

Installation & Maintenance Manual

Series NOL forced draught oil burner Models NOL18 to 100-38 High/Low

Oil Burner

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IMPORTANT - SAFETY

It is essential that the following instructions and adjustments are carried out by qualified engineers that are experienced in pressure jet oil burner commissioning. The manufacturer cannot be held responsible for any consequential damage, loss or personal injury as a result of customers failing to follow these instructions, or as a result of misuse. Your attention is drawn to the **Emergency Instructions** on page 10

EUROPEAN BOILER EFFICIENCY DIRECTIVE (B.E.D.)

All burners and boiler bodies marketed separately should comply with EN267 (oil burners) or EN676 (gas burners) and EN303-1 (boiler bodies).

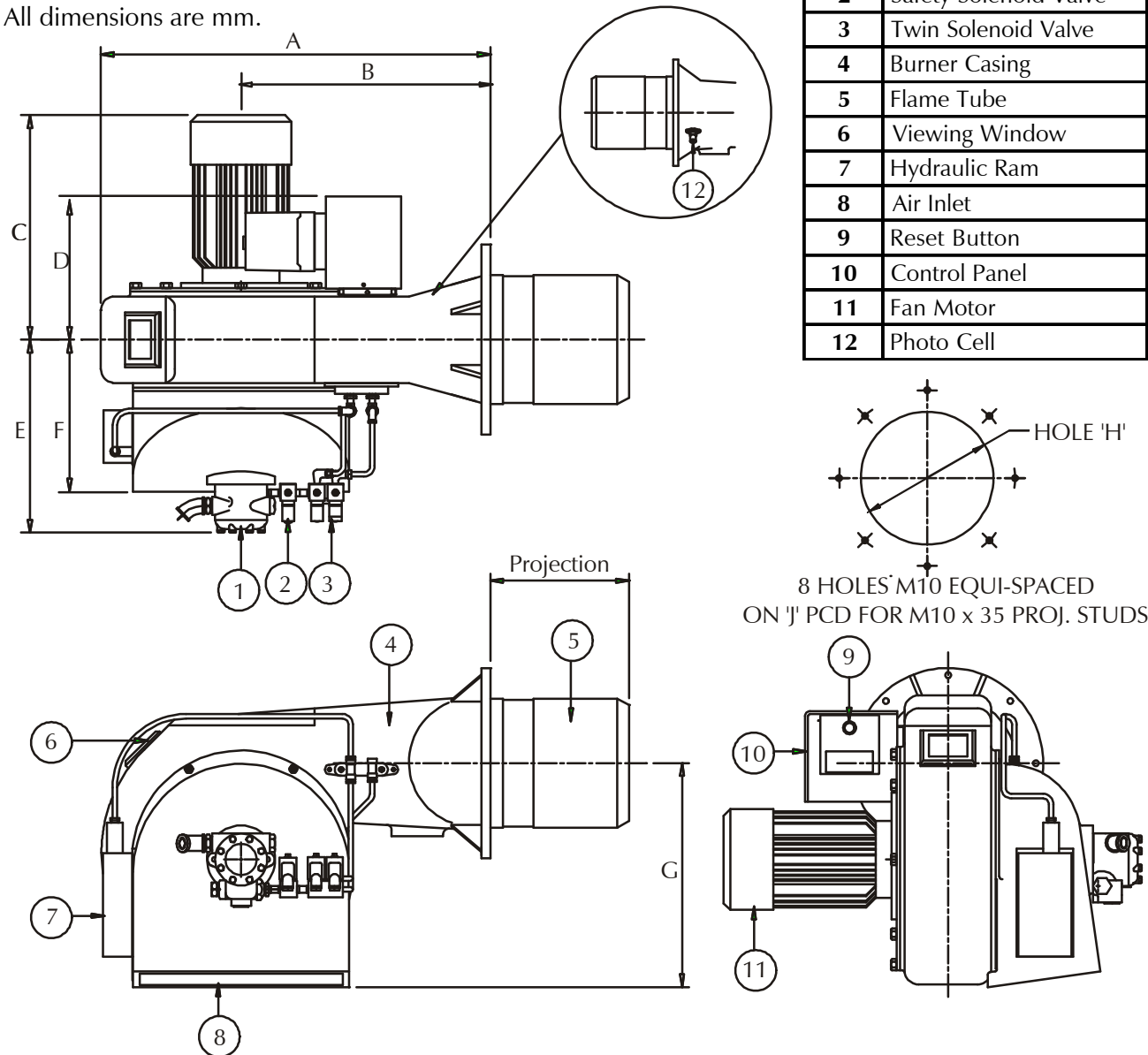
Burner adjustments must be made in accordance with boiler manufactures' instructions, and these must include flue gas temperatures, average water temperature, and CO₂ or O₂ concentration.



BURNER & COMPONENT IDENTIFICATION

Standard Burner Arrangement Shown

All dimensions are mm.

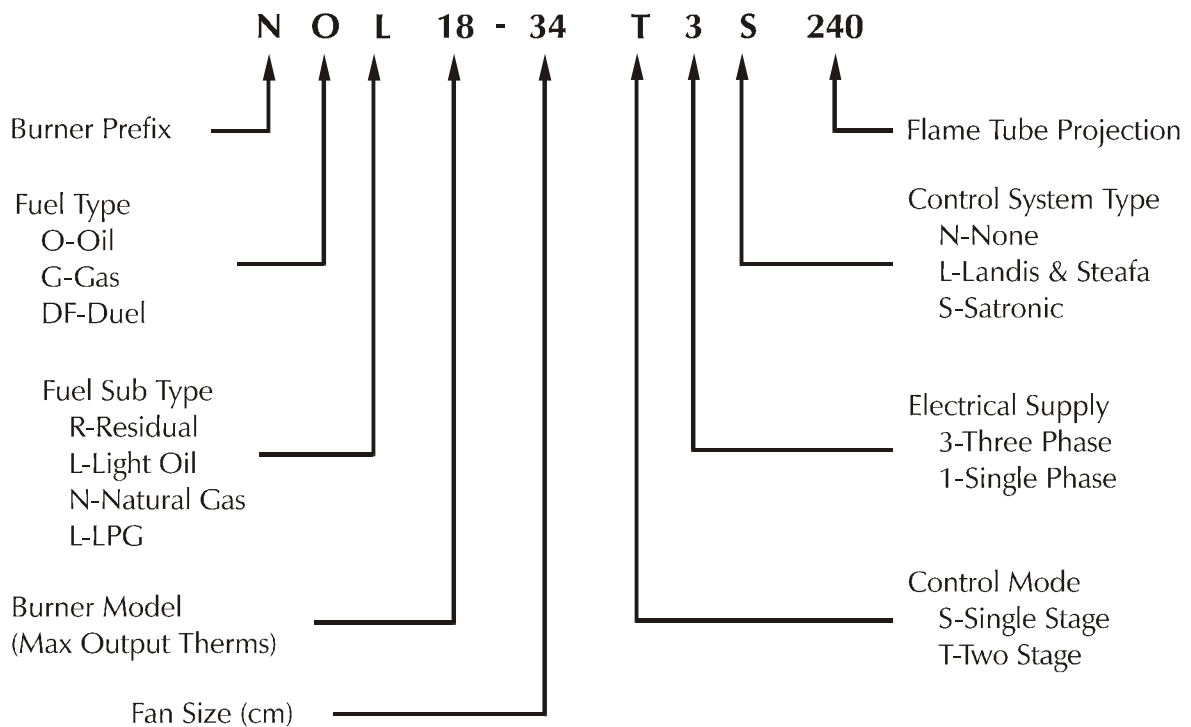


ITEM	DESCRIPTION
1	Oil Pump
2	Safety Solenoid Valve
3	Twin Solenoid Valve
4	Burner Casing
5	Flame Tube
6	Viewing Window
7	Hydraulic Ram
8	Air Inlet
9	Reset Button
10	Control Panel
11	Fan Motor
12	Photo Cell

BURNER	A	B	C*	D	E	F	G	H	J
NOL18-34	674	440	420	250	335	265	400	230	305
NOL18-38	721	465	457	250	335	295	475	230	305
NOL30-25	544	365	307	250	300	215	315	230	254
NOL35-25	544	365	307	250	300	215	315	230	254
NOL35-34	674	440	420	250	335	265	400	230	305
NOL35-38	721	465	457	250	340	295	475	230	305
NOL50-28	674	440	420	250	335	265	400	254	305
NOL50-34	674	440	457	250	335	265	400	254	305
NOL50-38	721	465	480	250	340	295	475	254	305
NOL60-28	674	440	457	250	335	265	400	254	305
NOL60-34	674	440	480	250	335	265	400	254	305
NOL60-38	721	465	480	250	340	295	475	254	305
NOL85-38	721	465	537	250	340	295	475	280	305
NOL100-38	721	465	537	250	340	295	475	280	305

* Motor dimension may vary according to motor size and type

BURNER MODEL DESIGNATION



GENERAL

Nu-way NOL18 to NOL100-38 pressure jet burners are designed for automatic two stage operation with burner outputs from 200 to 3000kW(Gross).

This manual is structured to enable the user to proceed from the delivery of the burner to its commissioning and use.

The conditions to be fulfilled and the controls and adjustments to be used are dealt with in the sequence that should be followed for the correct installation and use. Pre-commissioning and Live Run are described, and the location of necessary controls and adjustments to undertake these are illustrated and supported by appropriate tabular matter and graphs.

Routine maintenance, Fault Finding and Spare Parts identification complete the manual. Literature on proprietary components is available on request.

Burner Range & Outputs

BURNER	MAX OUTPUT (Kw)
NOL18-34	560
NOL18-38	560
NOL30-25	960
NOL35-25	1100
NOL35-34	1025
NOL35-38	1025
NOL50-28	1465
NOL50-34	1465
NOL50-38	1465
NOL60-28	1810
NOL60-34	1810
NOL60-38	1810
NOL85-38	2460
NOL100-38	2930

FEATURES

Developed from Worldwide field experience, the NOL series sets standards in efficient and reliable operation. The burners, which are designed to meet the requirements of all International markets, are designed for flange mounting to the appliance front plate and are delivered ready to install with a pre-wired packaged control system.

Air Regulation

Air for combustion at high and low firing rates can be adjusted to give maximum efficiency.

Controls and Safety Systems

Flame supervision is by photocell with a sequence controller for automatic start-up, running, and shutdown of the burner.

Fuels

As supplied NOL burners are suitable for light distillate oil class D (1.5-5.5 cSt @ 40°C) with a gross CV of 45.5 MJ/kg (12.6 kW/kg).

Burners can be supplied, on request, for use with Kerosene Class C2 (1.0-2.0 cSt @ 40°C) with a gross CV 12.9kW/kg.

Fuel System

Suitable for single pipe gravity or two pipe suction lift systems. The filter supplied with the burner is of the disposable element type.

Construction

Of monobloc design using fasteners to ISO standards and designed for flange mounting.

Manual Operation

The burner is normally fitted with a low flame terminal link switch to assist commissioning.

Combustion Head

The burner head assembly is of a high quality which ensures delivery of good combustion performance which can be maintained over extended periods of operation, leading to optimal appliance thermal efficiency and reduced running costs.

This high specification ensures low level emission of pollutants and excellent flame stability.

SITE CONDITIONS AND SERVICES

Fuel Storage and Handling

The requirements of BS2869 will ensure that the fuel is suitable. Under sustained cold and exposed conditions, fuel should be stored and supplied to the burner at a minimum temperature of 5°C (41°F).

Fuel Supply

The oil line should consist of metallic tube (NEVER galvanised steel). The final connection to the pump inlet port is made with a flexible pipe supplied with the burner. Joints should be made with compression fittings.

When gravity feed is used, the maximum head should not exceed 4m (35 kPa).

On installations where the fuel tank is situated below the level of the burner the maximum suction permitted is 0.4bar (5.8psi) and a two-pipe (supply and return) fuel supply system MUST be used.

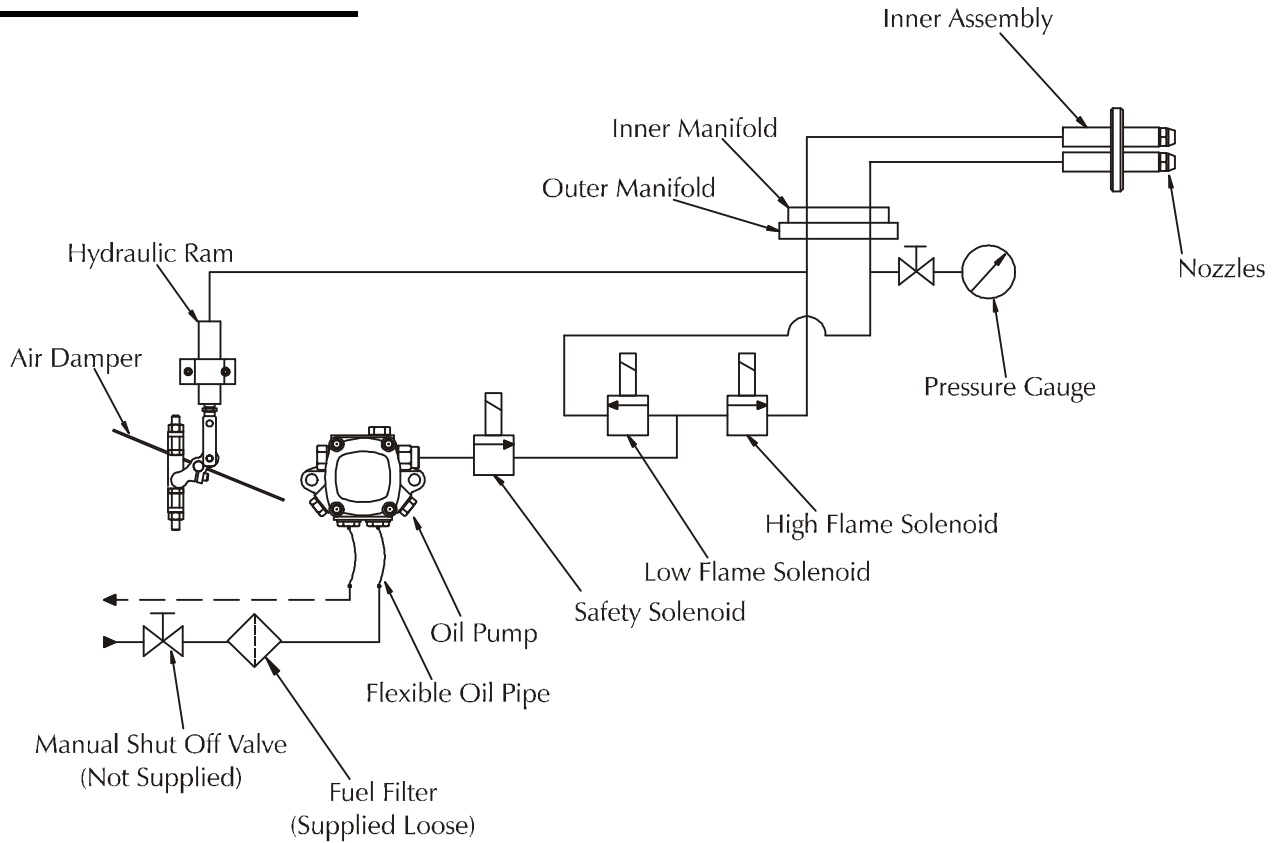
Single Pipe system

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 pressure gauge plug, connect the pressure gauge port to a suitable container.

Two-Pipe System

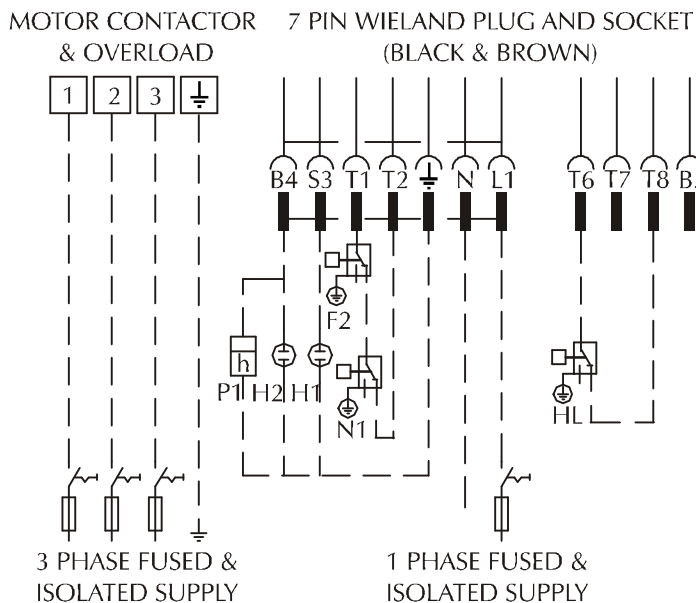
The suction line will require priming before energising the pump mechanically. It is essential to ensure that the return pipe is not obstructed in any way. Any obstructions will damage the pump. The fuel supply line may need priming if the oil storage is allowed to drain completely.

BURNER OIL SYSTEM

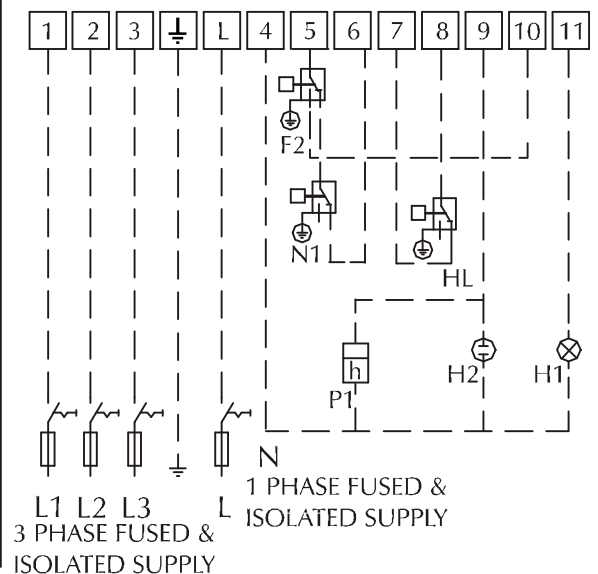


ELECTRICAL CONNECTIONS

POWER & EXTERNAL CONNECTIONS VIA 7 & 4 PIN PLUGS

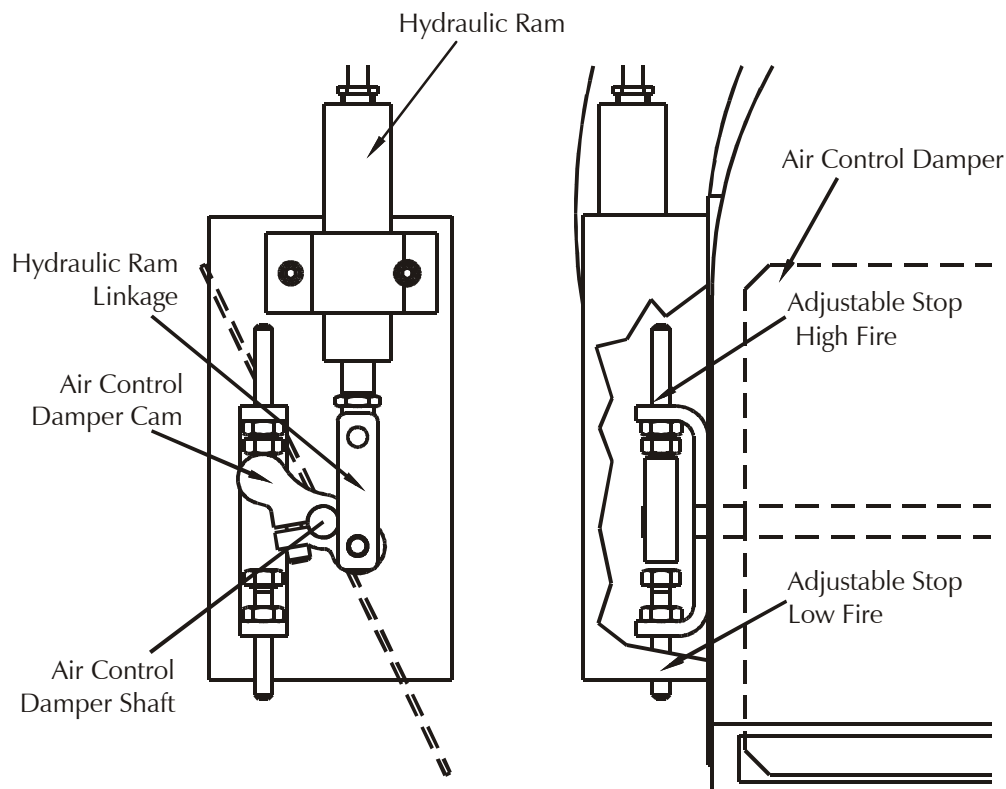


POWER & EXTERNAL CONNECTIONS VIA BURNER TERMINAL STRIP (OPTIONAL - REMOVE 7 & 4 PIN PLUGS)



ITEM	DESCRIPTION	ITEM	DESCRIPTION
F2	Appliance Limit Instrument	P1	Burner Operating Hours Run Counter
H1	Burner Fault Signal	HL	High/Low Instrument
H2	Burner Operating Signal	LO	Remote Lockout Signal
N1	Appliance On/Off Instrument		

AIR DAMPER ADJUSTMENT



Flue and Chimney Requirements

The flue and chimney must be constructed and installed to the appropriate local conditions, Codes and Standards. It shall be of sufficient size to satisfy the volume of flue gases at all firing conditions.

Plant Room Ventilation

An adequate dust free supply of fresh air is required for the burner at both high and low level in accordance with the appropriate standards.

Existing Appliances

In preparing the appliance to receive the NOL oil burner, a careful inspection should be made of its condition after it has been cleaned thoroughly to remove all adhering tars, scale and dirt.

Combustion Chamber Conditions

When the burner is fitted to an appliance designed to work under balanced or negative combustion chamber conditions, the over-fire draught must not exceed 0.25 mbar.

Should the over-fire draught exceed this figure, then steps should be taken to reduce it to this level.

INSTALLATION

General

Check that the burner is appropriate for the appliance rating. Detailed burner performance data is given on page 17 at the rear of this manual.

Fitting to the Appliance

If the burner is to be fitted to a new packaged unit, refer to the manufacturers recommendations.

If the burner is being fitted to an existing appliance, prepare the mounting flange as detailed on the dimensions illustration on page 4.

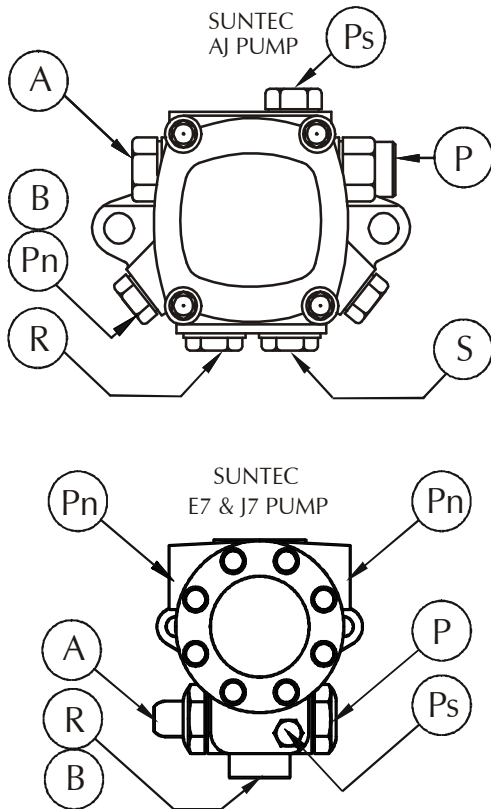
Ensure the joint between appliance and burner is effectively sealed with the gasket provided.

The flame tube projection is specified by the boiler manufacturer.

Oil Supply Connections

Connect the oil supply to the burner oil pump using the flexible pipes supplied. Refer to the burner oil system diagram.

PUMP COMPONENT ID



All pumps are set for 2 pipe (suction & return) system. Remove the by-pass plug for single pipe operation.

ITEM	PORT	ITEM	PORT
S	Suction Port	Ps	Pressure Gauge
P	Pressure Port	A	Adjustment Screw
R	Return Port	B	By-pass Plug
Pn	Vacuum Gauge		

Electrical Power Connection

Connect either a three phase or single phase, 50 Hz electrical supply to the burner according to specification of the burner, observing all applicable Codes and Standards. The electrical connections required are shown on page 7 and in the wiring diagram contained in the instruction pack attached to the burner. These diagrams also show the auxiliary control connections, which must be made.

If the burner is supplied as part of a packaged appliance/burner unit refer to the appliance manufacturers instructions.

BURNER AIR CONTROLS

Air Diffuser

The air diffuser creates a pressure drop to ensure good fuel/air mixing and flame stability.

Air Damper

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 page 8).

BURNER OIL CONTROLS

Oil Pump

Suntec pump models 'AJ6', 'J7' and 'E7' are fitted to this range of NOL burners, see page 9 for identification and location of connections and adjustments.

Maximum flow rates are stated at the recommended pump pressure for Class D oil of 20.7 Bar (recommended pump pressure for Class C2 Oil (Kerosene) 15 Bar.

If the burner is to be used with Kerosene ensure that Nu-way are informed when ordering, a suitable pump can then be fitted to the burner.

BURNER MODEL	PUMP UNIT	MAX FLOW @ 20.7 Bar
NOL18 to NOL50	Suntec AJ6	155 l/h
NOL60 to NOL85	Suntec J7	280 l/h
NOL100	Suntec E7	355 l/h

Oil Nozzle

The oil nozzles are of the simplex (single orifice) atomising type and are fitted to the front end of the inner assembly and located in the flame tube.

The nozzles should be sized to match the rating and turndown requirements of the appliance.

There are two atomising nozzles arranged horizontally, controlled by two magnetic valves.

The right hand nozzle (looking from the rear of the burner) sprays only on low flame whilst both nozzles spray together on high flame.

Hydraulic Oil Ram

Adjustable stops set the position of the air damper at high and low flame. Ensure that the locking bolts have been tightened when commissioning is complete.

OPERATION

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 nozzle and the 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 air damper 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 valves. A limit instrument (hand reset) is also normally fitted to the appliance.

COMMISSIONING

IMPORTANT - SAFETY

It is essential that commissioning shall be undertaken only by suitably qualified and experienced personnel. In the case of NOL burners, commissioning engineers should be experienced in pressure jet oil burner commissioning. Nu-way can accept no responsibility for consequential loss, damage or personal injury which results from a failure to follow the commissioning instructions provided or from commissioning procedures being undertaken by unqualified personnel.

EMERGENCY INSTRUCTIONS

NOL burners are designed and constructed to meet current legislation. When used in accordance with the instructions provided, NOL burners are unlikely to produce a hazardous condition. If, however such a condition should arise in connection with the burner, the appliance or of any instrument, machine or service in the vicinity of the burner, the **OIL AND ELECTRICITY SUPPLIES SHALL BE ISOLATED IMMEDIATELY** and they shall remain isolated until the fault has been identified and rectified.

Inspection

Before commissioning is begun it is important to:

- Check that the electrical wiring is complete and complies with all applicable Codes and Standards.
- Ensure that the fuses are fitted and are of the correct rating.
- Check electrical earthing.
- Verify that the oil supply system is correctly designed and that the supply pipework is correctly sized and free from leaks.
- Ensure that all manual fuel isolation valves are operable, fully closed and leak tight.
- Make all personnel involved in the commissioning aware of the location of the emergency fuel and electricity isolation points.
- Establish that the appliance is in an appropriate and safe condition to be fired; for example, that there is water in the boiler.
- Set the appliance controls to call for heat.
- Check the appliance ventilation and flueing arrangements.
- Ensure that any warning notices appropriate to the commissioning procedure are in position.
- Ensure that all necessary tools and test equipment are available and ready for use. Essential items include temperature measuring instruments for measuring flue gas and appliance water temperatures, and a means of analysing the flue products for carbon dioxide (CO₂), oxygen (O₂), carbon monoxide (CO) and smoke.
- Check that all relevant documentation is available including, where appropriate:
 - The agreed plant performance specifications.
 - Plant drawings and pipework layouts.
 - Electrical logic and wiring diagrams.
 - Certificates confirming satisfactory completion of procedures such as soundness testing and electrical safety tests.
 - Commissioning, operating and maintenance instructions for the plant.

- Establish that the operation of plant other than that being commissioned will not have an adverse effect on the operation of the plant to be commissioned and similarly, that the operation of the plant to be commissioned will not have an adverse effect on other plant.

Confirm that the operation of adjacent plant and machinery will not constitute a hazard to the personnel involved in commissioning.

Pre-firing Checks

With the oil and power switched off, carry out the following checks.

- Check the nozzle size and position relative to the diffuser plate. (The burner head dimensional details are given on page 17).
- Check that the electrode positions and H.T. leads are correct.
- Check the fan motor overload settings.
- If the appliance is a boiler, check that the water level is correct, the controlling valves are open and that the water pumps are in working order.
- If a flue damper is fitted, check that it is correctly interlocked to the burner or fixed in the fully open position.
- Ensure that there is a good oil supply to the burner pump. Bleed one or two gallons from the flexible to eliminate any pipe scale and air from the system.
- Check that the oil supply is of the recommended temperature and pressure.
- For single pipe systems bleed the burner pump manually by opening a pressure port until air-free oil flows. With two pipe operation bleeding is automatic.
- Switch on the electricity supply to the burner.
- Switch on the burner at the control panel. The hydraulic ram will remain in the low fire position during the pre-purge period.
- Allow the fan motor to run up to speed, switch off the burner and check the fan rotation (Anticlockwise as viewed from the motor side) as the fan slows down.

- Remove and cover the photoelectric cell with a clean lint free cloth, switch on the burner, and allow it to run through to lockout. During this run check that the ignition spark is occurring, and note oil pressures at the moment of ignition. Reset the sequence control and repeat the run if necessary to check these functions. If necessary, adjust the pump to the required pressure and recheck.

- Replace the photoelectric cell.

THE BURNER IS NOW READY TO BE COMMISSIONED.

Commissioning the Burner

- Open the low flame hold switch (LFC) or temporarily disconnect the live feed to the H/L thermostat from its connection in the burner terminal block.
- Switch on the burner, the hydraulic ram will remain in the low fire position during the pre-purge period (approx. 30 Seconds).
- The burner should light in the low fire position. If ignition is not achieved refer to the fault finding section at the rear of the handbook
- Check the flame visually. If the flame is dirty, adjust the low fire stop until the flame becomes clean.
- Allow the burner to run until the system is at normal operating temperature. Turn off the burner, the flame should go out immediately and the pressure gauge drop to, or just above, zero.
- Switch off the electricity supply and close the low flame hold switch. Restart the burner and allow the burner to change to high flame. Adjust the high flame stop until the damper is sufficiently open to give clean combustion.
- Check the oil consumption. If this is not correct for the full burner rating then further adjustments to the fuel pressure and the high flame stop will be required.
- Switch the burner back to the low flame position. The oil consumption rate should now be up to 50% of the rated maximum.
- The burner can now be switched between the high and low position whilst measuring the flue gas composition. Adjust the combustion air volume as necessary to give a high flame CO₂ should be within 11% and 12% and the low flame about 1% lower than these figures.

- Smoke readings should not exceed No. 2 on low flame and No.1 on high flame on the Bacharach Scale under steady flow conditions.

When a satisfactory setting has been achieved tighten the lock nuts on the adjustment device.

Check the correct function of all safety controls and interlocks

If the burner control panel is inclusive of Low – Excess low and High Water interlocks and alarms, test that these function correctly. Ensure that the boiler feed pump switchgear provided in the panel is operating satisfactorily.

Allow the boiler to attain the correct working pressure/temperature and adjust the controlling instruments to the desired values.

Finally check all ancillary controls and equipment such as damper interlocks etc.

ROUTINE MAINTENANCE OF NOL BURNERS

General

It is vitally important that personnel responsible for the day to day operation and maintenance of the plant are instructed by the commissioning engineer on the basic function of the burner as well as the need for routine maintenance and daily checking of burner operations.

Final adjustments, which will have been made during the commissioning, must be recorded on the *Commissioning Sheet* at the back of this manual and in the appliance **logbook**. A copy of the commissioning data **must** be sent to the appliance manufacturer.

The burner should be kept clean inside and out. It will be more reliable, and if an oil leak occurs it will be spotted more readily.

Inspect the burner regularly to check if there is any variation from the correct *operating sequence*. Check the correct oil pump pressure.

Ignition and flame should be inspected and any irregularities observed should be rectified i.e. nozzles and/or electrodes cleaned and any deposits removed from the inside of the flame tube and diffuser.

Photoelectric Cell

Remove the photoelectric cell and clean with a soft lint free cloth if necessary. Be careful not to touch the glass bulb of the cell as this can lead to premature failure of the unit.

Replenishing the Fuel Supply

It is usual practice to shut boiler(s) off whilst delivery of fuel is being made and allow approximately 30 minutes for any sediment to settle before restarting the burners.

Boiler Combustion Surface

Keep the boiler combustion surfaces and flueways clean. Any accumulation of soot will decrease the efficiency of the boiler and increase the flue gas exit temperature. Always cover up the burner during boiler cleaning operations.

If a burner becomes troublesome then the assistance of a qualified commissioning engineer should be obtained. To assist in his diagnosis, notes should be made detailing the events leading up to the lockout situation. The symbol appearing in the lockout window should also be noted prior to resetting the burner. (*Refer to the Sequence Diagram and Timing Chart*).

FLAME FAILURE & SEQUENCE

CONTROL

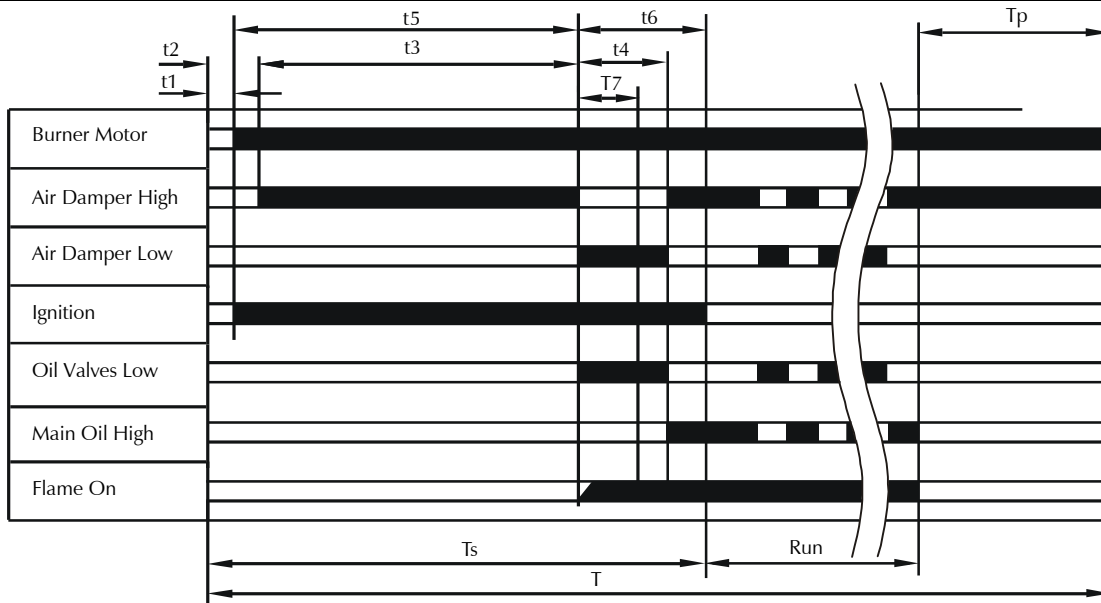
Various types of control boxes are fitted to the NOL 18-100 High/Low series of burners. This manual covers the standard models from Satronic and Landis & Staefa.

The units are designed to provide control and supervision for atomising oil burners of medium to large capacity. They are suitable for use on multi-stage and modulating burners.

For safety reasons, at least one controlled shutdown must be provided within each 24-hour period of continuous operation.

COLOUR	WHERE	WHAT	REASON
GREEN	End	Does not start	Incorrect wiring
			No voltage at terminal 9
			No neutral connection
BLUE	Anyw- here	Lockout	Stray Light
			Photo Cell faulty
			Solenoid Leaking
			Flame monitoring circuit broken
YELLOW (NO FLAME)	End	Lockout	No ignition
			Fuel supply problem
			Solenoid valve defective
YELLOW (WITH FLAME)	End	Lockout	Photo cell dirty
			Photo cell or circuit faulty
			No voltage at terminal 20

SEQUENCE CONTROL TIMINGS



PERIOD	TIME (secs)		DESCRIPTION
	LAL- 1.25	TMO- 720	
t1	2.5	2.5	Start up time for fan motor
t2	5	5	Delay to damper open
t3	22.5	30	Full air pre-purge
t4	11.5	7.5	Delay to 'High flame'
t5	34	30	Pre-ignition
t6	15	7.5	Post Ignition Time
t7	5	5	Safety period
Ts	36.5	40	Total start up time
Tp	15	0	Post purge time
T	51.5	40	Control re-cycle time

When a burner failure is encountered the box goes into lockout mode. This is indicated by a red light, which displays within the lockout window of the control and is repeated at the lockout lamp on the panel fascia.

If a lockout situation occurs, the burner will not start until it is manually reset by pressing the lockout window on the control. (The control can also be reset by the off/on/reset switch situated on the control panel fascia)

If the burner fails to fire and persists in locking out, **no more than three attempts should be made.** To do so may create a **dangerous situation.**

When lockout occurs, the control can be reset immediately. After the resetting (and also after the correction of a fault which resulted in a controlled shutdown, or after each mains failure) the sequence switch always runs through to the start position, whereby **only** selected terminals receive voltage in accordance with the control program. It is only then that the control unit programs a fresh burner start up.

Note: Do not press the lockout reset button (or remote reset switch) for more than 10 seconds.

PLEASE NOTE. When the control box goes to lockout it is generally performing the function it is designed for.

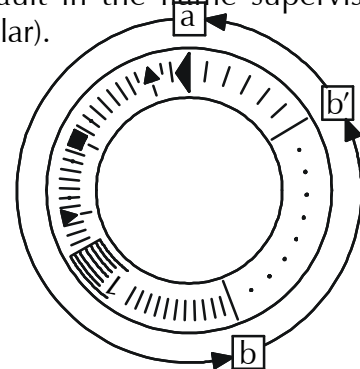
FAULT CONDITIONS AND LOCKOUT INDICATION

LAL1.25

In the event of fault conditions the sequence switch stops and simultaneously the lockout indicator. The symbol appearing above the reading mark indicates the kind of fault encountered.

- ◀ **No start**, because, one or more of the contacts has not closed or extraneous light due to leaking fuel valves or faulty flame supervision circuit.
- ▲ **Shut down of start up sequence**, because the OPEN signal has not been supplied to control box terminal 8 by the servo motor limit switch. Terminals 6,7 and 15 remain under voltage until the fault is corrected.
- **Lockout** due to a fault in the flame supervision circuit.
- ▼ **Shut down of start up sequence**, because the signal for the low flame position has not been supplied to control box terminal 8 by the servo motor auxiliary switch. Terminals 6,7 and 15 remain under voltage until the fault is corrected.
- 1 **Lockout**, because no flame signal has been received on completion of the safety time.
- | **Lockout**, because the flame signal has been lost during burner operation or an air pressure failure has occurred.
- ◀ **Lockout on completion or after completion of the control program sequence** due to extraneous light (e.g. flame not extinguished, leaking fuel valves) or due to a faulty flame signal (e.g. fault in the flame supervision circuit or similar).

Landis & Staefa
LAL1. Program
Sequence Disk.



- a - b Start up sequence.
- b - b' idle steps up to the self shut down of the sequence switch.
- b(b') - a Post purge sequence.

Loss of flame during operation results in immediate cancellation of fuel release, followed by direct lockout or repeat of start sequence if jumper II has been cut..

Start without flame establishment causes cancellation of fuel release within 5 sec. of its initial release.

Fuel is supplied only when all parts of the unit are functioning correctly. All safety circuits are automatically checked before fuel is released.

Failure of the mains supply always results in a normal start sequence on restoration of power. If the control box is at lockout, failure of the mains supply does not cause it to reset.

Stray light during the pre-purge phase leads to shutdown and lockout.

BURNER OIL NOZZLE

When the nozzle has completed 3000 hours of operation, it should be replaced with the same **Make, Type and Size** as fitted. Failure to do so will alter the characteristics of the burner and may impair the performance and efficiency of the plant. The nozzle identification code is stamped onto the face of the hexagonal nut section of the nozzle body as shown below.

Should any doubts arise concerning the suitability or performance of the burner nozzle, please contact the Nu-way Technical dept..

SERVICE & REPLACEMENT

Nu-way Ltd. Parts & Components Division carry a comprehensive stock making up the burner systems described in this handbook. Should it become necessary to order replacement parts, it is important to quote the burner model, specification and serial numbers to ensure correct expedition of your order.

Nu-way Ltd. is able to offer 'on site' Commissioning, Service and Repair through its worldwide network of authorised distributors and sales offices. Please contact the Nu-way Service Department for further information.

FAULT FINDING

If the Burner Fails to Start

Make sure that all the thermostats and switches in the control circuit are in the 'made' position.

Check that the electricity supply to the burner is 'live' and that the control and main circuit fuses are intact. If a fuse is found to be 'blown' then the cause should be investigated and rectified before proceeding further.

On steam boilers, check that the 'water level interlocks' are in the 'made' position.

If the burner is found at lockout (red)lockout lamp illuminated

Reset the burner and observe the starting sequence. (Make reference to the *Sequence Diagram and Timing Charts* for the Flame Failure controls on page 13 for further information).

Check the fan motor overload and reset if necessary.

Flame Occurs Followed by Immediate Lockout

Check the PE cell and the air damper for correct operation. Check that the oil pressures are correct. Ensure that there is sufficient oil in the storage tank, bleed the oil pump in case it is partially air-locked. Check to ensure that all stop/fire valves in the supply line are fully open.

The Burner Starts With The Correct Oil Pressure But No Flame Appears

Check the ignition system, HT lead connections, electrode gap and the condition of the electrode insulators. Check that the air damper mechanism is not broken or disconnected. **It is important to note that continued resetting of the burner should be avoided as this can lead to a dangerous situation.**

BURNER COMMISSIONING SHEET

This manual contains a record of the essential information and will have been completed by the commissioning engineer with individual details of the burner. These details should be verified periodically and adjusted if variations are noted. Commissioning details must also be recorded in the **appliance logbook**.

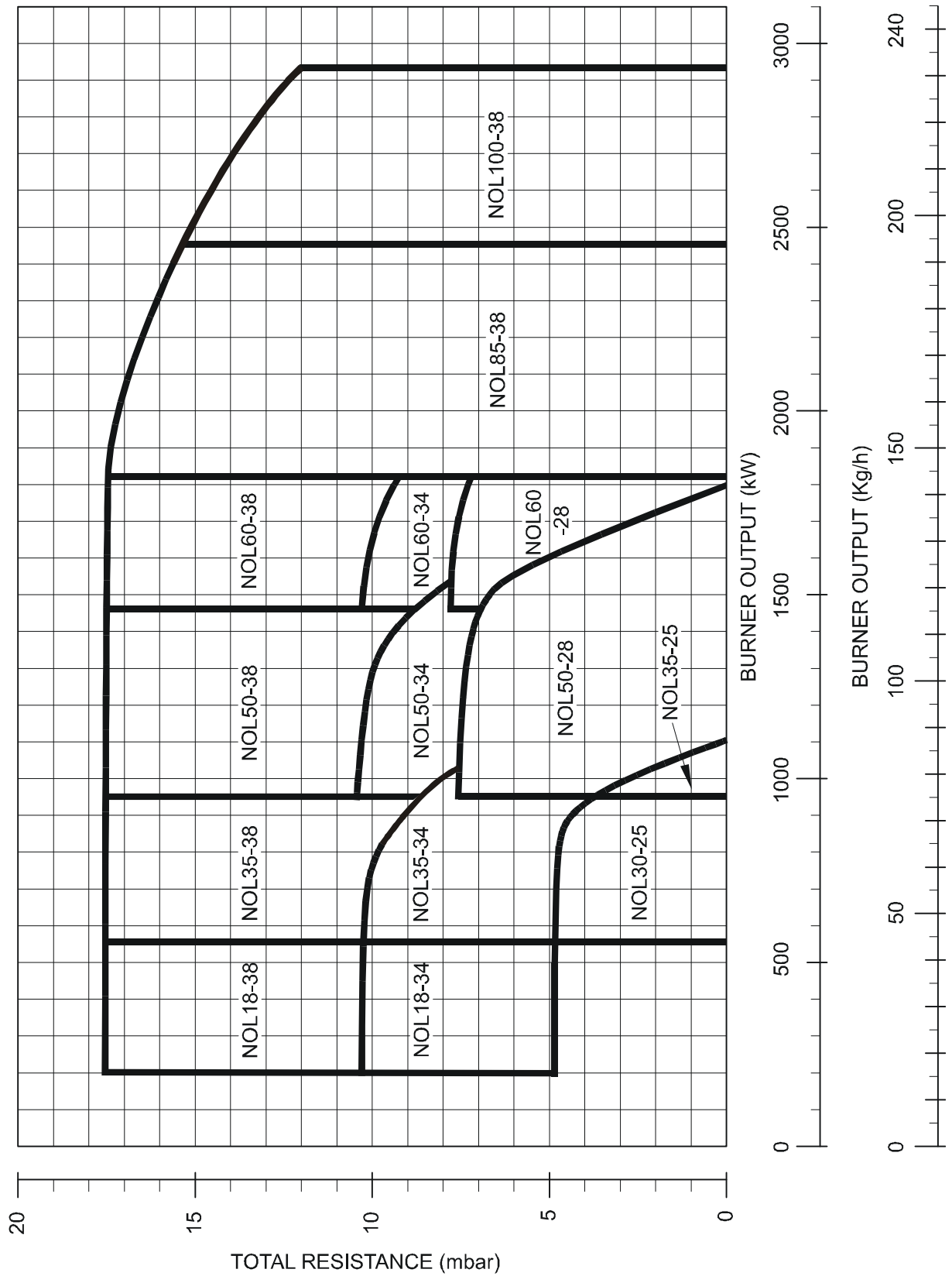
BURNER PERFORMANCE CURVES

The Performance Graph shown on page 15 plots burner input against the appliance running resistance. The appliance starting resistance is derived from a combination of the combustion chamber shape, volume, start rate and flue conditions. It may be necessary to select a burner with a higher fan static pressure than would normally be chosen, if the appliance has a high starting resistance.

Similarly, when firing a reverse pass boiler up to 2 MW, with a combustion intensity of 2 MW/M³ and an operating resistance between 40 and 90 mm wg. it is recommended that a burner with a higher fan static pressure is selected, i.e. if the graph selects a burner with a 28 cm fan then use the 34 cm fan model for correct combustion.

All outputs quoted are based on gross C.V.

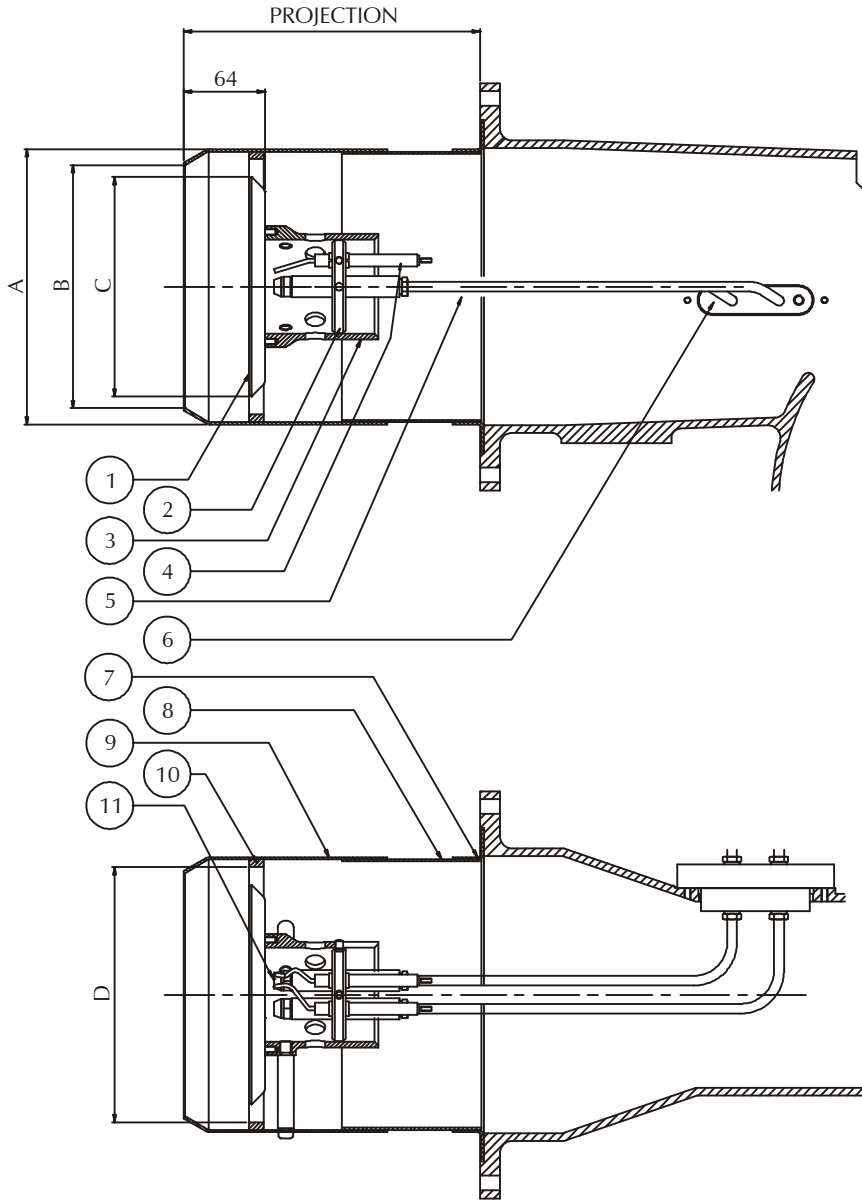
BURNER PERFORMANCE CURVES



Burner outputs are based on a gross calorific value of class D fuel of 12.66 kW/Kg.
 Graphs produced in accordance with BS EN 267.

BURNER COMBUSTION HEAD

ITEM	DESCRIPTION
1	Diffuser
2	Primary Air Disc
3	Primary Air Tube
4	Ignition Electrodes
5	Oil Line
6	Inner Assembly Union
7	Draught Tube Adaptor
8	Draught Tube
9	Flame Tube
10	Restrictor Ring
11	Oil Nozzles

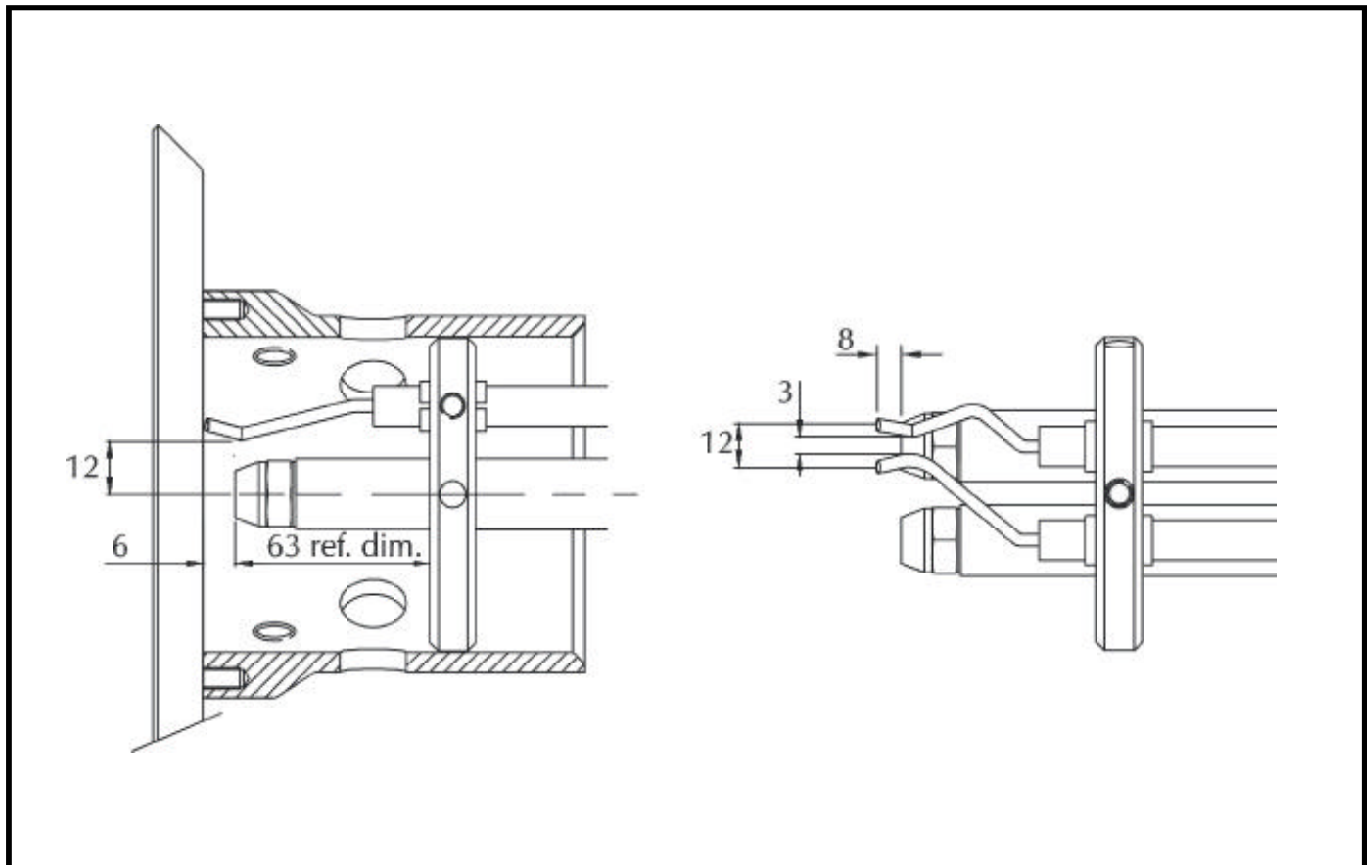


BURNER	ØA	ØB	ØC	ØD	BURNER	ØA	ØB	ØC	ØD
NOL18-34	178	165	152	165	NOL50-34	220	197	178	206
NOL18-38	178	165	152	165	NOL50-38	220	197	178	206
NOL30-25	178	165	152	NONE	NOL60-28	220	206	178	NONE
NOL35-25	178	165	140	NONE	NOL60-34	220	206	178	NONE
NOL35-34	178	165	152	NONE	NOL60-38	220	206	178	NONE
NOL35-38	178	165	152	NONE	NOL85-38	254	228	203	NONE
NOL50-28	220	197	178	206	NOL100-	254	228	203	NONE

ELECTRICAL DATA TABLE - SUPPLY 400-3-50

Burner Model	Motor (kW/rpm)	Start Current (A)	Full Load Current (A)	Overload	Cable Size (mm ²)
NOL18-34	2.2/2800	25	5.0	4 - 6.2	1.5
NOL18-38	3.0/2800	35	6.6	6 - 9.2	1.5
NOL30-25	1.1/2800	15	3.6	1.8 - 2.8	1.5
NOL35-25	1.1/2800	15	3.6	1.8 - 2.8	1.5
NOL35-34	2.2/2800	25	4.6	4 - 6.2	1.5
NOL35-38	3.0/2800	35	6.1	6 - 9.2	1.5
NOL50-28	2.2/2800	25	4.6	4 - 6.2	1.5
NOL50-34	3.0/2800	35	6.1	6 - 9.2	1.5
NOL50-38	4.0/2800	45	8.0	6 - 9.2	2.5
NOL60-28	3.0/2800	35	6.1	6 - 9.2	1.5
NOL60-34	4.0/2800	45	8.0	6 - 9.2	2.5
NOL60-38	4.0/2800	45	8.0	6 - 9.2	2.5
NOL85-38	5.5/2800	40	11.5	8 - 12	2.5
NOL100-38	7.5/2800	60	14.4	11 - 16	4.0

ELECTRODE SETTING



COMMISSIONING SHEET

The details below are to be completed by the Commissioning Engineer

CUSTOMER/SITE ADDRESS:	CONTRACT NO:
BOILER TYPE/DETAILS:	Rating:
BURNER TYPE/DETAILS:	Serial No:
Nozzles (Make/Size/Angle):	Spec No:
Oil Viscosity:	Production Date:

Boiler Room Ventilation (BS 6644)	Satisfactory		Unsatisfactory	
Flue Check (Visual) (BS 5440)	Satisfactory		Unsatisfactory	
Oil Leaks (Visual)	Satisfactory		Unsatisfactory	

COMBUSTION DETAILS								
CO ₂	%							
Smoke Number								
Ambient Temp.	°C							
Gross Stack Temperature	°C							
Chamber Pressure	mbar							
Draught Smoke Hood								
Fan Static	mbar/mm							
Oil Temperature	°C							
Oil Pressure Atomising bar	bar							
Return Pressure	bar							
Oil Throughput	cal/metre							
Boiler Temperature / Pressure								
Boiler Starting Resistance	mbar/mm							
Air Control Setting %	%							
P E Signal								

CHANGE TO SPECIFICATION:

SATISFACTORY / UNSATISFACTORY NAME:

SIGNED:

DATE:



BURNER SERVICE RECORD

The details below are to be completed by the Servicing Engineer

This sheet to be completed and signed following each service / adjustment

Date	Details Of Service	Signature

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