Euroheat Distributors (H.B.S.) Ltd
Unit 2 Court Farm Business Park
Bishops Frome
Worcestershire
WR5 6AY

Thermic Distribution Europe S.A.
B-5660
Frasnes Les Couvin
Belgium

Installation, Servicing and Commissioning Instructions for Harmony Oil Stoves H11, H21, H31 & H41

Part No.

Serial Number

E&OE Instructions Part Number IN1190 Ed B
H11##0105A

Contents

Introduction

A Harmony oil stove is the elegant result of many years of engineering research and design expertise. It was built by people who are justly proud of knowing the Harmony oil stove is the finest stove produced and would like to know their efforts will bring many years of pleasure, instilling the pride of ownership it deserves. Before beginning the task of installing the stove it should be remembered that it will be the major attraction in any room when it is lit and will continue to add character even when cold.

We hope this manual will answer all the questions that may ever need answering about the stove, but it should not be regarded as more than a general guide, highlighting the requirement of a good installation. We recommend the installation of the stove is carried out by suitably qualified persons working to the Codes of Practice issued by OFTEC and HVCA which are current at the time of installation. Our technically qualified staff will happily answer any questions which are not covered by the literature delivered with the stove.

The installer is responsible under the Health and Safety at Work act 1974 vi the caustic nature of fire cement and the possibility of disturbing asbestos and other materials such as ceramic in existing installations and to suggest appropriate protection to be given to the person(s) carrying out the installation.The complete installation must be carried out with due reference to the following Standards and Codes of Practice. It should be noted that the requirements and these publications may be superseded during the life of this manual.

BS 799 Part Five Specification For Oil Tanks.
BS 5410 Part One , Oil Firing Installations Up To 44kW.
BS 4543 Parts One & Three, Factory Made Insulated Chimneys.
BS 5449 Forced Circulation Hot Water Central Heating Systems For Domestic Use.

Building Regulations:-
Part J England and Wales. Part F Scottish Regulations. Technical Booklet L For Northern Ireland

Engineer support line 01885 491117
8.30- 5.30 during week days.
Facsimile 01885 491101 24 hours.

Competent Persons Regulations and Oil Technicians in England and Wales

The Government have introduced the Competent Persons Scheme in England and Wales to give an advantage to operatives within the Construction Industry who are members of bodies that implement approved systems of competence assessment and inspection. It is designed to remove some of the burden of supervising work away from the Local Authority Building Control Departments, so that they can concentrate on tracking down and prosecuting the 'cowboy' element within the construction industry.

For the oil industry, the OFTEC Registration Scheme has been chosen to define competence.

The Building Act of 1984 requires a person carrying out certain types of building work to give building notice or Building Regulation approval to Building Control. This will involve payment of a fee to the Local Authority.

As from 1st April 2002, an amendment to Regulation 12 of the Building Regulations which covers Combustion Appliances came into force. This exempts OFTEC Registered Installation, Commissioning and Servicing Technicians and Tank Installation Technicians from the need to give notice and pay a fee when carrying out new installation work, replacement work or making a major change to a system, in the areas covered by their class of registration. Registered Technicians are required to keep a record of any work they undertake. OFTEC provides approved control documents for installation work (CD/10) and commissioning work (CD/11).

It should be noted that the Building Regulations define installation work as including commissioning. An oil installation will, therefore, require to be both installed and commissioned by a suitably qualified OFTEC Technician, if the need to apply for a notice and pay a fee is to be avoided. The table overleaf shows which categories of technician can undertake the various types of work covered by the new Regulations.

OFTEC QUALIFICATION	INSTALL	COMMISSION	CONTROL DOCUMENTATION
OFT 105 Appliance Installation Technician	Appliance Flues & Vents Oil Lines & Fire Valves Tanks Heating Systems	- - Oil Lines & Fire Valves Tanks Heating Systems	**OFTEC CD/10**
OFT 101 Pressure Jet Commissioning Technician	-	Appliances Combustion & Safety Flues & Vents Oil Lines & Fire Valves Tanks	**OFTEC CD/11**
OFT 102 Vaporising Commissioning Technician	-	Vaporising Appliances Combustion & Safety Flues & Vents Oil Lines & Fire Valves Tanks	**OTEC CD/11**
OFT 600A	Oil Lines & Fire Valves Tanks	Oil Lines & Fire Valves Tanks	**OFTEC CD/10**

Note: Separate qualifications are required for installations involving unvented hot water storage covered by Advisory Document G3.

The types of work covered under the new Part J Approved Document of the England and Wales Building Regulations are new or replacement installations of boilers, oil tanks, associated pipe work, including the fitting of remote acting fire valves and major changes to flueing systems. Part L1 of the Regulations, which came into force at the same time, covers the energy efficiency aspects of heating system installation, particularly their controls and requires commissioning to be properly undertaken and a certificate completed by a competent person.

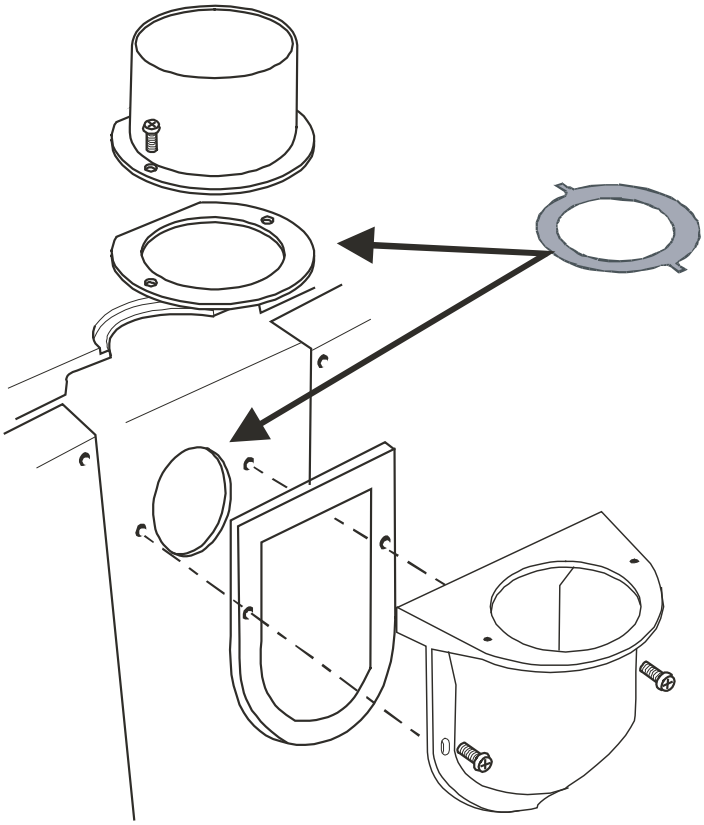
The Building Act falls under criminal law and there is a structured fining system for those who are found not to comply.

This is an important step which acknowledges those in the industry who work to Regulations and Standards and will help customers recognise that OFTEC Registered Technicians have had their competence independently assessed.

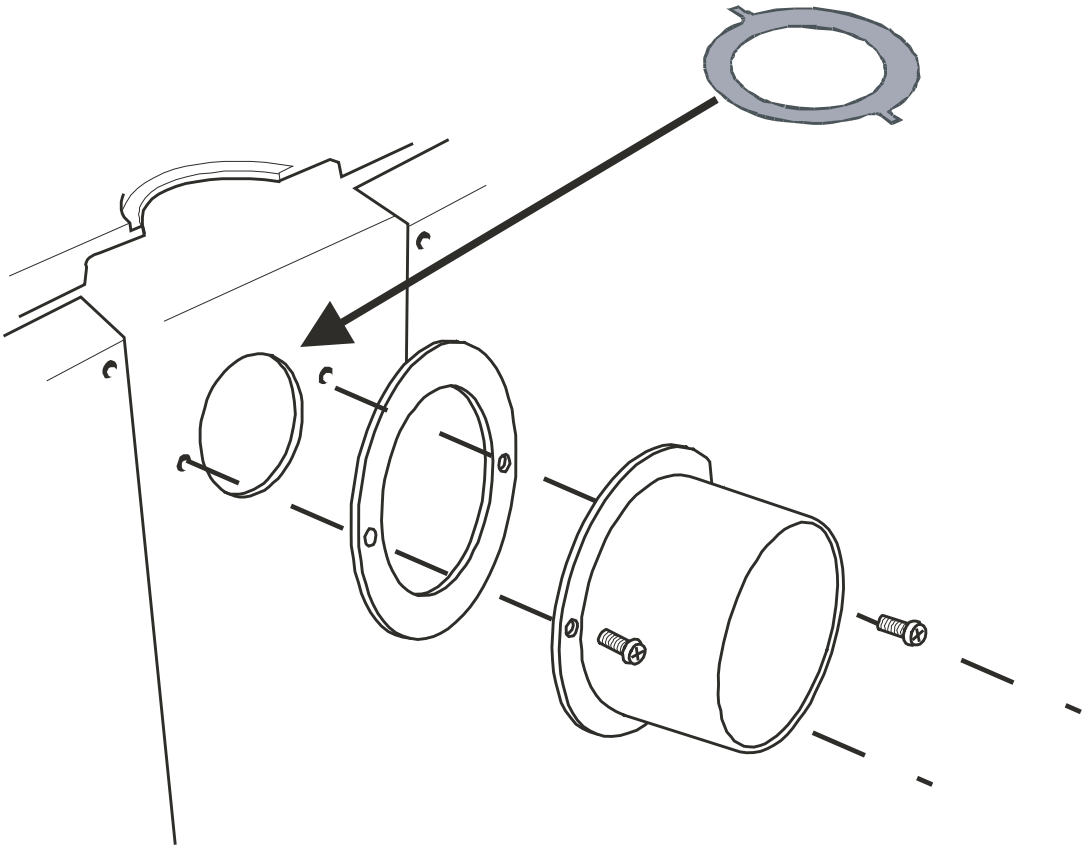
April 2002

Flue Options Harmony 11, 31 & 41

Top and Rear flue options where a top flue adapter is fitted.



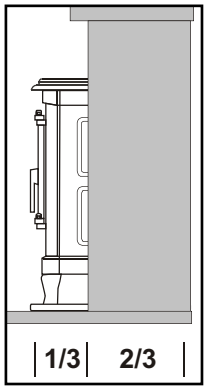
Replace choke plate when converting the flue flue outlet if one is supplied with the stove.



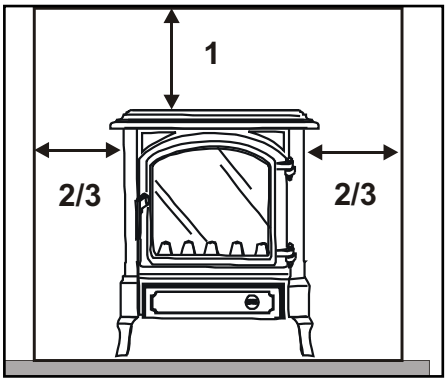
Installation

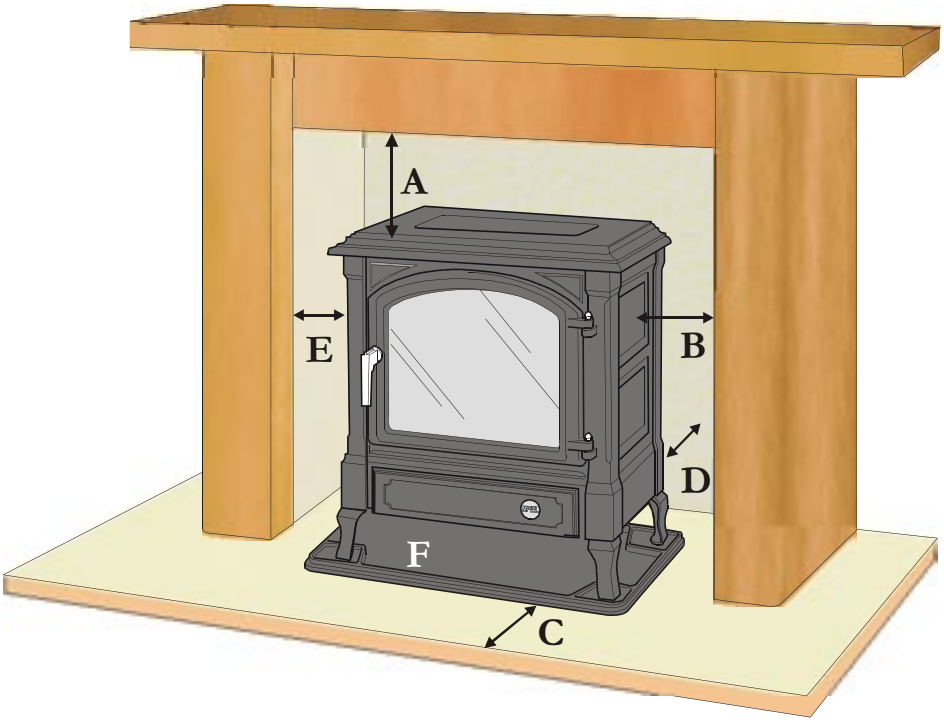
Do not be tempted to fit the stove into an unsuitable fireplace. Beyond the requirements of the building regulations and access to facilitate servicing the stove, providing a setting which will compliment the Harmony is not a luxury, it is the practicality of making the most of an investment. A good builder will be able to transform even the most utilitarian of fireplaces, whether altering its proportions to those of the "Golden Mean" ideal, exposing a wooden lintel, stone or simply removing superfluous detailing for comparatively small costs, and the result will be a pleasure for many years.

Golden Mean Side View



Golden Mean Front View





Minimum Installation Clearances

	Minimum clearance from combustable materials	Minimum clearance from non inflammable materials
A	18" 450mm	12" 300mm
B	16" 400mm	12" 300mm
C	1" 25mm	N/A
D	4" 100mm	4" 100mm
E	16" 400mm	6" 150mm

F = Decorative Plinth Available as option on Harmony 11, 21, 31 & 41

The measurements are for advice only. In all installations surrounding inflammable materials must not exceed 80°C. The stove must always stand perfectly level and have sufficient space allowed for service work.

Important: commissioning and service engineers must be able to access the oil control valve.

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The Flue

There is often confusion as to the terms “flue” and “chimney” and for the purposes of this manual we define whatever duct conveys the products of combustion as the flue, and the term chimney to mean any masonry structure within which the flue may be contained. It is upon the flue’s ability to provide a consistent negative pressure or “draught” that the efficiency and reliability of the stove will depend and it is therefore important to understand what can affect the flue’s performance and how to ensure the flue installation provides your stove with the optimum operating conditions.

However well the fuel metering valve is calibrated, good combustion is dependent on the correct amount of air being supplied to the stove at all times and this is ultimately dependent on a correct and stable negative flue pressure. The initial flue “draught” is created by the gas confined within the flue being hotter and therefore lighter than the air outside the flue. The tendency for the hot gas to move up the flue is proportional to the height of the flue, since the difference in weight of equivalent columns of air and flue gas is greater the higher the column. Whilst this may be theoretically true, in practice, because the temperature of the flue gas is cooled through the wall of the flue and the flow is slowed by the friction of the internal surface of the flue, the benefits of extreme flue heights are negated. The need to minimise the fluctuating effects of wind by having very hot flue gas temperatures inducing the greatest possible constant negative pressure within the flue, conflicts with the ideal of utilising all the heat generated within the stove for heating. The compromise is to ensure that whatever heat it is necessary to expend on creating a gas flow within the flue, the flue makes the most efficient use of this heat by being constructed with an internal surface as smooth as possible and by being thermally insulated. Both these requirements can be met in an existing chimney by lining it with a stainless steel oil liner insulated with vermiculite or mineral wool, and where no chimney exists, double walled insulated stainless steel flue systems are available.

Atmospheric Influences

Wind blowing across the flue terminal will increase the negative pressure within the flue proportionately to the wind speed, but as wind speed is never constant the varying effect this has on the stove would be unacceptable. To control this, the stove is fitted with a draught stabilizer. When the negative pressure approaches the desirable upper limit the stabilizer will open, drawing air directly into the flue to supplement the flue gases coming from the stove, thereby reducing the negative pressure to within its limits. When the wind speed decreases the stabilizer will close to return the full negative pressure of the flue to the stove. When the stove is commissioned the negative pressure within the stove is measured and the stabilizer is adjusted to suit the characteristics of the flue, ensuring it gives the optimum control.

If the flue terminal is too low in relation to the roof, or is masked by other buildings, it is possible for winds coming from certain directions to have become so turbulent that the stove’s stabilizer will be unable to respond quickly enough to the changing conditions. Trees often create turbulence problems that cause difficulties because they are often overlooked in the search for the culprit. Not only are the aerodynamics of trees changed with the seasons and leaf growth, but a large tree may have no effect for many years and its last foot of growth may never be suspected as the cause of a previously well controlled stove becoming erratic. No “patented” cowl fitted to the flue terminal will overcome serious wind turbulence, but minor turbulence can often be reduced to acceptable levels with a suitable cowl. For major turbulence problems, increasing the height of your existing flue or demolishing the offending obstruction will be the only effective cure.

The term “down draught” is often used erroneously to explain almost any flue unable to sustain sufficient thermally induced gas speed to overcome high pressure zones caused by winds hitting an obstruction beyond the flue terminal. In most instances this is caused by a poor flue cooling the flue gases and a cure would be effected with an insulated flue. True “down draught” affects houses situated on or near to hills, when cooling air travels down the hillside. This wind, called katabatic wind, can normally be controlled with an efficient flue system and suitable cowl, but if the wind causes a high pressure zone at the flue terminal, re-siting the flue to the opposite side of the house may be the only effective answer if an otherwise satisfactory flue causes a problem. The opposite condition, when warming air travels up a hillside giving anabatic wind, can produce very high negative flue pressures which will sometimes necessitate a barometric damper being fitted to the flue. Windows and doors opened down wind of prevailing winds and the running of large extraction fans without adequate ventilation may cause the flue to stall or even become positively pressurised with potentially dangerous consequences. Any smell of flue gases within the house should be investigated immediately. Damp weather is one of a multitude of atmospheric conditions blamed for poor flue “draught”. There is no theoretical or practical foundation for these, only the existance of an oversized, cold and damp chimney needing lining and insulating.

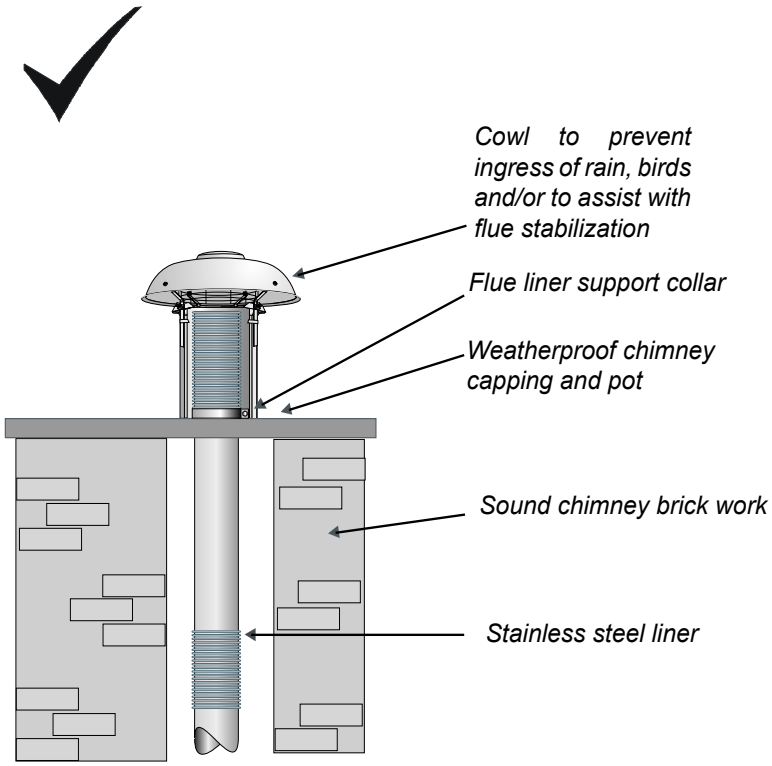
For heat outputs see stove and boiler technical details page 15

Ventilation

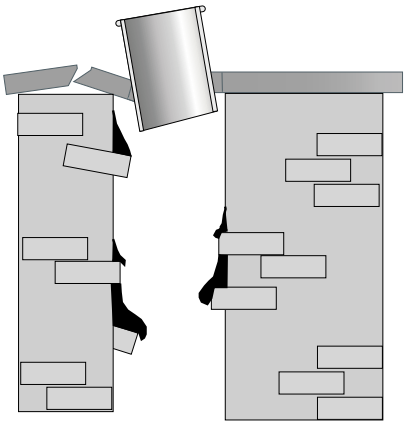
The ventilation to provide the stove with air has to be regarded as an integral part of the flue system, because unless the air passing through the flue is replaced with equal amounts of air entering the house, the flue will cease to function. The cooler the outside temperature and the harder the stove is working to maintain the required temperature inside, the cooler the incoming air and the greater its flow. No amount of strategically positioned knitted draught excluders will overcome the laws of physics or your discomfort if ventilation is ignored, with correctly sized and positioned ventilation not being given the planning it deserves.

Any room or space containing an appliance should have a permanent ventilation opening of free area at least 550mm sq. for each kW of rated output above 5kW.

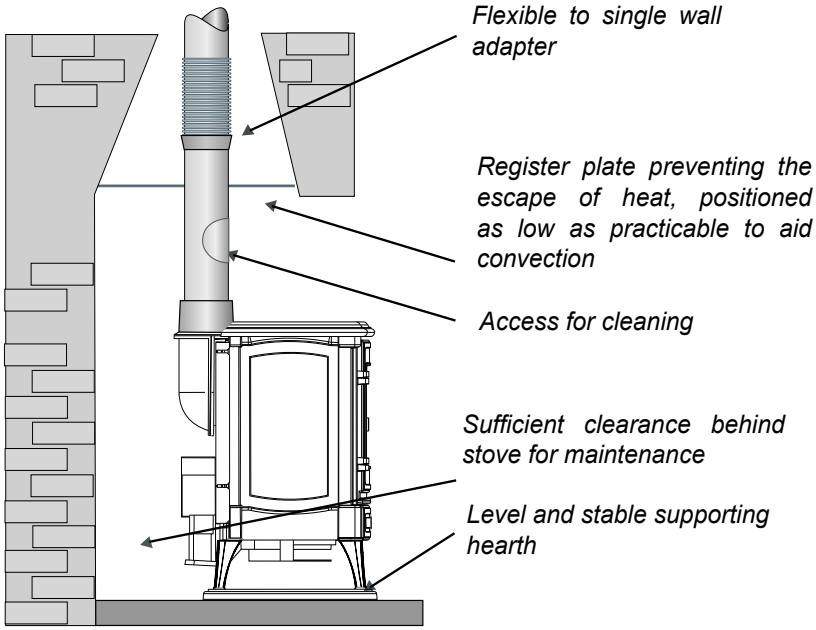
The Flue and Connections

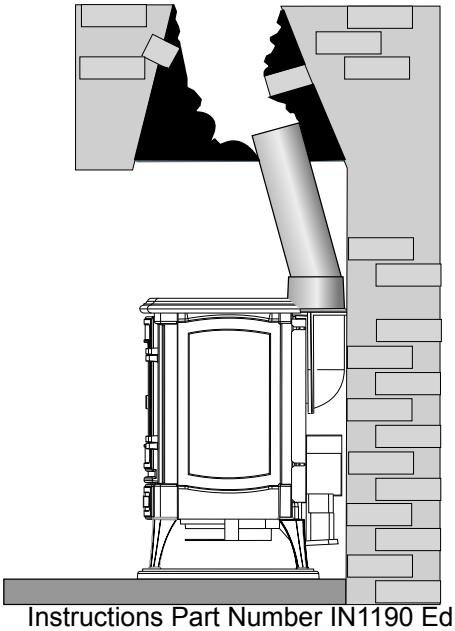


Minimum of 4m total flue height

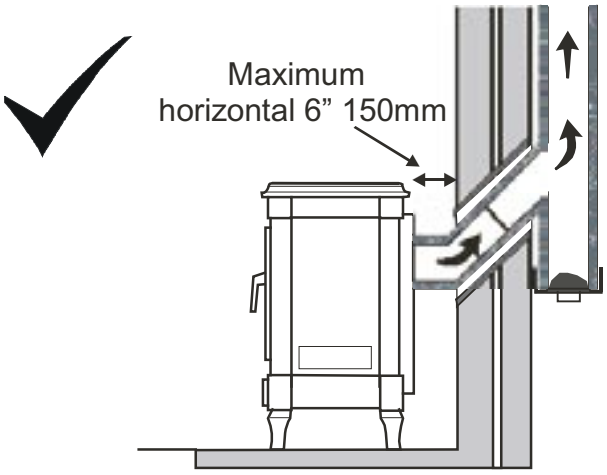


Less than 4m total flue height

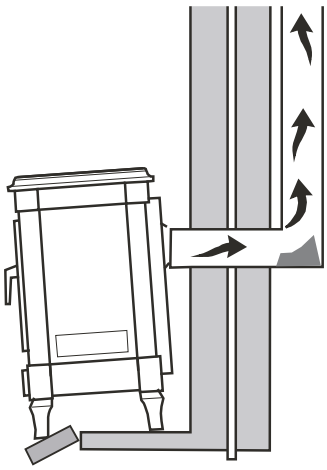




External Flues

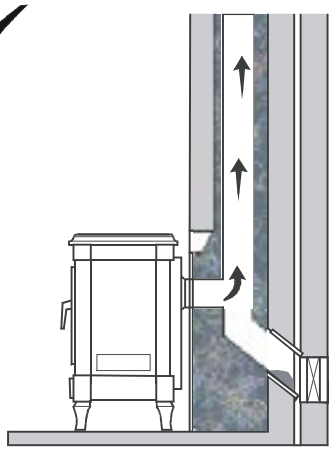


Insulated flue providing the minimum horizontal length. Access for cleaning, stove provided with stable and adequate hearth.

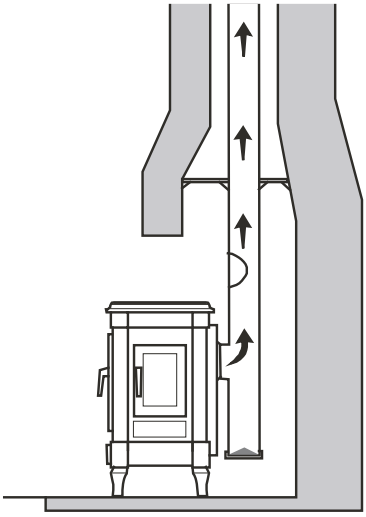


Single skin flue with no cleaning access and undesirable horizontal length allowing flue debris to restrict the flue. No allowance for flue expansion and an unstable hearth will both contribute to leaking flue seals.

Internal Flues



All voids within the chimney filled with insulating material. Access for cleaning, minimum horizontal path.



Bends in flue pipe

Top exit

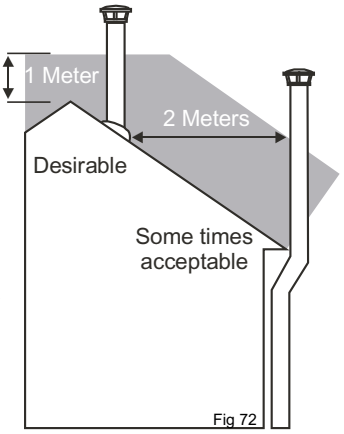
A flue pipe shall have no more than four bends, each providing a maximum change of direction of 45º, there should be not more than two of these bends before an access point for sweeping and two between a sweeping point and the flue terminal.

Back exit

For a back outlet application using a T pipe, this should be treated as two 45º bends. If a “T” piece is to be used, the horizontal flue run from the back outlet of the stove shall only be used to connect the stove to a T pipe and shall not be more than 150mm in length.

On top exit stoves, ideally the flue should rise vertically 1 meter before the first bend. It is permissible to have a bend no greater than 45° from the top flue outlet, or off the top of a T pipe, as long as it does not adversely effect the flue draught.

Flue Terminations



Chimney cowls

The chimney cowl is an important part of the installation, which is often ignored. A cowl normally serves more than one purpose. It prevents rain entering the chimney system which will result in poor chimney operation and potential damage to the appliance.

It can prevent birds nesting resulting in partial or blocked chimneys.

Most important it can act as a stabilizer in windy conditions. Different types of cowls produce different conditions which will effect the negative pressure of the chimney system. Great caution must be taken when choosing the cowl as an incorrect choice will can result in poor stove operation.

Euroheat currently recommend 4 cowls.

Colt top cowl. Available from most local stove centres and builders merchants.

Eurocowl E (FP106). Available only from Euroheat on 01885 491126

(cowl pictured in these diagrams is the Euro-cowl)

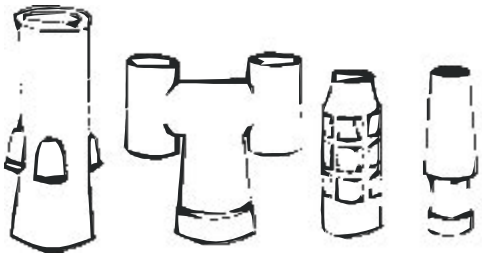
Aero-cowl (FP103) and inverted GC1 cowl (FP104 & FP105) available only from Euroheat.

Stabilizing why ?

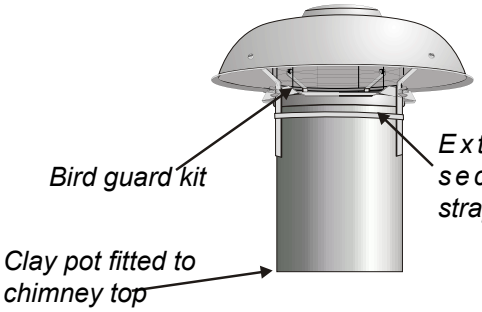
If you the installer follow the recommendations of this instruction manual one factor you cannot control is the effect that wind pressure has at the flue termination. Wind blowing across an open flue termination will increase the negative pressure within the flue system. As this wind comes and goes the negative pressure will vary in the stove resulting in poor combustion. The most common result of unstable flue conditions is soot at low setting in windy weather and noisy burner at high oil flow positions. Other than rain cap type cowls, most more advanced cowls are designed to increase the negative pressure in wind conditions rather than to stabilize. This is a design to assist with the prevention of down draughts. This type of cowl is not recommended in normal conditions as they will result in unstable negative flue pressure conditions.

Fitting

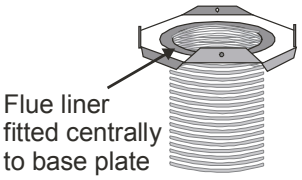
It is as important to fit the cowl correctly to the flue termination. All installations of this type should have a chimney pot fitted to the top of the chimney. The flue liner should be brought to the top of the chimney pot with insulation between the liner and pot.

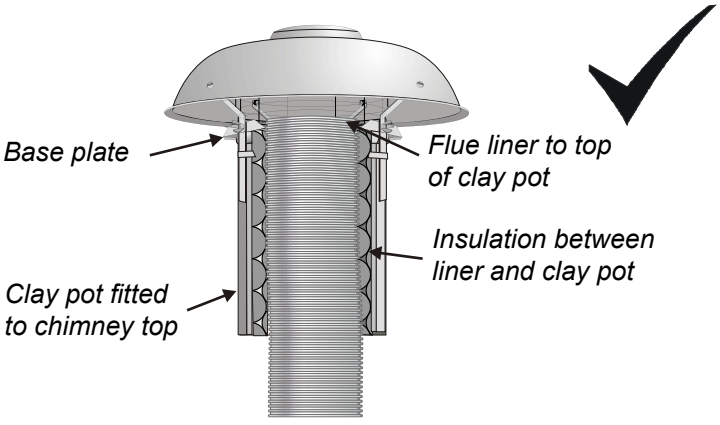


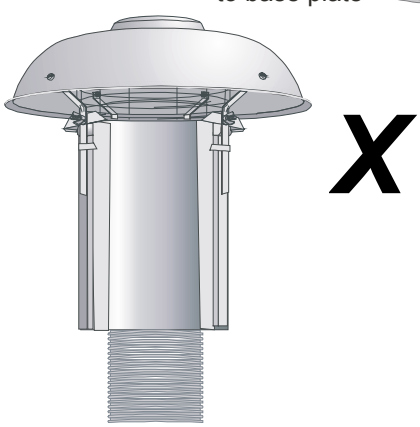
Unsuitable chimney pots



When ordering a Euro-cowl we suggest it is ordered with a bird guard, base plate and additional retaining strap.







Fuel and Fuel Oil Storage

All stoves are calibrated for commercial Class C2 kerosene to B.S. 2869:suitable for vapourising pot burners. The oil metering valve can be replaced to allow for operation with 35 second gas heating oil. With 35 second fuel the coal effect is not advised to be used.

The Oil Storage Tank

Many fuel companies allow discounts on an oil delivery of more than 500 gallons (2300 litres), and by installing a tank with a capacity of at least 600 gallons (2750 litres) your customer will be able to take advantage of this arrangement whilst having the security of an adequate reserve. An easily read level indicator fitted to the tank will help to establish your customers pattern of fuel consumption and so avoid "topping up" the tank with small premium priced deliveries or indeed running out of fuel. It is important that this level indicator is calibrated in volumetric units enabling the oil delivery driver to ensure he does not overfill your tank.

Type of Tank

Contaminated fuel may do irreparable damage to the installation and as it is impossible to determine whether or not an oil tank is free from contaminates by visual inspection, we strongly advise not to fit a second-hand oil tank. A steel tank will provide an annual opportunity to paint and treat any signs of rust with the knowledge that even a well maintained steel tank will eventually develop rust holes - usually at the inaccessible areas of the tank where it rests on its supporting piers. A polyethylene tank, will never rot or rust, are maintenance free and it is possible to render them inconspicuous with suitable permanent screening.

Position of Tank

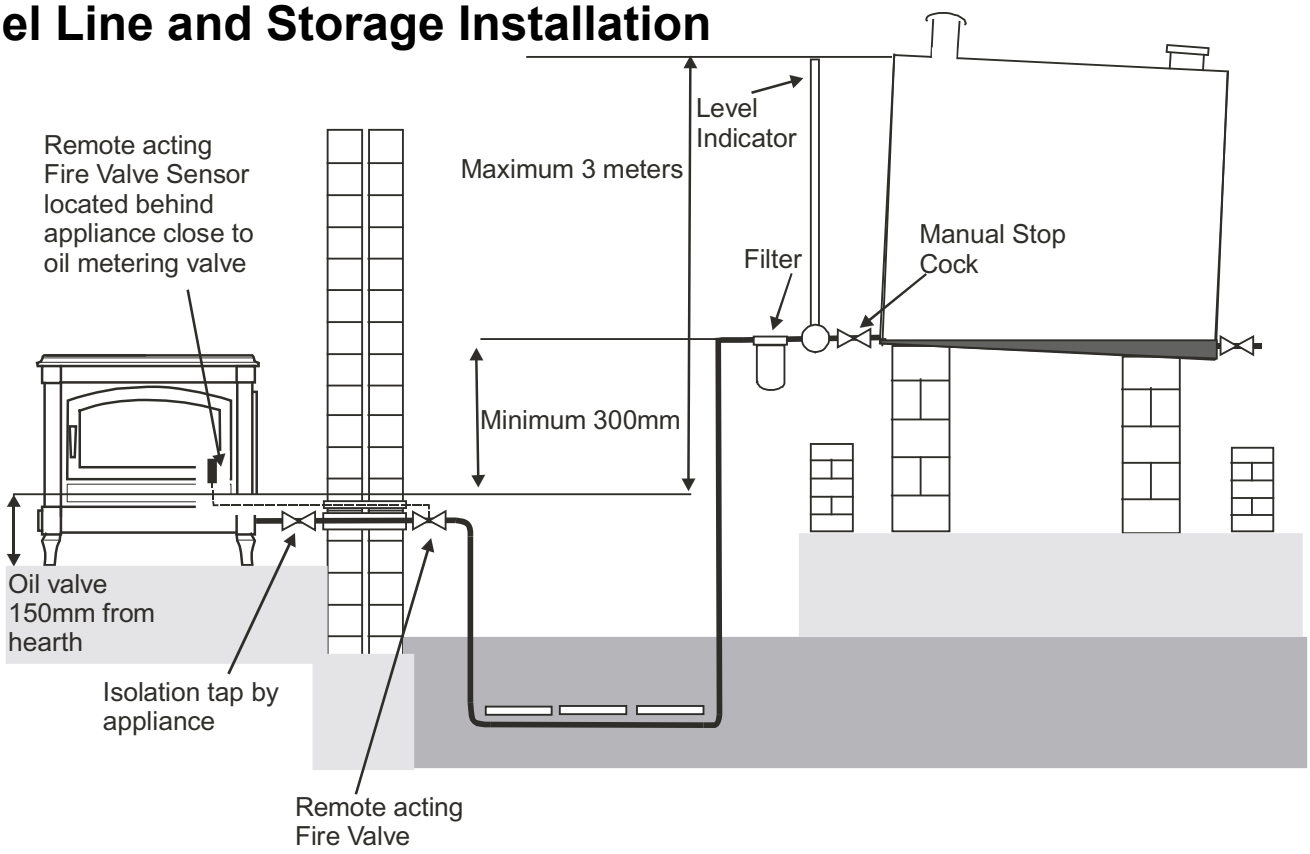
Avoid sitting the tank where it will be subjected to direct sunlight. Warm tanks invariably smell when localised oil spillages vaporise. Sunlight will also create problems by causing condensation within the tank. This condensate falls through the oil (water being more dense than oil) to the bottom of the tank where it will either flow into the stove which may damage the metering valve, or during severe weather freeze and stop all flow from the tank. The majority of delivery vehicles are equipped to deliver 30 metres beyond the limits of vehicle access but expecting the heavy and unwieldy delivery hose to be threaded neatly through border plants and ornamental hedges is unrealistic. Try to make the path from delivery vehicle to storage tank as straight and as uncluttered as possible. To provide the stove with fuel at the correct pressure it will be necessary to have the tank outlet at least 300mm above the stove's metering valve top. The highest fuel level must never be allowed to exceed 3 metres above the valve top. If these limits cannot be achieved a secondary reservoir with a lift pump or pressure reducing valve must be fitted. You will need to refer to the relevant building regulations and local bye-laws for any restrictions on tank position relative to buildings and boundaries together with the provision of barrier walls that may exist in your area. Whatever type of tank you fit it must be equipped with two outlets, one to supply the stove and one at the opposite end through which to drain off any accumulation of dirt or condensate from the tank. To facilitate this the tank must be mounted to allow a fall, away from the stove outlet end and towards the drain, of 20mm for every 1 metre of tank length.

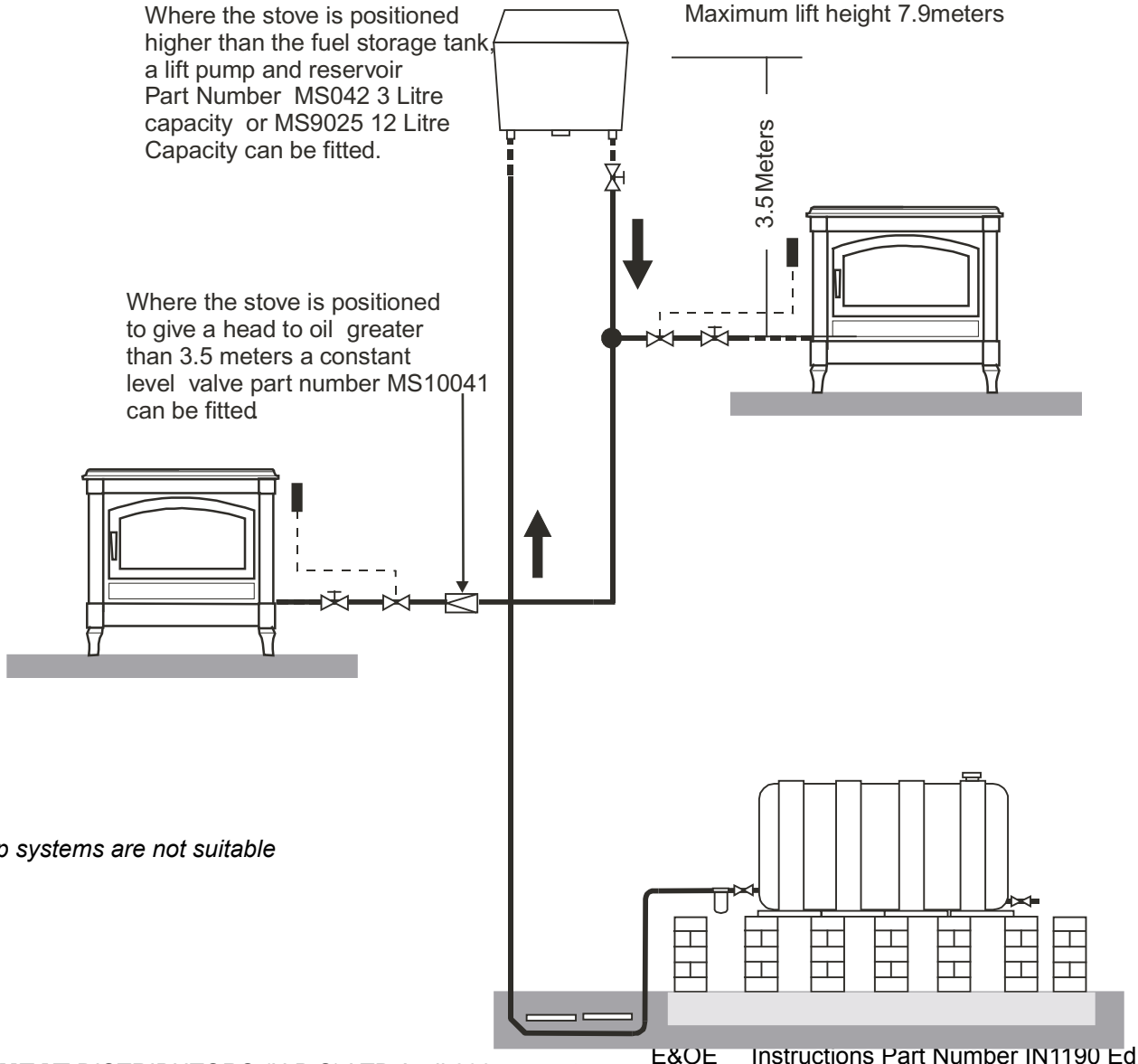
If a metal tank is installed it may be supported on brick piers insulated from the tank with a waterproof membrane. A polythene tank must be supported over its entire base area. Do not underestimate the weight of a full oil tank, it is heavy and must be supported with adequate foundations and plinth. All cemented supports must be allowed sufficient time to cure before fitting the tank.

Tank Fittings and Pipe work

An isolating valve must be fitted directly to the tank outlet, allowing for the maintenance of the other components in the pipeline. These components should include a metal bowl oil filter mounted to allow adequate room for the removal of the sediment bowl and filter element without difficulty. The filter element should be cleaned or replaced at least annually. Filtration of the fuel is very important, we recommend a replaceable cartridge filter with a water separation bowl is installed. Whilst the pipe work from the tank to the stove may be in either steel or copper, the fitting of steel pipe necessitates regular maintenance, therefore, the use of plastic covered copper pipe is recommended because it is easily installed and virtually maintenance free. The use of galvanised steel pipe is prohibited because zinc reacts with the fuel. Where it is possible it may be desirable to bury the pipe, and whilst this is perfectly acceptable it must be done with the utmost attention to the protection of the pipe from damage, both during the installation and throughout its life, as it will not be possible to make inspections for leaks after installation. Before the pipeline enters the building a fire valve should be fitted which will cut off automatically the oil supply in the unlikely event of a fire within the property. This valve is controlled by a remote sensing element situated within or near the stove and above the metering valve. Finally, another manual isolation valve should be positioned as close to the stove as possible to enable all supply to be turned off for stove maintenance. It is possible to bury oil tanks, install them in house cellars and send oil pipe work over a tortuous route of many hundreds of yards, but any oil installation other than the most simple should be attempted only by suitably qualified and experienced personnel, with the written approval of your insurance

Fuel Line and Storage Installation

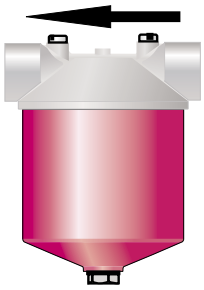


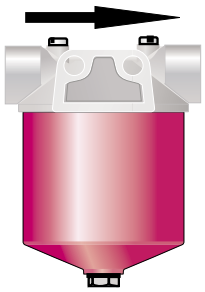


Tiger loop systems are not suitable

Euroheat Oil Filter Kit

The importance of an oil filter:



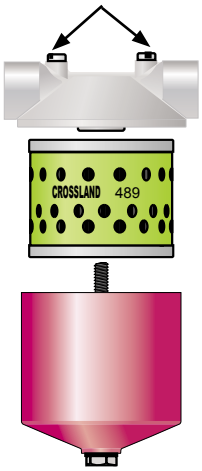


Internal corrosion and condensation: caused by direct sunlight on any oil tank.
Disturbed sediment or impurities: caused by refilling.
Any of the above can occur in any installation new or old.
Euroheat and Oftec strongly recommend the fitment of paper disposable cartridge filters, they do not prevent any of the afore mentioned problems occurring, however they will stop impurities reaching the heating appliance. Prevention is always preferable to cure.
Most standard combined site gauge and filter assemblies have a mesh size which is not small enough to separate the smaller foreign bodies from the oil, they are also a fiddle to remove and clean. The paper cartridge filter is designed to be replaced annually and consequently overcomes all the above problems.
The correct flow of oil at all times is crucial for long term reliability to any oil burning appliance, therefore maintaining clean and efficient combustion.

Euroheat Oil Filter Kit Includes:

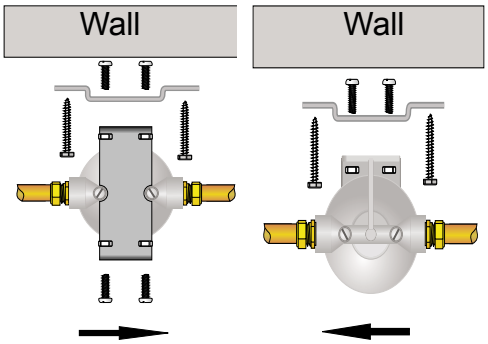
Heavy duty, high quality wall mounting bracket, reversible for any direction of flow.
The design incorporates an inlet and outlet bleed screw, therefore, simplifying the removal of air from the filter and line.
Replacement cartridges and O ring seals readily available.

Filter bleed screws



Features:

Paper replaceable filter
Wall mounting kit
Bleed screws to prevent air locks
Brass compression fittings 10mm included
Robust and secure construction



To Order

Contact your local Euroheat retailer or call Euroheat Spares Department direct on: 01885 491126.
Order Number: MS9195

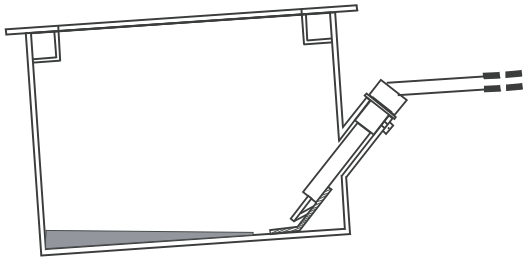
Electric Ignition

The electric ignition system operates by heating a small electric heating element positioned in the bottom of the burner. Oil entering the burner is drawn by capillary attraction into stainless steel gauze, and then heated to its ignition temperature by the heating element. The coil is energised for the period that ignition button is pressed.

Common reasons for ignition to fail

Electrical cable not connected
Oil supply switched off
Burner has large amount of oil in the base
Stove not level
Igniter leads at the transformer poorly connected

Stove and burner must be level



If the oil burner is not level as oil enters for ignition it will flow away from the igniter. This oil will build up until it finally reaches the igniter. This will result in long ignition times and excessive oil at ignition. Excessive oil will cause large flames, soot and very noisy operation.

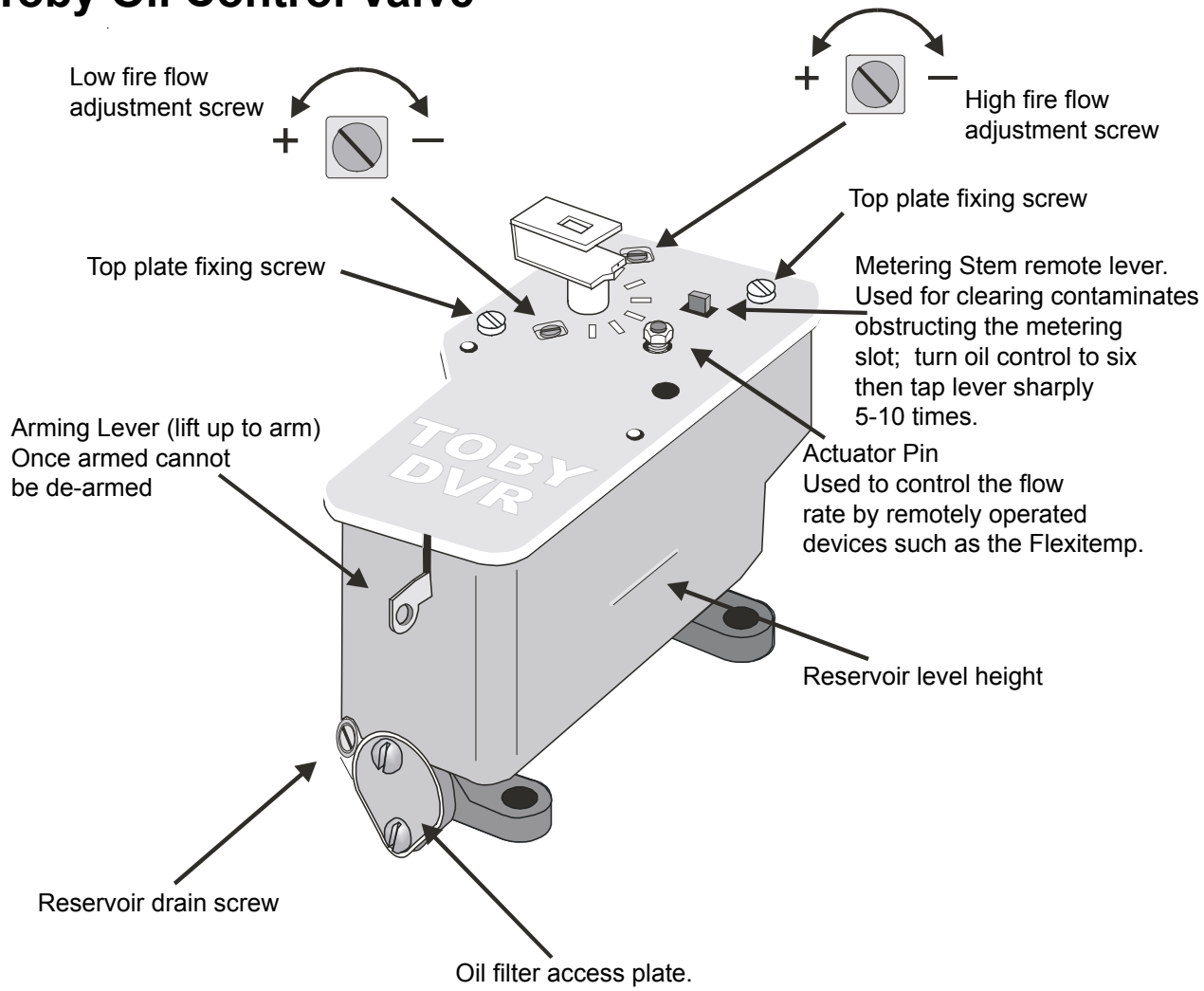
Oil Metering Valve

The oil metering valve is set to give the correct flow rates before being fitted to the stove and will not normally require further adjustment. Any but a small adjustment should be regarded as an indication of a fault of the fuel supply, or of a flue system giving an incorrect negative pressure within the stove, and these should be examined thoroughly before attempting to re-calibrate the oil metering valve.
The oil metering valve performs three operations within its main body; it regulates with a float valve the depth of oil held, it meters with an adjustable outlet the fuel supplied to the burner, and its safety float valve will isolate the fuel should the levels within the valve body become too high.
The safety float will cause the arming lever to “trip” whenever the fuel levels become too high, but severe vibration can cause ripples on the fuel surface to lift the float, and because of this it is possible for the vibration set up by heavy passing traffic to shut off the valve.
Having “tripped”, resetting the arming lever may need to be done several times before the fuel level within the valve falls sufficiently to allow reliable operation.
The firing rate of the burner is regulated by the oil metering valve and having set the extremes of low and high firing as detailed in the commissioning instructions, the firing rates are proportioned as indicated by the indices 1-6 on the valve top when aligned to by the control knob.

Most common problems

The Toby oil control is a very reliable Swiss made control system. If a problem with the oil flow is suspected it is very unlikely to be the control valve.
The most common reason for poor flow rates will be air trapped within the oil supply pipe or the oil valve float control stem. If an air lock is suspected the oil line should be disconnected from the oil valve and at least 1 litre of oil allowed to flow after no air is present.
If an air lock is suspected in the oil control valve, remove the top plate mounting screws and press the float assembly to the base of the oil control for 2-3 seconds. This will fully open the oil level metering stem releasing trapped air.

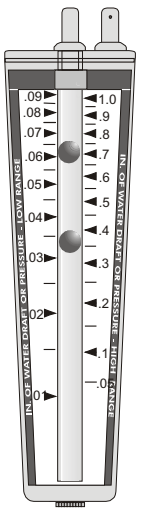
Toby Oil Control Valve



Flue Pressure Adjustment

The flue creates the negative air pressure within the stove which induces the air into the burner. For the correct operation of the burner this air flow must be proportioned to the firing rate of the burner. The chart illustrates the required negative air pressures relative to the burner settings, with the shaded band giving the tolerance within which the burner will give satisfactory performance. The stoves are equipped with easily accessible pressure test points which will give the actual pressure within the stove, but it is not possible to verify the pressures to enable the correct adjustment of the draught stabilizer without a suitable manometer.

Euroheat are able to supply a suitable negative pressure measuring device, part number MSO26. This is the recommended measurement system.



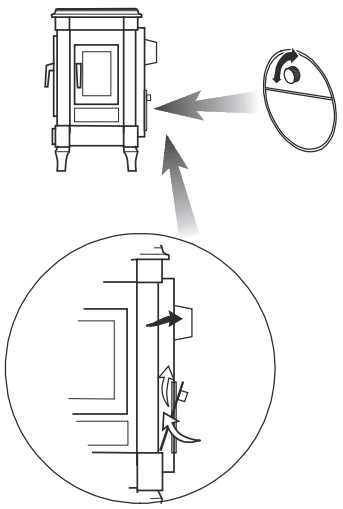
Note this is not a water gauge used to measure gas pressure.

Flue Measurement Conversion

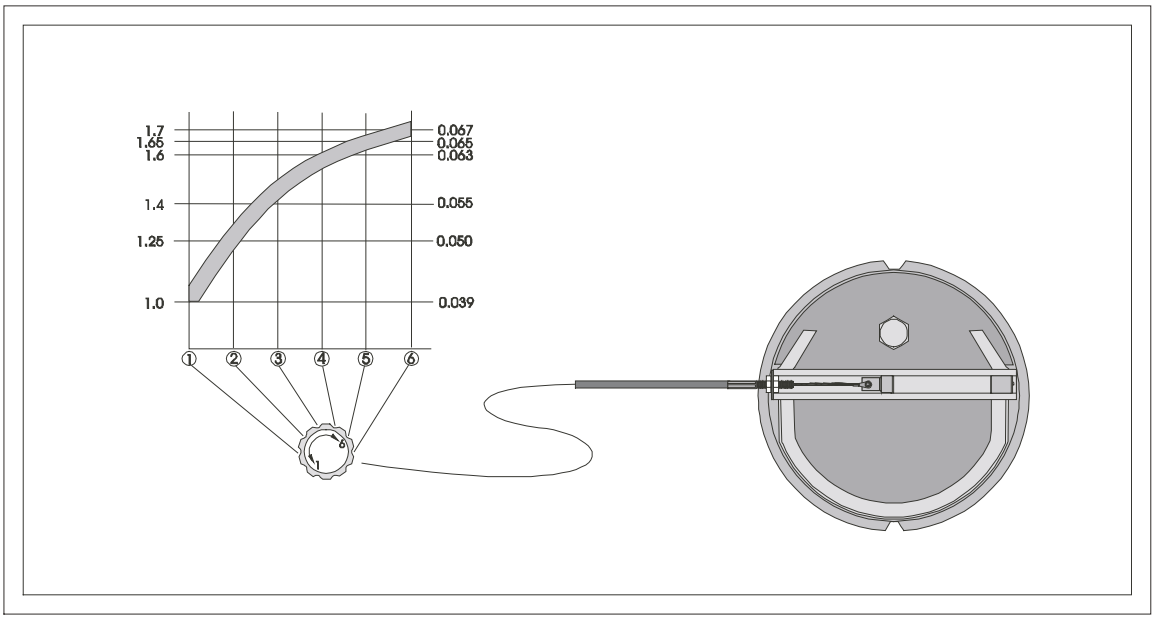
Inches	MM	PA
0.01	0.25	2.49
0.02	0.51	4.98
0.03	0.76	7.48
0.04	1.02	9.97
0.05	1.27	12.46
0.06	1.52	14.95
0.07	1.78	17.44
0.08	2.03	19.93
0.09	2.29	22.43
0.10	2.54	24.92
0.11	2.79	27.41
0.12	3.05	29.90
0.13	3.30	32.39
0.14	3.58	34.88
0.15	3.81	37.38
0.16	4.06	39.87
0.17	4.32	42.36
0.18	4.57	44.85
0.19	4.83	47.34
0.20	5.08	49.83

Conventional Draught Stabilizer

The flue stabilizer works by opening to provide an additional air supply to the flue whenever the flue's negative pressure reaches its upper limit and so checks any rise beyond this limit to maintain the correct negative pressure within the stove. This system of flue control is universally accepted as both effective and reliable, or the flue itself is of higher efficiency than normal, the stabilizer may be unable to supply sufficient air to reduce the negative pressure adequately, or be needlessly wasting room heat by having to supply dilution air constantly. The Harmony oil stove can be supplied with two sizes of governing plates which may be fitted to the stove's flue spigot, if during commissioning the flue is found to be subjecting the stove to a negative pressure which is too high for efficient combustion or the longevity of the stove.



Progressive Draught Stabilizer



The operation of an oil stove with its naturally aspirated burner relies upon the correct amount of air being supplied to the burner for all firing rates. Too little air being supplied will result in incomplete combustion and the formation of soot and too much air will not only result in incomplete and noisy combustion but the excess air only serves to cool the stove. Achieving the correct burner air pressure at all firing rates has always been, at best a tediously difficult operation, and a task that has sometimes proven to be almost impossible. Whilst extending and insulating a flue will cure uniformly low draught and fitting a choke plate will reduce excess draught, the adjustment of the stabilizer which can only be set to give to one counter balance weight bias to control the range of flue draughts necessary for all firing rates is often an adjustment to achieve a compromise rather than an ideal.

Our new, and patented, magnetically adjusted draught stabilizer overcomes this problem by magnetically varying the effective biasing of the flap to correspond to the setting of the fuel valve. In practice this means that the draught stabilizer's counter balance weight can be adjusted to give the correct flue draught with the fuel valve at its minimum setting and as the fuel valve is turned from its minimum to maximum settings the pressure at which the flap opens will automatically be the correct operational pressure for the fuel rate.

The commissioning time for a stove can now be dramatically reduced and in many instances the operation of the stove being better than ever achieved before.

The magnetic draught stabilizer is not designed to induce draught in a stalling flue nor will it control ridiculously high flue draughts, it is designed to provide the correct draught settings with flues whose inadequate or excessive draughts have been brought to within reasonable parameters.

Further information can be obtained from your Euroheat dealer or directly from Euroheat by requesting technical document IN 1078 Progressive Draught Stabalizer.

Due to the construction of the various stoves there are specific stabilizers for each stove:
Harmony 5 DR030
Harmony III / Coachman 8" - 10" DR031
Harmony I & II DR032

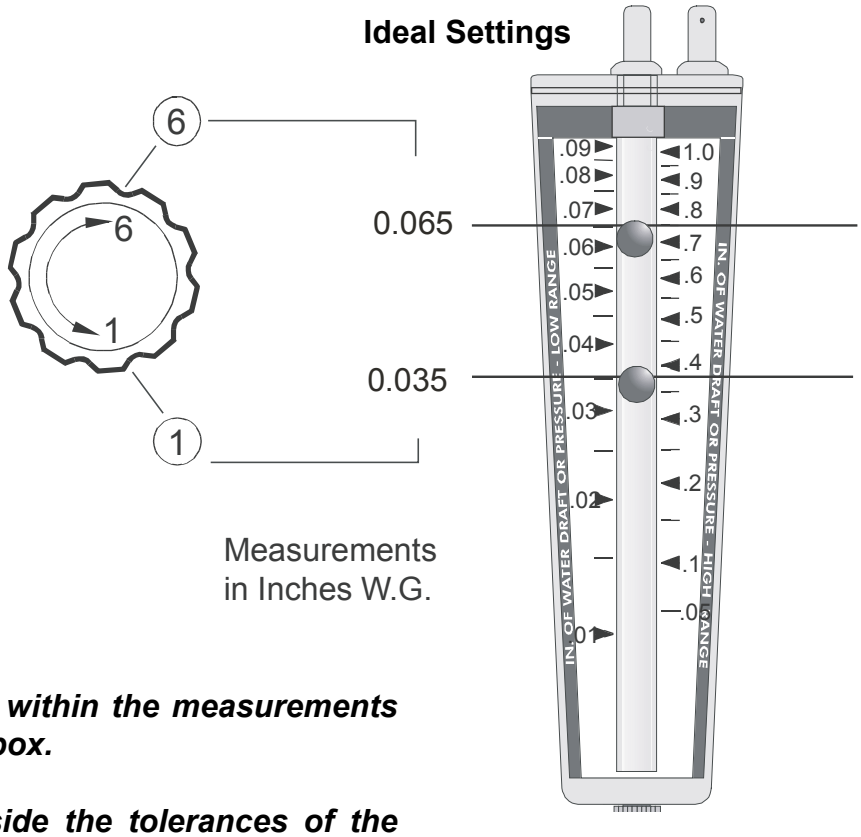
Choke Governing Plates

Choke plates are used to reduce the flue size when the chimney naturally creates excessive flue draught. By reducing the flue diameter the flue draught will be reduced. Euroheat supply two standard sizes 100mm (4”) and 75mm (3”).

Suitable Flue Choke Plates				
Stove Model	Rear Flue 100mm (4”)	Rear Flue 75mm (3”)	Top Flue 100mm (4”)	Top Flue 75mm (3”)
Harmony 11	not available	MS1013 fitted as standard	not available	MS1013 fitted as standard
Harmony 21	MS1014	MS1013	MS1014	MS1013
Harmony 31	MS1014	MS1013	MS1014	MS1013
Harmony 41	MS1014	MS1013	MS1014	MS1013

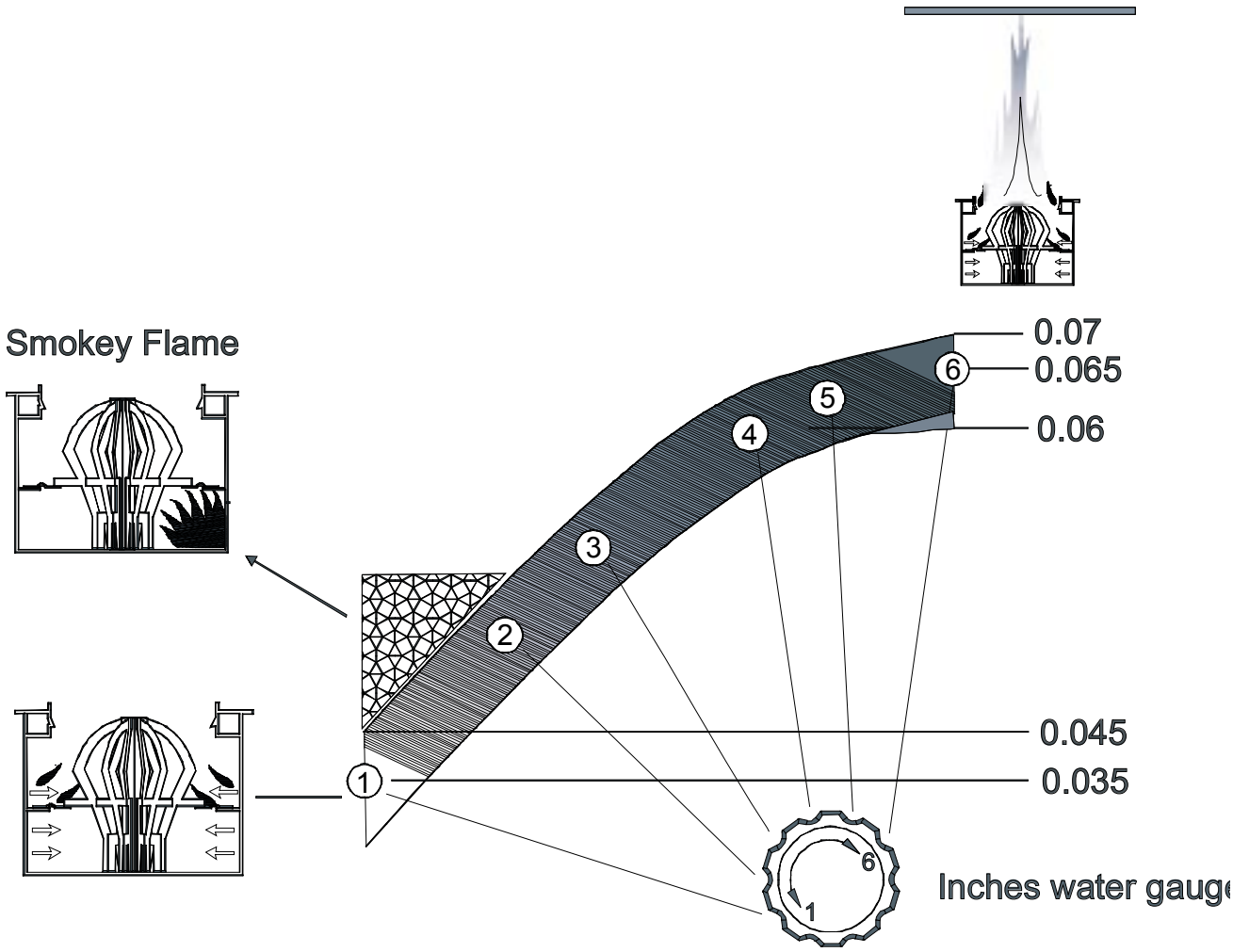
Draught Requirements 6” Burner

Combustion Chamber Pressure Requirements



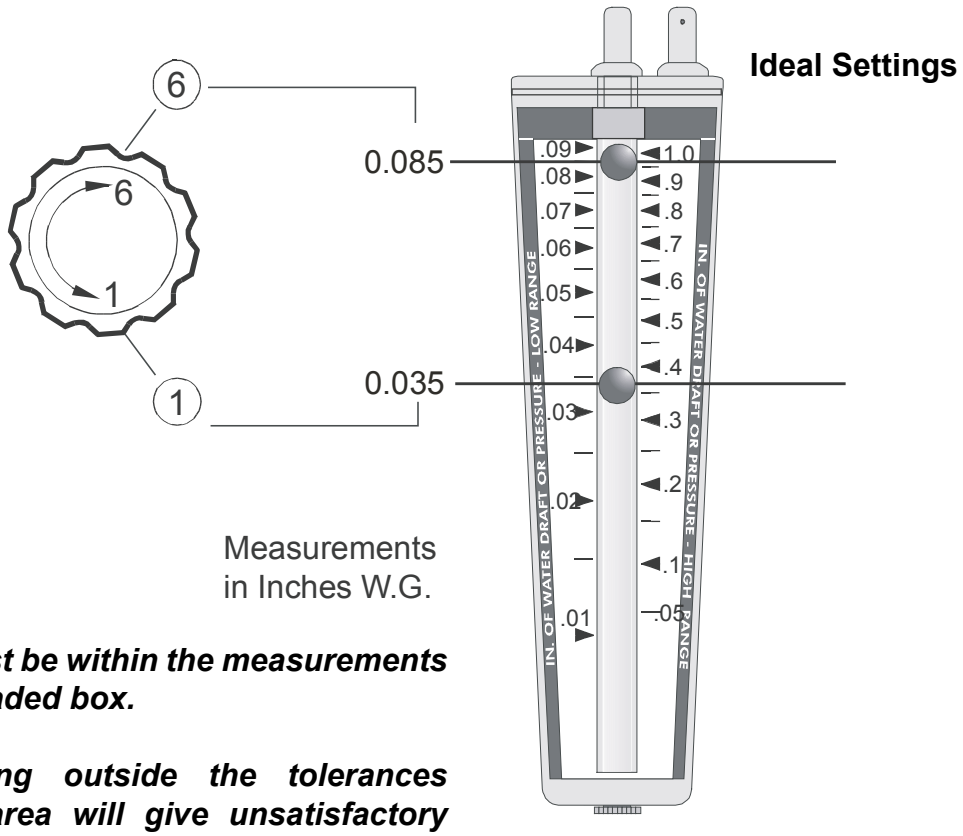
All draught readings must be within the measurements defined by the darkly shaded box.

Draught readings falling outside the tolerances of the darkly shaded area will give unsatisfactory combustion.



Draught Requirements 8”& 10” Burner

Combustion Chamber Pressure Requirements



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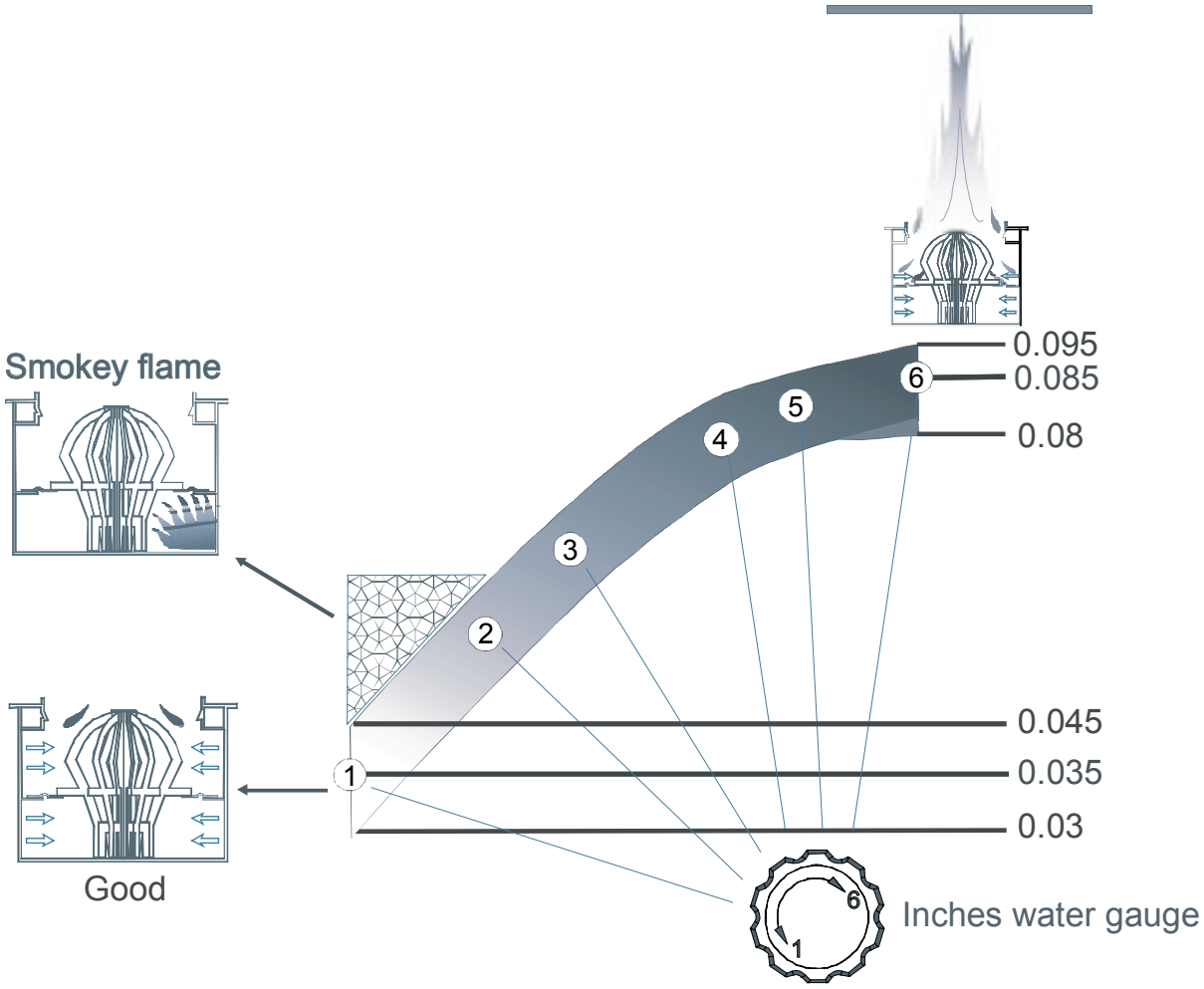


Commissioning Concepts

Combustion for the consideration in this document is the burning of the correct mixture of a fuel (oil) and oxygen (air). The fuel is metered by a Toby oil control valve. This is an accurately Swiss manufactured control with a precalibrated flow rate for the type of oil fuel specified. All Harmony stoves as standard are calibrated for Class C2 kerosene to BS2869 suitable for vapourising pot burners. For initial consideration the oil control valve is assumed to be correctly calibrated. However in practice the viscosity is very rarely correct and may result in slight alterations to the precalibrated flow rate. (See flow rate correction)

The oil control valve is pre-mounted on a location frame which should not require any alteration. However an inspection should be made to confirm it is level.

Air for combustion is drawn into the oil burner by the negative pressure created by the chimney system (chimney draught). This air movement is the main consideration when commissioning the appliance. It is the one factor we cannot control as all chimney systems are different. The amount of air entering the burner is very important as the incorrect quantity will result in one of the following problems.

Excessive negative pressure

(Negative Pressure) at low fire (No1)
Soot build up (for example overnight).
Damage to catalyser. Damage to igniter system.
Increased room heat on boiler model stoves
Smell of oil vapour from over heated oil supply components.

Low negative pressure at Low fire (setting No1)

Vaporization slow at lighting resulting in sooty glass.

Excessive chimney draught at high settings

Poor flame effect. Noisy operation

Poor chimney draught at high settings

Sooty interior.

The stove is fitted with a draught stabilizer. The stabilizer is in most cases used to prevent the flue draught exceeding the maximum requirement for high fire. However in cases of erratic or excessive flue draught the stabilizer can be utilized for low fire negative pressure control (See solving negative pressure problems)

Burner Operation

The oil burner can be referred to as a dry burner. During the burning operation the burner base is dry of oil. As the oil enters through the oil supply pipe it is vaporised by the heat reflected from the catalyser. Under no circumstances should the appliance be operated with oil in the burner other than a small damp patch at time of ignition.

The ability of the burner to burn correctly is dependant on the correct mix of fuel (oil) and oxygen (air).

Minimum commissioning equipment required.

Negative pressure meter. We recommend the use of MS026 Dwyer measurement gauge (available from Euroheat)

Commissioning should not be undertaken if the wind is abnormally high or blustery, nor should it be undertaken by anyone without suitable experience, testing equipment and working knowledge of the relevant standards and regulations.

The customers who will operate the stove are an essential component of any installation. Ensuring they understand the operation of the stove, its controls and what to expect from the installation, whether simple or complex, is probably the most important single aspect of commissioning. Someone who understands never queries a satisfactory stove, but will tell you when something actually is wrong.

Check box`s

As each section of commissioning is completed tick the confirmation box.

Pre-Commissioning Checks

❶ The installation should be inspected to ensure the work is complete and the workmanship satisfactory. The commissioning engineer may be held responsible for any faults with the installation that would have been apparent at the time of commissioning. No stove should be signed as commissioned if any part of the installation does not comply with the relevant standards and regulations or requirements of these instructions.

❑

❷ The oil tank should be examined to confirm there is a supply of the correct grade of oil, that a filter and working isolation valve are fitted. Having verified that the oil pipe work to the stove is complete and that the fire valve is opened, the tank isolation valve should be opened and the pipe work inspected for leaks. The pipe into the inlet of the metering valve should be uncoupled, and a minimum of one litre of oil collected into a suitable receptacle. If dirt, water or air bubbles are present in this sample additional oil should be allowed through the pipe work until it is free from contaminates. The fuel pipe work should be reassembled.

(Note : air with in the oil supply system or oil control valve will affect the ability of the oil control valve to allow the correct flow rate. If incorrect flow rate is suspected, examination of the oil control valve and supply line for air is required).

❑

❸ The stove's combustion pressure testing point located. The draught stabilizer should be examined to ensure it opens and closes freely before lighting the stove. Following the lighting instructions relevant to the stove being commissioned.

(Note: Do not light the burner if oil is present in the burner base. Remove this oil before lighting).

❑

Commissioning

Remove coal effect before attempting commissioning .

❶ Shortly after the stove is lit a stove air pressure reading should be taken and the pressure monitored at fifteen minute intervals to ensure the stove and flue are operating safely with sufficient air. As the stove and flue warm, the supply of air being induced into the burner will increase, and it will be possible to raise the stove's firing rate progressively until the stove is running at its maximum output.

(Note do not increase oil flow rate to the point where smoke is produced)

The entire Stove, flue and boiler, if fitted, (if a boiler is fitted to the stove the return temperature should be at least 50°C) should be allowed to reach normal operating temperature. Depending on the flue system this may take 1-4 hours.

Commissioning without the system at operating temperature will probably result in you the engineer returning to correct the commissioning at a later date.

❑

❷ Reduce the control setting to No 1 (low setting). After 5-10 minutes take a draught reading. This reading should be within the requirements of the stove. If the draught readings are higher than required see section solving negative pressure problems.

❑

❸Once the correct low fire chimney draught has been achieved turn the stove to high fire No 6. Wait 10-15 minutes for the chimney draught to recover. Adjust the draught stabilizer weight so the chimney draught does not exceed the maximum required. If the draught cannot be achieved for high fire see section reducing high fire flow rates.

❑

❹ With the chimney draught settings correctly set the oil flow rates need to be checked. This is normally checked by the visual size of the flame. The following flame size diagrams are to assist with correct adjustments.

❑

Flow Rates		
Model	Minimum Flow	Maximum Flow
Harmony 11	2.1cc	7.7cc
Harmony 21	2.5cc	10.5cc
Harmony 31	4.3cc	15.3cc
Harmony 41	5.3cc	20.0cc

Flow Rate Correction

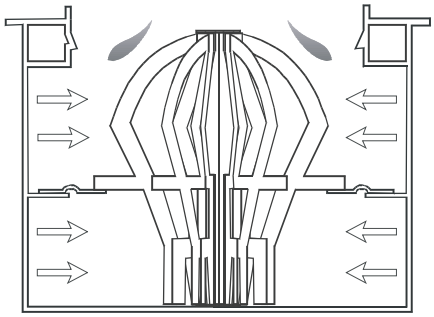
Correct flame pattern with 8" or 10" burner *(Coal effect removed)*

No assessment of flame size or pattern should be made until the stove and flue have reached full operating temperature and the correct negative pressure (chimney draught) within the stove has been achieved. All adjustments to the oil metering valve should be followed with a period of undisturbed running before making any assessment and several minutes should be allowed for the flue draft to stabilise after adjusting the flue stabilizer.

Low Fire (Minimum flame size)

Flue draught at maximum requirement for low fire No 1 setting i.e. 0.045"wg

The catalyser will glow brightly from its inner core of vanes and with a dull red glow from its outer vanes, with the only visible flames being horizontal blue translucent jets dancing between the catalyser and the holes in the burner cylinder wall.



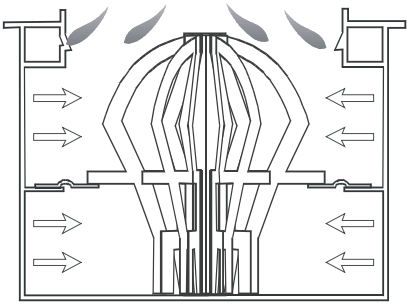
If the flame size is larger than this decrease low fire flow rate, if the flame size is smaller increase the oil flow rate. (See adjusting oil valve).

Do not adjust more than 1/4 turn before allowing burner to settle

Low Fire
(Maximum flame minimum flue draught)

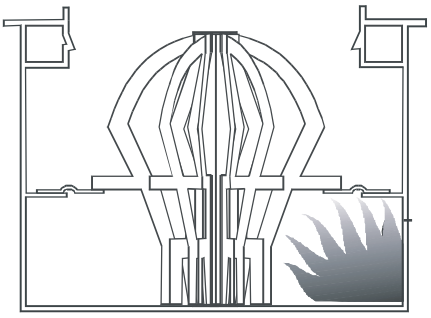
Flue draught at Minimum requirement for low fire No 1 setting i.e. 0.03"wg

The main body of the flame should be a translucent ring, beginning from the top row of holes in the burner body and finishing approximately 15mm above the burner rim. The complete catalyser should be glowing brightly with blue flame jets dancing horizontally between the catalyser and the holes in the burner cylinder wall. This setting will increase coal effect operation.



Oil flow rate to low

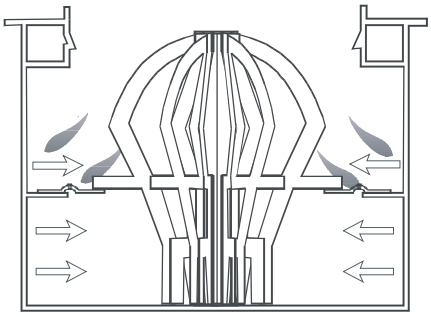
If the oil flow rate is too low insufficient heat will be produced to vaporise the oil entering the burner, this will result in the fuel being burnt as liquid which will wick from the bottom of the burner creating smoke. The same symptom can occur with excessive chimney draught at low fire as the amount of air passing through the burner will cool the burner preventing vaporisation of the fuel.



6" Burner

The6" burner is designed to operate at a very low level. This results in a smaller flame in the burner at low fire setting (no 1) than would be expected in an 8" burner.

With the flue draught of 0.04" water gauge the expected flame size should be as shown.



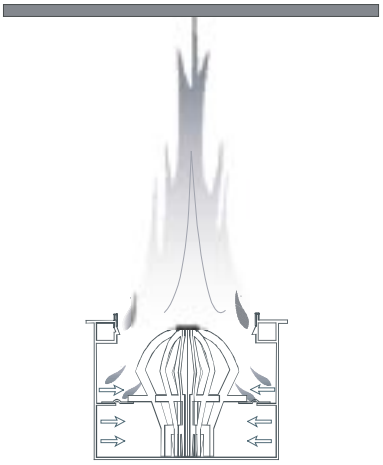
If the flame size is lower than shown smoke will be the result.

Low fire chimney draught correctly adjusted

❑

❺ Maximum flame size (no 6 setting)

The maximum flame size depending on the chimney draught requirements should not touch the top of the stove. The size of the flame depends on the chimney draught produced. If insufficient draught is created a tall long flame will occur. If excessive the flame size will be small. A good guide is that the flame should not pass higher than the top of the glass door. If a poor flue draught occurs the flame at maximum flow rate should be adjusted to reduce the flow rate to gain a correct maximum flame.



High fire chimney draught adjusted.

❑

Solving Negative Pressure Problems

What to do if the chimney draught is too high at low fire.

There are two reasons chimney draught can be high at low fire.

1. The chimney is susceptible to increases of draught from external conditions such as wind. If this is the case the flue termination position must be examined to confirm it is correct and a draught stabilizing cowl fitted (see chimney cowl section).

2. Excessive negative pressure can occur with chimneys over 20ft (6 meters).

There are two solutions to this problem.

1. A chimney choke plate can be fitted to reduce the flue size so reducing the chimney diameter and the draught (see Choke governing plates).

2. Utilize the draught stabilizer at low setting to reduce the chimney draught. This solution can only be used if the higher heat settings of the stove are unlikely to be required.

In this case adjust the draught stabilizer to reduce the flue draught at setting 1 to 0.045" water gauge. Turn the control knob to setting 6 maximum and reduce the high fire oil flow setting to decrease the flame size until a clean soot free flame is produced.

What to do if the chimney draught is too low at high fire setting.

This problem will only normally occur with poor flue construction or short chimneys, other than the alterations listed above. The only solution to this is to improve the chimney system or calibrate the high fire oil flow to reduce the flame size.

Once the stove has been correctly adjusted and operating correctly the following points must be checked'

❻ The stove and the oil system should be examined for any evidence of oil leaks which may only occur when the stove is hot and similarly if the stove has a boiler fitted this should, as far as practicable, be inspected for any evidence of leakage.

❼ The customer is advised about the operation and the lighting procedure. If the chimney system is slow in establishing a chimney draught the customer should be advised that soot may occur on the glass at lighting. This can be removed with a dry cotton cloth.

❽ The warranty registration form should be completed and the user advised to return it fully completed to Euroheat.

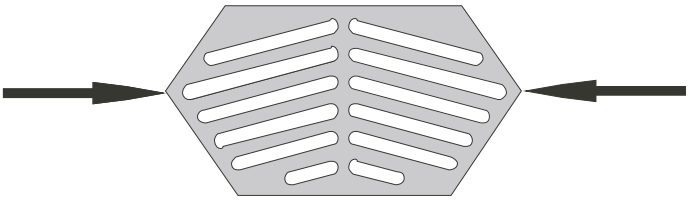
❾ All instructions are left with the user

Commissioning Engineers notes

Record any unusual procedures taken

The Coal Effect

For the maximum effect and efficient combustion it is important that these instructions are followed and a few minutes familiarising yourself with the following pages before attempting to create your " fire" will be time well spent.
The grid upon which the coals are positioned should be handled with great care and should never be lifted at any point other than by holding it at both ends. Lifting it at the front edge will result in it breaking.



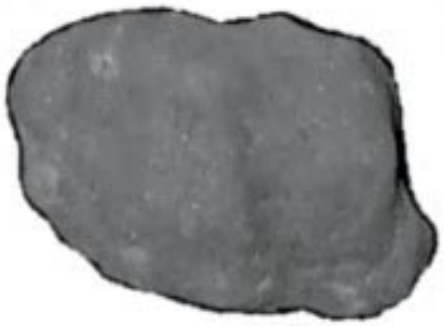
Rather than positioning the coals for the first time with the grid positioned within the stove you may find it easier to place the grid on the top of the stove where access and visibility is better. Whether you choose to lift, very carefully, the base and positioned coals into the stove or, having become familiar with the positioning choose to remove the coals and replace them when the grid is installed is a matter of choice and the steadiness of your hands. Resist any temptation to improve on the layout of the coals.

The CE103 kit contains four different models of coal and kit CE402 contains 3 different sizes of coal but no coal is identical to another. You will need to identify the different models and place them into their group before you attempt to position them.

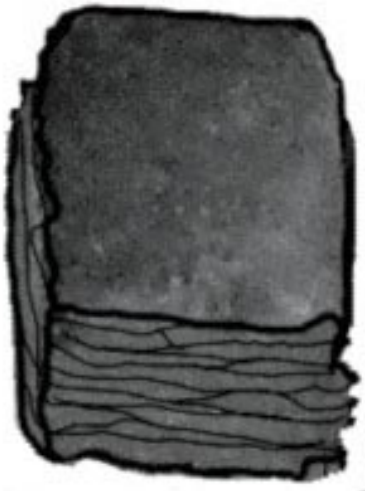
CE103 Coal Effect Kit for 6 & 8" Vapourising Oil Burners

Kit CE103 comprises of:

Small cube
15 in total



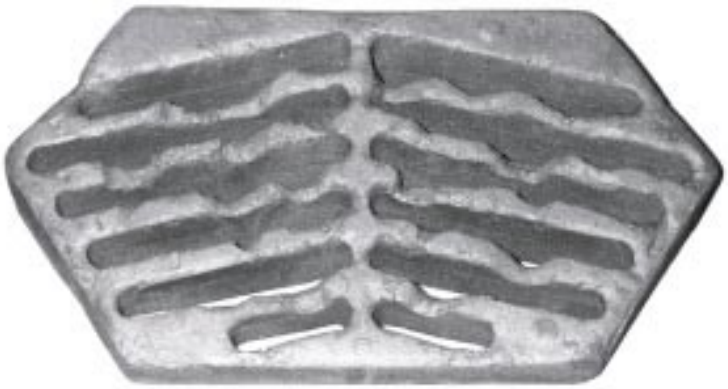
Moulded
2 in total



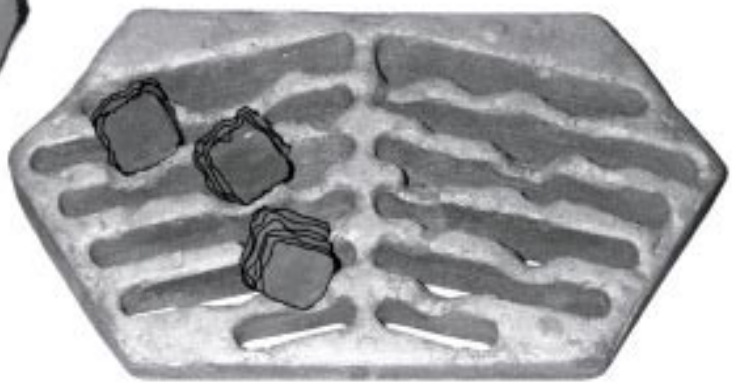
Large cuboid
3 in total

Irregular
6 in total

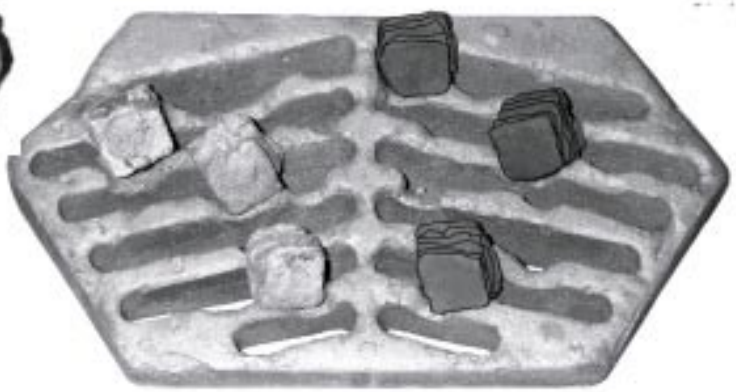
The grid plate should be placed with the notched grid bars uppermost and the shallowest grids towards you.



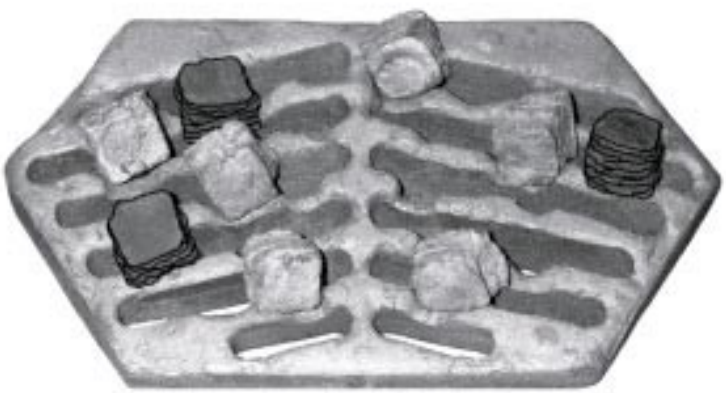
The small cube coals have two smooth faces, and four layered faces. Place 3 small cube coals with the smooth face towards the front and with a layered corner in the grid indentations shown. The smooth face at the rear should rest against the grid bar behind.



Position three more small cube coals in the illustrated indentations. Again, place them with a smooth face towards the front and a layered corner at the bottom, with the back smooth face resting against the grid bar behind.



Position three more small cube coals as illustrated. But place them with a smooth face downwards and a layered face towards the front. The back left coal will sit in an indentation and the front two will bridge two grid bars.



The three largest cuboid coals are placed as illustrated. The two centre coals with their smooth face uppermost and resting on the central grate bar. The far right hand coal is placed vertically, with the smooth face towards the front, within the back grid slot.

Place a small cube coal with a smooth face towards the front and a layered corner at the bottom, in the grid indentation illustrated. The back smooth face should rest against the grid bar behind.

Place one of these irregular coals, with the smaller of the two smooth faces, uppermost to bridge the three coals as illustrated. It should not bridge the cube coal at the front of the grid.

Place one of the two smooth moulded coals to bridge the three small cube coals, as illustrated. It should not touch the grid bars.

Place an irregular coal with the smaller of two smooth faces uppermost to bridge the two large coals and the small cubic coal.

Place a small cubic coal with a smooth face uppermost at the front of the grid.

Place an irregular coal with the smaller of two smooth faces uppermost to bridge the three small cubic coals.

Place an irregular coal with the smaller of two smooth faces uppermost onto the back left corner of the grid.

Place the last moulded coal at the edge of the grid and resting on two cubic coals.

Place an irregular coal with the smaller of two smooth faces uppermost to bridge the three small cubic coals.

Place the last irregular coal with the smaller of two smooth faces uppermost onto the back right corner of the grid.

Place the remaining four cubic coals when the grid and guard are in the stove so that the coals rest against the guard.

CE402 Coal Effect Kit for 10” Vapourising Oil Burners

Kit CE402 comprises of:

Small cube:
10 in total
In this document
we will call it -
A

Medium cube:
19 in total
In this document
we will call it-
B

Large cube:
5 in total
In this document
we will call it -
C

Base

The Harmony 2 with a 9 kw boiler size 3, does not need all of the large coals because the the boiler protrudes over the coal bed.
(see diargram 2)

DIAGRAM 1

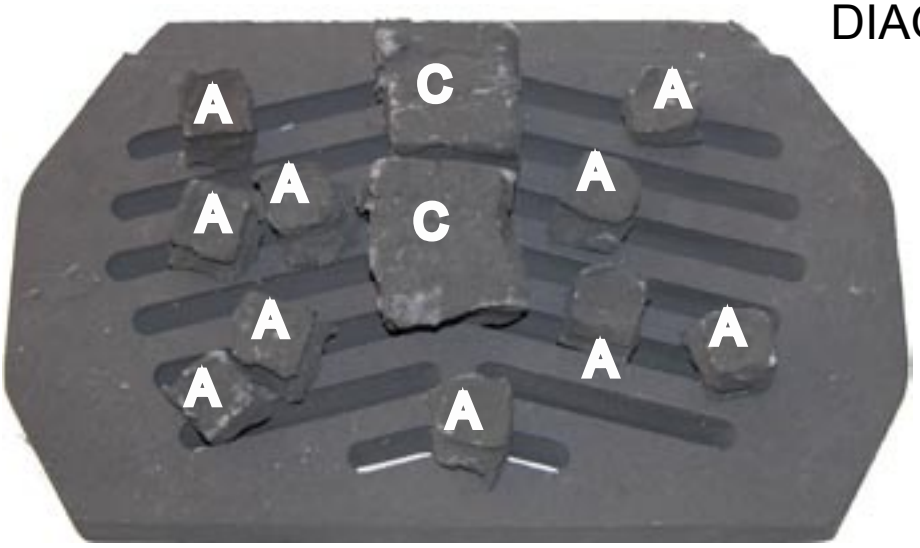


DIAGRAM 2

For the Harmony II with a 9 kw boiler, size 3, you will NOT be able to fit this coal.

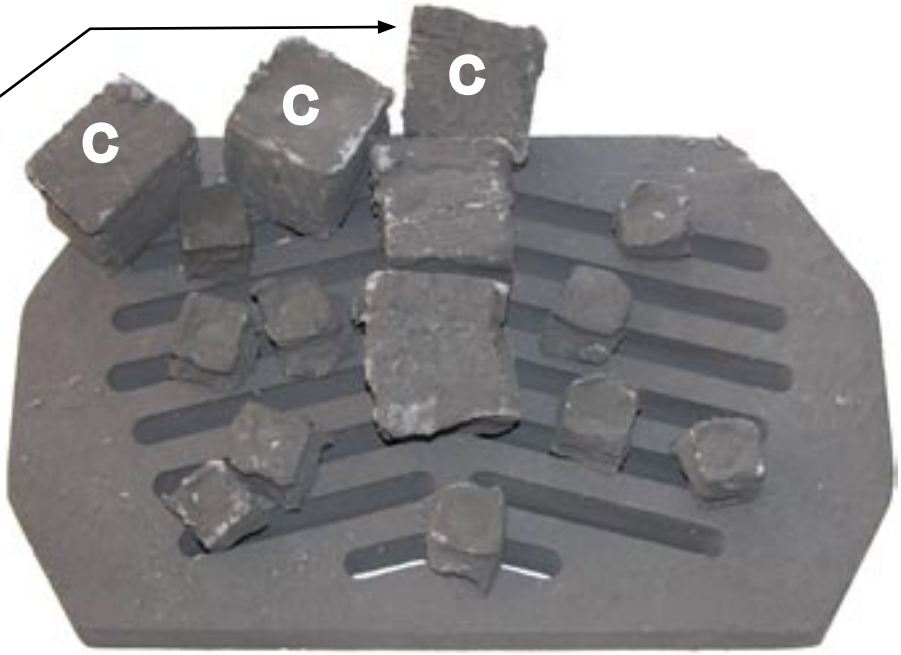


DIAGRAM 3

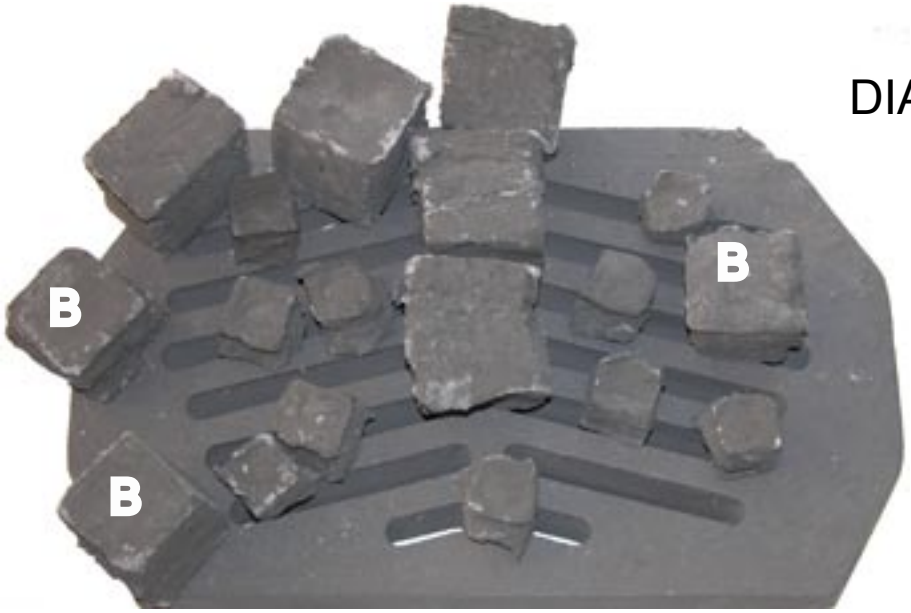


DIAGRAM 4

DIAGRAM 5

DIAGRAM 6

DIAGRAM 7

DIAGRAM 8

The result of laying the coals should be that the flames off the oil burner are spread evenly through the coals. If there are areas where there is large columns of flame in one or two places, the coals need adjustment to allow flames through in other areas and those places with the large columns of flame need reducing. The coals when fired may shrink and move, so after commissioning the customer should be made aware that they may have to reset some coals.
Be careful not to let the coals smother the burner.

Annual Servicing

A) The catalyser and support ring should be removed from the burner.

B) The flue should be examined for evidence of soot and where this is evident the flue should be swept.

C) All flue joints examined and re-sealed where necessary.
The stove should be vacuumed to remove all soot and debris.

D) The drip tray removed and cleared of all dirt and fluff.

E) The burner bowl should be examined for deposits adhering to both the sides and bottom, and all deposits removed from the fuel inlet. Where fitted, the electric igniter should be cleaned and examined for any signs of distress.

F) The catalyser should be cleaned and assessed as to its condition and suitability for a further 12 months operation.

G) The glass should be cleaned using only vinegar and water with any damaged glass being replaced.

H) All rope and glass seals should be examined and replaced where necessary.

I) The door, hinge and locking mechanism examined for damage and/or adjusted.

J) The stove body examined for damage.

K) The oil metering valve and control knob extensions examined for wear or damage.

L) The oil storage tank should be examined for leakage, the filter removed and examined for evidence of contamination before being cleaned or replaced.

M) The oil supply pipe work and any valves and filters examined and cleaned or replaced as necessary.

N) The oil valve and immediate supply and delivery pipe work examined for evidence of leaking.

O) The catalyser should be examined for signs of deterioration and black carbon, which indicates poor flue draught.

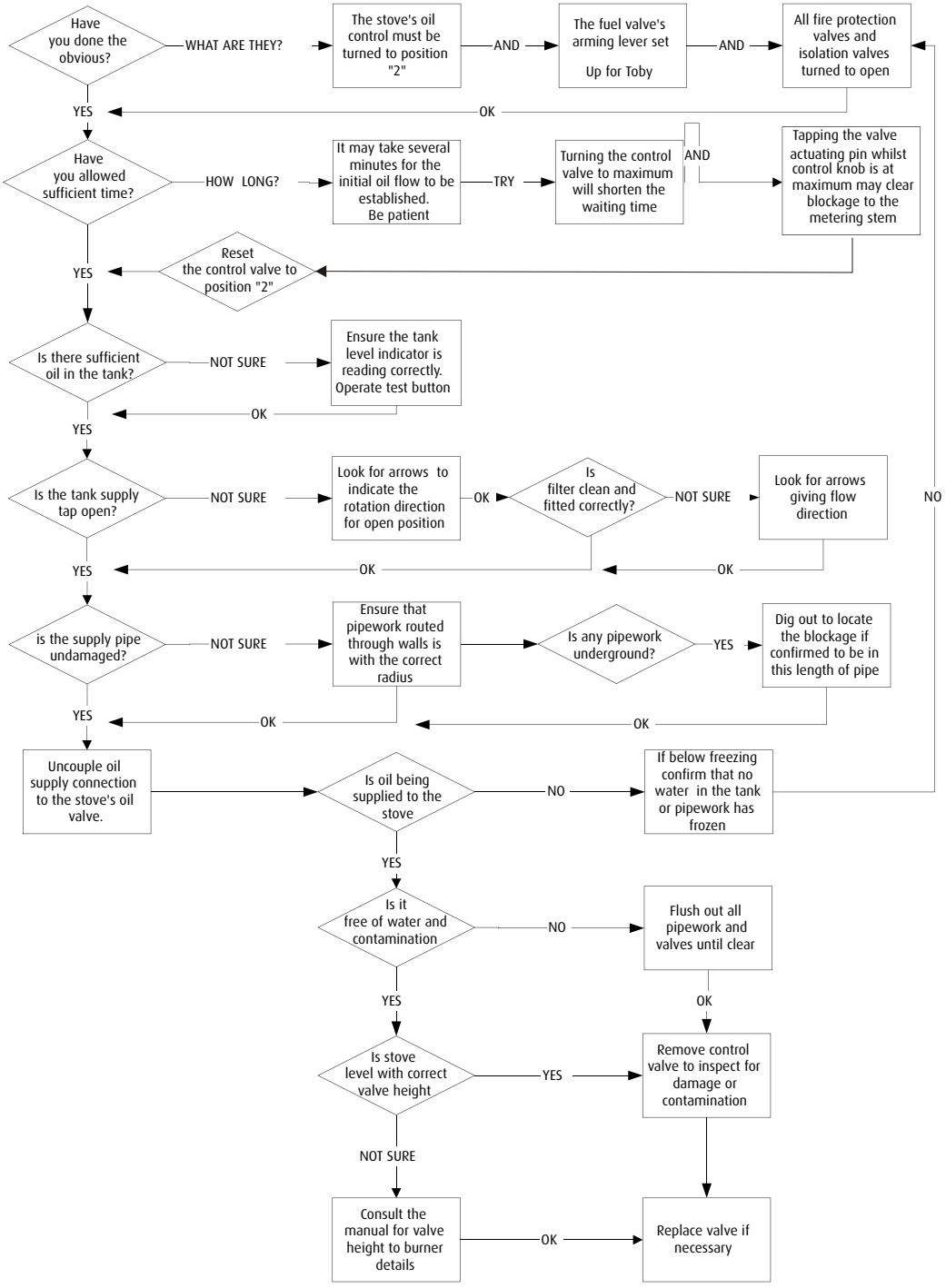
P)The catalyser and support ring should be reassembled and the burner lit and the stove and flue allowed to reach its operating temperature.

Q) A draught reading should be taken at both low and high fire with adjustment to the draught stabilizer being made where necessary.

R) If the operation of the appliance is suspect follow and complete the commissioning instructions, or follow the fault finding charts.

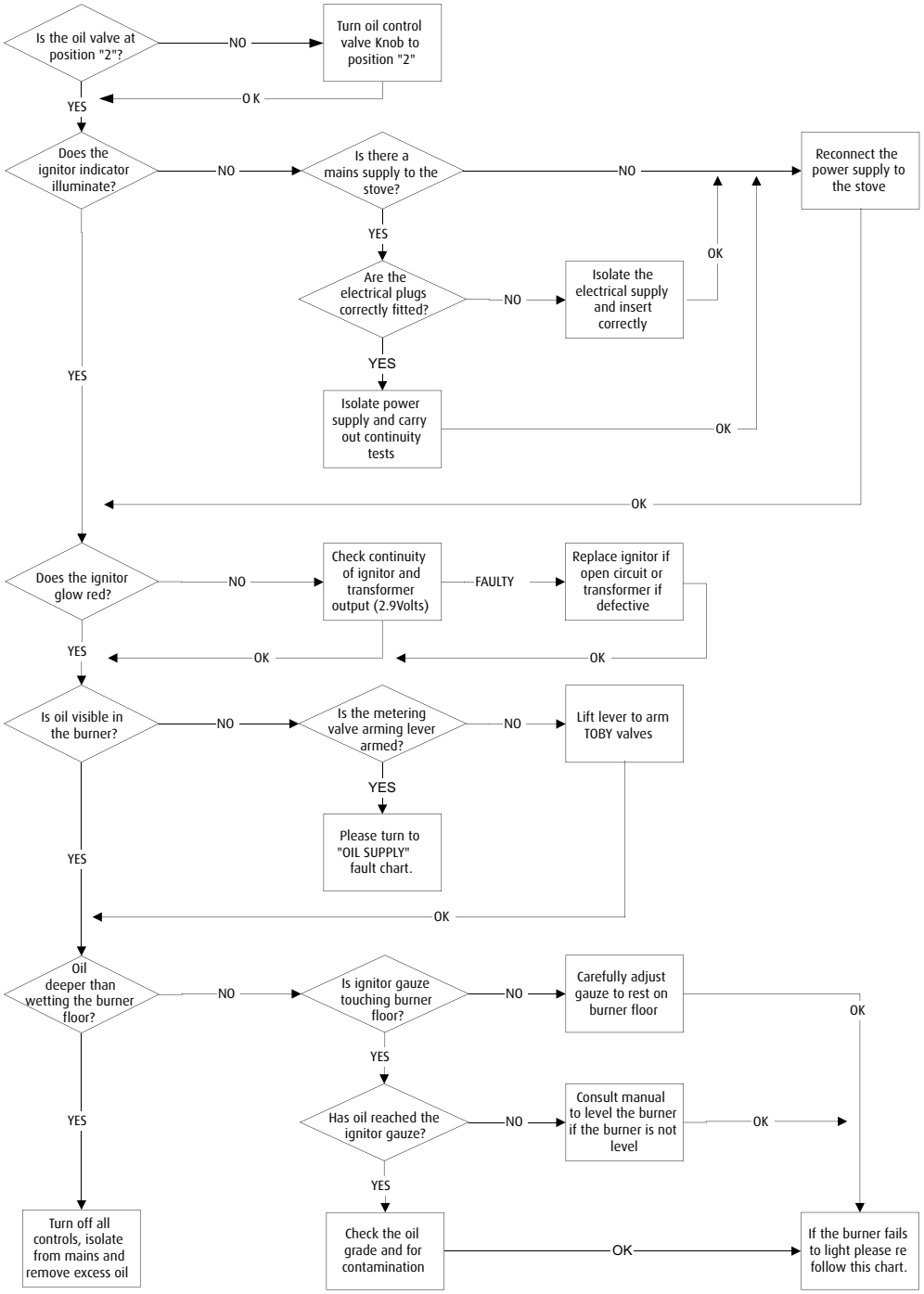
Fault Finding Flow Chart 1

OIL SUPPLY



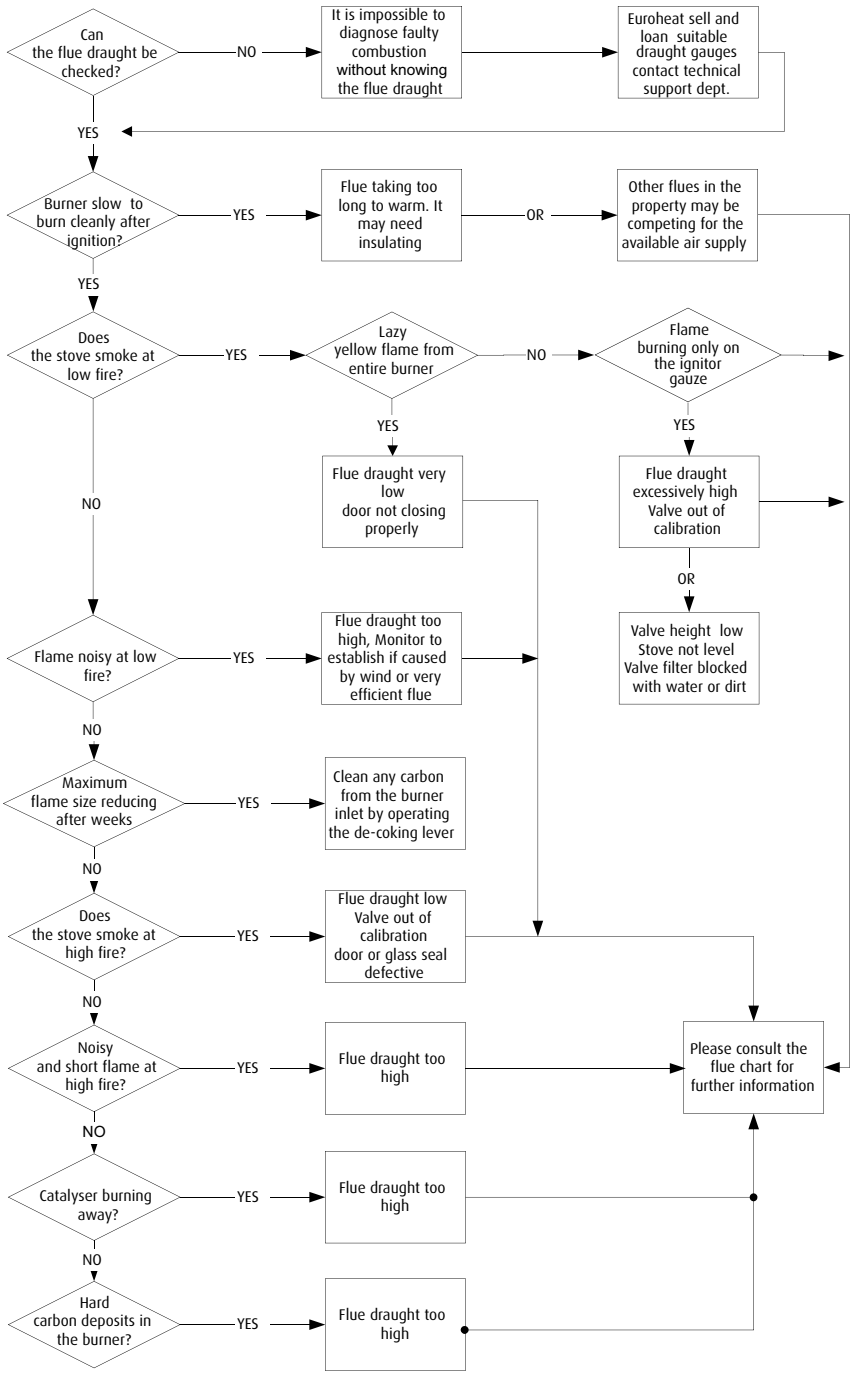
Fault Finding Flow Chart 2

BURNER FAILS TO IGNITE



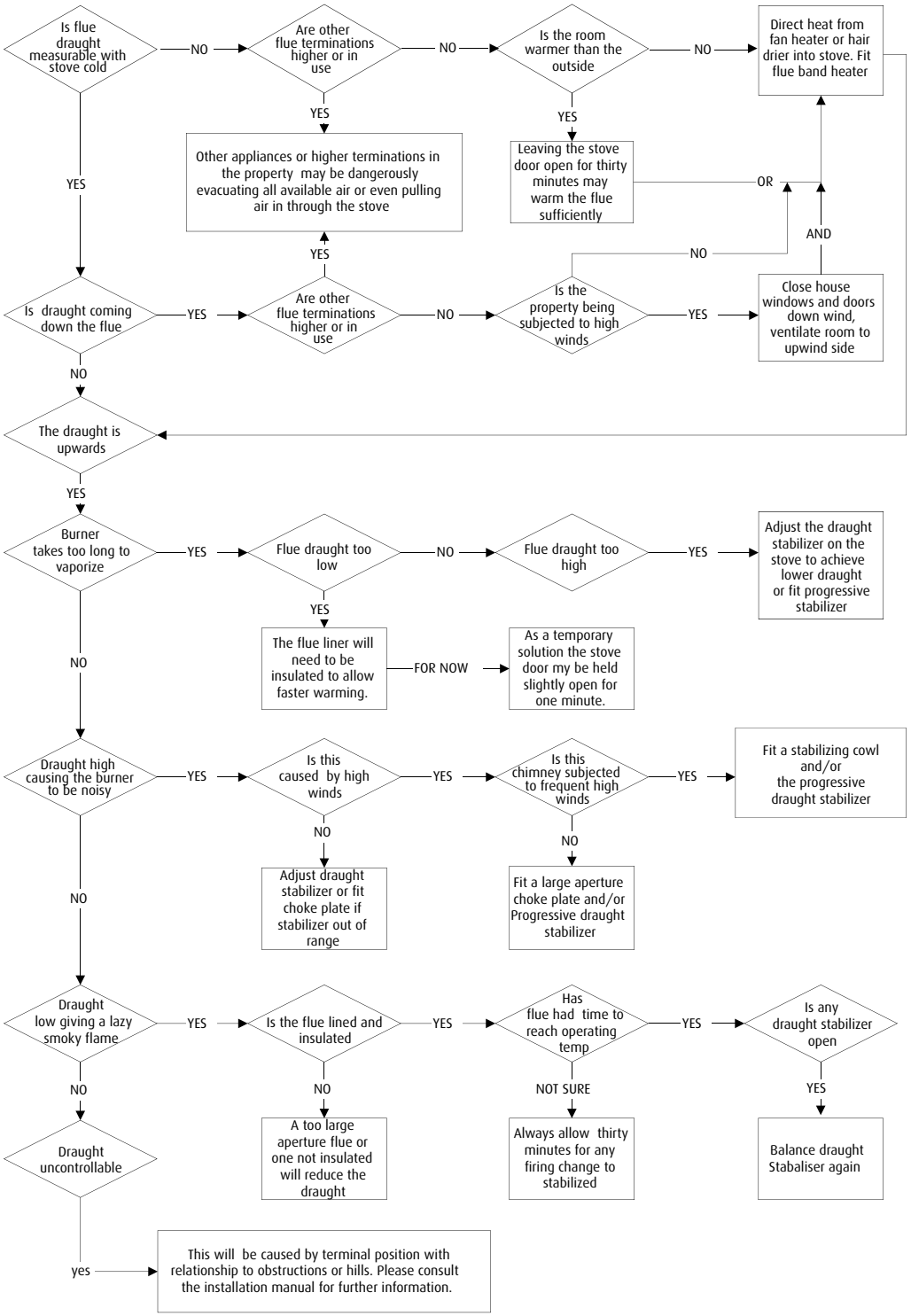
Fault Finding Flow Chart 3

BURNER NOT OPERATING SATISFACTORILY



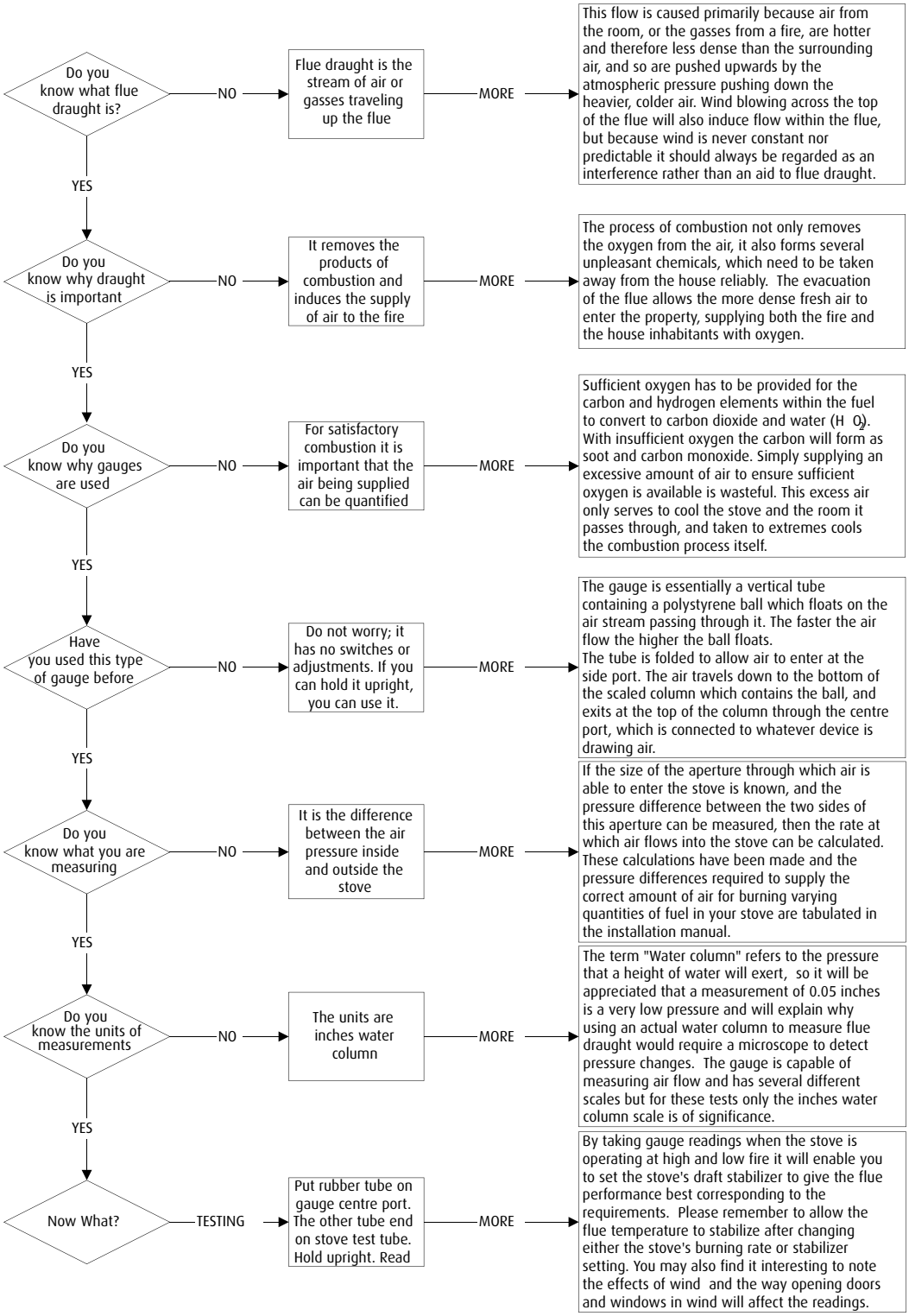
Fault Finding Flow Chart 4

FLUE DRAUGHT



Fault Finding Flow Chart 5

THE DRAUGHT GAUGE



Service Record

Year 1

Annual Service Completed :- Date _____ *Parts Replaced*

Service Engineer :- .....
House Name .....
Number/Street Name .....
Locality Name .....
Post Town .....
County .....
Post Code .....
Telephone Number .....

Year 2

Annual Service Completed :- Date _____ *Parts Replaced*

Service Engineer :- .....
House Name .....
Number/Street Name .....
Locality Name .....
Post Town .....
County .....
Post Code .....
Telephone Number .....

Year 3

Annual Service Completed :- Date _____ *Parts Replaced*

Service Engineer :- .....
House Name .....
Number/Street Name .....
Locality Name .....
Post Town .....
County .....
Post Code .....
Telephone Number .....

Year 4

Annual Service Completed :- Date _____ *Parts Replaced*

Service Engineer :- .....
House Name .....
Number/Street Name .....
Locality Name .....
Post Town .....
County .....
Post Code .....
Telephone Number .....

Year 5

Annual Service Completed :- Date _____ *Parts Replaced*

Service Engineer :- .....
House Name .....
Number/Street Name .....
Locality Name .....
Post Town .....
County .....
Post Code .....
Telephone Number .....

READ THIS BEFORE INSTALLATION

1. **Permanent ventilation giving at least 550 sq. mm for every one kW/hr of heat output above five kW/hr must be available.**
   (See installation guide for additional information)

2. **An approved fire valve must be fitted to the oil supply pipe.**

3. **Check that transportation and handling have not loosened any of the oil fittings to the burner or oil control valve.**

4. **At least one litre of oil must be flushed through the oil supply line after no contaminates or air bubbles are observed before connecting the supply pipe to the oil control valve.**

5. **Read the installation and commissioning manual before installing the appliance. Before lighting the stove read the operating instructions.**

6. **The stove must be commissioned before user operation.**

Euroheat
The Stove Company

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The Euroheat Technical Team