



Reliable energy. Flexible approach.

## INSTRUCTION MANUAL FOR OIL BURNER MODELS

X400 14-36 kW

X500 34-62 kW

X600 50-80 kW

### ONE STAGE, GAS OIL, KEROSENE AND B10 BIOFUEL BURNERS



The X-series range is available in three models, with outputs ranging from 14 to 80 kW. They can be configured for conventional or ducted air inlets to suit installations in domestic, commercial and light industrial premises. All the models are approved by the EN267 European Standard and conform to European Directives for EMC, Low Voltage, Machinery and Boiler Efficiency.

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## Declaration



**UK  
CA**

**UK  
NI**

**CE**



## DECLARATION OF CONFORMITY

We, EOGB Energy Products Ltd

Of, 5 Howard Road, Eaton Socon, St Neots, Cambs, PE19 8ET

Manufacture the following products;

X400, X500 & X600 Oil fired burners

In accordance with the following Directives and Normative documents:

- Machines Directive 98/37/EEC
- Efficiency Directive 92/42/EEC
- Pressure Equipment Directive 97/23/EC
- Low Voltage Directive 2014/35/EU
- EMC Directives 2014/30/EU
- EN 267 2009+A1:2011
- RoHs (Regulation of hazardous substances) directive 2015/863 known as RoHs 3

I hereby declare that the equipment named above has been designed to comply with the relevant sections of the above standard and meets all essential requirements of the specified Directives.

Signed: Mr Martin Cooke

Signature

Position: Managing Director

Date

23rd June 2021

Location: St Neots, Cambs, UK

## Information and general warnings

### 2 Information and general warnings

#### 2.1 Information about this instruction manual and general warnings

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##### 2.1.1 Introduction

The instruction manual supplied with the burner:

- is an integral and essential part of the product and must not be separated from the burner. It must therefore be kept carefully for any necessary consultation and must accompany the burner even if it is transferred to another owner or user, or to another system. If the manual is lost or damaged, another copy can be requested from EOGB on request.
- is designed for use by qualified personnel.
- offers important indications and instructions relating to the installation safety, start-up, use and maintenance of the burner.

##### Symbols used in the manual

In some parts of the manual you will see triangular DANGER signs. Pay great attention to these, as they indicate a situation of potential danger.

##### 2.1.2 General dangers

The dangers can be of 3 levels, as indicated below.

Maximum danger level!



This symbol indicates operations which, if not carried out correctly, cause serious injury, death or long-term health risks.



This symbol indicates operations which, if not carried out correctly, may cause serious injury, death or long-term health risks.



This symbol indicates operations which, if not carried out correctly, may cause damage to the machine and/or injury to people.

##### 2.1.3 Danger: live components



This symbol indicates operations which, if not carried out correctly, lead to electric shocks with lethal consequences.

##### Other symbols



##### ENVIRONMENTAL PROTECTION

This symbol gives indications for the use of the machine with respect for the environment.

##### Delivery of the system and the instruction manual

When the system is delivered, it is important that the instruction manual is delivered to the user by the system manufacturer, with the recommendation to keep it in the room where the heat generator is to be installed.

- The system supplier must carefully inform the user about the use of the system;
- Any further tests that may be required before activating the system;
- Maintenance, and the need to have the system checked at least once a year by a representative of the manufacturer or suitably qualified technician.

To ensure a periodic check, the manufacturer recommends the drawing up of a Maintenance Contract.

## Information and general warnings

### 2.2 Guarantee and responsibility

The manufacturer guarantees its new products from the installation date, in accordance with the regulations in force and/or the sales contract. At the moment of the first start-up, check that the burner is integral and complete.

Please note that EOGB's contract lies with the stockist/distributor from where the burner was purchased. Please check with the stockist /distributor regarding their returns policy.



Failure to observe the information given in this manual, operating negligence, incorrect installation and carrying out of non-authorized modifications will result in the annulment by the manufacturer of the guarantee that it supplies with the burner.

In particular, the rights to the guarantee and the responsibility will no longer be valid in the event of damage to things or injury to people, if such damage/injury was due to any of the following causes:

- incorrect installation, start-up, use and maintenance of the burner; improper, incorrect or unreasonable use of the burner;
- intervention of unqualified personnel;
- carrying out of unauthorised modifications on the equipment; use of the burner with safety devices that are faulty, incorrectly applied and/or not working;
- installation of untested supplementary components on the burner;
- powering of the burner with unsuitable fuels;
- faults in the fuel supply system;
- continuation of use of the burner when a fault has occurred; repairs and/or overhauls incorrectly carried out;
- modification of the combustion chamber with inserts that prevent the regular development of the structurally established flame;
- insufficient and inappropriate surveillance and care of those burner components most likely to be subject to wear and tear;
- the use of non-original components, including spare parts kits, accessories and optional;
- force majeure.

### 2.3 Guidance for the use of biofuel blends up to 10% where gas oil use is permitted by the appliance manufacturer

#### Background

With increasing focus on renewable and sustainable energy requirements, Biofuel usage is set to increase. EOGB is committed to promoting energy conservation and the use of renewable energy from sustainable resources including liquid biofuels; however there are some technical aspects that must be considered at the planning stage of using such fuels to reduce the potential for equipment failure or the risks of fuel leakage.

Liquid biofuel is a generic description used for oil that can come from numerous feed stocks including recycled cooking oils. These types of oils have to be considered and treated differently from standard mineral or fossil fuels, as they are generally more acidic, hygroscopic and less stable.

Due to this, a holistic approach is needed from the specification of the liquid biofuel, the storage of the fuel, its oil supply line and ancillary equipment, and very importantly the oil filtration and the burner itself. The specification for FAME (Fatty Acids Methyl Ester) liquid biofuel is critical to reliable equipment operation.

It is a minimum requirement that the fuel blend (up to 10% bio) is obtained with gas oil in accordance with the relevant EN standards, regional regulations and FAME in accordance with EN 14214. It is also important that the fuel blends meet the requirements related to operational environment conditions within the relevant EN standards.

The manufacturer furthermore declines any and every responsibility for the failure to observe the contents of this manual.

The warranty is subject to correct burner, appliance & application matching and set-up in line with EOGB's instructions and guidelines. All components within the hydraulic circuit suitable for bio fuel use and supplied by EOGB will be identified as bio compatible. No warranty is given in relation to the use of components which are not so identified with biofuel blends. If in any doubt please contact EOGB for further advice.

If any EOGB burners are used with fuel with a bio content >10% then the components within the hydraulic circuit may be affected and are not covered under warranty.

The hydraulic circuit consists of:

- Pump
- Hydraulic ram (where applicable)
- Valve block
- Flexible oil lines (considered as a consumable component)

1 Irrespective of any warranty given by EOGB in relation to normal use and manufacturing defects, when fuels not meeting the relevant standards are used, or where fuel storage issues have not been addressed correctly, or the equipment used is not compatible, if failures occur which are directly or indirectly attributed to such issues and/or to the non-observance of this guidance, then no warranty or liability is implied or accepted by EOGB.

2 EOGB have carefully chosen the specification of the bio compatible components including the flexible oil lines to protect the pump, safety valve and nozzle. The EOGB warranty is dependent upon the use of EOGB genuine components, including the oil lines, being used.

3 EOGB warranty does not cover defects arising from incorrect commissioning or servicing by non-EOGB employed service engineers, and any issues impacting the burner arising from external site-related issues.

When choosing your EOGB oil products where you know biofuels will be in use, please make sure that a bio compatible burner and/or components have been supplied. If an existing burner is to be used with a liquid biofuel then a kit may be required to make it compatible and the guidance notes enclosed concerning oil storage and filtration must be adhered to. The end user is responsible for the thorough verification of the potential risks associated with the introduction of a bio fuel blend and the suitability of the appliances and installation applicable.

Irrespective of any warranty given by EOGB in relation to normal use and manufacturing defects, when fuels not meeting the relevant standards are used, or where fuel storage issues have not been addressed correctly, or the equipment used is not compatible, if failures occur which are directly or indirectly attributed to such issues and/or to the non-observance of this guidance, then no warranty or liability is implied or accepted by EOGB.

## Information and general warnings

### 2.3.1 Information and general instructions

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To ensure consistency, the supplier of the fuel must be able to demonstrate compliance with a recognised Quality Control and management system to ensure high standards are maintained within the storage, blending and delivery processes.

The installation of an oil storage tank and its ancillaries must also be prepared BEFORE liquid biofuel is introduced.

Checks and preparation should include:

- For new installations, make sure that all materials and seals in the oil storage and supply line to the burner are compatible with biofuels. For all installations, there must be a good quality bio compatible oil filter at the tank and then a secondary filter of 60 Microns protecting the burner from contamination.
- If an existing oil storage tank is to be used then in addition to the materials checks as detailed above, it will be essential that the tank is first inspected for condition and checked for water or other contamination. EOGB strongly recommends that the tank is cleaned and oil filters replaced prior to biofuel delivery. Due to the hygroscopic nature of biofuel, if this is not completed then it will effectively clean the tank and absorb water present which in turn will result in equipment failure that is not covered by the manufacturer's warranty.
- Depending on the capacity of the oil storage tank and oil usage, fuels may remain static within the tank for some considerable time and so EOGB recommends that the oil distributor is consulted regarding the use of additional Biocides within the fuel to prevent microbial growth from occurring within the tank. EOGB suggests that fuel suppliers and/or service companies are contacted for guidance on fuel filtration. Special attention should be applied to dual fuel applications where oil may be stored for long periods of time.
- The burner must be set according to the appliance application and commissioned checking that all combustion parameters are as recommended in the appliance technical manual.
- EOGB recommends that the in line and burner oil pump filters are inspected and if required replaced at least every 4 months during burner use, before the burner start-up following a long period of discontinue operation and even more frequently where contamination has occurred. Particular attention is needed when inspecting and checking for fuel leakages from seals, gaskets and hoses.

### 2.3.2 Product Disclaimer Statement

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CAREFULLY READ THE FOLLOWING DISCLAIMER. YOU ACCEPT AND AGREE TO BE BOUND BY THIS DISCLAIMER BY PURCHASING EOGB BIO COMPATIBLE BURNERS AND/OR COMPONENTS.

Although the information and recommendations (hereinafter "Information") in this guidance is presented in good faith, believed to be correct and has been carefully checked, EOGB (and its subsidiaries) makes no representations or warranties as to the completeness or accuracy of the Information. Information is supplied upon the condition that the persons receiving will make their own determination as to its suitability for their purposes prior to use. In no event will EOGB (and its subsidiaries) be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information.

Other than set forth herein, EOGB (and its subsidiaries) makes no additional warranties with respect to the bio compatible burner, either express or implied, including that of merchantability or fitness for a particular purpose or use.

In no event shall EOGB (and its subsidiaries) be liable for any in-direct, incidental, special or consequential damages including, without limitation, loss of profits, damages for loss of business profits, business interruption, loss of business information, loss of equipment, or other pecuniary loss or compensation for services whether or not it is advised of the possibility of such damages.

With the exception of injuries to persons, EOGB's liability is limited to the customer's right to return defective/non-conforming products as provided by the relevant product warranty.

# Safety and prevention

## 3 Safety and prevention

### 3.1 Introduction

The burners have been designed and built in compliance with current regulations and directives, applying the known technical rules of safety and envisaging all the potential danger situations. It is necessary, however, to bear in mind that the imprudent and clumsy use of the equipment may lead to situations of death risk for the user or third parties, as well as the damage to the burner or other items. Inattention, thoughtlessness and excessive confidence often cause accidents.

It is a good idea to remember the following:

- The burner must only be used as expressly described. Any other use should be considered improper and therefore dangerous.

In particular:

it can be applied to boilers operating with water, steam, thermic oil, and to other uses expressly named by the manufacturer,

the type and pressure of the fuel, the voltage and frequency of the electrical power supply, the minimum and maximum deliveries for which the burner has been regulated, the pressurisation of the combustion chamber, the dimensions of the combustion chamber and the room temperature must all be within the values indicated in the instruction manual.

- Modification of the burner to alter its performance and destinations is not allowed.
- The burner must be used in technically safe working conditions. Any disturbances that could compromise safety must be quickly eliminated.
- Opening or tampering with the burner components is not allowed, apart from the parts requiring maintenance.
- Only those parts detailed as available as spare parts by the manufacturer can be replaced.

### 3.2 Safety warnings

The dimension of the boiler's combustion chamber must respond to specific values in order to guarantee a combustion with the lowest polluting emissions rate.

The Technical Service Personnel will be glad to give you all the information for a correct matching of this burner to the boiler.

This burner must only be used for the application it was designed for.

The manufacturer accepts no liability within or without the contract for any damage caused to people, animals and property due to installation, adjustment and maintenance errors or to improper use.

### 3.3 Basic safety rules

- Children or inexpert persons must not use the appliance.
- Under no circumstances must the intake grids, dissipation grids and ventilation vents in the installation room be covered up with cloths, paper or any other material.
- Unauthorised persons must not attempt to repair the appliance.
- It is dangerous to pull or twist the electric leads.
- Cleaning operations must not be performed if the appliance is not disconnected from the main power supply.
- Do not clean the burner or its parts with inflammable substances (e.g. petrol, alcohol, etc.). The cover must be cleaned with soapy water.
- Do not place anything on the burner.
- Do not block or reduce the size of the ventilation vents in the installation room.
- Do not leave containers and inflammable products or combustible materials in the installation room.

### 3.4 Personnel training

The user is the person, body or company that has acquired the machine and intends to use it for the specific purpose. He is responsible for the machine and for the training of the people working around it.

The user:

- undertakes to entrust the machine exclusively to suitably trained and qualified personnel;
- must take all the measures necessary to prevent unauthorised people gaining access to the machine;
- undertakes to inform his personnel in a suitable way about the application and observance of the safety instructions. With that aim, he undertakes to ensure that everyone knows the use and safety instructions for his own duties;
- must inform the manufacturer if faults or malfunctioning of the accident prevention systems are noticed, along with any presumed danger situation.
- Personnel must always use the personal protective equipment envisaged by legislation and follow the indications given in this manual.
- Personnel must observe all the danger and caution indications shown on the machine.
- Personnel must not carry out, on their own initiative, operations or interventions that are not permitted within their local authority control.
- Personnel must inform their superiors of every problem or dangerous situation that may arise.
- The assembly of parts of other makes, or any modifications, can alter the characteristics of the machine and hence compromise operating safety. The manufacturer therefore declines any and every responsibility for any damage that may be caused by the use of non-original parts.

## Technical description of the burner

### 4 Technical description of the burner

#### 4.1 Technical data

		X400	X500	X600	
Burner information	Burner operation mode	One Stage			
	Heat output	kW	14-36	34-62	50-80
		Kg/hr	1.2-3	2.83-5.15	4.23-8.45
	Working temperature	°C min./max.	0-40		
Weight (burner only)	kg	8kg	8kg	9.3kg	
Fuel / Air Information	Viscosity	Kerosene	Maximum viscosity 5.5 cst @ 20°C Suitable for bio blends < B10		
		Gas Oil			
		mm <sup>2</sup> /s (cSt)	4 - 6 (@ 20°C) for light oil models / 1.5 - 6 (@ 20°C) for kerosene models		
	Pump	Type	BFP11 L3	BFP11 L3	BFP11 L3
		Pump Pressure range	7-15 bar (max . 10 bar @ 1.3 cSt, max 15 bar @ 1.8 cSt)		
		Factory setting	10 bar +/-1		
		Capacity	24 l/h		
	Fuel temperature	Max °C	50		
	Fan	Type	Centrifugal, Counter clockwise		
	Air temperature	Max °C	40		
Electrical data	Electrical supply	Ph/Hz/V	1 / 50-60 (+10/-15%) / 230 V (195-253 V)	1 / 50-60 (+/- 6%) / 230 V (195-253 V)	
	Control box	Type	LMO14	OBC81A	OBC81A
	Protection level	IP Rating	IP40		
	Motor info	Wattage	90	90	130
		Voltage	230	230	230
	Ignition transformer	Type	Danfoss EBI	Danfoss EBI	Danfoss EBI
		Info	230v 0.25 A 60VA 40 mA (rms) 15kV 2 pole 33% ED in 3 min		
	Photo Transistor	Type	Siemens QRB4	Danfoss LDS	Danfoss LDS
			For flame simulation, a minimum value must be > 65µA No Flame/Darkness the value must not exceed > 5µA		
	Operation	Intermittent (at least one stop every 24 hours)			
Start current (amps)		1.6	1.6	2.2	
Run current (amps)		0.53	0.53	0.87	
Emissions	Sound pressure	dB (A)	69	67	68
	CO emission	mg/kWh	<30		
	Grade of smoke indicator	N° Barcharach	<1		
	Nox emission	mg/kWh	< 200		
Approval	Directives	Machines Directive 98/37/EEC Efficiency Directive 92/42/EEC Pressure Equipment Directive 97/23/EC Low Voltage Directive 2014/35EU EMC Directive 2015/30/EU RoHs (Regulation of hazardous substances) directive 2015/863 known as RoHs 3			
	Conforming to	EN 267 2009+A1:2011			

**Reference conditions**

Temperature 20 °C  
 Pressure 1013 mbar  
 Altitude 0 m a.s.l  
 Noise measured at a distance of 1 meter

**Table. A**



## Technical description of the burner

### 4.2 Burner components

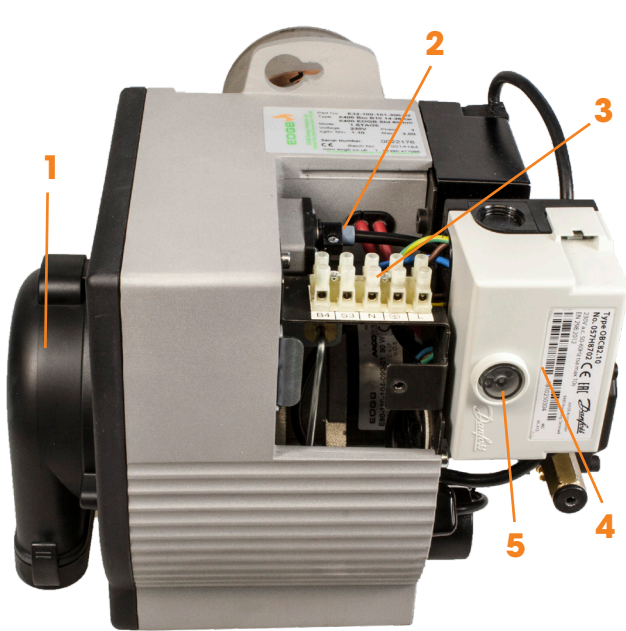


Fig. 1.1

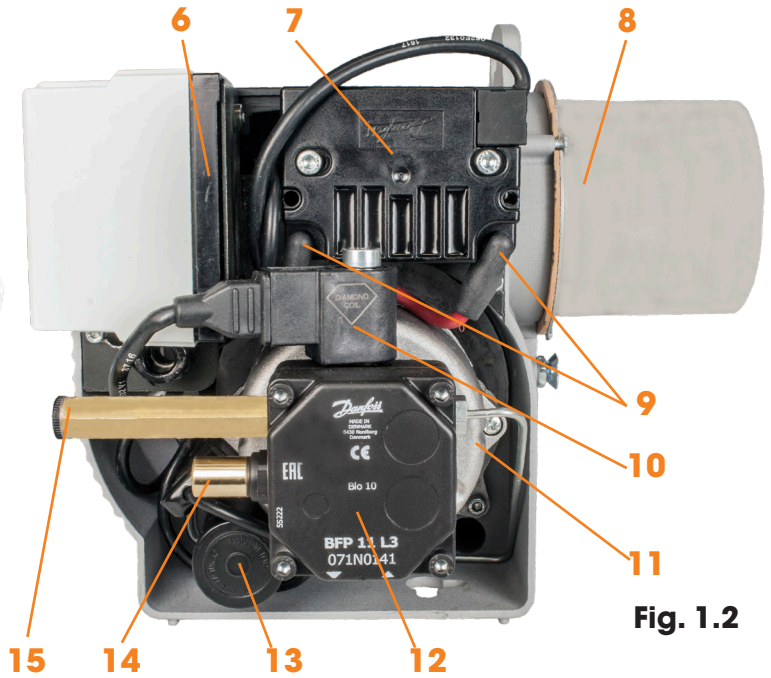


Fig. 1.2

- |   |                      |    |                     |
|---|----------------------|----|---------------------|
| 1 | Air intake           | 9  | HT leads            |
| 2 | Photo Transistor     | 10 | Solenoid valve      |
| 3 | 5 Pin terminal strip | 11 | Motor               |
| 4 | Control box          | 12 | Fuel pump           |
| 5 | Lockout reset button | 13 | Capacitor           |
| 6 | Wiring base          | 14 | Pressure adjuster   |
| 7 | Ignition unit        | 15 | Pressure gauge port |
| 8 | Blast tube           |    |                     |

### 4.3 Burner accessories

The following accessories will be found within the X-Series carton.

- 1 x Burner mounting flange (including mounting bolt)
- 1 x Burner mounting gasket
- 4 x Nuts, bolts, and washers to fix the mounting flange
- 1 x 3.5mm allen key
- 1 x 4mm allen key
- 1 x Blast tube sealing gasket
- 1 x Green bio flexible
- 1 x 7 Pin plug (X600 only, or if requested)
- 1 x Annular Shim (X600 only, or If requested)
- 1 x Narrow air intake (X400 only)
- 1 x Balanced flue air intake
- 1 x Balanced flue rubber adaptor 60mm to 70mm (X400 and X500 only)
- 1 x Low output air damper (X400 and X500 only)
- 1 x High output air damper



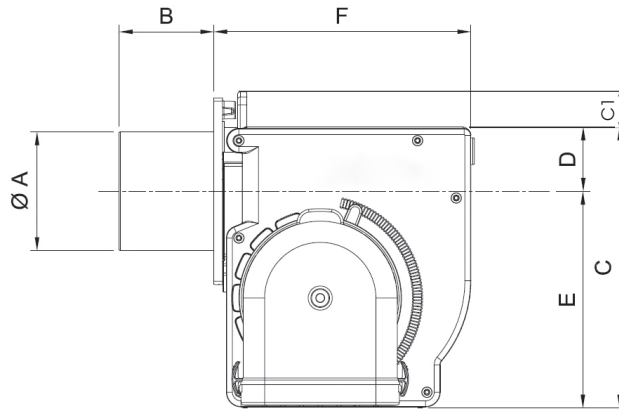
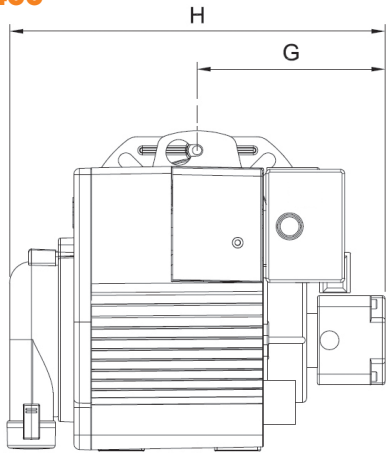
Please note that EOGB's green biofuel flexibles are suitable to use with Kerosene, Gas Oil and biofuel blends of up to 100% for FAME based biofuels when supplied by a reputable fuel supplier

If other bio blends of fuel are to be used then please contact EOGB for further information, please note that a specification of the biofuel may be requested.

## Technical description of the burner

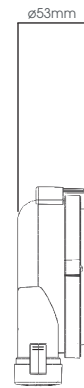
### 4.4 Burner dimensions

#### X400

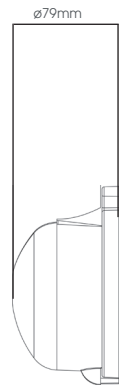


Additional air intake option

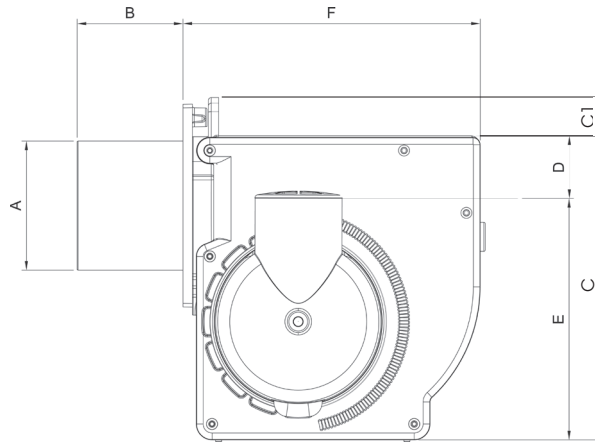
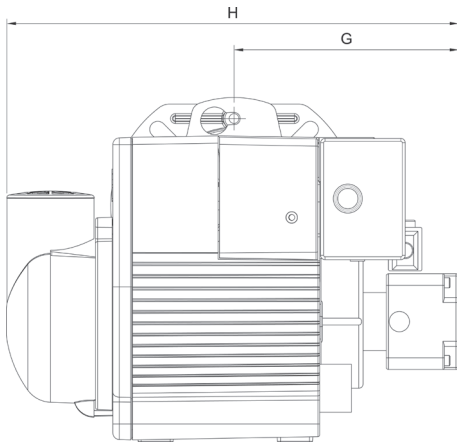
Narrow Version



Balanced Version



#### X500 X600

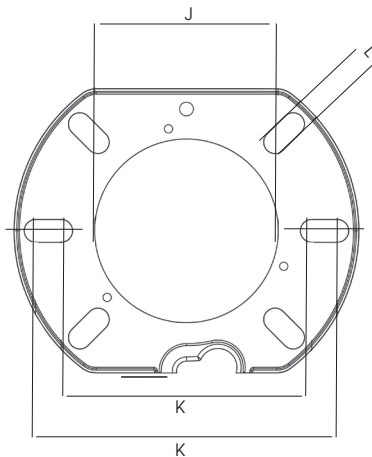
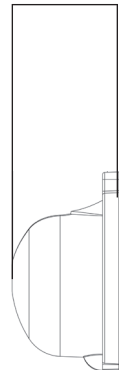


Air intake options

X500  
ø79mm



X600  
ø86mm



#### Burner dimensions (mm)

	Aø root	Aø max	B*	C	C1	D	E	F	G**	H**	Jø	Kø	L	M	N****
X400	89	90	67	211	26	50	161	201	138	278***	90	125-150	10	23	7
X500	89	90	74	211	26	50	161	218	152	304	90	125-150	10	23	7
X600	89	90	128	211	26	50	161	218	161	348	90	125-150	10	23	7

\* Guidance only - other tube lengths are available  
 \*\* Please note that dimension G & H is extended by 30mm on the air inlet side whilst rotating the burner into the locking mounting flange  
 \*\*\* Add 26mm if the balanced flue intake is used.  
 \*\*\*\* Add 2mm for Gasket thickness

**Fig. 2**

## Technical description of the burner

### 4.5 Firing rates

The MAXIMUM OUTPUT is chosen from within the diagram area (Fig. 3).

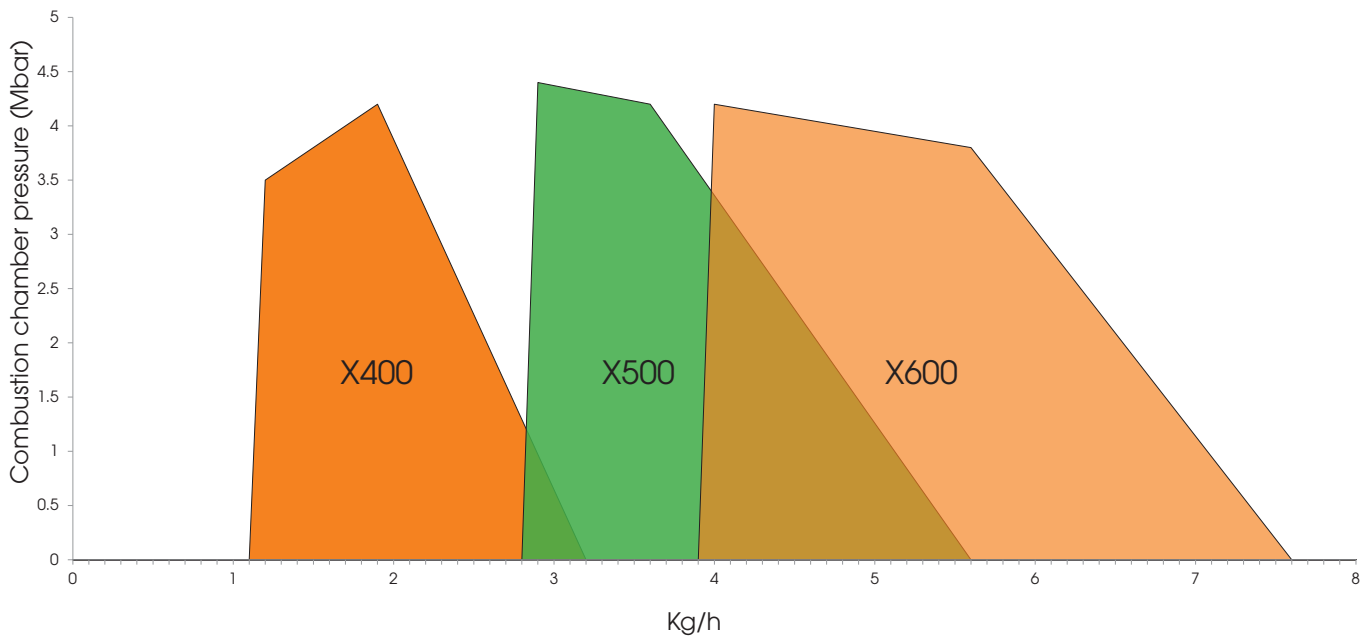
The MINIMUM OUTPUT must not be lower than the minimum limit of the diagram.

The burner delivery must be selected within area of the diagrams (Fig. 3). This area is called firing rates and provides the maximum delivery of the burner in relation to the pressure in the combustion chamber.

The work point may be found by plotting a vertical line from the desired delivery and a horizontal line from the pressure in the combustion chamber. The intersection of these two lines is the work point which must lie within the firing rates.



The firing rate area values have been obtained using Class C2 Kerosene and considering a surrounding temperature of 20 °C, and an atmospheric pressure of 1013 mbar (approx. 0 m above sea level) and with the combustion head adjusted to factory settings



**Fig. 3**

## Installation

### 5 Installation

#### 5.1 Notes on safety for the installation

After carefully cleaning all around the area where the burner will be installed, and arranging the correct lighting of the environment, proceed with the installation operations.



The installation of the burner must be carried out by qualified personnel, as indicated in this manual and in compliance with the standards/regulations and local authority legislation.



All the installation, maintenance and disassembly operations must be carried out with the electricity supply disconnected.

#### 5.2 Handling



The handling operations for the burner can be highly dangerous if not carried out with the greatest attention: keep any unauthorised people at a distance; check the integrity and suitability of the available means of handling.



After positioning the burner near the installation point, correctly dispose of all residual packaging, separating the various types of material. Before proceeding with the installation operations, carefully clean all around the area where the burner will be installed.

Check also that the area in which you are working is empty and that there is an adequate escape area (i.e. a free, safe area to which you can quickly move if the burner should fall).

#### 5.3 Preliminary checks

##### Checking the consignment



After removing all the packaging, check the integrity of the contents. In the event of doubt, do not use the burner; contact the supplier.



The output of the burner must be within the boiler's firing rate.

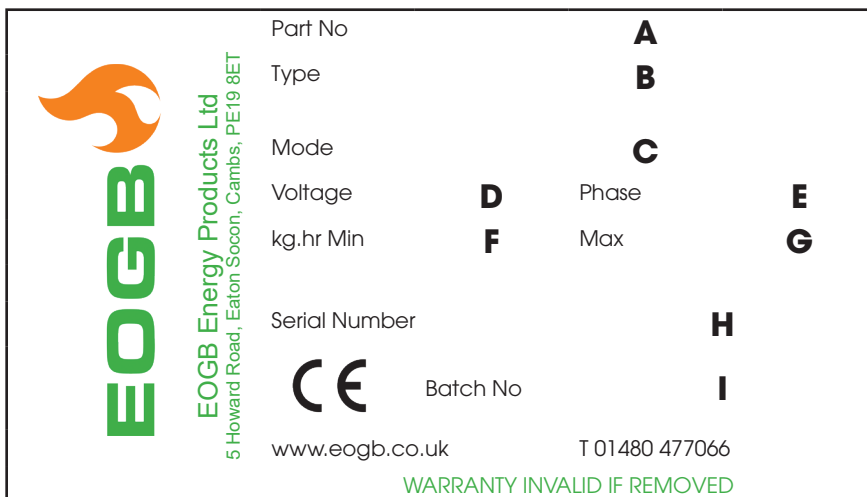


The packaging elements (wooden cage or cardboard box, nails, clips, plastic bags, etc.) must not be abandoned as they are potential sources of danger and pollution. They should be collected and disposed of in the appropriate manner and location.



A burner label that has been tampered with, removed or is missing, along with anything else that prevents the definite identification of the burner makes any installation or maintenance work difficult.

##### Checking the characteristics of the burner



Check the identification label of the burner showing

- A** - Part number
- B** - Burner type
- C** - Burner Mode
- D** - Burner Voltage
- E** - Motor Phase
- F & G** - Minimum & maximum flow rate
- H** - Serial number
- I** - Batch number

**Fig. 4**

## Installation

### 5.4 Installer/service notes for the use of gas oil with bio blends up to 10% where gas oil use is permitted by the appliance manufacturer

- During the burner installation, check that the gas oil and biofuel blends are in accordance with EOGB's specifications (please refer to the chapters "Technical Data" and "Guidance for the use of biofuel blends up to 10%" within the burner technical manual).
- If a bio blend is in use the installer must seek information from the end user that their fuel supplier can evidence that the blends of fuel conform to the relevant standards.
- Check that the materials used in the construction of the oil tank and ancillary equipment are suitable for biofuels. If not these must be upgraded or replaced with bio compatible parts. (Please contact EOGB for more info on other biofuel compliant products)
- Particular attention should be given to the oil storage tank and supply to the burner. It is recommended that existing oil storage tanks are cleaned, inspected and any traces of water are removed BEFORE biofuel is introduced (contact the tank manufacturer or oil supplier for further advice). If these recommendations are not respected this will increase the risk of contamination and possible equipment failure.
- In line oil filters should be replaced making sure that they are bio compatible. It is recommended that a good quality bio compatible oil filter at the tank and a secondary 60 micron filter are used to protect the burner pump and nozzle from contamination.
- The burner hydraulic components and flexible oil lines must be suitable for biofuel use (check with EOGB if in doubt). EOGB have carefully chosen the specification of the bio compatible components including the flexible oil lines to protect the pump, safety valve and nozzle. The EOGB warranty is dependent upon the use of EOGB recommended components including the oil lines, being used. The burner must be commissioned and combustion parameters set to appliance manufacturer's recommendations.
- Regularly check visually for any signs of oil leakage from seals, gaskets and hoses.
- It is strongly recommended that with Biofuel use, oil filters are inspected and replaced every 4 months. More regularly where contamination is experienced.
- During extended periods of non operation and/or where burners are using oil as a standby fuel, it is strongly recommended that the burner is put into operation for short periods at least every three months.

### 5.5 Working position



The burner is designed to operate only in the positions **1**, **2**, **3** and **4** (Fig. 5).

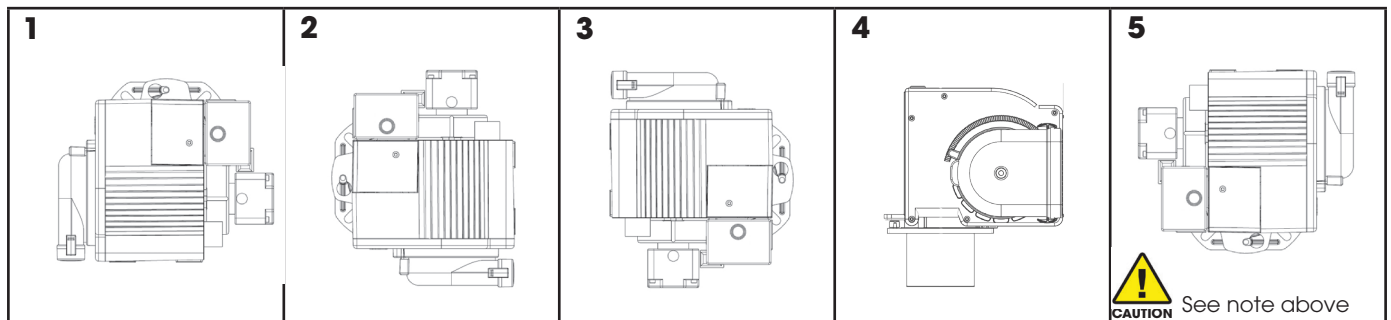
**WARNING**

Installation **1**, **2** and **3** is preferable, as it is the only one that allows performing maintenance operations as described in this manual. Installation **4** allows for working operations but may incur maintenance issues as some adjustable settings may be obstructed



**CAUTION**

Any other position could compromise the correct operation of the appliance. Installation **5** is forbidden for safety reasons, unless the burner has been supplied to suit an upside down firing position or the burner has been modified so the oil pump has been rotated 90 degrees to prevent the solenoid coil firing in a downwards orientation (please seek further assistance from EOGB on this modification.)



**Fig. 5**

## Installation

### 5.6 Boiler fixing

#### 5.6.1 Mounting onto the appliance

The burner is mounted onto the appliance by means of a removable 6-bolt flange.

The gasket needs to be put in place before the flange is fixed onto the appliance. The burner tube is then inserted through the centre hole after fitting the O-ring over the blast tube.

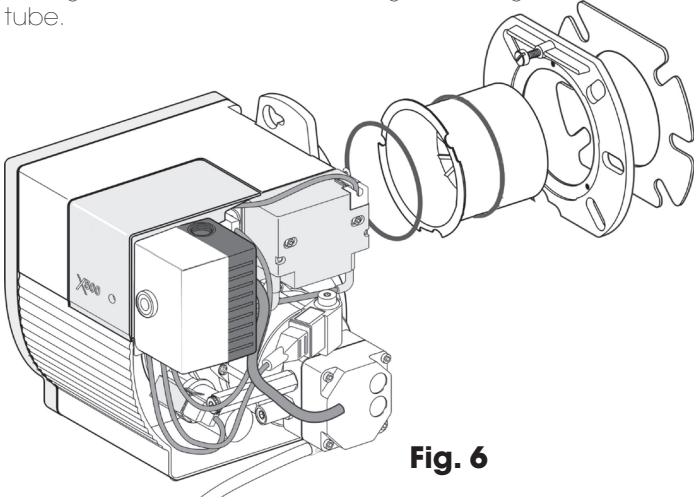
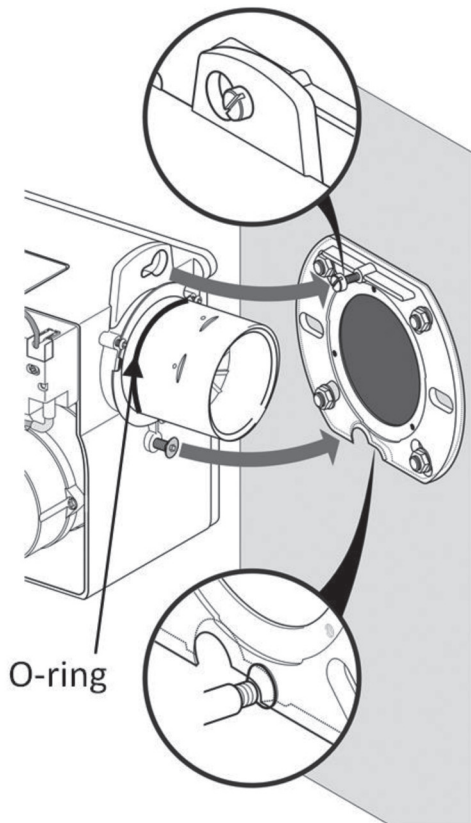


Fig. 6

With the burner rotated a few degrees clockwise the flange bolts will pass through the locating holes. When the burner is twisted into position the top bolt can then be tightened to secure the burner.

If required, the burner can be mounted in any position. It is important though to ensure that the solenoid valve on the oil pump is not inclined below horizontal (**see 5.5**) for more info.



O-ring

Fig. 6.1

#### 5.6.2 Service mounting position

For ease of servicing and access to the burner components the burner has, on the bottom face, a keyhole cut-out. This allows the burner to be hung from the mounting flange in a more convenient position.

After loosening the fixing bolt the burner can be extracted from the flange, turned around and then the keyhole can be located onto the bolt.

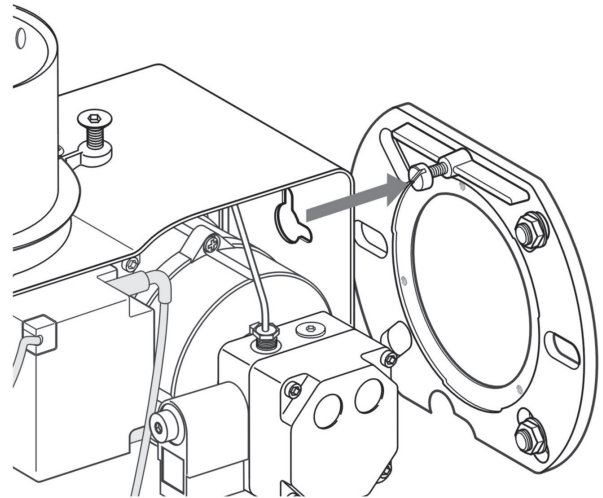


Fig. 6.2

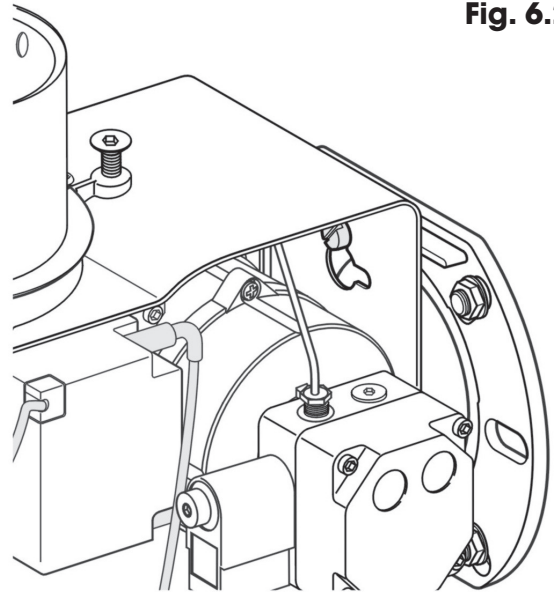


Fig. 6.3

For more help please see our YouTube channel for informative instruction videos on how to install and commission the X-Series burners

**YouTube** [www.youtube.com/EOGBenergyproducts](https://www.youtube.com/EOGBenergyproducts)

or scan this QR code to take you directly to the YouTube site



## Installation

### 5.7 Air intake assembly

#### 5.7.1 Conventional Flue Applications (CF)

In case of CF applications, the X400 burner can be fitted with either Narrow or Balanced air intake. The X500 or 600 are supplied with the balanced version only. Whichever air intake options is required, it will need to be fitted upon installation with the correct air damper **(see section 8.6)**

#### 5.7.2 Balanced Flue Applications (BF)



For correct BF application, the burner must be installed on an appropriate BF boiler.

In case of BF applications, an optional air intake is supplied with the X400. **(see Fig. 7)**

The X500 and X600 both have the BF air intake supplied. Whichever air intake options is required, it will need to be fitted upon installation with the correct air damper **(see section 8.6)**



X400 narrow air intake

X500 balanced air intake.  
(also supplied with the X400)

X600 balanced air intake

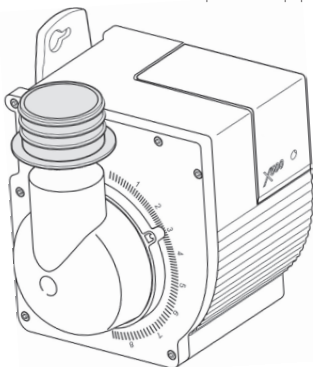
**Fig. 7**



The temperature of the incoming air must not exceed 70 °C.

An additional rubber adaptor is also supplied with the X400 and X500 models in the accessory kit (if required) and will convert the standard 60mm air intake fitting to a 70mm fitting. **see Fig. 8**

(Please note that the X600 has a 70mm air intake as standard and therefore does not have a adaptor supplied)



**Fig. 8**

#### 5.7.3 Balanced Flue Requirements

The combustion air supply is through a flexible or rigid pipe connected to the air intake. Consequently, you must comply with the following requirements and instructions:

The combustion air intake tube must be:

- fastened securely to the burner;
- made of a suitable material, with temperature characteristics in the range - 30 °C to 80 °C;
- in compliance with all requirements of applicable regulations in force in the country of destination.

- The intake-tube / burner system must not allow a loss of over 2 m<sup>3</sup>/h at 0.5 mbar: for instance, the above requirements will be met if you use flues for pressure exhaust of flue gases (the condensation kind).

- Make sure the air intake tube's inlet is positioned so that it is not likely to be obstructed by foreign matter and, where necessary, use suitable screens.

- The inside diameter of the hose must be at least 80 mm.

- The intake tube can be up to 6 metres in length. Length is reduced if there are bends in the intake section.



For instance, if using a tube with a smooth inside surface, you must allow for the following losses:

- for each 45° bend, tube length is reduced by 0.5 m;
- for each 90° bend, tube length is reduced by 0.8 m.

**NOTE:**

Burner installation must comply with one of the installations illustrated in the **figures 9 & 10**

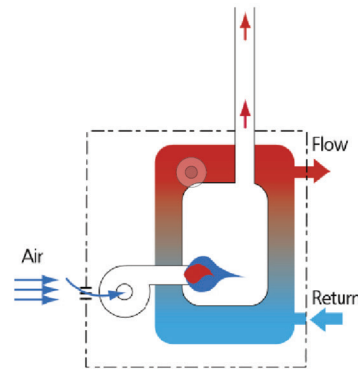


- Under no circumstances should the air's entry in the hose intake area be obstructed.

- The hose must not be blocked in any way or feature a shutting device (valves, membranes etc.).

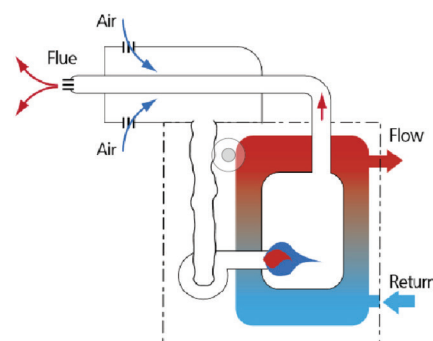
- Coaxial tubes must not be installed for any reason

Open flue



**Fig. 9**

Room-sealed balanced flue

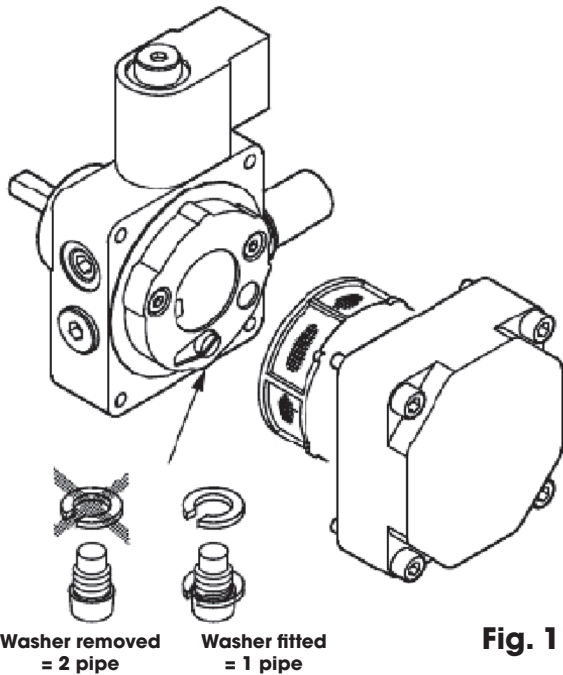


**Fig. 10**

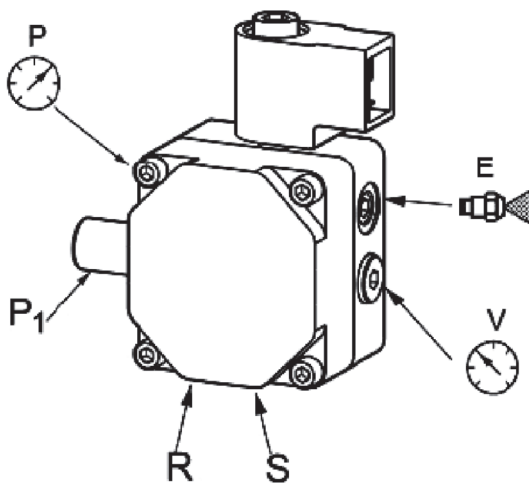
## 6.1 Pump

The pump is supplied and set as standard (unless specified otherwise) as a one pipe configuration.

In order to obtain a two pipe configuration it is necessary to remove the horseshoe washer from the BFP11 oil pump (See Fig. 11). After removal, an additional oil flexible will have to be fitted to the return port (additional oil flexible not supplied).



**Fig. 11**



**Key (Fig. 12)**

- P - Pressure gauge port 1/8"
- P1 - Pressure adjuster
- E - Nozzle outlet 1/8"
- V - Vacuum gauge port 1/8"
- R - Return outlet port 1/4"
- S - Suction inlet port 1/4"

**Fig. 12**

### 6.1.1 Priming the pump

#### 1 pipe system

To prime the oil pump, loosen the port plug of the vacuum gauge port **V**(Fig. 12). Run the burner and wait until the fuel flows out.

#### 2 pipe system / 1 Pipe Suction Lift With De-Aerator

To prime the oil pump, loosen the port plug of the pressure gauge port **P**(Fig. 12). Run the burner and wait until the fuel flows out. Should a lock-out occur prior to the arrival of the fuel, tighten the port plug to prevent air re-entering the pump, and wait at least 30 seconds before repeating the operation.

or

With the aid of an oil priming suction pump, attach and pull the oil through the vacuum gauge port **V**(Fig. 12)



**WARNING** In a 1 pipe system or a pressurised system, the installer must ensure that the supply pressure is not above 2 bar. Above that level, the pump seal is subject to too much stress.



**WARNING** In a 2 pipe operation before starting the burner, make sure that the return pipeline is not clogged/ obstructed and the oil pump is configured correctly as if not, then the pump shaft seal will break due to overpressure (not covered by manufacturer's warranty).



**WARNING** The pump vacuum should not exceed a maximum of 0.4 bar (30 cm Hg). Beyond this limit, gas is released from the oil.



**WARNING** Where gas oil containing biodiesel is in use, it is recommended to avoid over oxygenation of the blended fuels.

Where at all possible avoid the use of two pipe systems where the circulated fuel is returned to the tank. If this cannot be avoided make sure that the return pipe is normally below the surface of the fuel level within the storage tank. See **B) Fig. 13**.



**WARNING** The plug in the return line (R) must be a metal bung.



**WARNING** In case of use with gas oil containing up to 10% bio blend, it will be essential to use flexible oil lines suitable for biofuel use.

Please contact EOGB for further information.



## Oil Supply

### 6.2 Oil Supply

(See Fig.17).

Plastic or steel tanks should be installed to BS5410.

A steel tank should also conform to BS799; part 5 and be arranged with a slope of 1 in 24 away from the outlet valve with a sludge cock at its lower end.

Do not use galvanised steel tanks or pipework for the oil supply system.

Do not use soldered joints in the oil supply pipework as this could cause a hazard in the case of a fire.

All X-Series burners are supplied and configured to be connected to a single pipe gravity feed system. Details of how to convert the burners to a 2 pipe sub-gravity feed system are shown in **Fig. 15**

### 6.3 Oil Supply System

#### (Fig. 13 a) 1 Pipe System

If a single pipe system is employed, then the tank must be positioned such that the oil level does not exceed 4 metres above the level of the burner oil pump and in addition the oil level must be at least 0.3 metres above the level of the oil pump. Should it prove impossible to site the tank below the 4 metres maximum oil level, a head breaking device must be installed between the tank and the burner.

#### (Fig. 13 b) 2 Pipe System

If a 2 pipe system is used then the maximum suction height allowable is 3.5 metres.

#### (Fig. 13 c) 1 Pipe Suction Lift with De-aerator

If a single pipe suction lift with a de-aerator is used, the oil tank must be positioned below the burner. An inlet and return loop should be created between the de-aerator and oil pump. The oil pump should be connected as for a 2 pipe system. Details of how to convert to a 2 pipe system are shown in **Fig. 13**.

Oil inlet and return flexible hoses should be connected to the oil pump inlet and return ports.

**Table D** is a general guide to determine the maximum allowable pipe run when using a de-aerator.

**Table D** does not override the de-aerators manufacturer's instructions and should only be used in conjunction with the manufacturer's instructions.

If a non-return valve is not incorporated within the de-aerator unit, a non-return valve should be fitted in the oil line between the oil tank and the de-aerator.

NOTE: If a de-aerator is used it should be fitted externally to the building (with exception to specific internally version in which would have to be vented to the outside).



You are advised to use additional filters on the fuel supply line. It is recommended that a good quality fuel filter at the tank (**Fig. 13**) and a secondary filter (60 µ for gas oil and 15 µ for kerosene) are used to protect the burner pump and nozzle from contamination.

In case of biodiesel use, pay attention to install compatible filters. (Contact EOGB for more information)

### 6.4 Oil Supply Pipework

a) The oil supply pipe diameter can be determined using **Tables B, C** and **D** depending on whether a 1 or 2 pipe system or 1 pipe suction lift system is being installed. Selection of the correct pipe diameter will depend on the position of the oil storage tank relative to the burner and the length of pipe run.

b) The oil supply pipe should be laid as level as possible to avoid air pockets and unnecessary friction losses.

c) The following components should be fitted in the fuel line between the storage tank and burner:

1. A manual isolating valve installed as close to the tank as possible.
2. A fire valve in accordance with BS5410, Part 1 as shown in Fig 17. The fire valve should be fitted externally with a fire detection element located within the appliance case. Use of a capillary type valve will allow a neat and simple installation. A suitable valve is the KBB manufactured by Teddington Controls Limited.
3. An oil filter should be fitted close to the oil storage tank. If there is doubt about the internal oil line condition, a further filter should be fitted near the boiler.

**Table. B - 1 Pipe Gravity Feed System**

HEAD (metres)	Maximum Allowable Pipe Run (metres)	
	8mm inside dia pipe (10mm OD copper)	10mm inside dia pipe (12mm OD copper)
0.5	12	30
1.0	25	69
1.5	37	91
2.0	49	100
2.5	62	100
3.0	74	100
3.4	87	100
4.0	99	100

**Table. C - 2 Pipe Sub-Gravity Feed System**

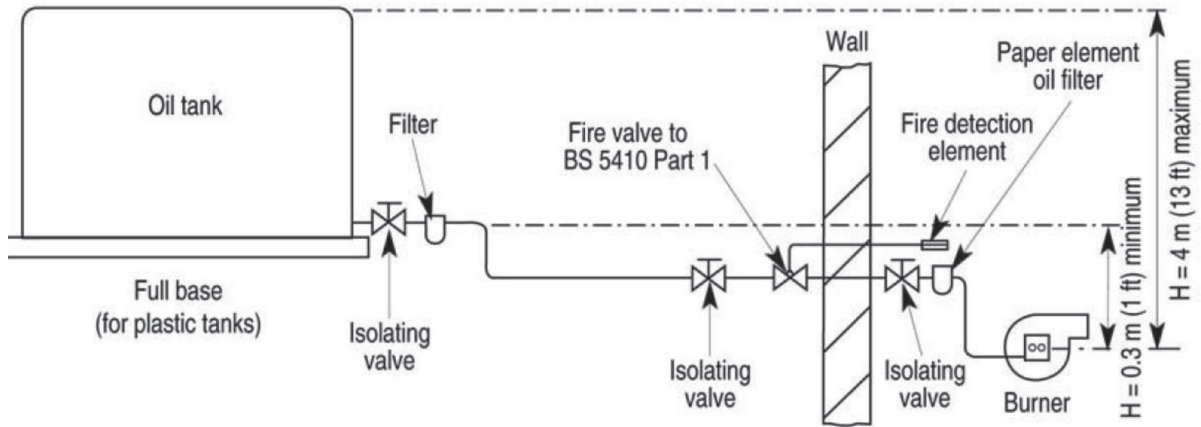
HEAD (metres)	Maximum Allowable Pipe Run (metres)	
	8mm inside dia pipe (10mm OD copper)	10mm inside dia pipe (12mm OD copper)
-0.5	12	30
-0	25	69
-0.5	37	91
2.0	49	100
2.5	62	100
3.0	74	100
3.4	87	100
4.0	99	100

## Oil Supply

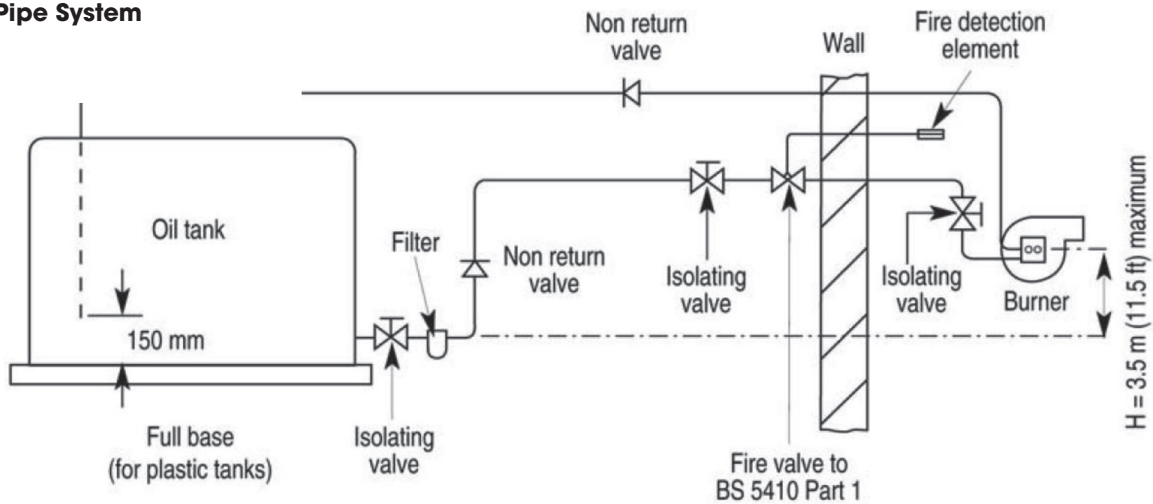
**Table. D - 1 Pipe Suction Lift With De-Aerator**

Flue Flow-rate	Maximum Allowable Pipe Run From Tank To De-Aerator (metres)			
	2.5 (kg/h)	5.0 (kg/h)	10 (kg/h)	10 (kg/h)
HEAD (metres)	6mm inside dia. pipe (8mm O.D copper)			8mm inside dia. pipe (10mm O.D copper)
0	100	55	26	100
-0.5	95	45	23	100
-1.0	80	40	20	90
-1.5	70	35	17	75
-2.0	60	30	14	65
-2.5	45	25	11	50
-3.0	35	15	8	35
-3.5	25	10	5	20

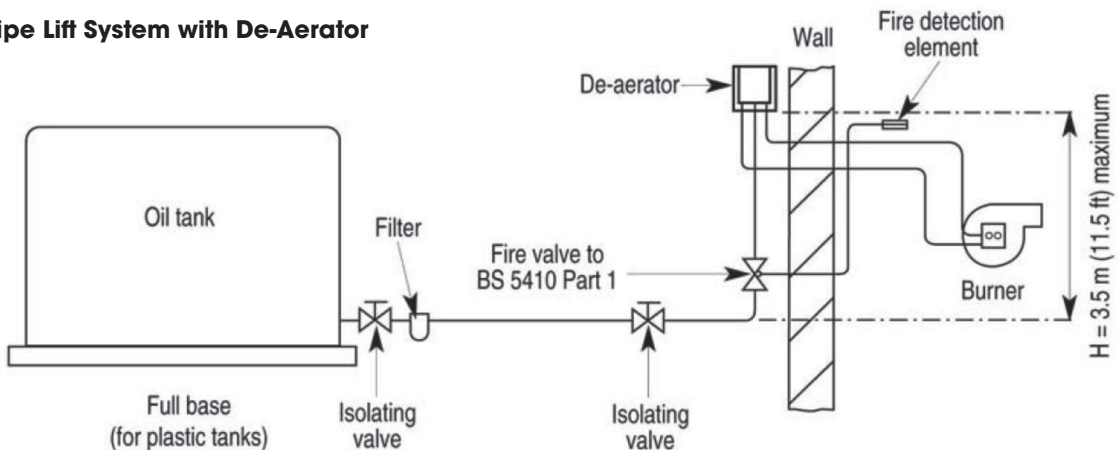
**(a) - 1 Pipe System**



**(b) - 2 Pipe System**



**(c) - 1 Pipe Lift System with De-Aerator**



**Fig. 13**

## Electrical System

### 7 Electrical system

#### 7.1 Notes on safety for the electrical wiring

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- The electrical wiring must be carried out with the electrical supply disconnected.
- Electrical wiring must be carried out by qualified personnel and in compliance with the regulations currently in force in the country of destination. Refer to the wiring diagrams.
- The manufacturer declines all responsibility for modifications or connections different from those shown in the wiring diagrams.
- Do not invert the neutral with the phase in the electrical supply line. Any inversion would cause a lockout due to firing failure.
- Check that the electrical supply of the burner corresponds to that shown on the identification label and in this manual.
- The burners have been set for intermittent operation. This means they should compulsorily be stopped at least once every 24 hours to enable the control box to perform checks of its own start-up efficiency. Normally the boiler's thermostat/pressure switch ensures the stopping of the burner. If this is not the case, it is necessary to apply an in series timer switch, that turns off the burner at least once every 24 hours. Refer to the wiring diagrams.
- The electrical safety of the device is obtained only when it is correctly connected to an efficient earthing system, made according to current standards. It is necessary to check this fundamental safety requirement. In the event of doubt, have the electrical system checked by qualified personnel.
- The electrical system must be suitable for the maximum input power of the device, as indicated on the label and in the manual, checking in particular that the section of the cables is suitable for the input power of the device.
- For the main power supply of the device from the electricity mains:
  - do not use adapters, multiple sockets or extensions;
  - use an omnipolar switch, as indicated by the current safety standards
- Do not touch the device with wet or damp body parts and/or in bare feet.
- Do not pull the electric cables.

Before carrying out any maintenance, cleaning or checking operations:



Disconnect the electrical supply from the burner by means of the main system switch;



Isolate the fuel supply

If the cover is still present, remove it and proceed with the electrical wiring according to the wiring diagrams.

Use flexible cables in compliance with the EN 60 335-1 standard.

## Electrical System

### 7.2.1 Electrical wiring



This operation must be performed by a qualified engineer with the boiler turned off and mains power disconnected.

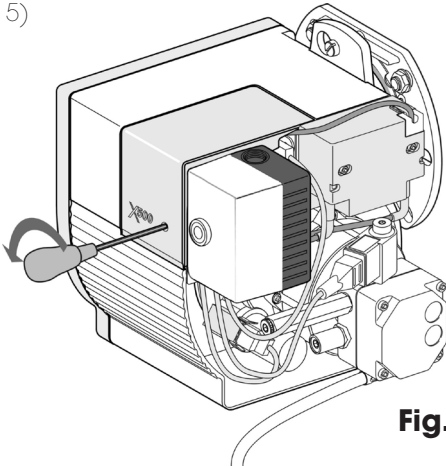
Do not swap neutral and phase over, follow the diagram shown carefully and ensure there is a good earth connection

The electrical wiring carried out by the installer must be in compliance with the rules in force in the country.

The section of the conductors must be at least 1mm<sup>2</sup> (unless requested otherwise by local standards and legislation).

### 7.2.2 X400 & X500 Electrical wiring (No 7 pin plug)

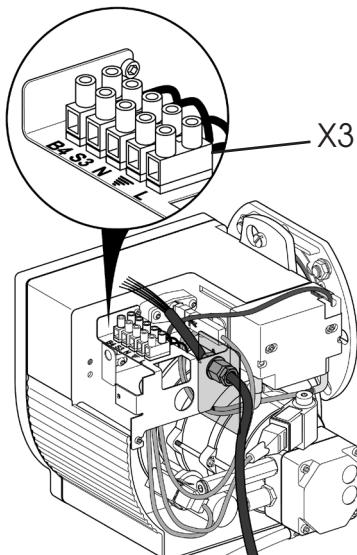
If fitting the X400 or X500 then before carrying out any electrical wiring, the electronics cover must be removed (see Fig 14 & 15)



**Fig. 14**

Once the cover has been removed then all wiring can be wired into the 5 pin terminal strip (X3 on Fig 16) please see wiring diagram for further information.

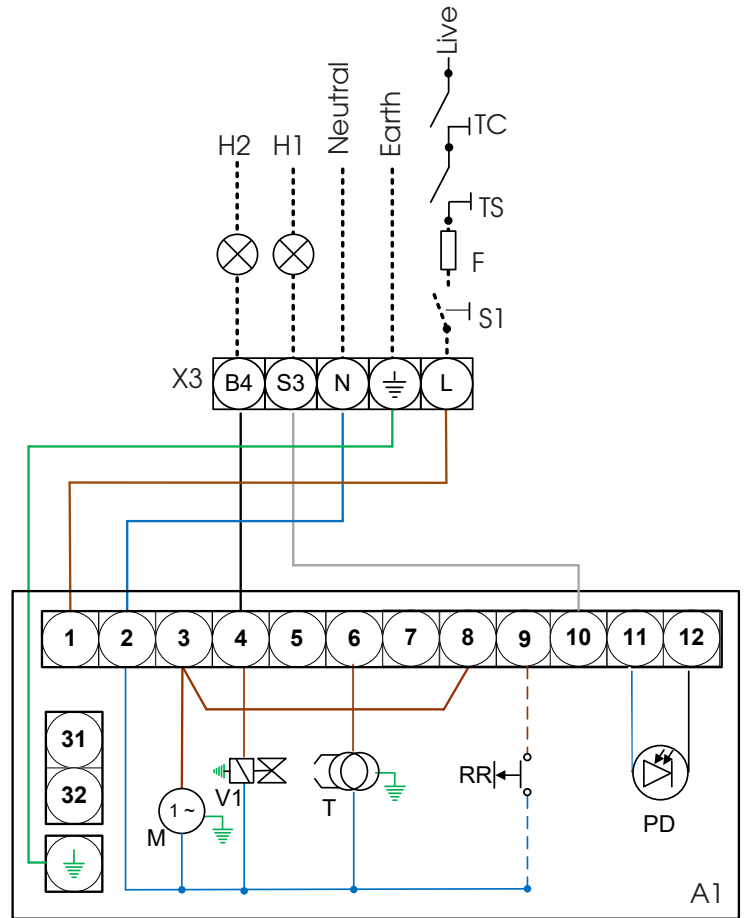
If the X-series burner is being fitted to a **WORCESTER BOILER** that has 6 wires then please follow instructions given in section 7.2.3



**Fig. 15**

### Wiring Diagram for X400 & X500 (Fig. 16) (without 7pin connections)

1 ph 230v - 50Hz



**Fig. 16**

#### Internal Components

- A1 - Wiring Base
- PD - Photo Transistor
- T - Transformer
- M - Motor
- RR - Remote Reset (Optional)
- V1 - Solenoid Valve
- X3 - 5 Pin Terminal Strip

#### External Components

- S1 - Isolation Switch
- F - Fuse (5 amp)
- TC - Control thermostat
- TS - Limit Thermostat
- H1 - Lockout indicator
- H2 - Burner Run Indicator



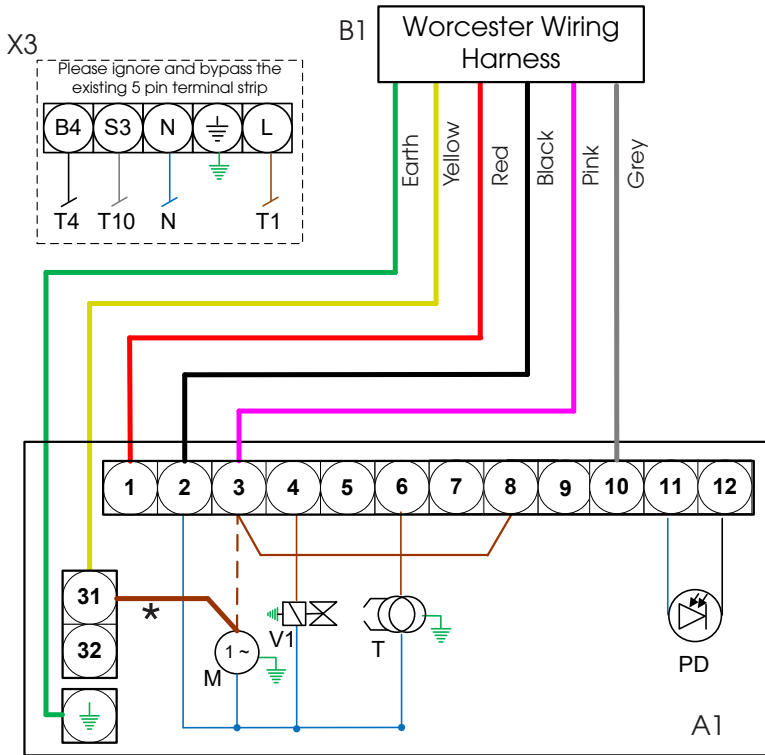
#### TESTING:

**Check the shut-down of the burner by opening the thermostats and the lock-out by darkening the photo-resistance.**

## Electrical System

### 7.2.3 Worcester Boiler Harness Electrical Wiring

With many Worcester boilers, the wiring harness will have 6 wires in total. If you have this version then please follow the following diagram. **(Fig. 17)**



**Fig. 17**

**\* remove motor lead wire from 3 and fit into 31 with yellow from harness**

**IMPORTANT** - Please bypass the 5 pin terminal strip (X3) and wire directly into the control box wiring base (A1).

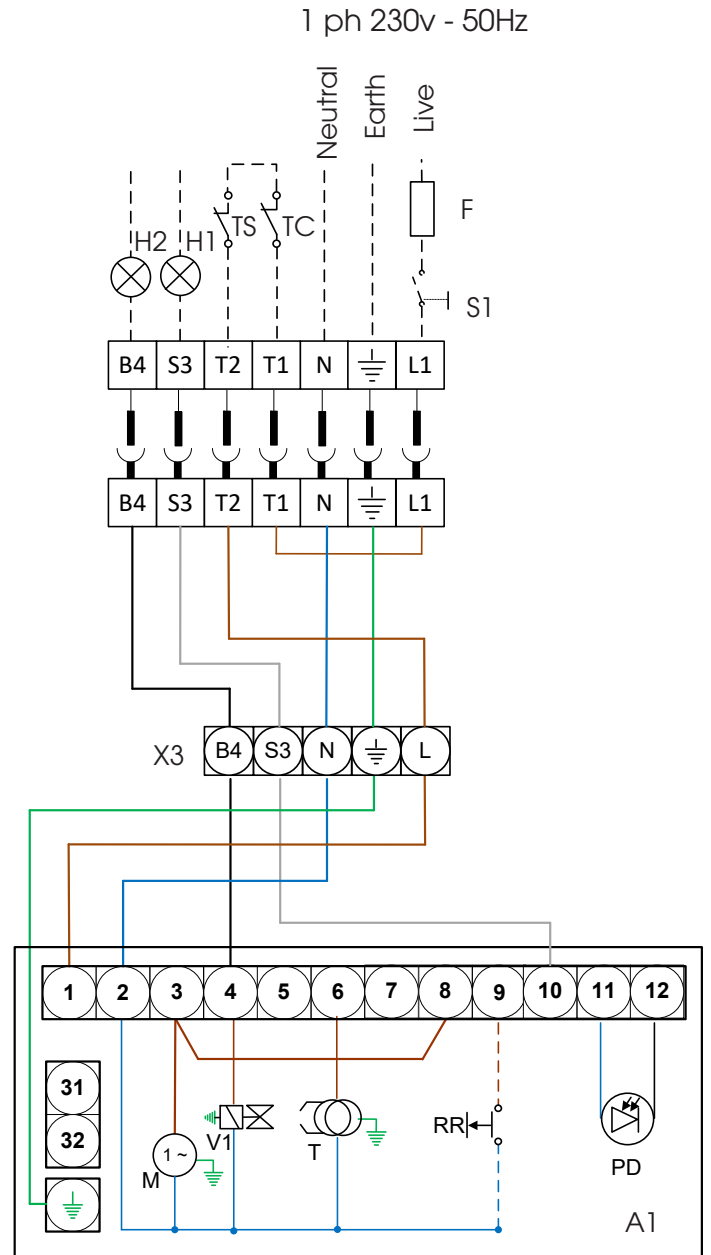
Wire as per wiring diagram.  
 Grey to Terminal 10  
 Earth to Earth Terminal  
 Black to Terminal 2 (Neutral)  
 Red to Terminal 1 (Live)  
 Pink to Terminal 3  
 Yellow to Terminal 31 (with Motor live)

**Components**  
 A1 - Wiring Base  
 PD - Photo Transistor  
 T - Transformer  
 M - Motor  
 V1 - Solenoid Valve  
 X3 - 5 Pin Terminal Strip  
 B1 - Worcester Wiring Harness

**TESTING:**  
 Check the shut-down of the burner by opening the thermostats and the lock-out by darkening the photo-resistance.  
**WARNING**

### 7.2.4 X500 & X600 wiring (with 7 pin plug)

If the X-Series has been supplied with a 7 pin plug, then please follow the below wiring diagram. **(Fig. 18)**



**Fig. 18**

**Internal Components**  
 A1 - Wiring Base  
 PD - Photo Transistor  
 T - Transformer  
 M - Motor  
 RR - Remote Reset (Optional)  
 V1 - Solenoid Valve  
 X3 - 5 Pin Terminal Strip

**External Components**  
 S1 - Isolation Switch  
 F - Fuse (5 amp)  
 TC - Control thermostat  
 TS - Limit Thermostat  
 H1 - Lockout indicator  
 H2 - Burner Run Indicator

**TESTING:**  
 Check the shut-down of the burner by opening the thermostats and the lock-out by darkening the photo-resistance.  
**WARNING**

## Burner Operation and Commissioning

### 8 Burner Operation and Commissioning

#### 8.1 Notes on safety for the first start-up.



The first start-up of the burner must be carried out by qualified personnel, as indicated in this manual and in compliance with the standards/regulations and local authority legislation



Check the correct working of the adjustment, command and safety devices.

#### 8.2 Combustion adjustment

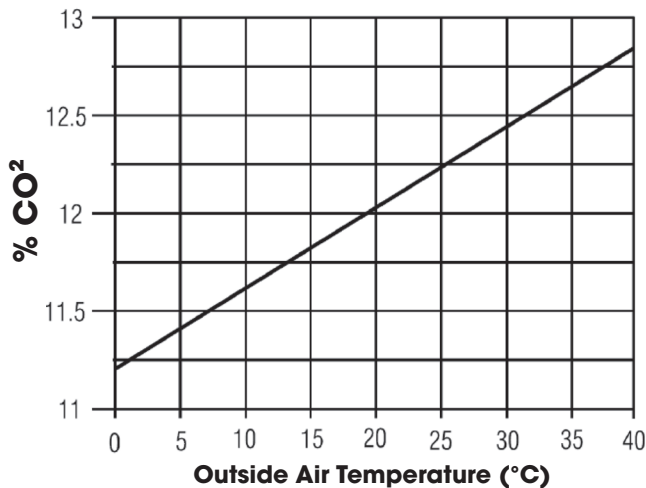
In conformity with Efficiency Directive 92/42/EEC the application of the burner on the boiler, adjustment and testing must be carried out observing the instruction manual of the boiler, including verification of the CO and CO<sub>2</sub> concentration in the flue gases, their temperatures and the average temperature of the water in the boiler.

Combustion air is drawn in from outside, meaning there may be notable changes in temperature, which can affect the percentage of CO<sub>2</sub>. You are advised to adjust CO<sub>2</sub> in accordance with the graph featured.



Example: outside air temperature 10 °C, adjust CO<sub>2</sub> to 11.6% (± 0.2%).

A CO level should be kept to a minimum and ideally less than 100ppm but if in doubt then contact EOGB.



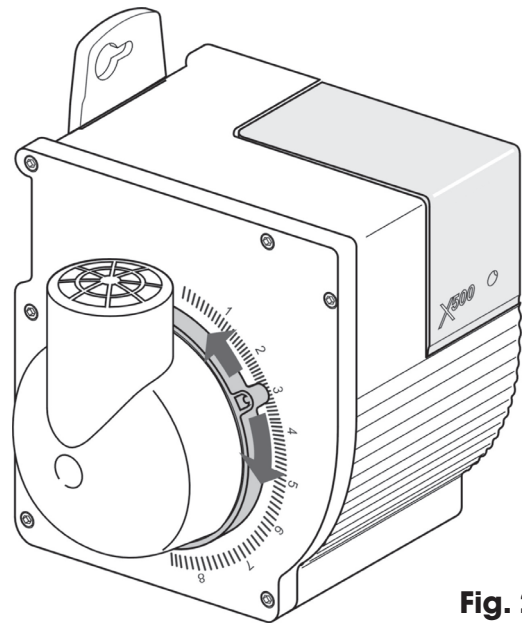
#### 8.3 Burner combustion adjustment

**Fig. 19**

From a suitable test point on the boiler, or in the flue, a smoke reading should be taken to ensure clean smoke-free combustion.

With the aid of a flue gas analyser, and by making adjustments to the air adjuster, the combustion can be set for maximum efficiency (see Fig 19).

The air damper control rotates to adjust the amount of combustible air (see Fig 20) and is locked in place by tightening the air damper locking screw. (see page 22, A Fig 25 )



**Fig. 20**

**Air control**  
**Clockwise = MORE air**  
**Anti-Clockwise = LESS air**

#### 8.4 Pump pressure

The pump pressure when it leaves the factory (unless other wise specified) will be set to run on kerosene at 145psi (10 bar). Pump pressure should then be set to appliance manufacturer's recommendations depending on what nozzle size is recommended (see Table 5 for more info).

#### 8.5 Nozzles installation

The burner complies with the emission requirements of the EN 267 standard.

In order to guarantee that emissions do not vary, recommended and/or alternative nozzles specified by the manufacturers in the instruction and warning booklet should be used. The information given in Table E should only be used as a guide where no information is provided by the boiler/application manufacturer's instructions/booklet.



It is advisable to replace nozzles every year during regular maintenance operations.



The use of nozzles other than those specified by the manufacturer may result in emissions that do not conform to the values set by the regulations in force, and in extremely serious cases, may cause potential hazards to people and objects.

The manufacturing company shall not be liable for any such damage arising from non-observance of the requirements contained in this manual.

#### 8.5.1 Nozzles recommended

##### 8.5.1.1 Nozzles recommended

- Delavan type A - W;
- Steinen type Q - S;
- Danfoss type H - S - EH - ES.

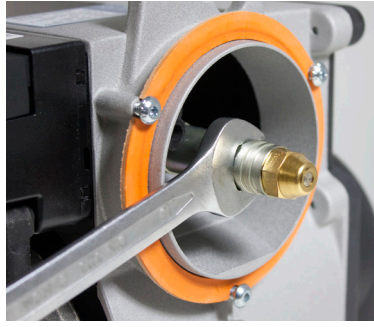
Angle 60° & 80° are advisable

## Burner Operation and Commissioning

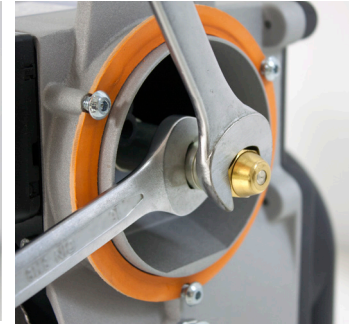


It is important that the nozzle holder is prevented from rotating by use of a second spanner while unscrewing the nozzle (see Fig 21 & 22)

\*Please note that boiler efficiency may differ so this table should be used as a guide only. If in doubt then contact the appliance/boiler manufacturer for advice



**Fig. 21**



**Fig. 22**

**Table E**

Burner	Oil Type	Nozzle Size	Spray Pattern	Boiler Efficiency Rating *	Pump pressure (psi)	Output (kW)	Air Damper
X400	Kerosene	0.40	ES / EH	90%	85-145	12-15.8	Low
		0.45			100-145	14.8-17.8	
		0.50			100-145	16.4-19.8	
		**0.55			100-145	18.0-21.8	
		0.60			100-145	19.7-23.7	Low/High
		0.65			100-145	21.4-25.7	
		0.75			100-145	24.6-29.7	
		0.85			100-145	27.9-33.6	
	1.00	100-120	32.8-36	High			
	Gas Oil	0.30	S / H	90%	174-220	14.7-16.5	Low
		0.35			174-220	17.2-19.3	
		0.40			174-220	18.6-20.9	
		0.45			174-220	21.1-23.8	Low/High
		0.50			174-220	23.8-26.8	
		0.55			174-220	26.9-30.2	
		0.60			174-220	30.2-34.	High
0.65		174-195			34-36		
X500	Kerosene	1.00	EH / ES	90%	108-145	34-39.5	Low
		1.10	S / H		100-145	37.9-43.5	High
		1.20			100-145	43.6-52.5	
		**1.25			100-145	46.1-55.5	
		1.35			100-145	50.6-61	
		1.50			100-118	57.2-62	
	Gas Oil	0.65		S / H	90%	174-220	
		0.75	174-220			37.5-42.1	
		0.85	174-220			42.2-47.4	
		1.00	174-220			47.4-53.3	
		1.10	174-220			54-60.7	
		1.20	174-208			56.7-62	
X600	Kerosene	1.25	S / H	90%	118-145	50-55.5	High
		1.35			100-145	50.6-60.1	
		*1.50			100-145	57.2-68.9	
		1.65			100-145	59.5-71.7	
		1.75			100-145	64.1-77.2	
		2.00			100-120	72.7-80	
	Gas Oil	1.00	S / H	90%	194-220	50-53.3	High
		1.10			174-220	54.1-60.7	
		1.20			174-220	56.7-63.7	
		1.25			174-220	60-67.5	
		1.35			174-220	65.9-74.1	
		**1.50			174-202	74.4-80	

\*\* Standard test nozzle supplied with the burner.

## Burner Operation and Commissioning

### 8.6 Low and high output air damper adjustment

The X400 & X500 are supplied with both LOW and HIGH output air dampers loosely within the box and the correct one must be selected and fitted prior to installing the burner.



If the **X400** burner output is between **14 to 25kW**s, the **LOW** output damper must be used  
If the **X400** burner output is between **25 to 36kW**s, the **HIGH** output damper must be used

If the **X500** burner output is between **34 to 40kW**s, the **LOW** output damper must be used  
If the **X500** burner output is between **40 to 62kW**s, the **HIGH** output damper must be used

The **X600** is only supplied with the **HIGH** output damper but it must be fitted prior to installation

**Low output damper**



**Fig. 23**

**High output damper**

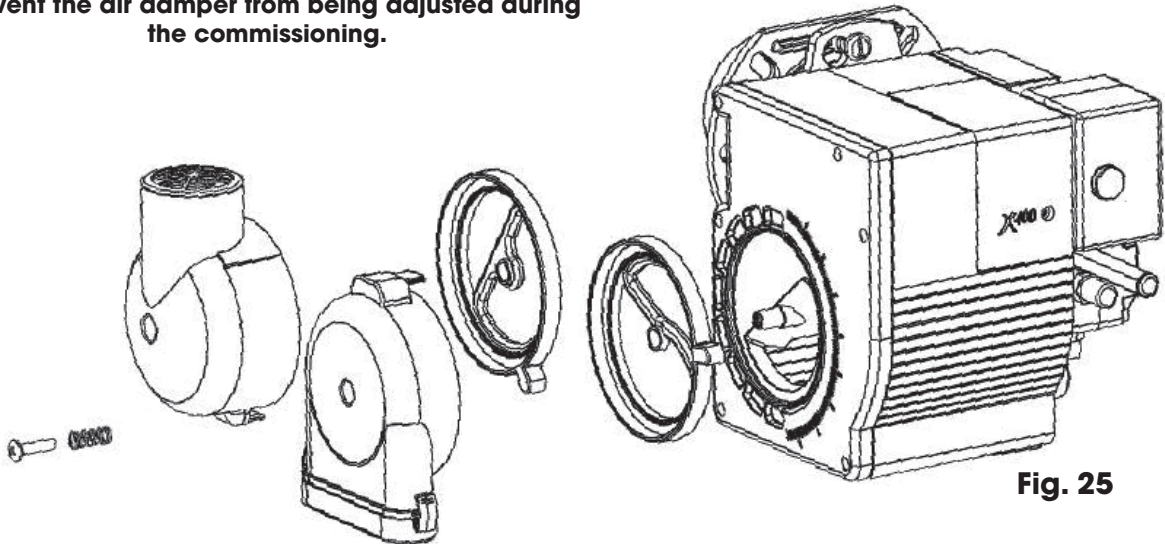


**Fig. 24**



To assemble the air intake and air damper, screw the spring loaded securing screw (see **Fig 25**) through the chosen intake and air damper into the burner side cover

**Screw "A" MUST NOT be overtightened which would prevent the air damper from being adjusted during the commissioning.**



**Fig. 25**



Please ensure that the acoustic foam baffle is fitted in the correct orientation (see **Fig 25.1**).



**Fig. 25.1**



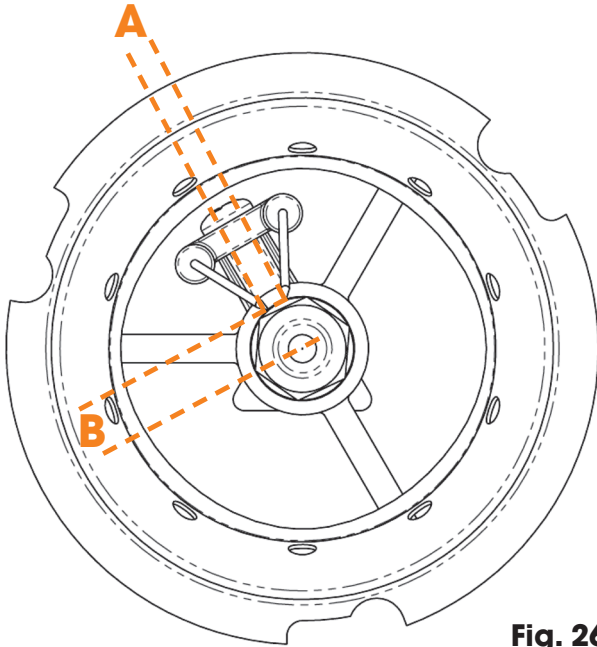
## Burner Operation and Commissioning

### 8.7 Electrode settings

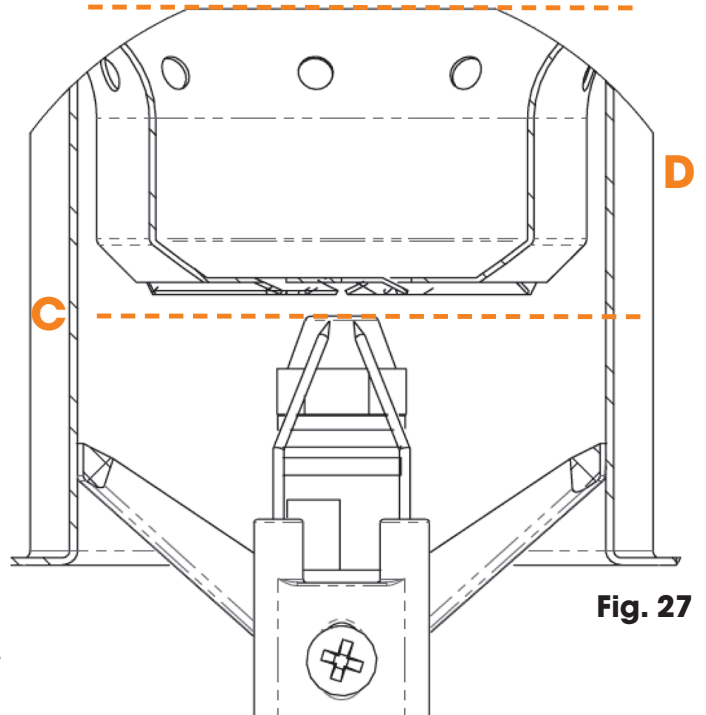


The position of the electrodes can be critical to ensure the ignition spark is generated in the correct place. To ensure a safe reliable ignition of the fuel, please check your electrode settings using the below diagrams.

#### X400



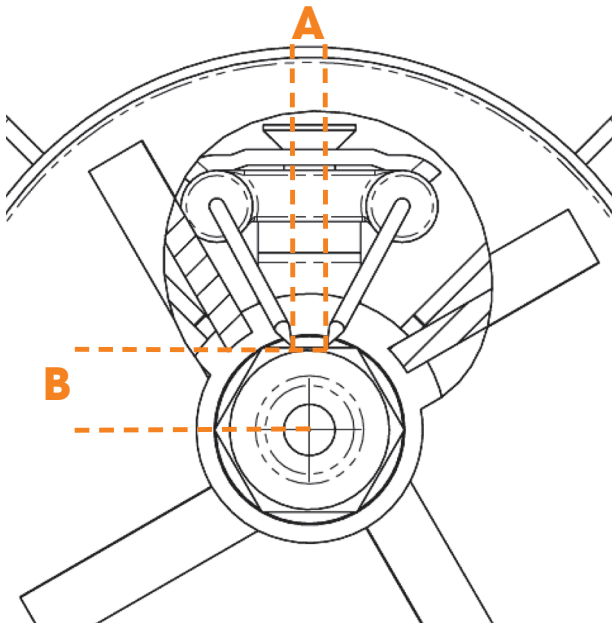
**Fig. 26**



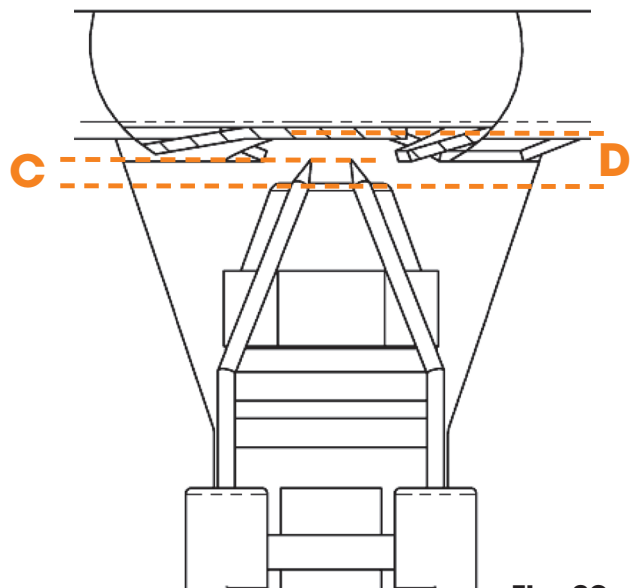
**Fig. 27**

Please note the position of the electrode block should be located at approximately 11:00 o'clock (see Fig 26)

#### X500 & X600 Only



**Fig. 28**



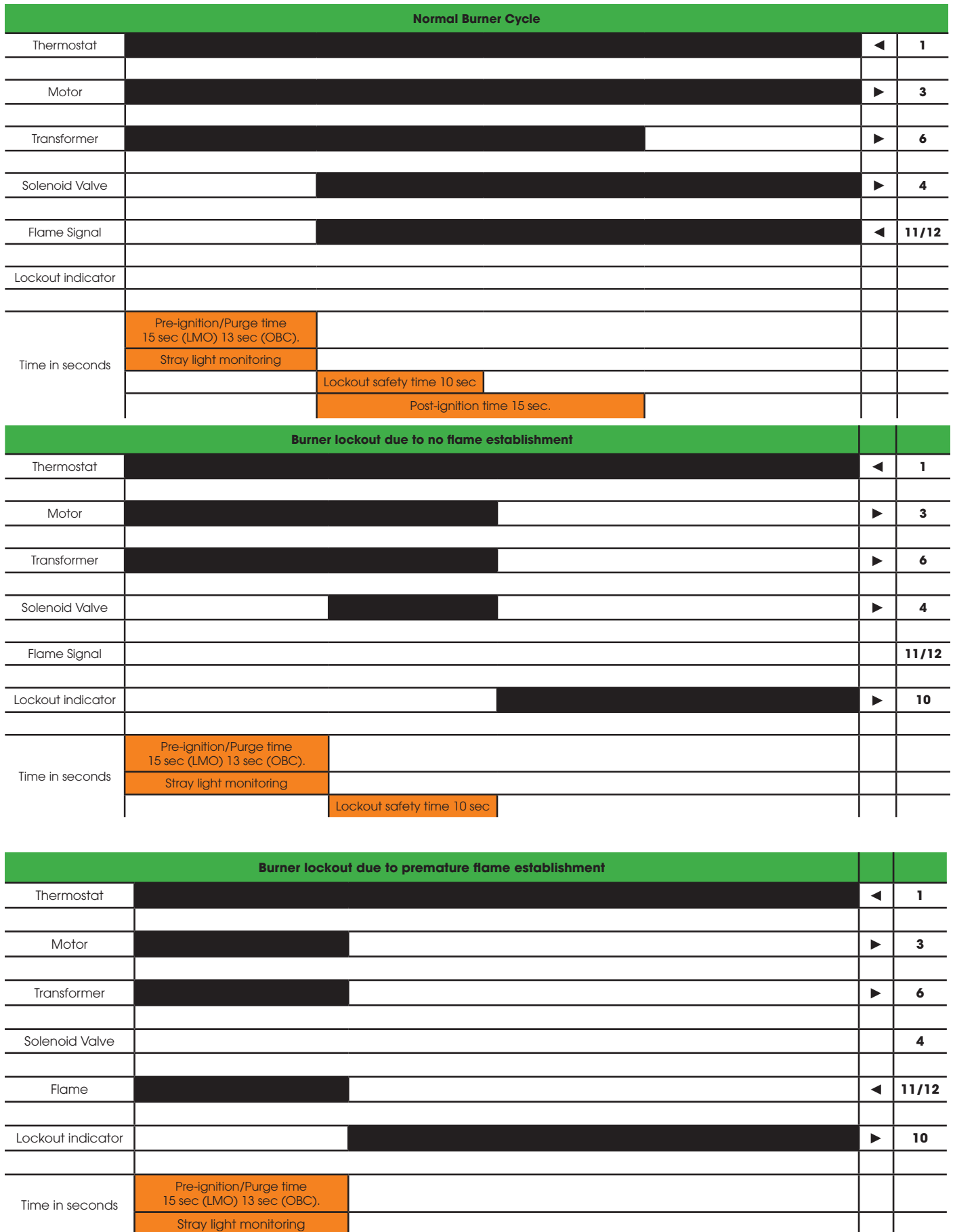
**Fig. 29**

Model	mm			
	A	B	C	D
X400	3.5	9.0	0	43.0
X500	3.5	6.0	2.0	6.0
X600	3.5	6.0	2.0	4.5

**Table F**

## Burner Operation and Commissioning

### 8.8 Burner Start Cycle



Lockout is indicated by the lockout indicator lamp on the control box (page 8, 5 Fig 1.1)

## Maintenance / Service

### 9 Maintenance & Service

#### 9.1 Notes on safety for the maintenance

Periodic maintenance is essential for the good operation, safety, yield and duration of the burner. It allows you to reduce consumption and polluting emissions and to keep the product in a reliable state over time.



The maintenance interventions and the calibration of the burner must only be carried out by qualified, authorised personnel, in accordance with the contents of this manual and in compliance with the standards and regulations of current laws.

Before carrying out any maintenance, cleaning or checking operations:



Disconnect the electricity supply from the burner by means of the main switch of the system;



Isolate the fuel supply.

#### 9.2 Maintenance programme

The combustion system should be checked ;

- at least **once a year** if **Kerosene** is being used by a representative of the manufacturer or another specialised technician.
- at least **every 6 months** if **Gas Oil** is being used by a representative of the manufacturer or another specialised technician.

##### 9.2.2 Checking & cleaning

###### Combustion head

Open the burner and make sure that all components of the combustion head are in good condition, not deformed by the high temperatures, free of impurities from the surroundings and correctly positioned.

Clean the combustion head in the fuel exit area, on the diffuser disc.

###### Burner

Check for excess wear or loose screws and clean the outside of the burner.

###### Fan

Check to make sure that no dust has accumulated inside the fan or on its blades, as this condition will cause a reduction in the air flow rate and provoke polluting combustion.

###### Photo-Transistor

Clean the photo-transistor

###### Electrodes

Check the correct position of electrodes

###### Nozzles

It is advisable to replace nozzles every year or 6 months depending on what fuel is being used. (see 9.2.1)

Do not attempt to clean the nozzle

###### Filters

Check the filter elements in-line and at the nozzle. Clean or replace if necessary. If rust or other impurities are observed inside the pump, use a separate pump to lift any water and other impurities that may have deposited on the bottom of the tank.

###### Pump

Please check that the supply line and filters are clear. The use of a pump vacuum gauge will assist in this. This measure permits the cause of the anomaly to be traced to either the suction line or the pump.

If the problem lies in the suction line, check to make sure that the filter is clean and that air is not entering the piping.

###### Flexible Hoses

- Check the condition of the flexible pipes periodically. They have to be replaced at least every 2 years.
- In case of use of gas oil and biofuel blends, it is strongly recommended to inspect even more frequently the hoses and replace them where contamination has occurred.
- Check to make sure that the hoses are still in good condition



The hose(s) supplied with this burner are suitable for use with Kerosene, Gas oil and Biofuel blends of FAME up to 100%

In case of use of a different Biofuel then please contact EOGB for further information (a fuel specification may be requested)

###### Fuel tank

If water or contamination is present within the fuel tank, it is essential that this is removed before the equipment is to be used. This is extremely important when gas oil containing Biodiesel is in use. If in doubt about how to achieve this then please contact the fuel or oil tank supplier.

###### Boiler

Clean the boiler as indicated in the appliance accompanying instructions in order to keep all the original combustion characteristics intact, especially the flue gas temperature and combustion chamber pressure.

###### Combustion

In case the combustion values found at the beginning of the intervention do not respect the standards in force or in any case, do not correspond to a proper combustion, contact the Technical Assistant and allow them to carry out the necessary adjustments.

Allow the burner to work for 10 minutes. and then check the combustion readings with the parameters indicated within the appliance instruction manual.

Then carry out a combustion check verifying:

- Flue gas temperature at the chimney;
- Content of CO<sub>2</sub> (%);
- Content of CO (ppm);
- Smoke value according to opacity smokes index according to Bacharach scale.

## Maintenance / Service

### 9.3 Fault finding

Below is a list of some scenarios that may lead to a failure causing the burner to go into lockout mode. There are also some relevant tests and solutions to hopefully overcome any problem that may occur.

Push the reset button to re-start the burner. If the burner then functions correctly the control has simply responded to a temporary fault. If the burner still fails then a further investigation will be required to correct any fault.

Fault	Probable cause	Useful test	Solution	
The burner will not start	Lack of Voltage	Is there is 230v on terminal 1 of the control box base?	Replace control box	
		If there is no voltage onto terminal 1 then there is an external fault	Check thermostats, switches, fuses etc to trace fault	
The burner starts but no flame is present and the burner goes to lockout	No fuel to burner		Check if there is oil present at the pump inlet	Check fuel tank, valves, etc for problems
	No fuel to the nozzle	No voltage to solenoid coil	Cover photo-transistor. If burner fires up ok then photo-transistor must be detecting a light source during pre-purge	Identify source, spark, etc and remedy
			If there is still no flame disconnect photo-transistor from base. If burner then fires then cell must be faulty.	Replace photocell
		Voltage to coil but not energizing	Test to ensure the coil measures a resistance of between 1.7-2.4 kohms	Replace coil
		Coil energized but no oil at pump outlet	Check valve opening. Replace if necessary	
	Oil at pump outlet but none through the nozzle	Replace nozzle, or check line for blockage		
No Spark		Check electrodes, HT leads and voltage to transformer. If all ok then transformer is faulty.	Replace transformer	
The burner starts, establishes a flame and locks out after 10 secs	Flame recognition (photo-transistor not seeing flame)	Remove photo-transistor and ensure that it is covered and not exposed to any light, reset burner and once the burner establishes a flame (after about 12 Secs) expose the photo-diode to a light source	If the burner still goes to lockout, then check photo-transistor lead connections or replace control box If the burner continues to run, check that photo-transistor is not obstructed from seeing the flame, Check combustion settings, consult EOGB for further information	
The burner starts, and a flame is established instantly and the burner goes to lockout after 15 secs	Solenoid stem is letting by	Disconnect solenoid lead and re-test.	If the burner still establishes a flame then replace solenoid stem/pump	
	Solenoid stem is being energised before it should be	Disconnect any external wiring from terminal B4 and test solenoid lead for 230v	If voltage disappears when external wiring is removed the fault will be external, investigate boiler wiring If voltage remains then replace control box	
The burner starts, no flame is established and the burner goes to lockout after 23 secs	Flame recognition/stray light		Disconnect/check wiring of the photo-transistor lead, and retest	If the burner <u>does</u> fire up for 10 secs the replace photo-transistor
				If the burner <u>does not</u> fire the replace control box
The burner fan motor does not start and burner locksouts after approx 23 secs	Motor Seized	Strip burner down and manually turn Oil pump and motors shaft to see if either has seized up.	If seized then replace (if pump has seized, check for signs of oil / water contamination)	
	Faulty Capacitor	Using a multimeter on a capacitance setting, ensure that the capacitor reading is correct (i.e. if you have a capacitor with a rating of 4 uF with a tolerance of +/- 5% then the reading must be in-between 3.80 and 4.20 uf)	Replace Capacitor if reading is outside stated tolerance	
	No Power to motor	Unplug motor lead, reset the control box and test for 230V AC on the motor lead	If no 230v AC, check cable or external wiring / replace control box If a 230V signal is present, Check Capacitor/replace motor	

## Maintenance / Service

Fault	Probable cause	Useful test	Solution
Flame is pulsating	Faulty or dirty nozzle		Replace nozzle
	Excessive flue draught	Measure draught	Reset combustion or adjust draught stabilizer (if fitted)
Smoking Flame	Faulty nozzle		Replace nozzle
	Combustion not set correctly	Check combustion	Reset combustion
	Insufficient air	Check combustion	Increase air setting. Check ventilation
	Fuel pressure too low/high	Check fuel pressure	Set fuel pressure as per manufacturers instructions
Burner keeps bringing ignition back on	Flame recognition or low sulphur fuel	Remove photo-transistor and ensure that it is covered and not exposed to any light, reset burner and once the burner establishes a flame (after about 13 Secs) expose the photo-transistor to light	If problem disappears the problem is with the flame picture - reset combustion If the problem does not disappear then the photo-transistor is at fault
	Low sulphur fuel	Remove photo-transistor and ensure that it is covered and not exposed to any light, reset burner and once the burner establishes a flame (after about 12 Secs) expose the photo-transistor to light	If problem disappears the problem is with the fuel luminosity caused by a lower sulphur fuel, reset combustion with a Co2 % of around 12-12.5 % or contact EOGB for further information If the problem does not disappear then the photo-transistor is at fault

### 9.3.1 Fault Codes (Danfoss OBC - X500 X600)

The OBC 81 is equipped with a two-coloured LED which displays both the operating status and can indicate the causes of errors leading to lockout. In the event of operating lockout, **the cause of error can be read out as a flash code by holding down the reset button for at least 5 seconds and then releasing it.**

Undervoltage will, however, be displayed automatically. **Reset can be performed directly in alarm mode (constant red light) or in flash code mode by pressing the reset button for at least 1 second** but no more than 3 seconds. In flash code mode it is possible to return to alarm mode by holding down the reset button again for at least 5 seconds.

Event	Code	Possible causes
False light	2 Flashes	Faulty photo diode/control box, Fuel Solenoid faulty/soiled, Light in combustion chamber or photo-transistor wired incorrectly (blue to T11 and Black to T12)
No flame when safety time elapses	3 Flashes	No flame establishment, No Fuel (faulty pump/solenoid), Faulty or Obstructed Photo diode, Faulty ignition equipment, Incorrect combustion settings
More than three restarts in the same cycle	4 Flashes	Faulty Solenoid coil, flue gas recirculation, incorrect combustion settings
Max waiting time on pre-heater overrun (10 mins)	5 Flashes	Pre heater not used on X-Series, Check link wire is present between terminals 3 & 8 in wiring base
Supply voltage above 264V ac	6 Flashes	Incorrect supply voltage
Under voltage <170v (automatic)	8 Flashes	Incorrect supply voltage
Application Failure (EMC)	10 Flashes	Wiring fault, internal fault, Faulty control box.



**Do not keep reset the control box more than 3 times as this will overheat the ignition unit. Allow 2 minutes between reset attempts to allow sufficient cooling.**

If the Remote Reset function is being used, and has been reset more than 4 times within 15 minutes the reset will be ignored until the 15 minutes has elapsed or if the power supply is turned off or if the control box is manually reset. Please note: The information given above is provided to assist the engineer with any problems they may encounter. This is not a definitive list. The manufacturer cannot accept responsibility for any damage to persons, animals or property due to error in installation or in the burner adjustment, or due to improper or unreasonable use or non observance of the technical instruction enclosed with the burner, or due to the intervention of unqualified personnel. If further problems are encountered then please contact EOGB Energy Products Ltd for advice.

**Technical helpline - Tel: 01480 477066 option 2.**  
**Email - [technical@eogb.co.uk](mailto:technical@eogb.co.uk)**  
**Web - [www.eogb.co.uk](http://www.eogb.co.uk)**

## Maintenance / Service

### 9.3.2 Fault Codes (Siemens LMO - X400)

The LMO14 is equipped with a two-coloured LED which displays both the operating status and can indicate the causes of errors leading to lockout. In the event of operating lockout, **the cause of error can be read out as a flash code by holding down the reset button for at least 5 seconds and then releasing it.**

Undervoltage will, however, be displayed automatically. **Reset can be performed directly in alarm mode (constant red light) or in flash code mode by pressing the reset button for at least 1 second** but no more than 3 seconds. In flash code mode it is possible to return to alarm mode by holding down the reset button again for at least 5 seconds.

Event	Code	Possible causes
No flame establishment	2 Flashes	No flame establishment, No Fuel (faulty pump/solenoid), Faulty or Obstructed Photo diode, Faulty ignition equipment, Incorrect combustion settings
Not Used	3 Flashes	
Stray/Extraneous Light on start up	4 Flashes	Faulty photo transistor /control box, Fuel Solenoid faulty/soiled, Light in combustion chamber or photo-transistor wired incorrectly (blue to T11 and Black to T12)
Not Used	5 Flashes	
Not Used	6 Flashes	
Too many losses of flame during operation	7 Flashes	Faulty Solenoid coil, flue gas recirculation, incorrect combustion settings
Pre-heater failure	8 Flashes	Pre heater not used on X-Series, Check link wire is present between terminals 3 & 8 in wiring base
Not Used	9 Flashes	
Application Failure (EMC)	10 Flashes	Wiring fault, internal fault, Faulty control box.



**Do not keep reset the control box more than 3 times as this will overheat the ignition unit. Allow 2 minutes between reset attempts to allow sufficient cooling.**

If the Remote Reset function is being used, and has been reset more than 4 times within 15 minutes the reset will be ignored until the 15 minutes has elapsed or if the power supply is turned off or if the control box is manually reset. Please note: The information given above is provided to assist the engineer with any problems they may encounter. This is not a definitive list. The manufacturer cannot accept responsibility for any damage to persons, animals or property due to error in installation or in the burner adjustment, or due to improper or unreasonable use or non observance of the technical instruction enclosed with the burner, or due to the intervention of unqualified personnel. If further problems are encountered then please contact EOGB Energy Products Ltd for advice.

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**Web - [www.eogb.co.uk](http://www.eogb.co.uk)**



## Commissioning Report Sheet

Commissioning Engineer			
Address			
OFTEC number			
Date of Commissioning			
Site address			

### Appliance

Make			
Model		Serial No.	
Output (kW/BTU)		Fuel	
Type of Flue			

### Burner

Model		Nozzle size	
Serial No.		Nozzle angle & Pattern	

### Settings

CO <sup>2</sup>	%		Flue Draft	mbar	
CO	PPM		Air damper setting	N.o	
O <sup>2</sup>	%		Head setting (X500/600 only)	N.o	
Smoke	No.		Flue Gas Temp Nett	°C	
Efficiency	%		Pump pressure	Psi/Bar	



**Please note: This report sheet must be completed by the Commissioning Engineer and the book is to be left with the appliance.**

## Maintenance / Service

### 9.5 Service Records

Service Date	Next Service due				
Burner					
Model			Nozzle size		
Serial No.			Nozzle angle & Pattern		
Settings					
CO <sup>2</sup>	%		Flue Draft	mbar	
CO	PPM		Air damper setting	N.o	
O <sup>2</sup>	%		Head setting (X500/600 only)	N.o	
Smoke	No.		Flue Gas Temp Nett	°C	
Efficiency	%		Pump pressure	Psi/Bar	
Service Notes					

Service Date	Next Service due				
Burner					
Model			Nozzle size		
Serial No.			Nozzle angle & Pattern		
Settings					
CO <sup>2</sup>	%		Flue Draft	mbar	
CO	PPM		Air damper setting	N.o	
O <sup>2</sup>	%		Head setting (X500/600 only)	N.o	
Smoke	No.		Flue Gas Temp Nett	°C	
Efficiency	%		Pump pressure	Psi/Bar	
Service Notes					

Service Date	Next Service due				
Burner					
Model			Nozzle size		
Serial No.			Nozzle angle & Pattern		
Settings					
CO <sup>2</sup>	%		Flue Draft	mbar	
CO	PPM		Air damper setting	N.o	
O <sup>2</sup>	%		Head setting (X500/600 only)	N.o	
Smoke	No.		Flue Gas Temp Nett	°C	
Efficiency	%		Pump pressure	Psi/Bar	
Service Notes					



## Maintenance / Service

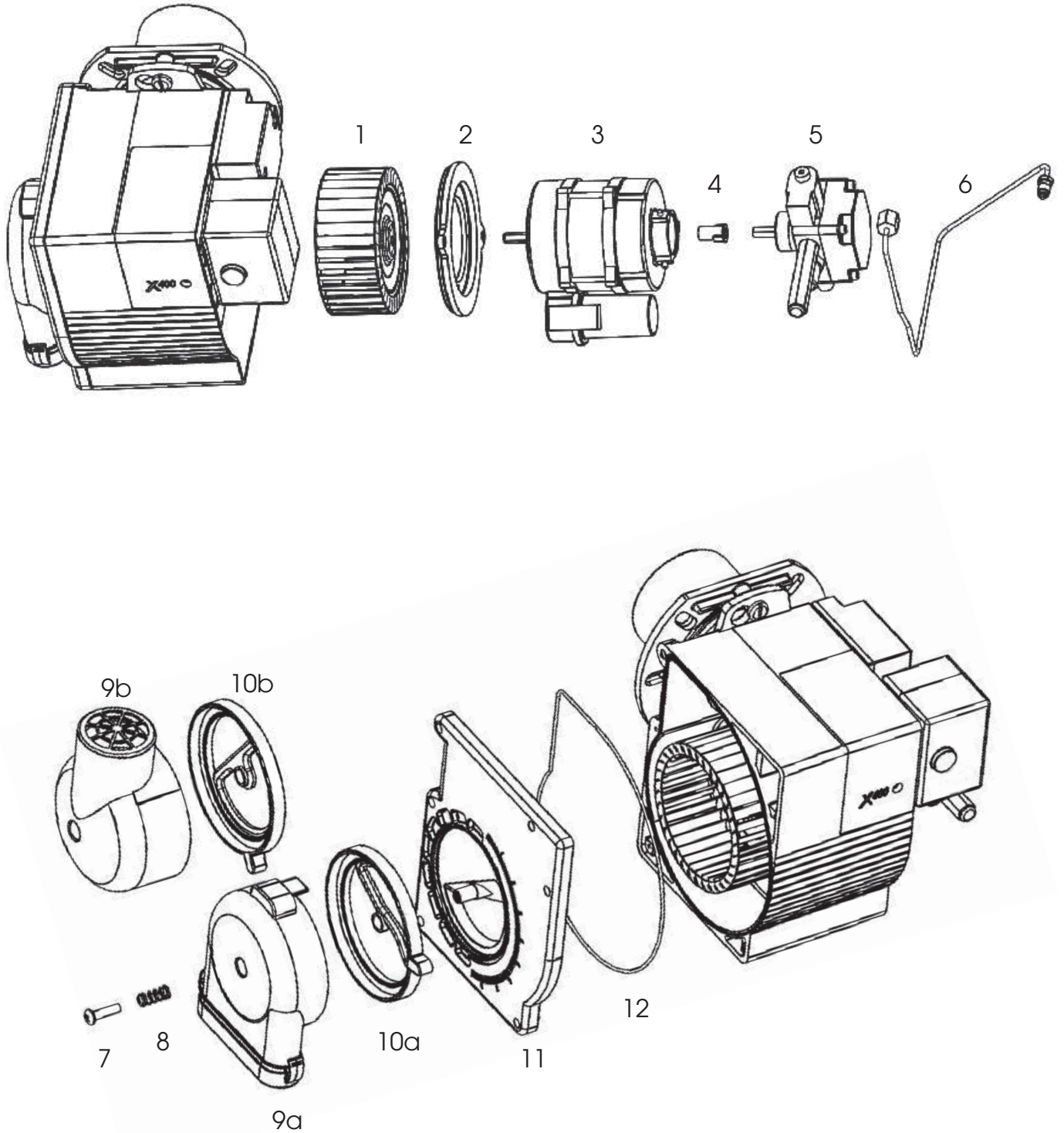
Service Date	Next Service due				
Burner					
Model			Nozzle size		
Serial No.			Nozzle angle & Pattern		
Settings					
CO <sup>2</sup>	%		Flue Draft	mbar	
CO	PPM		Air damper setting	N.o	
O <sup>2</sup>	%		Head setting (X500/600 only)	N.o	
Smoke	No.		Flue Gas Temp Nett	°C	
Efficiency	%		Pump pressure	Psi/Bar	
Service Notes					

Service Date	Next Service due				
Burner					
Model			Nozzle size		
Serial No.			Nozzle angle & Pattern		
Settings					
CO <sup>2</sup>	%		Flue Draft	mbar	
CO	PPM		Air damper setting	N.o	
O <sup>2</sup>	%		Head setting (X500/600 only)	N.o	
Smoke	No.		Flue Gas Temp Nett	°C	
Efficiency	%		Pump pressure	Psi/Bar	
Service Notes					

Service Date	Next Service due				
Burner					
Model			Nozzle size		
Serial No.			Nozzle angle & Pattern		
Settings					
CO <sup>2</sup>	%		Flue Draft	mbar	
CO	PPM		Air damper setting	N.o	
O <sup>2</sup>	%		Head setting (X500/600 only)	N.o	
Smoke	No.		Flue Gas Temp Nett	°C	
Efficiency	%		Pump pressure	Psi/Bar	
Service Notes					

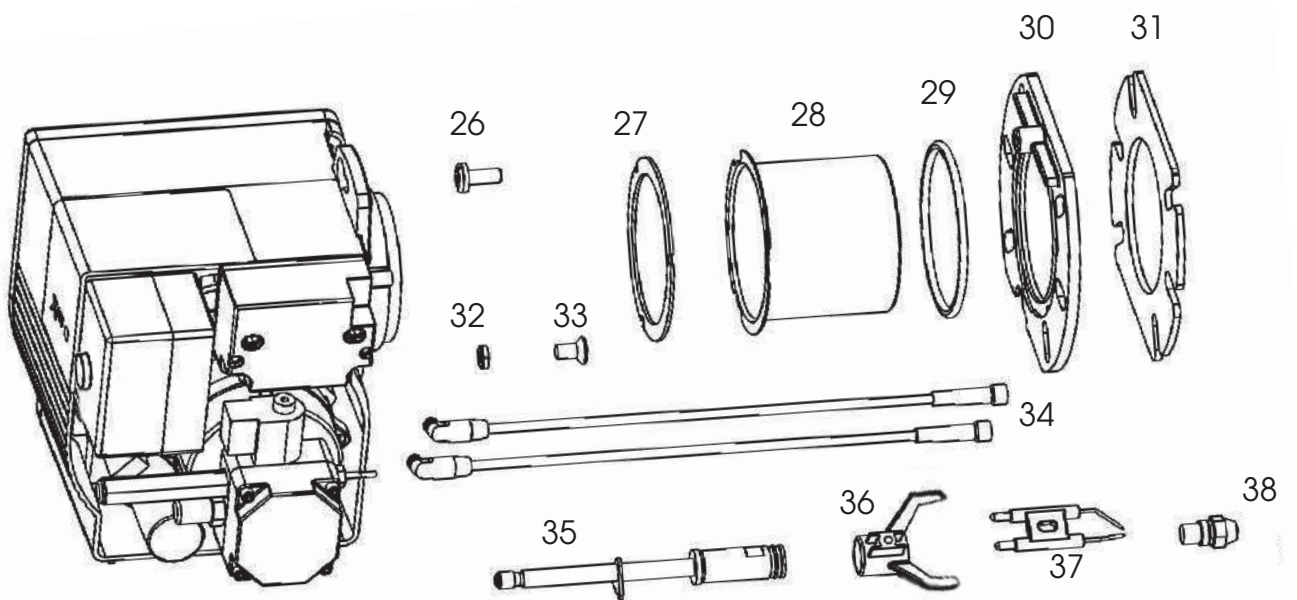
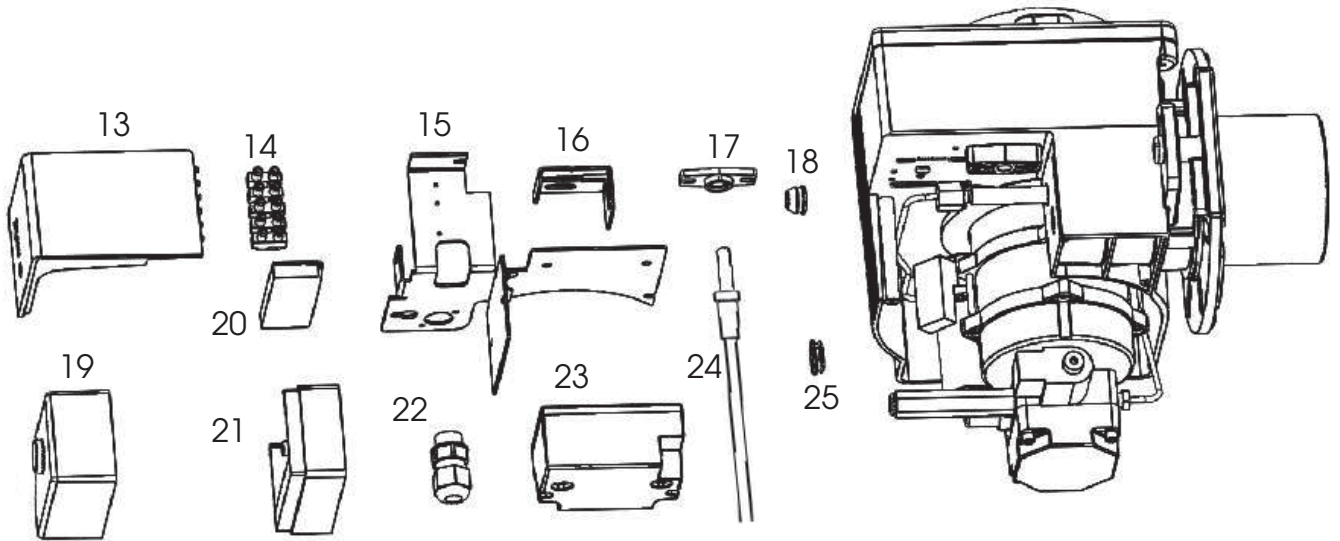
## Spare parts list

10.1 X400 Spare parts list



# Spare parts list

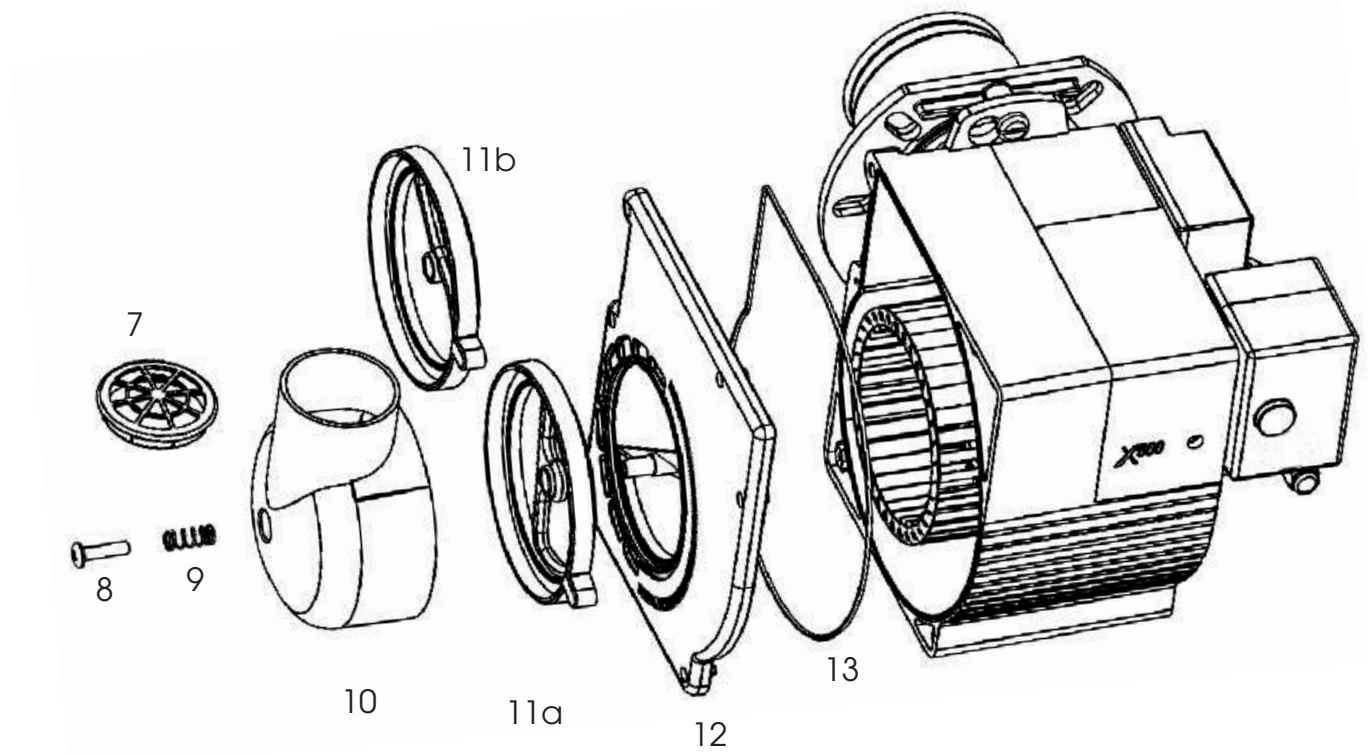
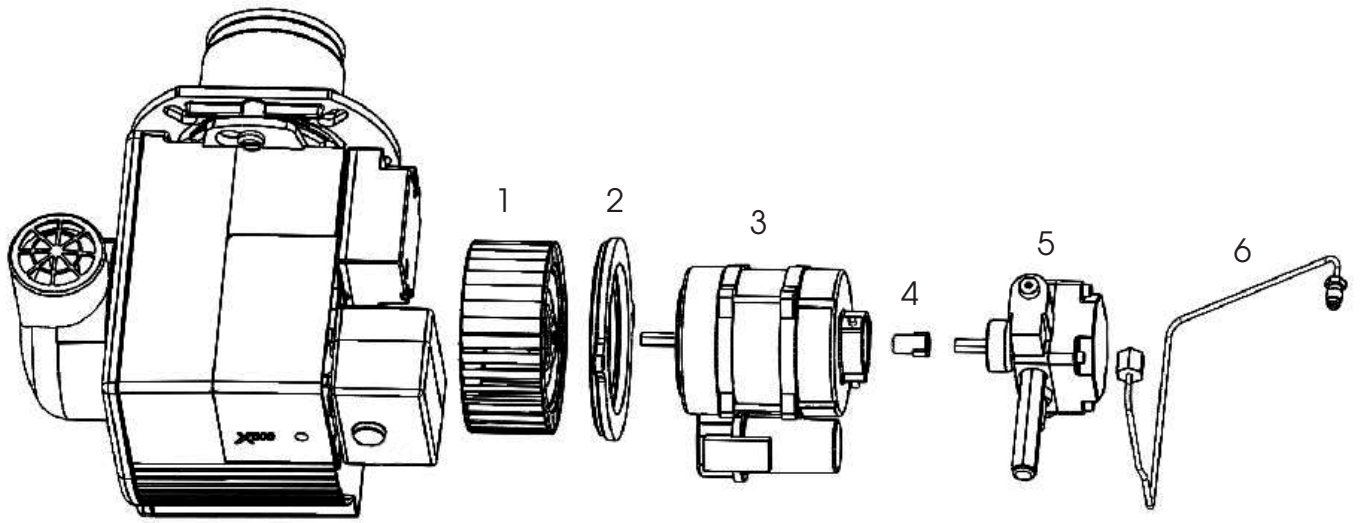
10.1 X400 Spare parts list



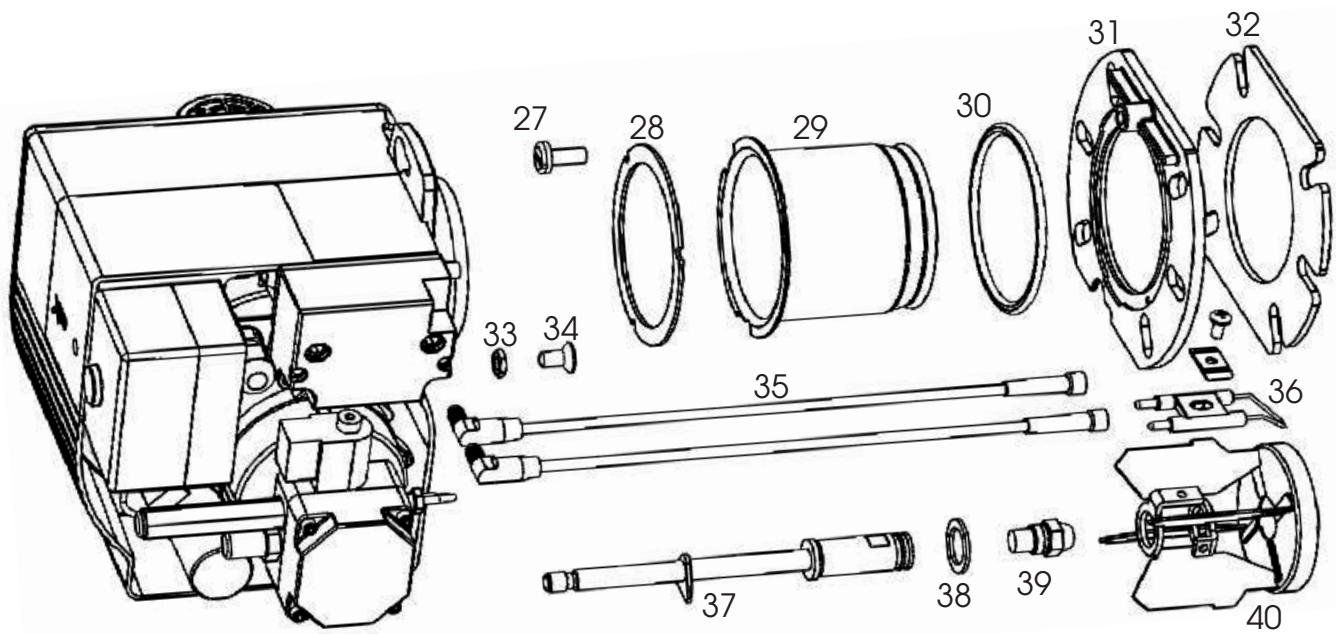
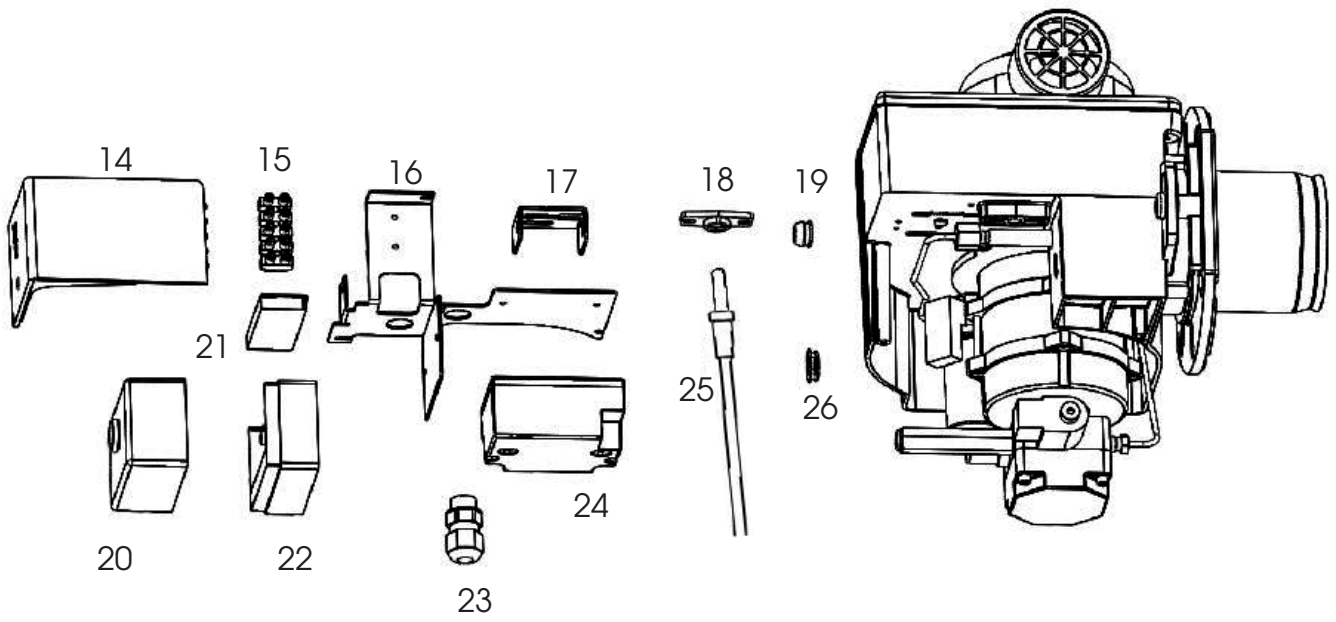
## Spare parts list

Item	Part number	Description	Item	Part number	Description
1	E80-0901	Fan 120mm x 52mm left hand rotation		E80-0101	Blast tube type ETB 6-7-19-10 80mm (X400 Standard)
2	E80-0702	Motor mounting flange		E80-0102	Blast tube type ETB 10-5-16-8 80mm
3	M02-1-90-18	Motor	28	E80-0103	Blast tube type ETB 10-5-16-8 127mm
	M02-0004	Capacitor 4mF		E80-0108	Blast tube type ETB 6-7-19-10 127mm
	M02-0012	3 Pin motor lead		E80-0104	Blast tube type ETB 6-7-19-10 147mm
4	C01-0005	Motor/pump coupling		E80-0105	Blast tube type ETB 10-5-16-8 147mm
5	D01-071N0156	BFP11 L3 Pump Bio 10		E80-004-002-031-00	Blast tube type ETB 6-7-19-10 207mm
	D01-071N0010	BFP 240v coil		E80-004-002-034-00	Blast tube ETB 10-5-16-8 207mm
	D01-071G0202	3 Pin pump solenoid cable 280mm		29	E80-0202
	E80-1405	Brass manifold 70mm 1/8"m x 1/8"m for pressure gauge	30	E80-0701	Burner mounting flange
	E80-300-999-000-00	1/8" port plug	31	E80-0201	Burner mounting gasket
6	E80-1401	Outer oil pipe - Pump to nozzle assembly	32	E80-402-102-080-00	M8 steel zinc plated half nut
7	E80-400-111-325-00	Bolt M6 x 24	33	E80-400-143-416-00	M8 x 16 steel zinc plated c/sunk
8	E80-407-100-000-00	Spring	34	E80-0601	Ignition cable 3mm angled x 3mm straight (sold individually)
9a	E80-0404	Air intake housing X400 (narrow)	35	E80-300-802-101-00	Inner assembly including nozzle holder to suit X400 80mm head (Standard)
	E80-0407	Air intake grill (narrow)		E80-300-802-103-00	Inner assembly including nozzle holder to suit X400 127mm head
	E80-1405	Acoustic baffle - X400 (narrow)		E80-300-802-105-00	Inner assembly including nozzle holder to suit X400 207mm head
9b	E80-0405	Air intake housing X400/500 (balanced flue)	36	E80-1200	Electrode holder
	E80-0408	Air intake grill X400/500 (balanced)	37	E80-0301	Electrode block
	E80-501-001-000-02	Acoustic baffle X400/500 (balanced flue)	38	Please note that the oil nozzle size should be determined by the boiler/appliance manufacturer. If in doubt the please contact EOGB for further information on nozzle sizing or refer to <b>Table E Page 21</b>	
	E80-0403	Air intake rubber adaptor 60mm to 70mm			
10a	E80-0010	Air damper (low output) + seal			
10b	E80-0007	Air damper (high output) + seal			
11	E80-0401	Side cover X400 Only			
	E80-0016	Side Cover Kit (Incs ,Side cover, Low output air damper, Narrow air intake, baffle, grill, spring and bolt			
12	E80-500-005-120-00	Neoprene sponge sealing cord 650mm required			
13	E80-1302	Electronics cover X400			
14	E80-302-006-112-01	5 pin terminal strip 32amp			
15	E80-002-008-000-08	Control chassis X400			
16	E80-1202	Inner assembly sliding bracket (fixed) X400			
17	L01-AGK42	Siemens QRB4B Mounting flange			
	X10-0215	Siemens QRB4B Spacer Plate			
	D01-057H7071	Danfoss LDS Mounting flange			
	S01-59101	Honeywell MZ Mounting flange			
18	E80-502-200-001-00	Grommet for inner assembly			
19	L01-LMO14.111C2	Siemens LMO14 Control box (replaces OBC81 on X400)			
	S01-TF830.3	Honeywell TF830.3 Control box			
20	D01-057H7011	Cable entry plate			
21	D01-057H7010	Control box wiring base			
22	X01-0048	Cable gland			
23	D01-052F4031	EBI ignition transformer (includes mains cable)			
	D01-052F0132	Mains lead for ignition unit 320mm			
24	L01-QRB4B-1	Siemens QRB4 Photo Transistor (Inc Clip + Flange)			
	L01-AGK43	Siemens QRB4 Clip only			
	D01-057H7316	Danfoss LDS Photo Transistor			
	D01-057H7072	Danfoss LDS Clip Only			
	S01-MZ770S-2	Honeywell MZ770S-2 Photocell			
	S01-FZ711S-050	Honeywell MZ 0.5m angled lead			
25	E80-502-200-001-00	Grommet for ignition cables			
26	E80-400-112-420-00	M8 x 20 steel zinc panhead slotted drive			
27	E80-0203	Blast tube gasket 105 x 86 x 2mm			

### Spare parts list

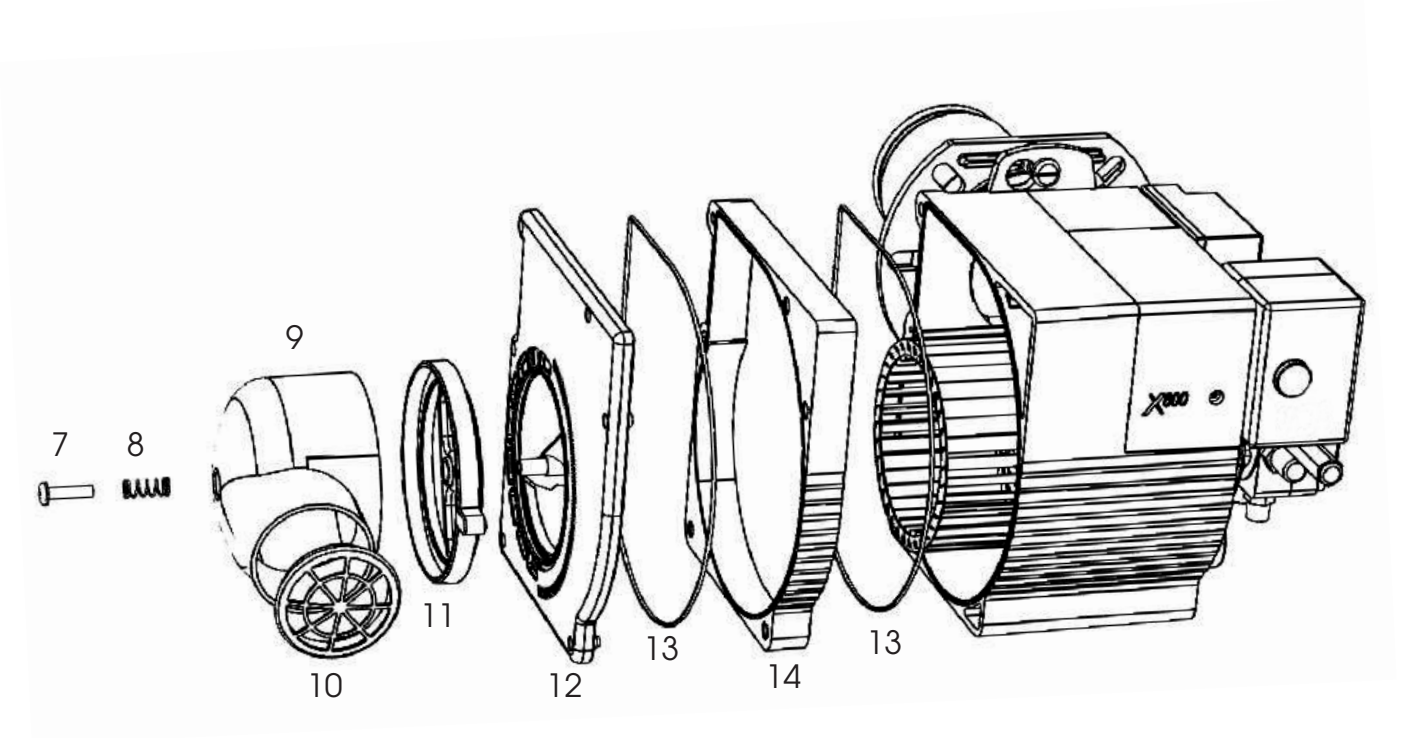
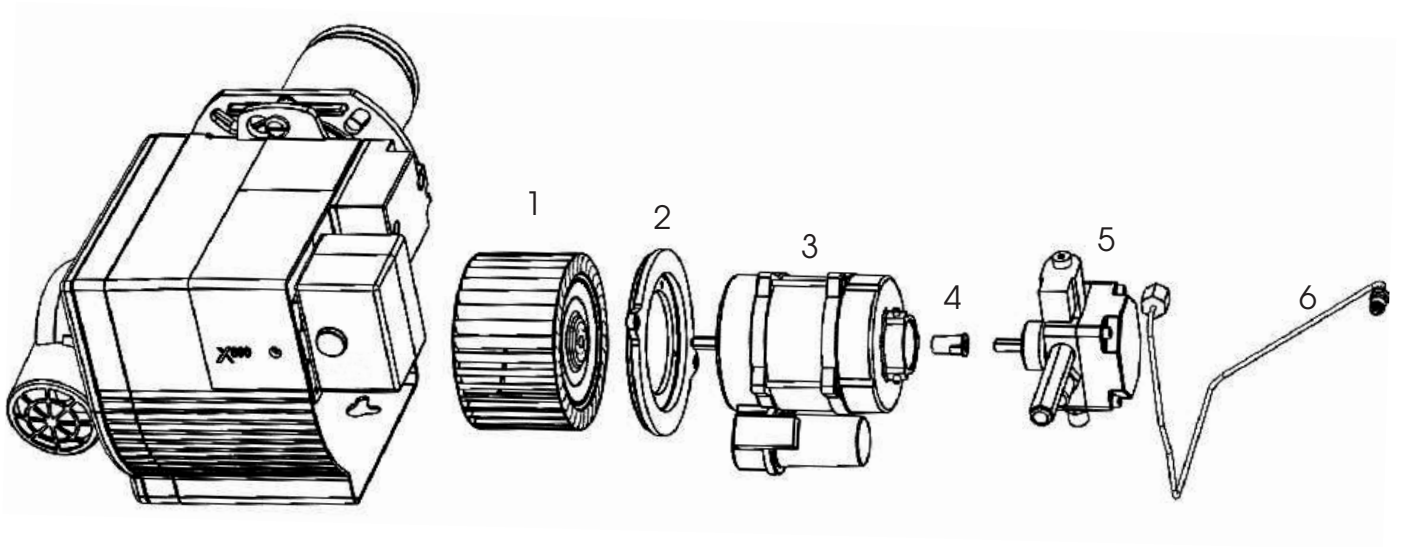


### Spare parts list



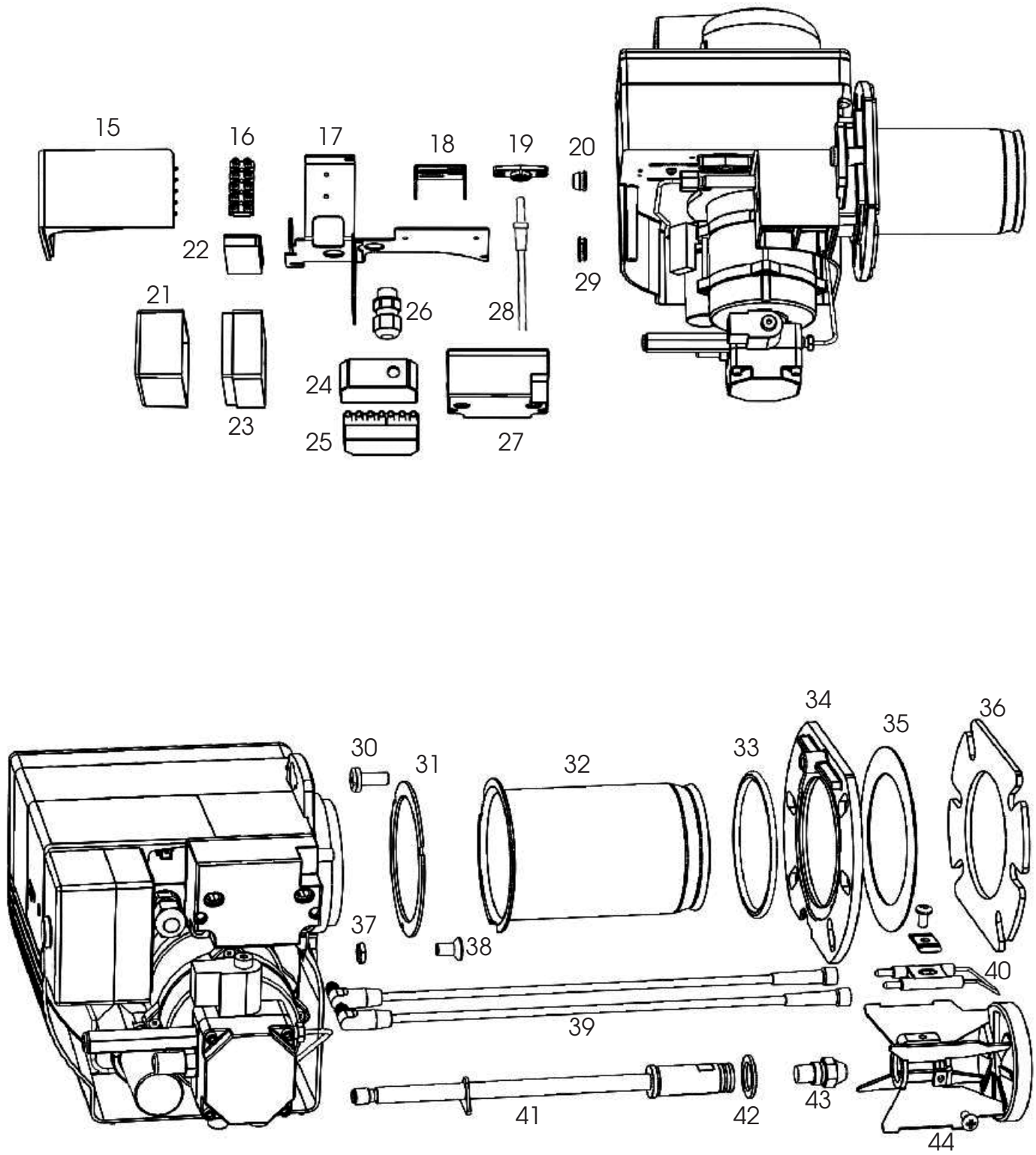
Item	Part number	Description	Item	Part number	Description
1	E80-0901	Fan 120mm x 52mm left hand rotation		E80-0106	Blast tube EMB 87mm X500 Standard
2	E80-0702	Motor mounting flange	29	E80-0107	Blast tube EMB 140mm
3	M02-1-90-19	Motor		E80-004-003-021-00	Blast tube EMB 207mm
	M02-0004	Capacitor 4mF	30	E80-0202	O ring - Blast tube to burner mounting flange 89mm ID x 5mm
	M02-0012	3 Pin motor lead	31	E80-0701	Burner mounting flange
4	C01-0005	Motor/pump coupling	32	E80-0201	Burner mounting gasket
5	D01-071N0156	BFP11 L3 Pump Bio 10	33	E80-402-102-080-00	M8 steel zinc plated half nut
	D01-071N0010	BFP 240v coil	34	E80-400-143-416-00	M8 x 16 steel zinc plated c/sunk
	D01-071G0202	3 Pin pump solenoid cable 280mm	35	E80-0601	Ignition cable 3mm angled x 3mm straight (sold individually)
	E80-01405	Brass manifold 70mm 1/8"m x 1/8"m for pressure gauge	36	E80-0301	Electrode block X500/600
	E80-300-999-000-00	1/8" port plug	37	E80-300-802-102-00	Inner assembly including nozzle holder to suit X500 87mm head (Standard)
6	E80-1401	Outer oil pipe - Pump to nozzle assembly		E80-300-802-104-00	Inner assembly including nozzle holder to suit X500 140mm head
7	E80-0408	Air intake grill X400/500 (balanced)		E80-300-802-106-00	Inner assembly including nozzle holder to suit X500 207mm head
8	E80-400-111-325-00	Bolt M6 x 24	38	E80-406-102-007-00	25mm x 18.5mm x 1.5mm spacer
9	E80-407-100-000-00	Spring	39	Please note that the oil nozzle size should be determined by the boiler/appliance manufacturer. If in doubt the please contact EOGB for further information on nozzle sizing or refer to <b>Table E Page 21</b>	
10	E80-0405	Air intake housing X400/500 (balanced flue)		E80-0502	Brake plate EMB type 87mm (includes electrode block) Standard X500
	E80-501-001-000-02	Acoustic baffle X400/500 (balanced flue)		E80-0501	Brake plate EMB type 140mm/207mm (includes electrode block)
	E80-0403	Air intake rubber adaptor 60mm to 70mm	40		
11a	E80-0010	Air damper (low output) + seal			
11b	E80-0007	Air damper (high output) + seal			
12	E80-0402	Side cover X500/600			
	E80-0019	Side Cover Kit (Incs ,Side cover, High output air damper, air intake, baffle, grill, spring and bolt			
13	E80-500-005-120-00	Neoprene sponge sealing cord 650mm required			
14	E80-1301	Electronics cover X500			
15	E80-302-006-112-01	5 pin terminal strip 32amp			
16	E80-002-008-000-07	Control chassis X500/600			
17	E80-1201	Inner assembly sliding bracket X500/600			
18	D01-057H7071	Danfoss LDS Mounting flange			
	S01-59101	Honeywell MZ Mounting flange			
19	E80-502-200-001-00	Grommet for inner assembly			
20	D01-057H8708	OBC 82.10 Control box			
	S01-TF830.3	Honeywell TF830.3 Control box			
21	D01-057H7011	Cable entry plate			
22	D01-057H7010	Control box wiring base			
23	X01-0048	Cable gland			
24	D01-052F4031	EBI ignition transformer (includes mains cable)			
	D01-052F0132	Mains lead for ignition unit 320mm			
25	D01-057H7316	LDS Photo Transistor			
	D01-057H7072	Photo Transistor Clamping Ring			
	S01-MZ770S-2 S01-FZ711S-050	Honeywell MZ770S-2 Photocell Honeywell MZ 0.5m angled lead			
26	E80-502-200-001-00	Grommet for ignition cables			
27	E80-400-112-420-00	M8 x 20 steel zinc panhead slotted drive			
28	E80-0203	Blast tube gasket 105 x 86 x 2mm			

### Spare parts list





### Spare parts list



## Spare parts list

Item	Part number	Description	Item	Part number	Description
1	E80-0902	Fan 120mm x 72mm left hand rotation		E80-0106	Blast tube EMB 87mm
2	E80-0702	Motor mounting flange	32	E80-0107	Blast tube EMB 140mm X600 Standard
3	M02-1-130-02	Motor		E80-004-003-021-00	Blast tube EMB 207mm
	M02-0005	Capacitor 5mF	33	E80-0202	O ring - Blast tube to burner mounting flange 89mm ID x 5mm
	M02-0012	3 Pin motor lead			
4	C01-0005	Motor/pump coupling	34	E80-0701	Burner mounting flange
5	D01-071N0156	BFP11 L3 Pump Bio 10	35	E80-010-100-001-00	Annular shim 128mm x 91mm x 1mm
	D01-071N0010	BFP 240v coil	36	E80-0201	Burner mounting gasket
	D01-071G0202	3 Pin pump solenoid cable 280mm	37	E80-402-102-080-00	M8 steel zinc plated half nut
	E80-1405	Brass manifold 70mm 1/8"m x 1/8"m for pressure gauge	38	E80-400-143-416-00	M8 x 16 steel zinc plated c/sunk
	E80-300-999-000-00	1/8" port plug	39	E80-0601	Ignition cable 3mm angled x 3mm straight (sold individually)
6	E80-1401	Outer oil pipe - Pump to nozzle assembly	40	E80-0301	Electrode block X500/600
7	E80-400-111-325-00	Bolt M6 x 24	41	E80-300-802-102-00	Inner assembly including nozzle holder to suit X600 87mm head
8	E80-407-100-000-00	Spring		E80-300-802-104-00	Inner assembly including nozzle holder to suit X600 140mm head (Standard)
9	E80-0406	Air intake housing (balanced flue) X600		E80-300-802-106-00	Inner assembly including nozzle holder to suit X600 207mm head
	E80-501-001-000-03	Acoustic baffle (X600)	42	E80-406-102-007-00	25mm x 18.5mm x 1.5mm spacer
10	E80-0409	Air intake grill (X600)	43	Please note that the oil nozzle size should be determined by the boiler/appliance manufacturer. If in doubt the please contact EOGB for further information on nozzle sizing or refer to <b>Table E Page 21</b>	
11	E80-0007	Air damper (high output) + seal		44	E80-0502
12	E80-0402	Side cover X500/600		E80-0501	Brake plate EMB type 140mm/207mm (includes electrode block) standard X600
13	E80-500-005-120-00	Neoprene sponge sealing cord 650mm required			
14	E80-001-007-100-00	Fan house Spacer X600			
15	E80-1301	Electronics cover X600			
16	E80-302-006-112-01	5 pin terminal strip 32amp			
17	E80-002-008-000-07	Control chassis X500/600			
18	E80-1201	Inner assembly sliding bracket X500/600			
19	D01-057H7071	Danfoss LDS Mounting flange			
	S01-59101	Honeywell MZ Mounting flange			
20	E80-502-200-001-00	Grommet for inner assembly			
21	D01-057H8708	Danfoss OBC 82-10 Control box			
	S01-TF830.3	Honeywell TF830.3 Control box			
22	D01-057H7011	Cable entry plate for base			
23	D01-057H7010	Control box wiring base			
24	X01-0001	7 pin wieland socket			
25	X01-0044	7 pin wieland plug			
26	X01-0048	Cable gland			
27	D01-052F4031	EBI ignition transformer (includes mains cable)			
	D01-052F0132	Mains lead for ignition unit 320mm			
28	D01-057H7316	LDS Photo Transistor			
	D01-057H7072	Photo Transistor Clamping Ring			
	S01-MZ770S-2 S01-FZ711S-050	Honeywell MZ770S-2 Photocell Honeywell MZ 0.5m angled lead			
29	E80-502-200-001-00	Grommet for ignition cables			
30	E80-400-112-420-00	M8 x 20 steel zinc panhead slotted drive			
31	E80-0203	Blast tube gasket 105 x 86 x 2mm			

## Notes

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