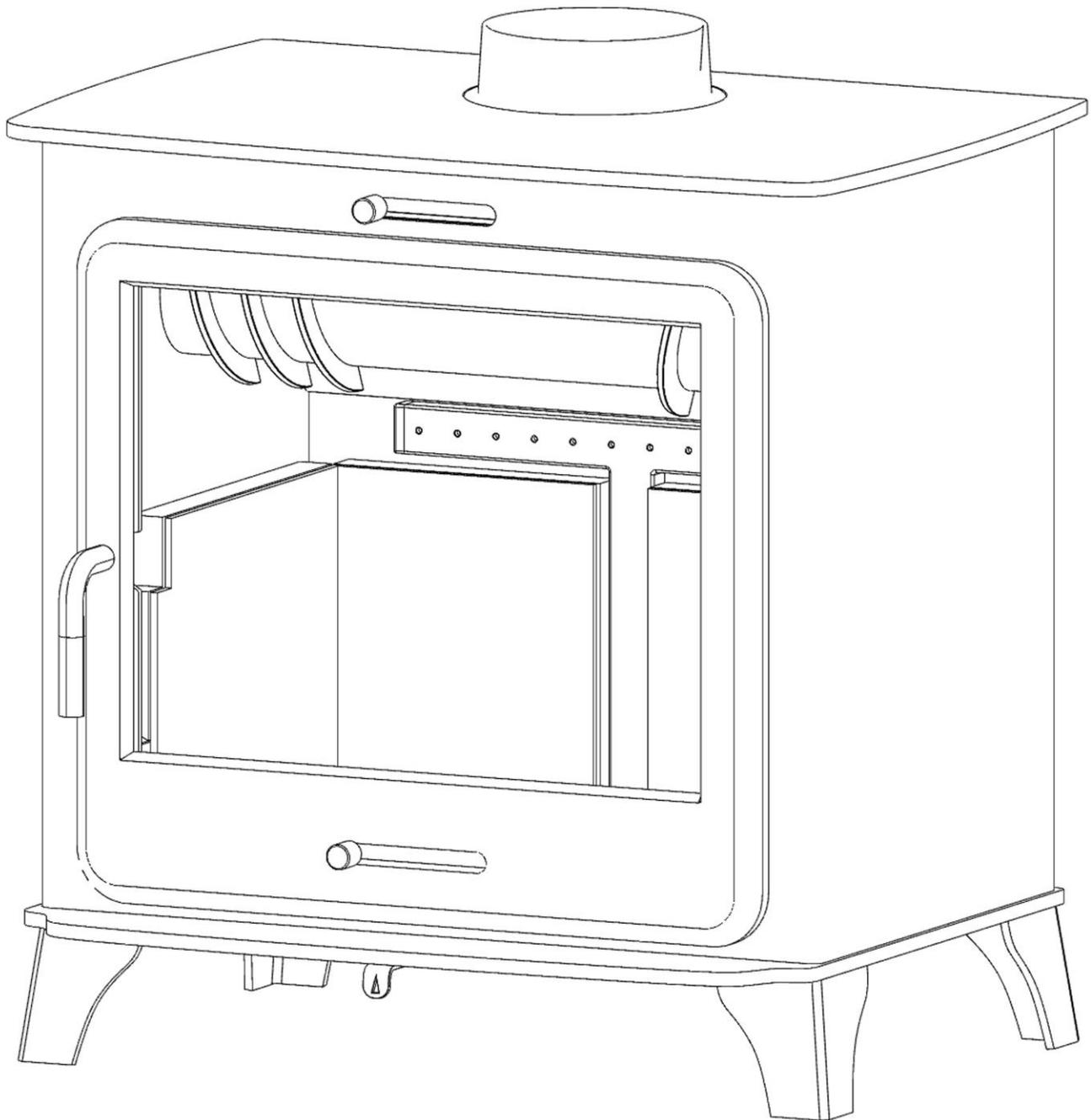


**Ekol Clarity 20 Boiler Woodburning Stove**  
**INSTALLATION AND OPERATING INSTRUCTIONS.**

**REF: Ekol Clarity 20 Boiler, MANUAL VERSION 1.1**

**MANUAL PUBLICATION DATE: 22.01.2014**



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**Approved under section 21 of The Clean Air Act 1993 for use within UK  
Smoke Control Area.**

## **Ekol Clarity 20 Boiler Woodburning Stove, – INSTALLATION AND OPERATING INSTRUCTIONS.**

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### **INTRODUCTION**

#### **SAFETY**

Safety is the most important consideration when using and installing your stove. If not installed and used correctly, a house fire could result. Installation must comply with relevant national and local Building Regulations and fire safety standards.

**IN THE EVENT OF CHIMNEY FIRE, EVACUATE THE PROPERTY AND CALL THE EMERGENCY SERVICES.**

Your stove will be heavy and care needs to be taken when lifting - 4 people will normally be required to lift.

#### **UNPACKING**

Your stove will have several of its components stored inside the stove itself for transportation.

Do NOT drag the stove on its legs – it must be carefully lifted into place.

Inside the stove will be a flue connector collar. This simply bolts with the fixings provided onto the top or rear outlet of the stove, depending on your choice of installation type. Ensure to secure the supplied circular blanking plate onto the other outlet using a good bead of fire cement to seal both the collar and the blanking plate.

Inside the stove will also be an ash-pan which sits underneath the grate, and will require regular emptying. You will also find a detachable tool for removal of the ash-pan.

You will also find a glove which must be used when opening the door or when adjusting air vents when the fire is hot.

There is also a removable baffle plate which rests on the top of the cylindrical section of the water jacket and the rear of the firebox (see diagram fig1.) this plate can be removed periodically to aid cleaning of the stove flueways and for easier access to the flue system. It is vital that the baffle is always replaced before use.

### **INSTALLATION**

Installation of your stove must comply with relevant local and national Building Regulations and fire safety standards.

#### **TECHNICAL**

Your stove has been tested to CE and British standards conforming to EN 13240.

Technical specs of both wood and multifuel below:

##### **SOLID FUEL based on intermittent use 1 hour refills:**

Nominal heat output total– 20.4 kW

Nominal output to water – 12.8kW

Nominal output to space – 7.6kW

Net Weight of Stove - 170 kg.

Max Height - 669 mm (see also Diagram Fig.2)

Max Width - 670 mm

Max Depth - 474 mm

Flue Diameter - 150mm (6")

Mean flue gas temperature directly downstream of the flue spigot - 395 degrees C. (with closed doors).

Flue gas mass flow – 12.1g/s

Mean CO emission (at 13% Oxygen) – 0.33%

Net Energy Efficiency 76.3%

**SOLID FUEL when used continuously at 4 hour refill periods:**

Nominal heat output total–15.9kW

Nominal output to water – 11.0kW

Nominal output to space – 4.9kW

Net Weight of Stove - 170 kg.

Max Height - 669 mm (see also Diagram Fig.2)

Max Width - 670 mm

Max Depth - 474 mm

Flue Diameter - 150mm (6")

Mean flue gas temperature directly downstream of the flue spigot - 360 degrees C. (with closed doors).

Flue gas mass flow – 8.5g/s

Mean CO emission (at 13% Oxygen) – 0.49%

Net Energy Efficiency 77.4%

**WOOD BURNING:**

Model; “Ekol Clarity 20 boiler”

Nominal heat output total– 14 kW

Nominal output to water – 8.3kW

Nominal output to space – 5.7kW

Net Weight of Stove - 170 kg.

Max Height - 669 mm (see also Diagram Fig.2)

Max Width - 670 mm

Max Depth - 474 mm

Flue Diameter - 150mm (6")

Mean flue gas temperature directly downstream of the flue spigot - 325 degrees C. (with closed doors).

Flue gas mass flow – 12.5g/s

Mean CO emission (at 13% Oxygen) – 0.17%

Net Energy Efficiency 74.6%

Maximum boiler operating pressure – 2 BAR

The stove is supplied with removable vermiculite panels lining the sides and back of the firebox. These should be left in place when burning wood – this helps to maintain a higher firebox temperature to ensure clean combustion minimising smoke emissions. If only burning suitable smokeless solid fuel e.g. Anthracite, these panels can be removed – resulting in a greater proportion of the heat being transferred to the water jacket.

The stove must not be installed within the specified minimum distances to combustible materials: A gap of at least 200mm needs to be left between the stove and any combustible materials at the sides and 200mm to the rear. Adjacent walls should be of non-combustible materials and construction, preferably masonry or brickwork.

All combustible items must be kept well clear of the stove, including log store, furniture, curtains etc and any item movable or otherwise which may pose a fire hazard.

Your stove will require a constant air supply, and should not be used at the same time and in the same room/space as extractor fans or any device which may draw air supply away from the stove.

The stove should be installed on a level floor with adequate load bearing capacity.

The stove needs to stand on a hearth of non-combustible materials not less than 12mm thick conforming to Building Regulations.

At least one permanent external air vent should be installed in the same room as the stove, to ensure a constant air supply for combustion. It should consist of a total free area of at least 7700mm<sup>2</sup>. – ie a square opening of 88mm x 88mm would be the minimum requirement. The vent should be positioned such that it is not liable to blockage.

NOT suitable for installation in a shared flue system.

If installed in a standard type chimney, a register plate needs to be fitted inside the chimney.

When purchasing flue pipe, 6" diameter is required. The flue pipe must be fitted INSIDE the flue spigot, and sealed with a generous amount of Fire Cement.

Access should be provided for cleaning the flue gas connector and chimney flue to ensure that the passageways for exhaust gases remain free from obstruction.

### **Flue Draught**

Flue draught should be measured at full output when up to full operating temperature and must be within the following limits: 12 to 18 Pascals. – If the flue draught at full output exceeds the upper limit, then a suitable flue draught stabiliser must be fitted to avoid overfiring and to allow sufficient burn-rate control.

We recommend that you have a qualified fitter install your stove. The British recognised standard for solid fuel installations is HETAS. You can find a HETAS qualified installer in your area by going to the HETAS website – [www.hetas.co.uk](http://www.hetas.co.uk).

### **Plumbing**

**IMPORTANT: - your stove MUST be plumbed in before use. Under no circumstances should it be ‘run dry’ – this would likely cause significant damage which would not be covered under warranty.**

**Please note: Ekol Stoves do not design heating systems. A suitably qualified installer should produce a safe system design with detailed plans following a site survey. The design should be in conjunction with relevant local and national Building Regulations.**

**The information provided below is intended to help as a minimum requirements guide only.**

### **Open Vented Only**

Your stove is suitable only for use in open vented systems – this means that it must be installed such that there can be no risk of the boiler jacket pressurising with increased water temperature. It must never be installed into sealed/ pressurised systems. However, using safe methods of system ‘link-ups’ your stove can be used when installed safely, in conjunction with other heating sources which may themselves be sealed systems. An example of this would be to use a thermal store with suitable automatic control system.

For a traditional basic ‘gravity’ system which enables indirect heating of a DHW (domestic hot water) cylinder and a pumped radiator heating circuit, a diagram is included in this manual as an example only (Diagram Fig.3) – please note this diagram is not an installation guide in itself – most importantly, if in doubt, a suitably qualified installer should design a suitable plumbing system based on your individual situation and requirements.

### **Drain Cock**

A drain cock should be incorporated at the lowest part of the system.

### **Capacity**

The water jacket on your stove has a capacity of 17.9 Litres.

### **Heat Sink/ Heat Leak**

To avoid overheating of the water system in the event of blockage or power failure, or low demand from the heating circuit, a heat-leak radiator should be incorporated on the gravity part of the circuit. This should have no manual control – ie be permanently open, and should be connected via 22mm diameter pipe – 15mm can be used for final connection to the radiator for a short distance only. The heat leak radiator should be a minimum 1.5kW or approx. 5200 BTU.

### **Rust/Corrosion Inhibitor**

Your stove boiler and radiators will be made of steel which will rust/ corrode due to oxidisation.

**It is essential that the heating system is filled with the correct concentration of chemical inhibitor such as ‘Sentinel X100’ or equivalent.**

The design of the system regarding pumps and their thermostatic controls should ensure that cold water is never allowed to circulate – cold water will rapidly increase the risk of corrosion.

### **Connections**

The 4 water connections on the back of the stove require a **TAPERED** 1 inch BSP fitting. This is what we use (but other brands are fine too):

<http://www.screwfix.com/p/conex-male-straight-connector-taper-302ta-28mm-x-1/64876>

The 1 inch Tapered end screws into the stove leaving a 28mm compression fitting for you to connect to.

### **OPERATING INSTRUCTIONS**

#### **The Clean Air Act 1993 and Smoke Control Areas**

Under the Clean Air Act local authorities may declare the whole or part of the district of the authority to be a smoke control area. It is an offence to emit smoke from a chimney of a building, from a furnace or from any fixed boiler if located in a designated smoke control area. It is also an offence to acquire an "unauthorised fuel" for use within a smoke control area unless it is used in an "exempt" appliance ("exempted" from the controls which generally apply in the smoke control area).

The Secretary of State for Environment, Food and Rural Affairs has powers under the Act to authorise smokeless fuels or exempt appliances for use in smoke control areas in England. In Scotland and Wales this power rests with Ministers in the devolved administrations for those countries. Separate legislation, the Clean Air (Northern Ireland) Order 1981, applies in Northern Ireland. Therefore it is a requirement that fuels burnt or obtained for use in smoke control areas have been "authorised" in Regulations and that appliances used to burn solid fuel in those areas (other than "authorised" fuels) have been exempted by an Order made and signed by the Secretary of State or Minister in the devolved administrations.

The “Ekol Clarity 20 Boiler” has been recommended as suitable for use in smoke control areas when burning seasoned wood and when used in accordance with these instructions. The air controls are factory set to allow a constant amount of combustion air, and must not be modified in anyway.

Further information on the requirements of the Clean Air Act can be found here : <http://smokecontrol.defra.gov.uk/>  
Your local authority is responsible for implementing the Clean Air Act 1993 including designation and supervision of smoke control areas and you can contact them for details of Clean Air Act requirements

### **FUEL**

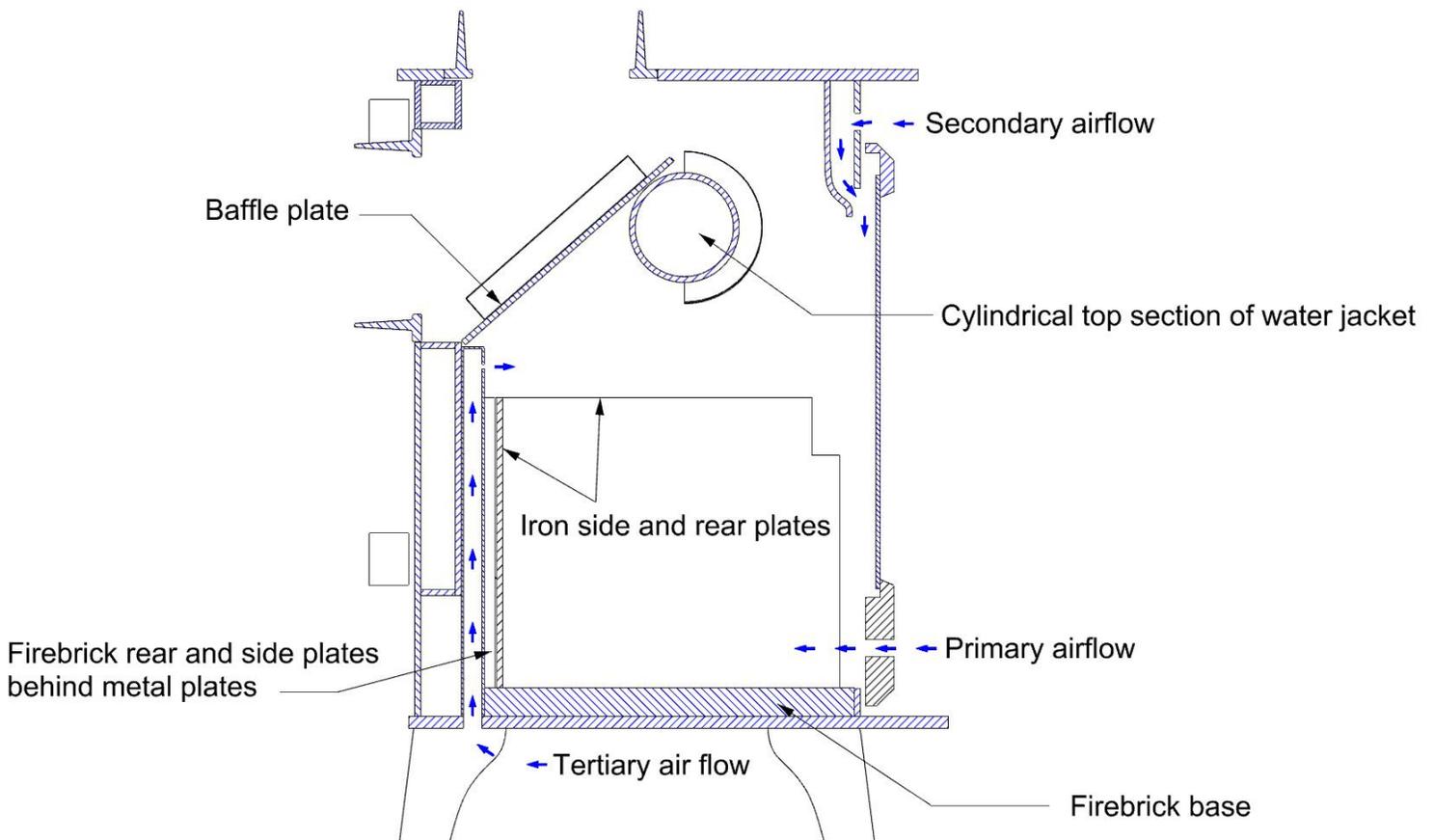
Wood- All types of wood are suitable provided they are well seasoned, UNTREATED, and have a moisture level between 12% and 20%. For soft woods, typically they will need to have been left in suitable storage for 9+ months in order for the moisture to evaporate. For hardwoods, this will usually be 18 months+. It is recommended that logs should be no more than 5” or 125mm in diameter. Logs should be no more than 260mm in length if laid front to back (for best results), or max 400mm if laid left to right in the firebox.. We strongly advise you can buy a moisture meter which will indicate the moisture levels in your fuel. 80 % of issues with poor performance are due to poor, usually wet fuel. Wood can feel dry on the outside but be very wet in the middle. To test moisture, split a log, and deeply insert the probes of the meter into the centre of the log. Liquid fuels must NEVER be used.

**WARNING:** Wet timber should not be used as this will create excess tar deposits in the chimney and stove and could increase the risk of chimney fire. Timber which is not of a suitable moisture content will also create more smoke and harmful emissions.

Never use your stove as incinerator to burn waste or rubbish.

**Diagram Fig. 1**

## SIDE CROSS SECTION



### **AIR INLET CONTROLS**

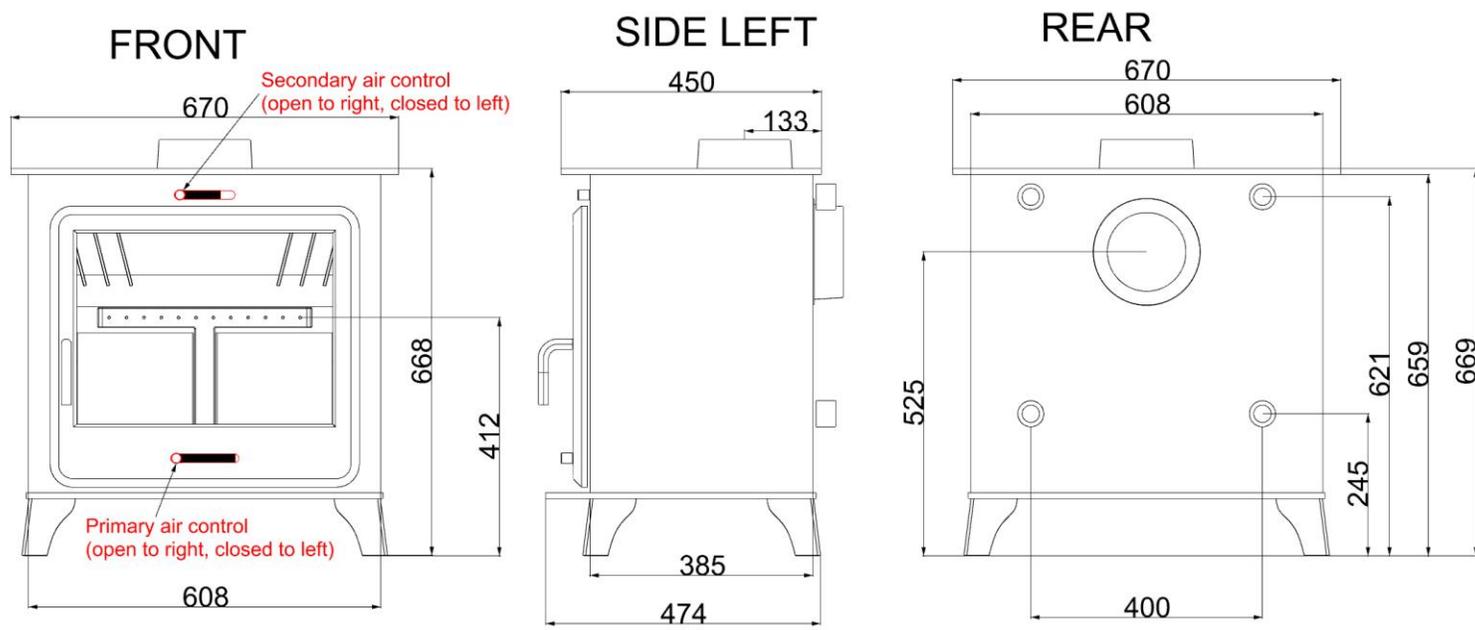
Your stove has four air inlet areas-

- 1) Vent at bottom part of door – this is the first Primary air vent which allows air to the base of the fire – needs to be kept open when lighting and briefly when refuelling to allow the firebox to get upto optimum operating temperature quickly. Moving slider to the left will minimise air flow/ burn rate. Moving to the right fully opens for maximum air flow.
- 2) Vent at back of stove, controlled by the thermostat is also a Primary air vent – the thermostat will allow air in initially but will close when upto temperature. When burning for longer periods, or when the stove is not supervised, all other vents shut be closed to minimum. If the water temperature exceeds safe limits, the thermostat automatically closes the rear Primary inlet thus slowing the burn rate to help avoid boiling of the water in the system.

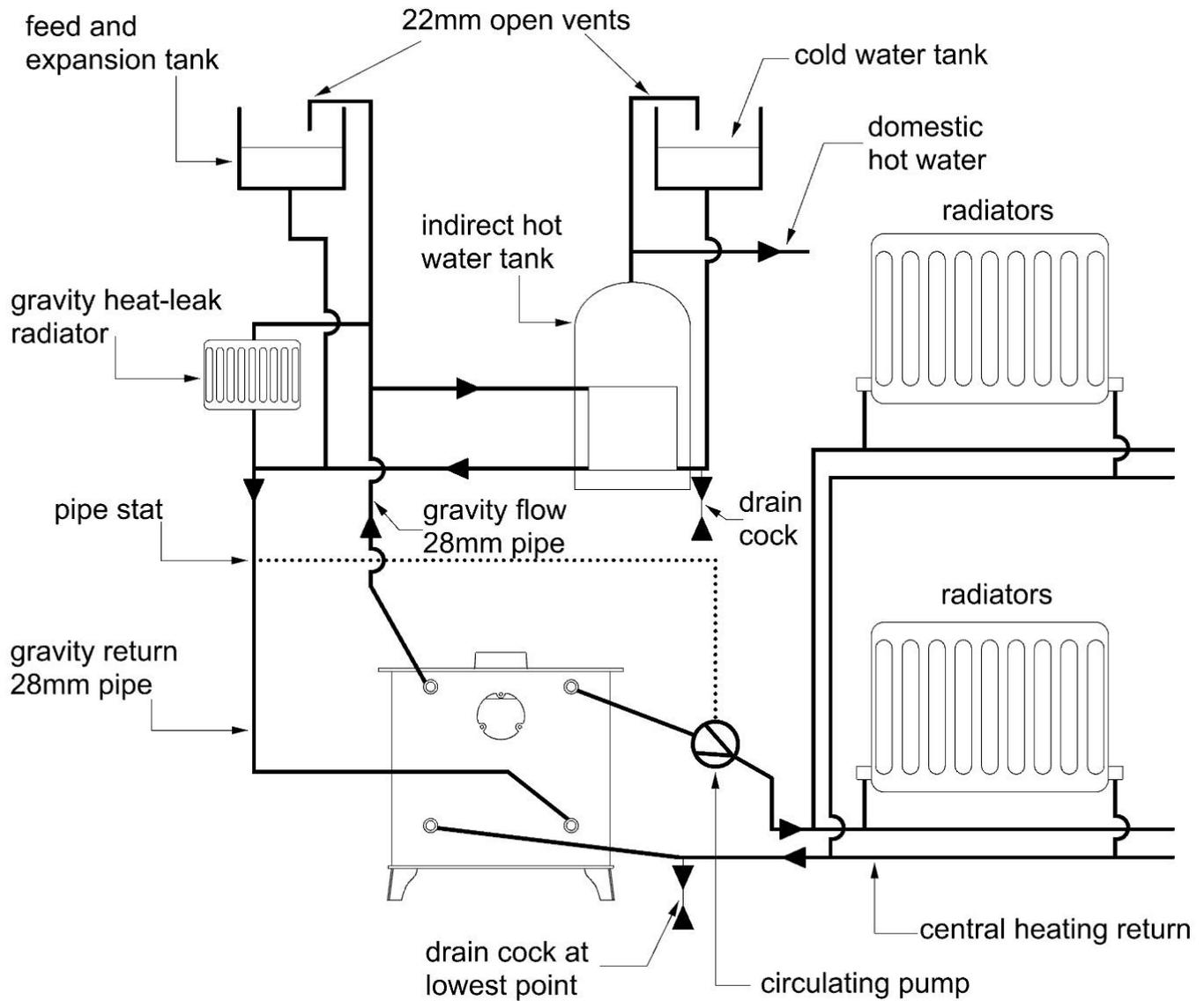
Before use, the operation of the thermostat should be checked when cold – turn the thermostat control dial to minimum, to ensure that the closure plate sits flush against the stove body. If it doesn't, it can be further tightened with a crosshead screwdriver. Once a satisfactory closure is achieved, the control arm can then be opened ready for use.

- 3) Vent control at top of door – this is the Secondary or Airwash supply – this vent allows air in which is flushed down onto the glass helping to keep the glass clean and aiding cleanburning of the gases. Moving slider to the left will minimise air flow/ burn rate. Moving to the right fully opens for maximum air flow and burn rate.
- 4) Vent under the stove body – this is the Tertiary air inlet and remains open – it allows air in to a channel behind the firebox and this air is preheated and introduced into the firebox through a series of small holes at the back of the firebox. This air supply is essential for clean burning of the fuel and gases.

**Diagram Fig.2**



**Diagram Fig.3 – Example plumbing circuit**



**TOOLS**

The glove is provided for adjusting the air inlets and for opening the door when the stove is hot, as these knobs will heat up when in use.

NOTE – all parts of the stove will become hot during use and care needs to be taken to avoid injury through burning.

The tool handle provided is for removing the ash-pan.

**LIGHTING THE FIRE**

- Prior to lighting the fire for the first time, ensure that-
- Installation and building work is complete.
- The chimney is suitable and sound and has been swept and free from obstruction.
- Adequate ventilation and provision for combustion air has been made.
- That the stove installation has been carried out in accordance with Building Regulations and any applicable local regulations as well as these installation instructions.
- That chimney draw has been checked and within specification. (The stove has been tested at nominal output with a flue draught of 12 Pa)

**ENSURE THAT YOU HAVE READ AND UNDERSTOOD THESE INSTRUCTIONS BEFORE LIGHTING THE FIRE, AND THAT YOU ARE CONFIDENT THE STOVE HAS BEEN INSTALLED CORRECTLY.**

**ALWAYS WEAR A PROTECTIVE GLOVE WHEN REFUELLING YOUR STOVE.**

### **Ignition**

- Ensure the ash-pan is in place.
- Ensure all air inlets are fully open
- Construct a pile of kindling in the middle of the grate using approximately 1.5kg of kindling wood
- Light with a single chemical firelighter
- Partially shut the door but leaving it cracked open slightly
- After about 5 minutes or when the fire is well established, shut the door
- After a further 3-5 minutes as the fire starts to die, add a further three larger pieces of wood weighing approx 2kg.
- Once these logs are alight, and after about 7 minutes or so, a normal load of 4 to 6 logs weighing approximately 4kgs in total can be added
- Once this load is burning well, the Primary air vents can be closed, with the Secondary and Tertiary vents left open.

### **Refuelling**

- Open the Primary air vents
- Add up to a maximum 5kg of wood
- After about 2 minutes or when flames from the fresh fuel fully established, close the Primary vents
- At high power output, your stove will require refuelling approximately every hour.
- It is important to follow these instructions in order to achieve clean burning and to maximise the efficiency of the stove
- Do not leave the fire unattended until flames are well established on the newly charged logs
- Always refuel onto hot embers.
- If the fire has died out at the point of refuelling, or if there is insufficient burning material in the firebed to light a new fuel charge, excessive smoke emission can occur. Refuelling must be carried out onto a sufficient quantity of glowing embers and ash that the new fuel charge will ignite in a reasonable period. If there are too few embers in the fire bed, add suitable kindling to prevent excessive smoke, re-establish the fire and follow the “Ignition” process above. It is important that the stove is not overloaded with fuel.
- Reduced burn rates can be achieved by reducing the openings of the Secondary and Tertiary air vents.
- Operation with the door open can cause excessive smoke. The appliance must not be operated with the door left open except as directed in the instructions above.

### **IMPORTANT NOTE ON OVERFIRING**

Your stove should NOT be used for extended periods with all vents fully open and should never be used with the doors open except when refuelling. – this is likely to cause over-firing, excessive temperatures which will lead to premature damage/ buckling and warping of internal components and in some cases the stove body itself. Overfiring can also be caused by excessive flue draught. Such damage will not be covered under the warranty.

### **UK Clean Air Act 1993 - Smoke Control Areas**

The “Ekol Clarity 20 boiler” wood burning stove has been recommended as suitable for use in smoke control areas when burning seasoned wood and when used in accordance with these instructions.. The air controls are factory set to allow a constant amount of combustion air, and must not be modified in anyway.

*WARNING- The high temperature paint covering the stove will give off some fumes during the initial few uses of the stove. The fumes are non-toxic, but some people may find them unpleasant – Ensure the area is well ventilated during this period.*

The output ratings of this stove are based on around 4kg of seasoned logs which would require refuelling every hour. This stove is suitable for intermittent burning, and should not be used constantly for extended periods. Not suitable for overnight burning.

Under certain abnormal weather conditions, e.g. down draughts, it may be difficult to get sufficient draw through the appliance to achieve good combustion. When this happens, the stove should not be used.

## **CLEANING/MAINTENANCE**

Regular cleaning of the stove is essential for safety and efficiency. The ash-pan should be emptied at least after every use, and during use if burning for longer periods.

When cold, the inside of the stove should be given a regular sweep out.

The flue and flue pipe will require cleaning with a suitable chimney brush, to minimise build up of soot and tar.

The baffle plate inside the stove can be simply lifted out for easy access to the flueways (see Diagram Fig.1)

You chimney will also require periodic sweeping.

If the glass becomes stained from the inside, the air-wash vent may need opening more during use. The glass can be cleaned with a cloth and chemical stove glass cleaner, or the glass cleaning pad made by Schott.

The high temperature paint which your stove is finished in should last many years with normal use, but when it does eventually require re-finishing, black heat resistant paint in spray cans can be purchased from most hardware stores. – Do not use regular paint which is not high temperature resistant.

After prolonged periods of not using the fire, the stove and flue system should be checked for blockages prior to re-lighting. We recommend regular servicing and safety checks are carried out by a qualified engineer.

There must be no unauthorised modification of the appliance. Use only replacement parts recommended by the manufacturer.

### **What to do in the event of a chimney fire:-**

- cut off the air supply to the stove, i.e. close the primary and secondary air supplies
- move any combustible materials well-away from the stove
- get everyone out safely
- make sure that the fire brigade has clear access
- call 999

If you have any questions or concerns regarding the safe use of your stove, please contact us.

## **Warranty**

Your stove is guaranteed to be free from manufacturing defects which would affect the performance of the stove.

When supplied through an authorised dealer and when registered through the website ([www.defrastoves.com](http://www.defrastoves.com)) , your guarantee will extend to 5 years and is limited to the original purchaser and the original installation/ address.

Guarantee terms are for supply of replacement parts only, returned to factory and does not include Grates, firebricks, glass, rope seals, paint, baffles, or internal lining plates.

Claims for damage caused by incorrect use or installation, damage caused by over-firing or use of incorrect fuels and accidental damage will not be accepted.

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