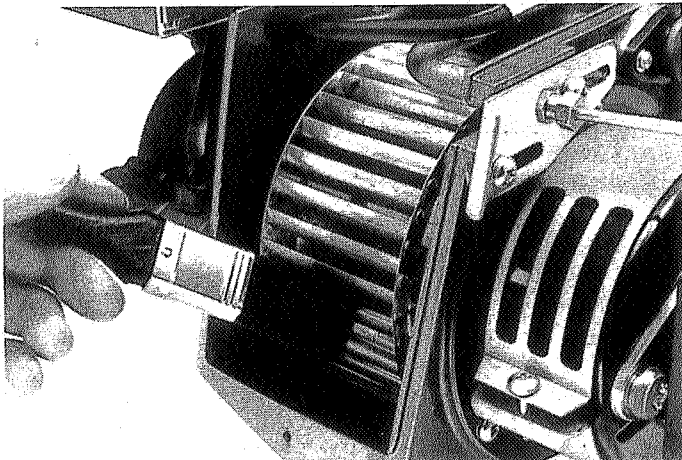
Cover removed after withdrawal of a single screw at cover base. Ignition electrode leads can then be removed from electrodes.



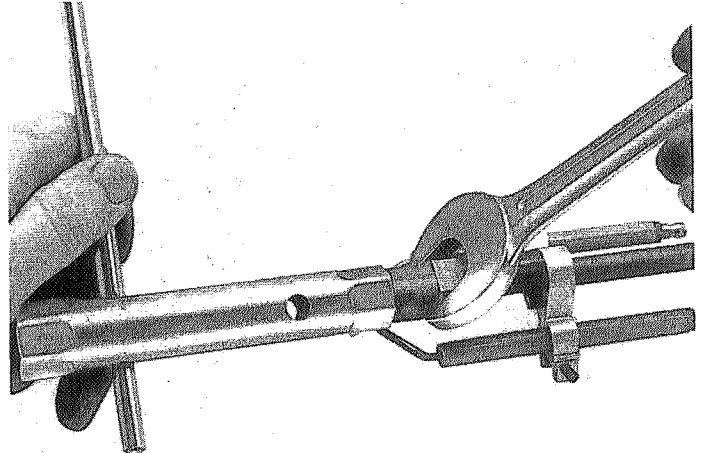
Photocell is removed from burner for cleaning. Do not touch cell with the fingers: use only a clean, dry cloth.



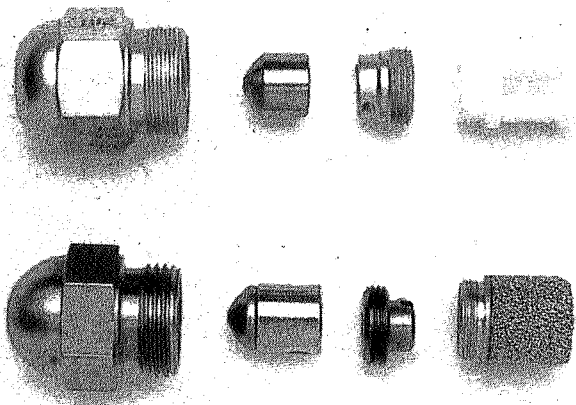
Before attempting to remove inner assembly withdraw photo-electric cell from its housing on right side of burner. Tubing nut and lock nut is fully unscrewed to release inner assembly which can now be withdrawn from burner.



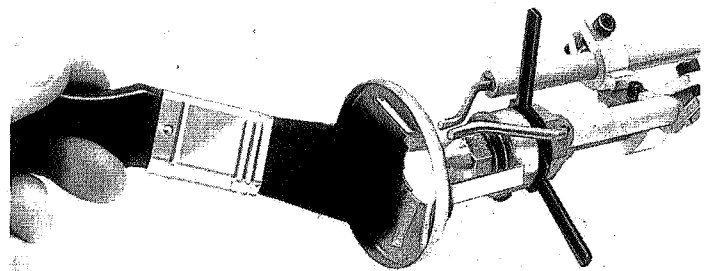
Cleaning the fan runner: use stiff brush.



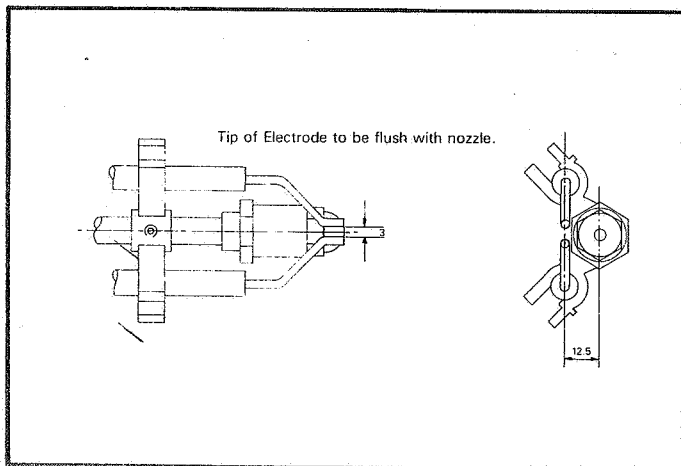
Note diffuser position before removal for nozzle changing/cleaning. Nozzle is removed from inner assembly using a tube spanner. Fit nozzle to burner inner assembly by hand: use spanner only for final tightening. Handle with care to avoid damage to electrode porcelains. REFIT DIFFUSER. See head arrangement drawing opposite.



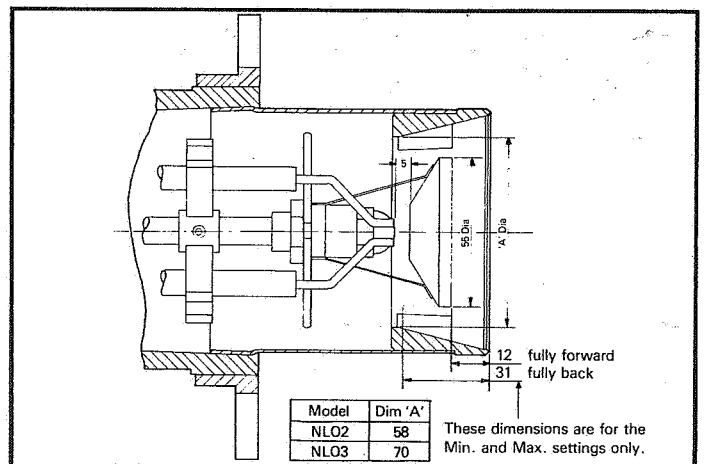
Dismantle nozzle itself to enable internal filter to be cleaned. Do not use any metal or wood to remove deposits. Wash in solvent. Wipe off any remaining dust using a clean, lint-free rag. Illustration shows correct assembly sequence for (above) Monarch and (below) Danfoss nozzles.



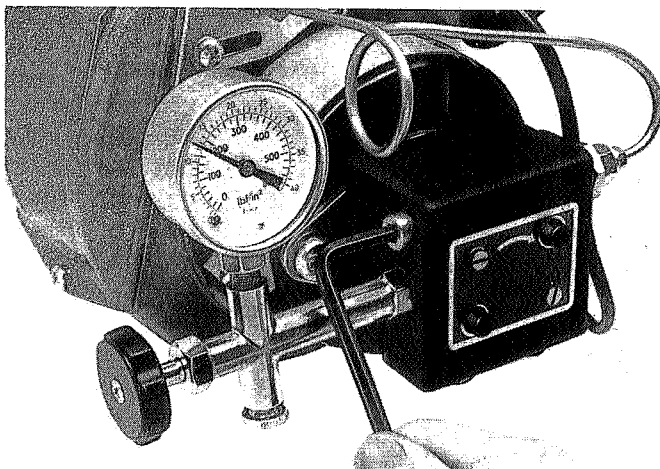
Air diffuser should be cleaned using a stiff brush.



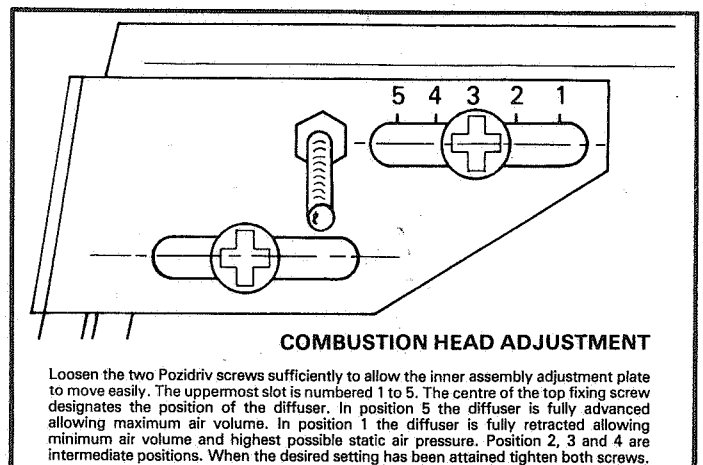
Electrodes should be set to these dimensions to ensure trouble free ignition. Dimensions are in millimetres.



Adjustable head arrangement NLO2 & NLO3 burners. Dimensions are in mm.



To check pump pressure fit pressure gauge and test manifold. Adjusting pump delivery pressure. Normal pressure is 1241 kPa (12.7 Kg/cm<sup>2</sup> = 180psi)





## service centres

### BELFAST

Boucher Centre, 69 Boucher Rd.,  
Balmoral Ind. Estate, Belfast BT12 6HR  
Tel: Belfast 668977

### DROITWICH

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

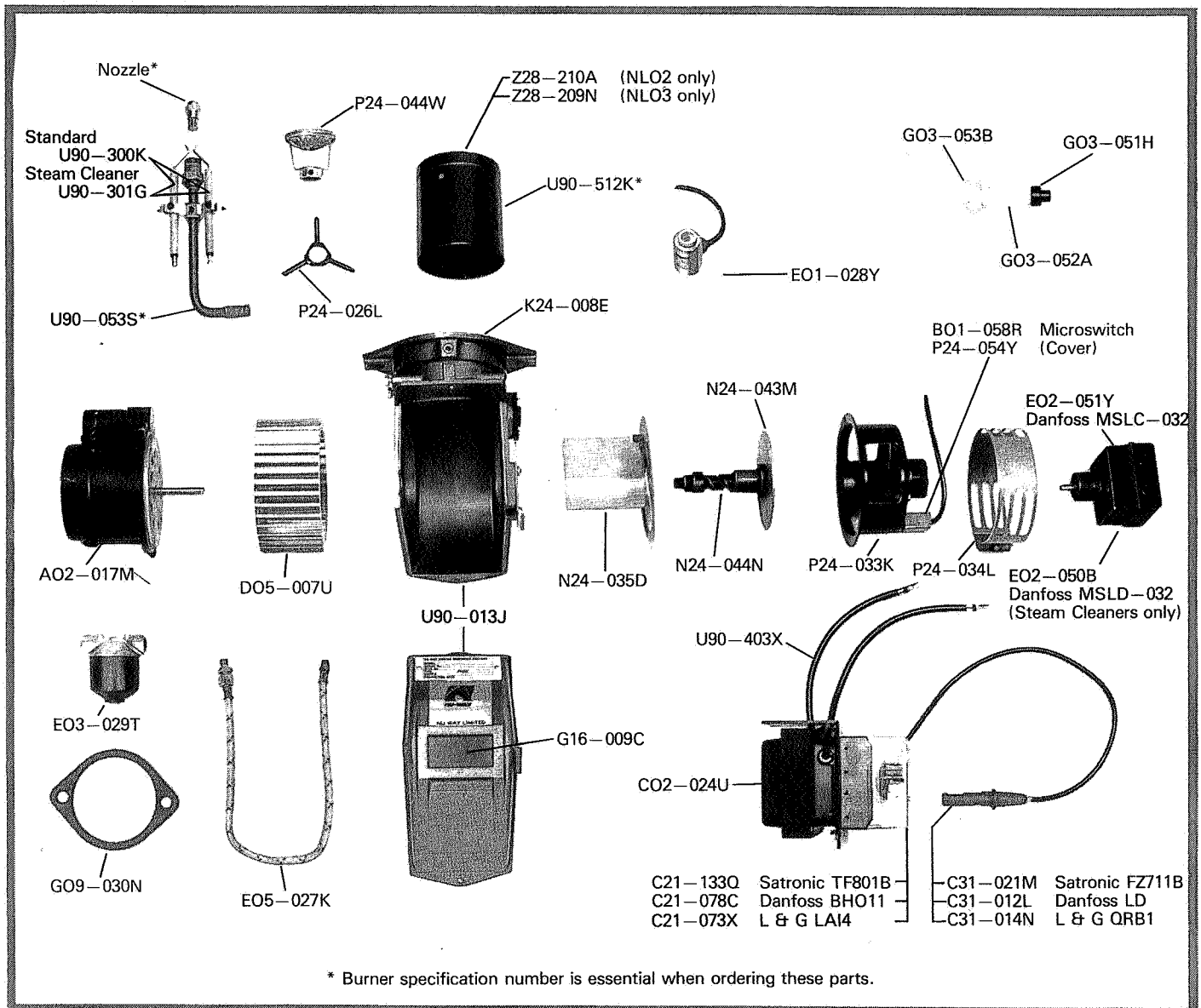
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