



Si 20

Solid Fuel Boiler Stove



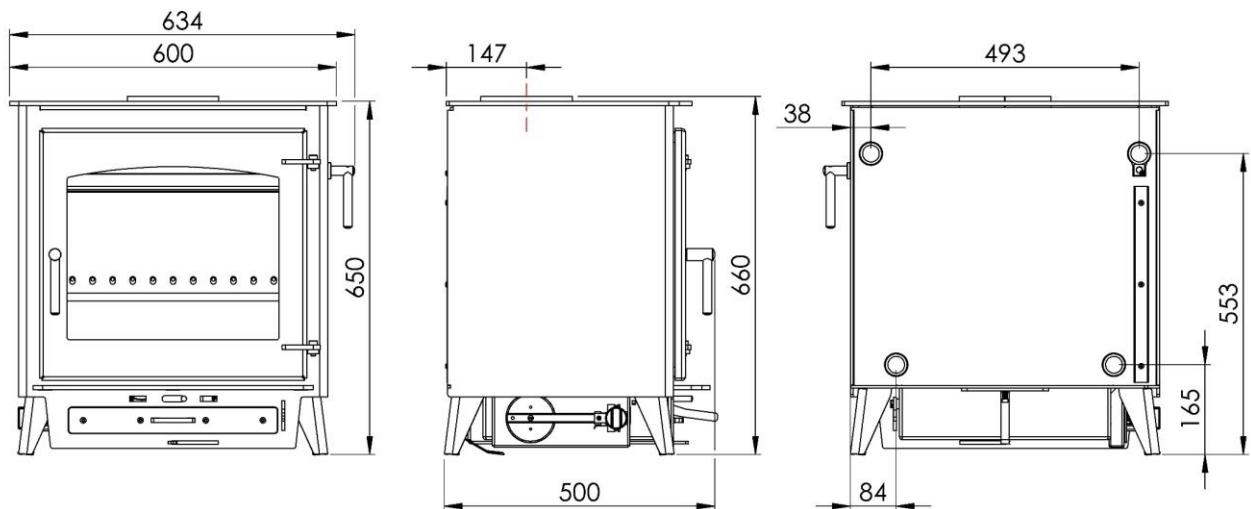
Installation and User Instructions

IMPORTANT INFORMATION

APPLIANCE INFORMATION

	Si 20
Nominal Total Heat Output	13kW
Nominal Heat Output (to Water) (to Room)	6.7kW 6.3kW
Maximum Heat Output	20kW
Maximum Heat Output (to Water) (to Room)	10.3kW 9.7kW
Wall Clearance to Combustible sides	100mm
Recommended Minimum Wall Clearance To Non-Combustible Sides and rear (for access to parts)	75mm
Flue Outlet Size (Top Outlet Only)	150mm
Minimum Flue Size	150mm (6")
Room Vent Required	Yes
Tappings	2 x 1" BSP
Heating System Requirements	Indirect Open Vented
Fuel Type	Smokeless Fuel
Construction	Seam Welded Steel
Double Skinned Combustion Chamber	Top and Rear

APPLIANCE DIMENSIONS Si 20



CONDITIONS OF INSTALLATION

It is the law that all wood fired heating appliances are installed in accordance with Building Regulations and that local authority Building Control approval is obtained for the installation. This can be done through a qualified installer who is part of an approved Competent Persons scheme (and who is able to self-certify his work) or by obtaining approval through a building inspector. Failure to install appliances correctly could lead to prosecution. It is in your own interest and that of safety to comply with the law.

The installation must also be in accordance with all relevant parts of the Local and National Building Regulations where appropriate, the Building Regulations (Scotland Consolidation) issued by the Scottish Development Department, and all applicable requirements of the relevant British Standard Code of Practice.

Hearth Suitability

The stove must only be installed on a full constructional and superimposed hearth that is constructed and sized in accordance with Document J of the Building Regulations.

Fire Openings

Fire openings and recesses must be constructed of non-combustible material in accordance with Building Regulations unless the internal surfaces are further away from the stove than the minimum clearances to combustibles stated in this manual.

If "boarding out" the internal faces of a suitable fire opening it is recommended that fire board of minimum thickness of 12mm is used that is capable of withstanding prolonged high temperatures to avoid cracking.

Combustible Materials

Any combustible materials must not be closer to the stove than the minimum clearances stated in the table at the back of this booklet.

Ventilation

Si 20 stove models have a nominal heat output of 13kW and require additional permanent ventilation. When installed in houses built prior to 2008, the stove requires a permanent vent with a total free area of at least 4400mm². When installed in properties built after 2008 the Si 20 stove requires additional ventilation in accordance with Document J of the Building Regulations. The siting of the vent should be carried out to minimise cross-room draughts. If a draught stabiliser is fitted to any of the stove models then the ventilation should be increased in line with Document J of the Building Regulations.

Flue and Chimney Suitability

These appliances are designed for use with conventional masonry chimneys and fabricated flues. **We do not recommend use in a masonry chimney without a flexible flue liner to prevent excessive cooling of the flue gases.** All flues must conform to the following minimum dimensions.

Minimum diameter of circular flues	150mm (6") flue
Minimum effective height of all flue types	5 metres

Flue and Chimney Suitability Continued

Before commencing installation, a flue or chimney should be inspected to ensure that all the following conditions are satisfied.

- Check that the chimney / flue only serves one fireplace and is clear of any obstruction. Any dampers or register plates must be removed or locked in the open position.
- Any chimney or flue which has been used for an appliance burning fuel other than gas must be thoroughly swept before using.
- **These appliances are high efficiency and are not suitable for use in unlined masonry chimneys. The heat loss through the structure of a masonry chimney and resulting low flue temperatures will cause poor flue draft and increase the risk of condensation, flue deposits and chimney fires. We strongly recommend that masonry chimneys are lined with a 6" (150mm) 316 or 904 grade solid fuel flexible flue liner to avoid condensation and prevent flue debris falling onto the appliance flue outlet. If solid fuel is to be used then we recommend that only 904 grade flexible liners are used to reduce the likelihood of sulphur attacking the liner.**
- A cleaning door must be provided on the connecting flue pipe to allow sweeping.
- **Using a smoke pellet, check that there is an up-draught in the chimney / flue and that the smoke can be seen issuing from the terminal / chimney pot outside. There must be no leakage of smoke through the structure of the chimney during or after the smoke pellet test and it is important to check inside upstairs rooms adjacent to the chimney / flue.** Check the chimney pot / terminal and general condition of the brickwork or masonry. If the chimney or flue is in poor condition or if there is no up-draught do not proceed with the installation without first rectifying the problems.
- As with any stove installation, it is advisable to check the location of the chimney termination for height and location with regard to roof features, ridges and adjacent structures or trees. Even compliant chimneys can cause problems in certain wind directions due to turbulence caused by these features. Any concerns should be raised with the customer prior to the installation taking place.
- The hot flue draught of the finished installation should be between 10 and 24 pascals. Inadequate flue draught will result in poor performance and smoking whereas excessive flue draught will result in excessive firing of the stove.

Heating System Suitability

The Si 20 stove is a high output boiler stove designed to heat a house requiring up to 10kW of boiler output or for use to heat a very large property as part of a “linked up” system alongside an additional boiler or appliance.

The stove must only be connected to indirect open vented systems with permanently open separate feed and expansion pipes.

A permanent gravity circulation must be provided with a heat leak radiator to provide a constant minimum heat load of at least 10% of the output of the stove to water.

It is important to control the returning water temperature as part of the system to avoid pumped cold return water causing condensation in the boiler. This is achieved with the use of a low limit thermostat as part of the system.

The stove has four 1” BSP tappings on the rear of the stove body. The flow tappings are higher than the return to facilitate gravity flow through the boiler. It is important to connect these tappings correctly, to facilitate gravity flow and effective venting of any air from the stove boiler out through the top tappings.

A drain valve should always be provided below a return tapping pipe run to facilitate future draining of the system / boiler.

System design should be in accordance with current best practice for solid fuel heating systems. There are a number of proprietary link-up systems available and if these are used then the suppliers instructions should be followed. **A high quality corrosion inhibitor like Fernox or Sentinel must always be used and maintained at the minimum concentration specified by the manufacturer to prevent boiler corrosion and sludge build up.**

On a conventional gravity and pumped solid fuel system it is recommended that the gravity circuit is piped up using 28mm copper pipe and that no valves or obstructions are present on the flow or return pipes or feed or expansion pipes to avoid any possibility of catastrophic pressure build up due to inadvertent closure of valves.

Gravity pipes should rise all the way to the vent position to avoid air locks and facilitate effective gravity flow through the pipes. With a four tapping boiler stove it is usual practice on a conventional gravity and pumped system to connect two diagonally opposite tappings to the gravity circuit and the other two tappings to the pumped (heating) circuit

Unpacking and Disassembly

The stove is extremely heavy and it may be beneficial to open the stove whilst still on the pallet and remove all loose items to reduce the weight. Remove the heavy steel cleaning access baffle (that is screwed to the pallet for transit). Open the stove door. The front austenitic stainless steel front frame protection strip should be lifted off from the inside of the top edge of the door opening and safely located for reassembly. The stove gloves, tube cleaner and screw-on handle, scraper tool, thermostat control knob and ash pan handle are located in a padded bag in the grate.

Remove the six hard refractory grate bricks. These should also be lifted out and stored safely. The 8mm steel front ash retainer can be lifted up at the right-hand side and withdrawn from the front of the stove.

There are 10 cast iron grate bars that are located on the rocker bar at the front and are identical bars which are alternatively located front to rear such that every other bar reciprocated backwards and forwards when the riddling lever is actuated. These should all be lifted off at the front and withdrawn from the stove. The ashpan is taped at each side for transit and the tape can now be removed and the ashpan withdrawn from the fire. To further lighten the stove, the door can be lifted off the hinge blocks and safely stored along with the two door pins for refitting later. The only remaining loose item is the rear flue cleaning baffle. This is located at the top rear of the firebox and has a steel peg on the lower centre which can be gripped to pull the baffle forwards off the retaining lugs. It can then be rotated forwards at one side to allow it to drop down off the top of the side fire lining panels. This will have considerably lightened the stove for moving.

The stove is secured to the wooden pallet with No 2 posidrive screws and steel strips hooked over the adjustable feet. These need to be removed before removing the stove from the pallet.

If trucking the stove after removal from the pallet, be careful not to damage the lower air control which is underneath the ash pit of the stove.

Locating and Connecting the Stove

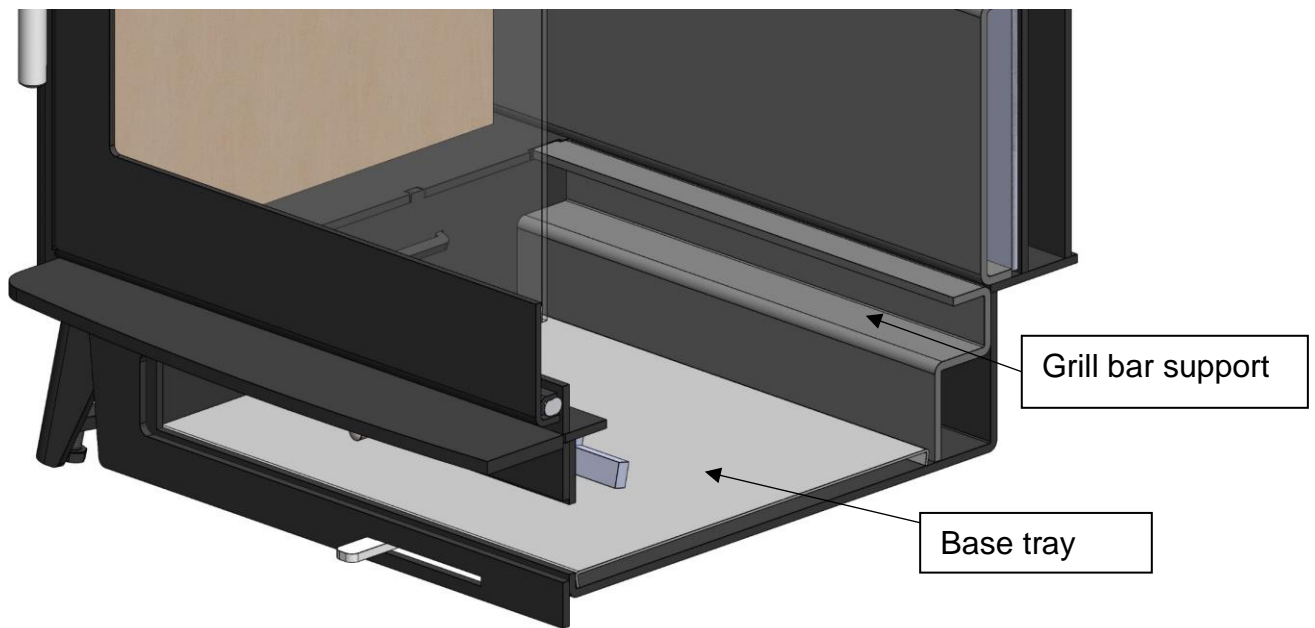
The stove should be located on the hearth with sufficient space behind the stove to allow connection of the flow and return pipes. Depending on the elbows used, 75mm should be adequate to do this. It is best to pre-make the connecting pipe runs prior to final positioning.

The stove should be levelled with the adjustable feet on each leg. These should spin down by hand and can be finally positioned with an open-ended spanner.

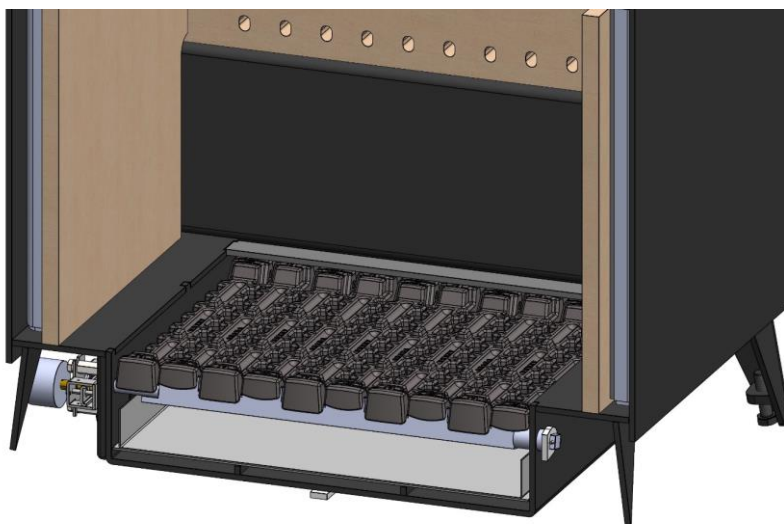
The connecting 6" flue pipe should be connected with a shouldered male spigot downwards into the flue outlet and sealed with fire cement and glass fibre tape. A cleaning door is recommended to allow sweeping of the flue with a conventional brush as this cannot be done through the stove.

Re-assembly of the Stove

Ensure both the base tray and grill bar support are fitted. The grill bar support locates in two slots in the base of the stove and two upper cutouts.

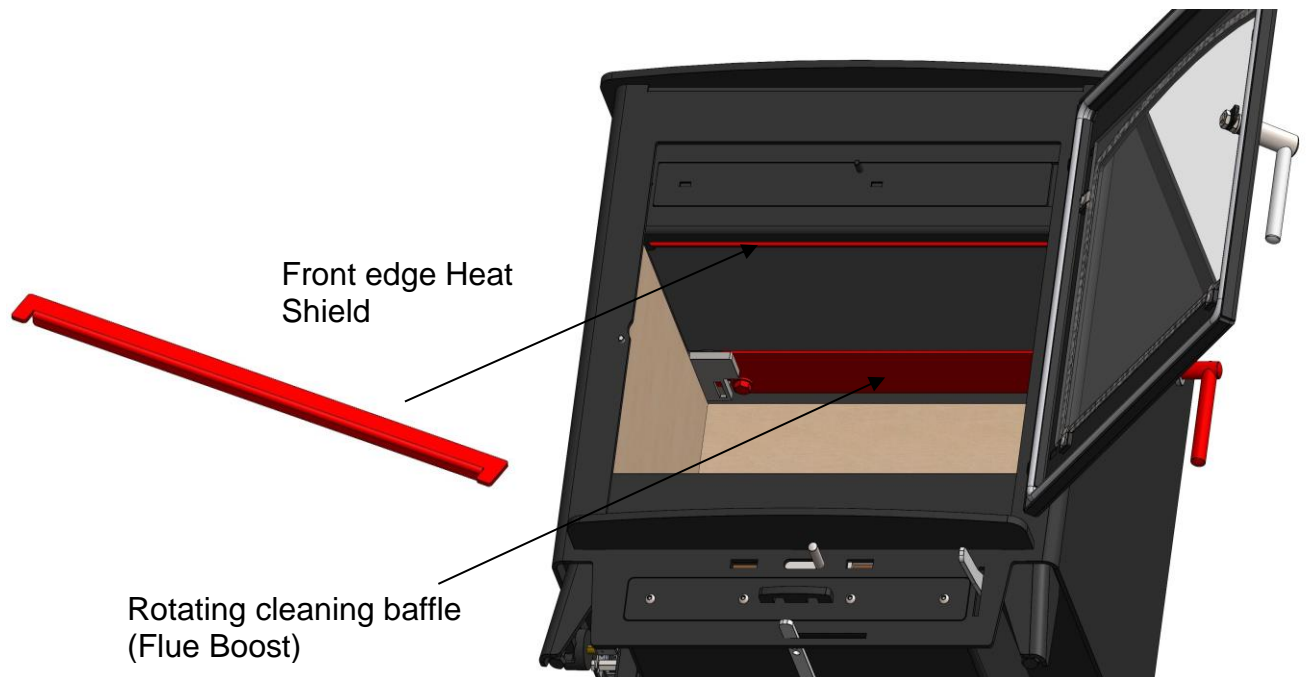


Refit the 10 grate bars alternatively positioned with the heavy end in the recesses on the rocker bar and the light end on the “turrets” of the rocker bar. Check that alternate bars move backwards and forwards freely when the riddling lever is operated.

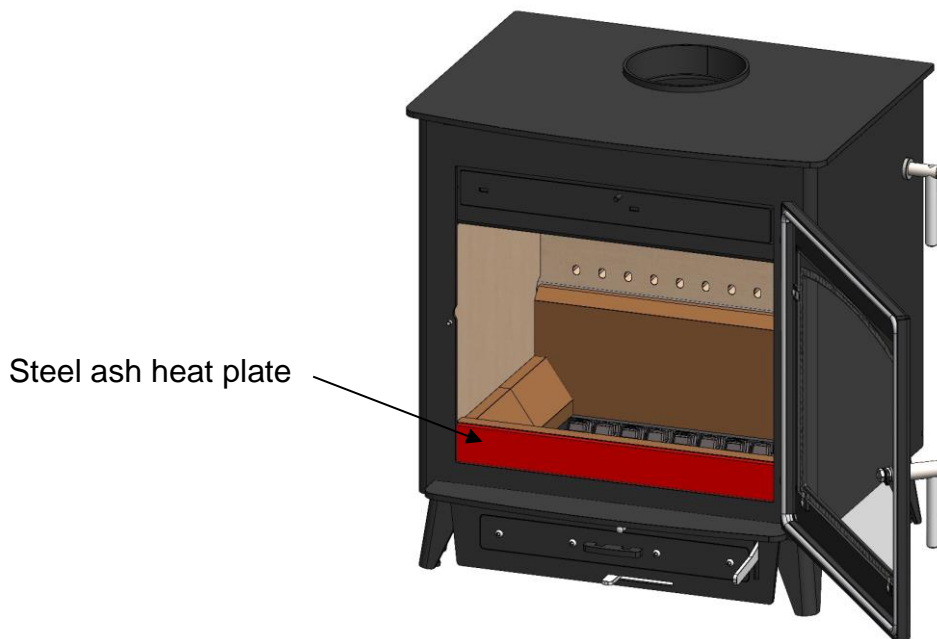


If the side and rear chamber lining panels have been removed, fit the rear lining panel first above the rear boiler panel at the rear of the firebox so the holes line up with the tertiary air holes in the steel rear panel. Fit each side panel with the located at the bottom rear of each side.

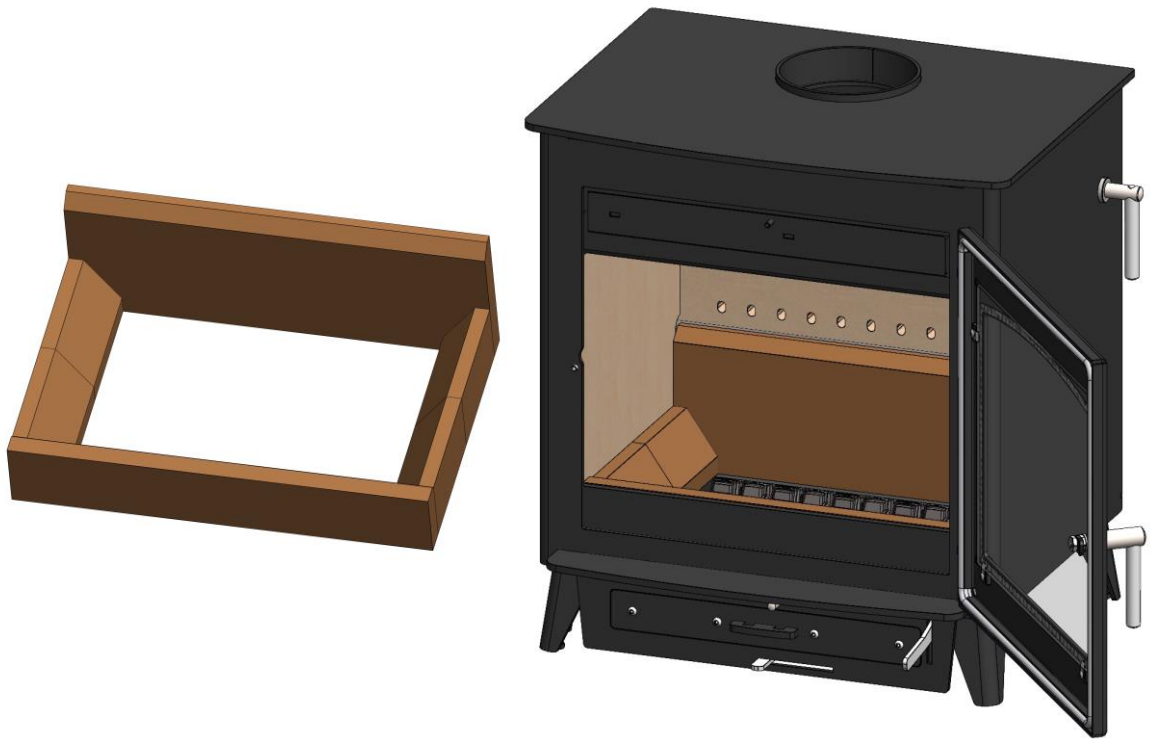
The steel cleaning baffle should be refitted by gripping the peg and positioning one end of the baffle above the rear of the side panel and rotating the other end backwards over the opposite side panel. Both ends should then be pushed fully backwards to securely locate on the steel retaining lugs. The front austenitic stainless steel heat shield should also be refitted to the inside of the top edge of the door opening and located into the two slots on the front frame, one at either end.



Fit the rectangular steel ash heat plate, this is held in place by the side firebox lining panels and can be removed or refitted by lifting the right-hand side until it is released from behind the side-lining panels.



Next fit the large hard refractory ceramic rear panel over the boiler in the back of the fire box. Next fit the four hard refractory firebricks should be positioned in the grate area, two each side as shown below. This is important as these protect the steel base of the stove around the ashpit from the high temperatures generated when burning solid fuel.



Finally fit the lower full width hard refractory front ceramic brick at the front of the firebox, between the steel ash retaining plate and the side bricks.

Check the ashpan is securely located in the aperture to prevent air leakage.



Commissioning

Commissioning checks should be carried out in line with the guidance of the relevant competent persons scheme and their commissioning check list form filled in. The checks should include flue pull, heating system performance and any thermostat settings. This will involve running the system until equilibrium is achieved and ensuring that operation is satisfactory. Check and bleed radiators and make sure they are correctly balanced.

Ensure that a CO alarm is supplied and correctly positioned and fitted, and that a fireguard conforming to BS 8423:2010+A1:2016 is used if children or old or infirm people are present.

Explain the operation of the controls to the customer and explain usage of the stove gloves supplied when operating the stove as all parts get hot during use.

Make sure the installation is registered with the relevant competent persons scheme and a certificate of compliance is generated.

Using the Stove

Basic Operation of an Si 20 Boiler Stove

- When burning solid fuel, both manual air controls are utilised along with the thermostat. The top control located below the ash lip of the stove controls primary air and moves from left (minimum) to right (maximum). This controls the air flowing up through the grate underneath the fuel bed. The lower control located below the ash pit door of the stove controls secondary and tertiary air which flows in through holes in the rear firebrick and down the door glass to provide a super-heated air wash to keep the glass clear. On solid fuel operation some staining of the glass can occur with certain fuels. This can be minimised by keeping the burn rate brisk and not fully closing the lower control lever. This control also moves from left (minimum) to right (maximum). The thermostat is located on the lower left-hand side

of the stove behind the left-hand front leg. The control is operated by turning the knob clockwise from 0 to 8. 8 is the maximum heat position and can be used when lighting the stove to provide maximum primary air flow up through the grate. When the fire is established, the control can be turned to give the desired level of output and the thermostat air damper flap will open and close to help maintain a constant water temperature as the heat load varies. Normal running is usually between 3 and 6 on the scale however this will vary depending on the size of the heating system and the level of heat required.

- Depending on the make and type of smokeless fuel, ash will accumulate in the ash pan at varying rates and so the ash pan will need checking and emptying regularly and always before the stove is lit. Ash must not be allowed to build up under the grate bars as this will cause them to overheat. To remove accumulated ash, slide open the ash pan with the tool provided. If the stove is hot the stove gloves must be worn. The ash should be immediately transferred to an enclosed steel container and left outside to cool. The ash pan must be immediately refitted and closed, making sure the closure panel is fully seated. This is important to prevent overheating.

Lighting the Stove

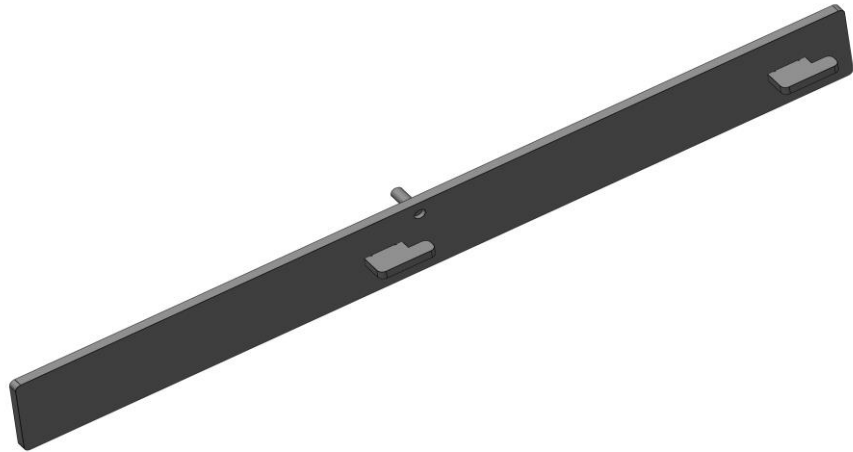
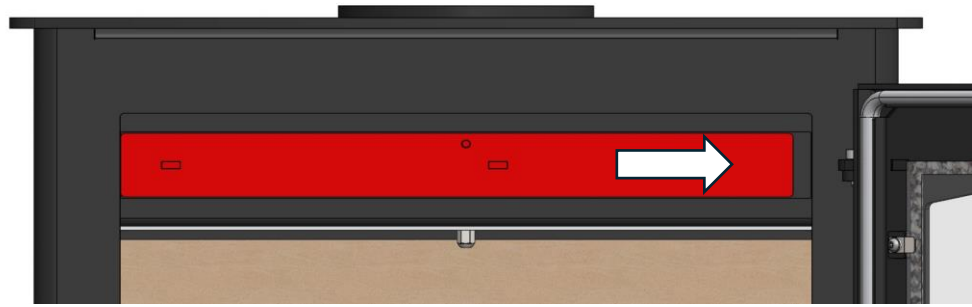
- With a boiler stove it is essential to light it in a way which heats up the flue and boiler as fast as possible to reduce condensation. **Some condensation can form and drip in to the firebox when lighting from a cold start. This is normal with any boiler stove and is not a water leak.** This is best carried out with quality fire lighters and plenty of dry kindling. Plenty of dry kindling will heat up fast and warm the flue. When lighting the control lever(s) should be fully open to the left.
- Initially place a small amount of the chosen fuel in with the kindling and build it up gradually as it becomes established to avoid smothering the kindling.
- A boiler stove is best run with a hot fire to avoid excessive chilling by the boiler. Low or slumbering fires will result in more rapid clogging of the tubes, particularly with wood.

Refuelling flue boost

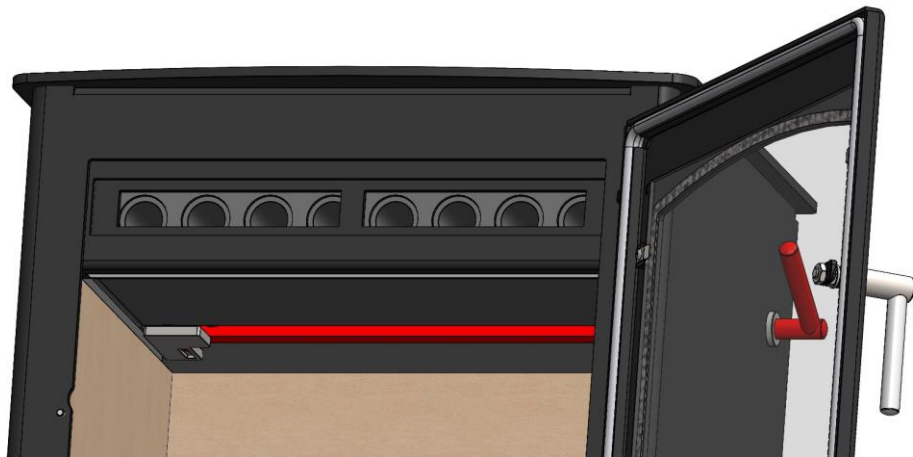
Open the flue boost by rotating the handle clockwise on the right side of the stove. This will help prevent smoke entering room when the door is open, by temporarily increasing the vacuum within the stove box. After closing the door, close the flue boost by fully rotating anti clockwise, to maintain efficiency.

Boiler and Tube Cleaning

- **As with any solid fuel boiler appliance it is essential that boiler and tubes are regularly checked and cleaned at least once a week.** This is essential for safe operation as blocked tubes or flues will cause flue products to leak out into the room. It will also maintain the efficiency of the stove. The tubes can easily be inspected and by sliding the boiler cover to the left and pulling forwards and away.



- Cleaning of the tubes can be carried out quickly and simply through the slots.

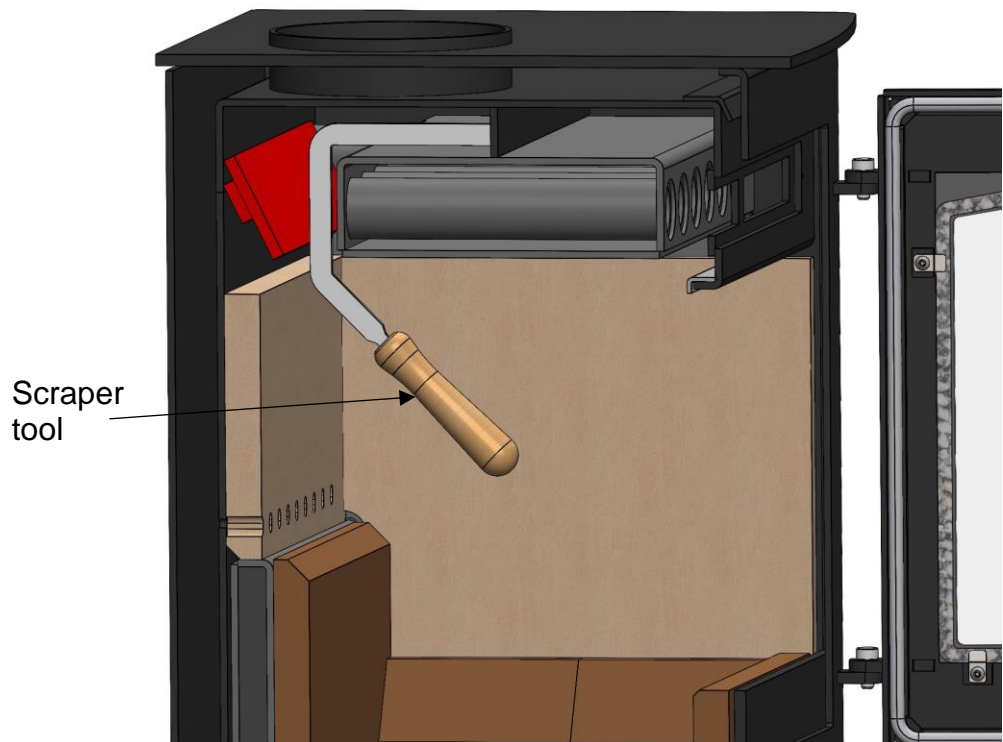


To clean the tubes the door should be opened. The flue boost baffle at the top rear of the firebox should be opened fully, by rotating the handle clockwise on the right side of the stove.

This will allow cleaning debris from the tubes to drop down onto the grate and removed.

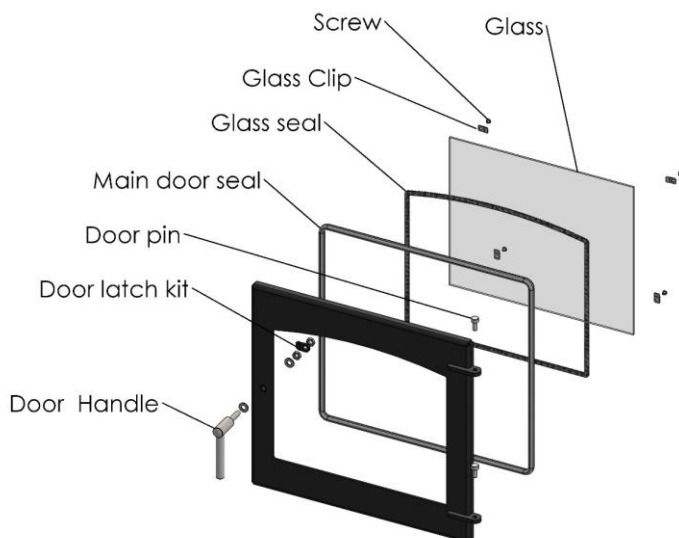
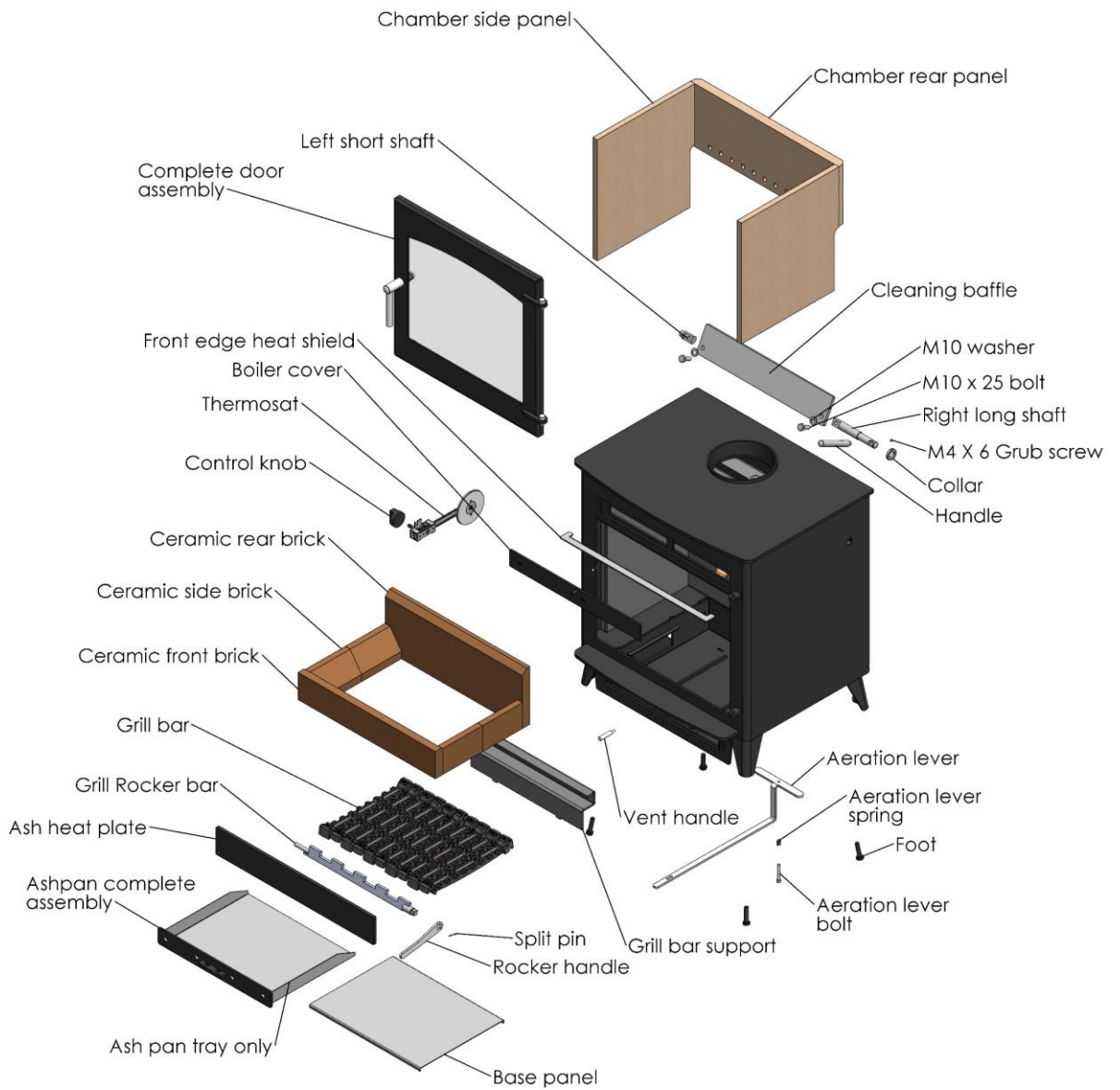
- Once the baffle is in the open position, the 8 tubes can be cleaned by pushing the wire tube cleaner into each tube in turn. The tube cleaner should be used to scrub the inside of the tube until it is clean. Regular cleaning makes this a quick and easy operation.

- Following cleaning of the tubes, the “question mark” shaped scraper should be used to clean the rear and top of the tube heat exchanger by holding the wooden handle and turning the tool sideways so it can be passed up behind the tubes. It can then be turned so the handle is pointing forwards and the scraped from side to side to clean the top and rear surfaces of the boiler. This is important to maintain flue operation and efficiency. The flat top edge of the tool can also be used to scrape the underside of the boiler to help maintain heat transfer.



- Once cleaning is completed, **the baffle plate should be rotated back to the closed position.** Failure to do this will result in loss of efficiency as hot gases will leak up behind the tubes instead of being drawn through them.
- Refit the boiler cover, slide it to the left so its located in the hooks.
- Any accumulated debris from cleaning can be riddled through the grate and emptied out of the ashpan before relighting the stove.
- For sweeping the flue the stove should be carried out via a cleaning door in the stove pipe. It is important that the area below the flue outlet is thoroughly cleaned with the “question mark” cleaning tool after sweeping.

Parts Diagram



Accessories
Ashpan Handle
Gloves
Scraper tool
Tube brush

Our spare parts distributors are Fire Spares Ltd and parts can be obtained from them at:

Fire Spares Ltd,
Unit 5 Wharncliffe Business Park
Middlewoods Way,
Carlton,
Barnsley,
S71 3HR
Phone: 01226 715 100
Email: info@firespares.co.uk
Website: www.firespares.co.uk

The rating plate of the stove is located on the rear of the stove. A copy of the appliance rating plate is stuck in the quick start guide supplied with the stove. Please retain this guide as the rating plate enables correct identification of your stove.

Stove Performance Data

Model: Si 20 Boiler

Flue Type:	MSF
Nominal Heat Output (Total):	13 kW
Efficiency (Net):	88.6%
Energy Efficiency Class:	D
Mean Flue Gas Temperature:	158°C
Mean CO ₂ Emissions:	10.06%
Mean CO Emissions @13% O ₂ :	0.05%
Mean CH ₄ Emissions @13% O ₂ :	38mg/m _o ³
Mean NO _x Emissions @13% O ₂ :	133 mg/m _o ³
Dust Emissions @13% O ₂ :	8 mg/m _o ³
Recommended Flue Draught:	8 – 24 pa
Maximum Hearth Temperature:	>100K
Maximum Distance to Combustible Material	
Rear (with heat shield and twin wall flue adaptor):	75mm
Side:	100mm

Si 20 Installation and User Manual V.6

Stove Innovations Ltd,
Shaw Top Farm, Upper Hulme, Leek, ST13 8UQ,

Telephone 01782 914169 E-Mail: sistoves@outlook.com