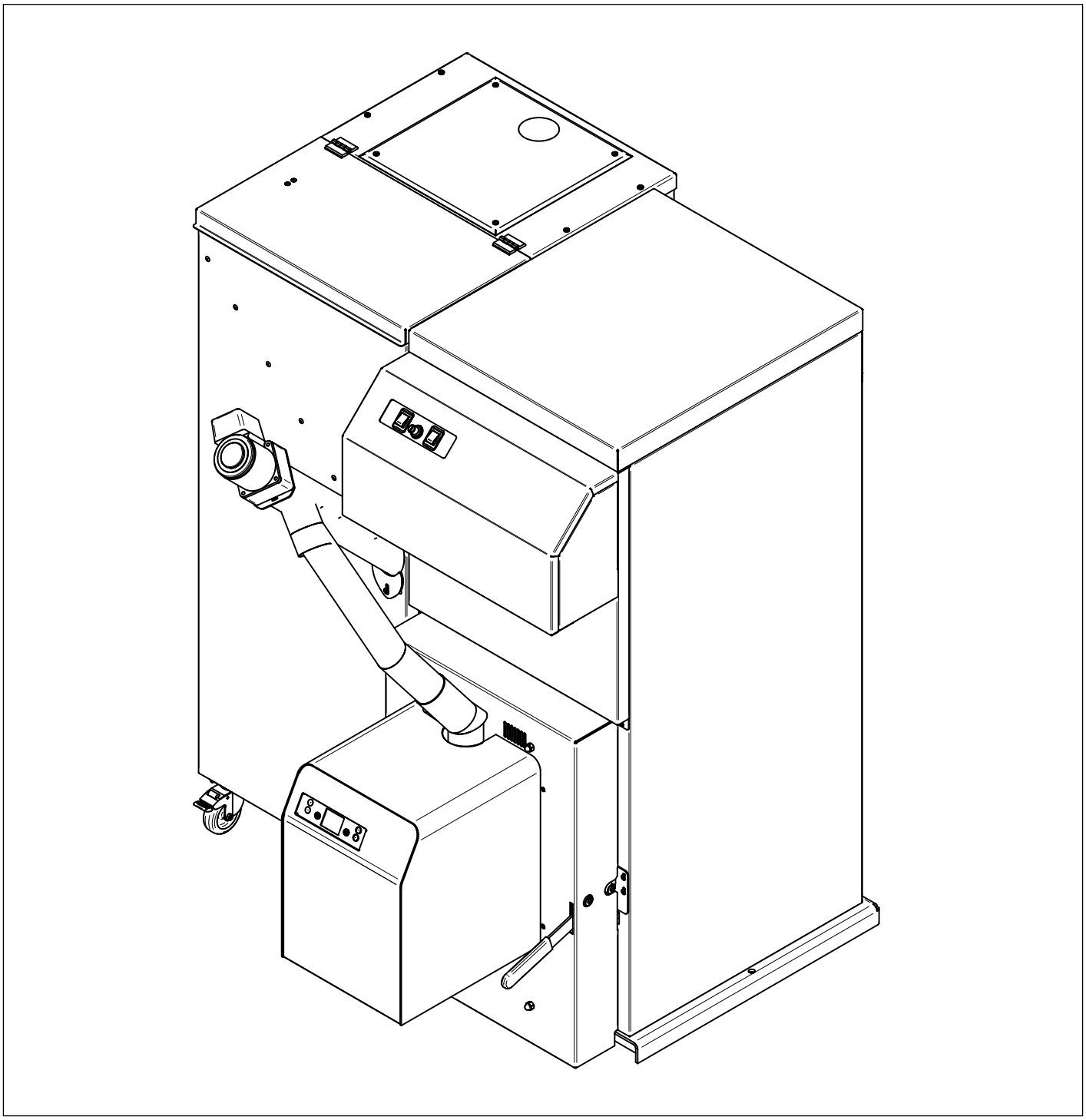
Grant Spira

5-18kW, 6-26kW and 9-36kW Condensing Wood Pellet Boiler

User, Installation and Servicing Instructions



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Important Note

Important Note for Installers

After installing the boiler leave these instructions with the appliance.
This appliance is deemed a controlled service and specific regional statutory requirements may be applicable.

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This manual is accurate at the date of printing but will be superseded and should be disregarded if specifications and/or appearances are changed in the interests of continued product improvement.
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User Instructions - contents

For the Installation and Servicing Instructions, please refer to page 20.

1	**Introduction**	**4**
2	**About your Boiler**	**4**
2.1	General	4
2.2	Pellet Hoppers	4
2.3	Bulk Pellet Stores	4
2.4	Boiler Operation	5
2.5	Cleaning	5
3	**About your Fuel**	**5**
4	**Boiler Controls**	**7**
4.1	Boiler Control Panel	7
5	**Burner Control Panel**	**8**
5.1	Burner Control Panel	8
5.2	Error Messages	9
5.3	Service Indicator	9
5.4	Active Symbols	9
6	**Pellet Feed Thermostat**	**10**
7	**Priming the Auger**	**10**
8	**Lighting the Boiler**	**11**
9	**If you Boiler Fails to Light**	**12**
10	**Emptying the Ash Pan**	**14**
11	**Cleaning and Servicing your Boiler**	**16**
12	**Ventilation**	**16**
13	**Electricity Supply**	**16**
14	**Sealed Central Heating system**	**16**
15	**Frost Protection**	**17**
16	**Corrosion and Protection**	**17**
17	**Service Log**	**18**

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

1 Introduction

This guide is intended to assist and instruct the user in the operation of the Grant Spira Condensing Wood Pellet Boiler.

A separate manual is available to the installer for the installation, servicing and commissioning of the boiler.

The following special text formats are used in this manual for the purposes listed below:

WARNING
Warning of possible human injury as a consequence of not following the instructions in the 'Warning'.

CAUTION
Caution concerning likely damage to equipment or tools as a consequence of not following the instructions in the 'Caution'.

NOTE
Note text. Used for emphasis or information not directly concerned with the surrounding text but of importance to the reader.

2 About your Boiler

2.1 General

Your Grant Spira wood pellet boiler should only be installed, commissioned and serviced by a Grant Accredited Installer who has undergone specific product training by Grant Engineering (UK) Ltd.

If you have a Grant Spira 5-18, 6-26 or 9-36, your boiler basically consists of two parts:

- The boiler itself, with the burner mounted on the front
- The pellet hopper, with the pellet feed auger protruding from the front of the hopper casing

The hopper may be either a 110kg or 200kg capacity unit and will be located on either the left or right hand side of the boiler.

Check with your installer for the actual capacity of pellet hopper you have with your boiler.

Alternatively, if you have a Grant Spira 11-44, 12-52, 15-62 or 18-72, your boiler will basically consist of three parts:

- Two boilers, each with the burner mounted on the front
- The pellet hopper, with two pellet feed augers protruding from the front of the hopper casing

In this case the hopper will have a 140kg capacity and will be located between the two boilers.

CAUTION
All Grant Spira boilers and pellet hoppers are designed for indoor use only and MUST be positioned in a dry environment.

2.2 Pellet Hoppers

The pellet hopper is mounted on castors (with the front castors lockable) to allow it to be easily moved when required. Allow sufficient area in front of the hopper for it to be moved out and away from the boiler(s) for servicing.

The electrical connections to the boiler(s) are all made to the 4-way electrical plug on one of the three factory-fitted 'flying leads' at the rear of the pellet hopper.

All Grant pellet hoppers are fitted with a contents switch. Refer to Figure 2-1.

This automatically detects when the level of pellets in the hopper falls to a pre-set minimum value.

The minimum quantity of pellets required to restart the boiler is 20kg for the single boiler hoppers and 30kg for the double boiler hoppers.

If you have a bulk pellet store (refer to Section 2.3), the contents switch automatically triggers the operation of either the bulk store auger or Grant SpiraVAC system, whichever is fitted, to deliver pellets from the bulk pellet store into the pellet hopper beside the boiler.

When there is no bulk store (but the pellet hopper only), the contents switch stops the burner operating when the minimum pellet level is reached. In this case, topping up the hopper with more pellets will automatically operate the contents switch and the burner will restart, as long as there is a demand from the heating controls (room thermostat, etc.) for the boiler to run.

Figure 2-1: Contents switch in the base of the pellet hopper

CAUTION
Always ensure that the door on the top of the pellet hopper is closed after filling to ensure no foreign debris enters the hopper. The hopper should only be filled to the point where it is still possible to close the top door.

2.3 Bulk Pellet Stores

You may also have a bulk pellet store, located either inside or outside the building. If so, check with you installer for the capacity of the bulk pellet store.

If you have a bulk pellet store you will have either a bulk store auger, or a Grant SpiraVAC vacuum system, to move the pellets from the bulk store to the pellet hopper as and when required. Check with your installer regarding which system you have fitted. If you have the Grant SpiraVAC system, please refer to the instructions provided with that system for details of its operation.

NOTE
If you have a bulk pellet store it is essential that you routinely check the level of pellets in the store and arrange for a delivery of pellets before the store is empty.

Where a bulk store is fitted; if the bulk store and pellet hopper are both allowed to run out of pellets then the error message 'FAILED

PELLET LIGHTING' will be displayed on the burner control panel screen. Once the bulk store has been refilled with pellets, the bulk store auger (if fitted) will need to be re-primed before the pellet hopper is automatically filled from the bulk store.

If a Grant SpiraVAC vacuum system is fitted refer to the Instructions supplied with the system to restart the pellet supply to the pellet hopper.

Once the pellet hopper is filled, the pellet hopper auger will also need to be re-primed. Refer to Section 7 of these instructions.

Once this has been done press the reset button on the burner control panel to cancel the error message and restart the boiler.

2.4 Boiler Operation

During the combustion process, hydrogen and oxygen combine to produce heat and water vapour. The water vapour produced is in the form of superheated steam that contains heat that is locked up in the flue gases. A conventional boiler cannot recover any of this heat and this energy is lost to the atmosphere through the flue.

Your Grant Spira condensing wood pellet boiler contains an extra (secondary) heat exchanger which is designed to recover much of the heat normally lost by a conventional boiler through the flue system. It does this by cooling the flue gases and extracting more heat from them, pre-heating the cooler water returning to the boiler from your heating system.

Even when not operating in a condensing mode, this additional heat exchanger ensures that your Grant Spira boiler will still operate at an extremely high efficiency.

The burner output is determined by the delivery rate of the pellets via the pellet feed auger (on the pellet hopper). This is automatically controlled by the burner control system. During commissioning the burner control parameters should have been checked and adjusted as necessary by your Installer.

WARNING

Do not adjust or modify the appliance in any way as to do so could cause malfunction of the appliance, injury to persons or death or result in a potential fire hazard.

Only an Grant trained installer, who has completed the Grant training course, should carry out any work on the appliance.

Once commissioned by a Grant trained installer, your Grant Spira boiler will operate automatically to provide heating and domestic hot water (if you have a hot water cylinder fitted), as long as:

- There are sufficient pellets of the correct type in the pellet hopper. Refer to Section 3.
- The pellet auger is fully primed. Refer to Section 7.
- The heating system controls are set to ON and 'calling', i.e. the programmer and room thermostat are on.
- The burner ON/STANDBY switch on the boiler control panel is set to ON. Refer to Section 4.

If your appliance is controlled by a remote programmer and/or a room thermostat, it will provide heating and (when fitted) hot water during the ON periods as set on the programmer, when either the room thermostat and/ or the hot water cylinder thermostat are 'calling'.

WARNING

Always ensure the front access door of the combustion chamber is fully closed and latched during operation.

Certain external surfaces of the boiler will be hot to touch when in operation, due care is needed.

2.5 Cleaning

The burner incorporates a brazier, located within the boiler combustion chamber, where the combustion of the wood pellets takes place. This brazier is fitted with a self-cleaning system to prevent a build-up of ash and clinker. This operates automatically after a pre-set period has elapsed.

The boiler has two heat exchangers, the primary and secondary (condensing), and each is fitted with a self-cleaning system to keep the heat exchanger tubes clear of ash build-up. As with the brazier cleaning system, these are operated automatically after a pre-set period has elapsed.

CAUTION

Even with the automatic cleaning systems, it is vitally important that the boiler ash pan is regularly emptied and the boiler regularly serviced. Refer to Sections 10 and 11 of these instructions for further information on the cleaning and servicing of your boiler.

3 About your Fuel

You Grant Spira boiler is designed to run only on 6mm diameter EN Plus Grade A1 wood pellets (conforming to EN14961-2).

Under no circumstances should any other form of biomass fuel be used with this boiler.

WARNING

ONLY EN Plus Grade A1 (EN14961-2) wood pellets MUST be used with your Grant Spira boiler. These pellets must be bark and sand free AND previously tested by Grant BEFORE being used in your Spira boiler.

Failure to use pellets that meet the conditions above will invalidate the product guarantee. If you are in any doubt over which pellets are suitable please contact Grant for assistance.

For your guidance, below are examples of both the correct grade of pellets to be used and poor quality pellets that must not be used in your Grant Spira boiler.

Meets EN Plus Grade A1.

Correct diameter and length with no dust and minimum bark content.

Figure 3-1: Correct grade of pellets

Pellets not pressed correctly causing them to easily disintegrate.

DO NOT USE!

The auger will be unable to consistently deliver these pellets from the hopper to the burner, resulting in pellet lighting problems.

Figure 3-2: Poor quality pellets

Too much bark content.

DO NOT USE!

These will cause excessive sand in the ash resulting in clinker blocking air holes, poor combustion and jamming of the brazier cleaning system.

Figure 3-3: Pellets too dark in colour

DO NOT USE!

The auger will not be able deliver these pellets at the correct rate to the burner, affecting the input (and output) of the boiler and the combustion.

Figure 3-4: Pellets too short in length

DO NOT USE!

The auger will not be able deliver these pellets from the hopper to the burner, resulting in pellet lighting problems.

Figure 3-5: Pellets with high dust content

Step 7

Disconnect the two plugs from each other and the auger will stop.

Refit the pellet delivery hose onto the pellet feed tube of the burner.

WARNING

Ensure that the pellet delivery hose forms an air tight seal each end and that the hose is not damaged. Leakage of air could cause increased temperature in the pellet delivery hose and result in the pellet feed tube thermostat shutting down the burner.

Step 8

Re-fit both the 6-way and then 7-way plugs to their corresponding sockets on the left side of the burner. Ensure that both plugs are fully pushed home until the small catch on each plug clicks into place.

Step 9

Make sure that the boiler pellet hopper is correctly located against the side of the boiler with the front edge aligned with the top front edge of the boiler. Refer to Figure 7-5.

Step 10

Finally, set the burner ON/STANDBY switch to the ON position.

Figure 7-3: Pellet tube ready for priming the pellet auger

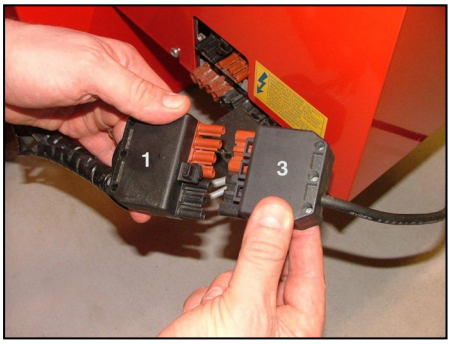

Figure 7-4: Connect plugs together

Figure 7-5: Correct alignment of hopper to boiler.

8 Lighting your Boiler

To start your boiler:

- First ensure that the electrical supply to the hopper and boiler is switched on.
- Check that the heating system controls are operating and are 'calling' for heat. There should be a cursor next to the 'Heating Demand' symbol on the burner display. Refer to Section 5.4 – Active Symbols.
- Set the burner ON/STANDBY switch to ON. The flue fan will start and pellets will be delivered to the burner for it to start.

NOTE

If the burner ON/STANDBY switch is switched to STANDBY at this stage the pellet feed will continue, and then the burner will go through the 'WAIT BOILER LIGHTING' phase and light.

It will then immediately go to 'TURNING OFF BRAZIER' followed by 'WAIT POST PURGE' and then stop.

This process will take several minutes to complete before the boiler can be re-started.

- The flue fan will start and pellets will be delivered to the burner. The boiler will now light automatically after a short ignition period.
- Set the heating (CH) and hot water (HW) functions on your programmer to 'Timed'. The boiler will now operate during the 'on' periods set on the programmer.

CAUTION

Do not repeatedly switch the ON/STANDBY switch on and off the burner at this stage, as a build-up of pellets in the brazier will occur resulting in poor combustion during lighting.

9 If your Boiler Fails to Light

If you experience a problem with your boiler, it may be due to something quite simple and by making a few checks you can quickly rectify it for yourself. If your boiler fails to light, please follow the procedure given below, starting with STEP 1:

STEP 1	Is the burner control panel display blank? NO - go to STEP 2 YES – Check the following: • Is the electrical supply to boiler and heating system controls switched on at fused spur? • Has the fuse in the fused spur blown? • Are all the plugs at the rear of the hopper, the rear of the boiler and the side of the burner fitted correctly? • Is the combustion chamber door closed and the catch fully engaged? • Has the boiler overheat thermostat tripped? Remove cap to check. If yes, press the reset button. Refer to Section 4. If this does not rectify the problem, contact your Installer. • Has the pellet feed tube thermostat tripped? Reset the thermostat. Refer to Section 6 – Pellet Feed Tube Thermostat for details. If this does not rectify the problem, contact your Installer. If, after checking the above, there is still a problem then contact your Installer for assistance.
STEP 2	Is one of the four ERROR MESSAGES scrolling across the bottom of the burner control panel display? YES – go to STEP 4 NO – go to STEP 3
STEP 3	Is there a cursor next to the 'Heating Demand' symbol on the burner display? YES – Check the temperatures on the burner display. • Is the H2O value on the display higher than the set point temperature value plus 5°C. If so, there is NO fault but the boiler is waiting for the system temperature to drop before firing again. NO – Check the following: • Is the burner STANDBY/ON switch set to the ON position? If not, then set it to ON. • Is there a sufficient quantity of pellets in the pellet hopper? If not, top up the hopper with pellets. • Are the heating system controls (programmer, room thermostat, etc.) 'calling' for heat? If not, set controls to call for heat. If, after checking the above, there is still a problem then contact your Installer for assistance.
STEP 4	Which one of the four ERROR MESSAGES is scrolling across the bottom of the burner control panel display? • FAILED PELLET LIGHTING – go to STEP 5 • SERVO MOTOR BLOCKED – go to STEP 6 • PROBE FAULT – go to STEP 7 • AIR PRESSURE ERROR – go to STEP 8

STEP 5	FAILED PELLET LIGHTING is scrolling across the bottom of the burner control panel display. Check the following: • Is there a sufficient quantity of pellets in the pellet hopper? If not, top up the hopper. • Is the pellet auger fully primed? If not, prime the auger. Refer to Section 7. • If there is a bulk pellet store, Are there pellets in the bulk store? Refer to Section 2 – Bulk pellet stores. • Is the bulk store auger (if fitted) fully primed? Refer to Section 2 – Bulk pellet stores. • If a Grant SpiraVAC vacuum system is fitted, is it delivering pellets to the pellet hopper? Refer to Instructions supplied with the SpiraVAC system. • Are pellets being delivered to the burner by the pellet hopper auger? If not, check the following: a) Is the auger rotating? If not, check if the auger power supply lead is correctly plugged in to the burner. If it is still not rotating then contact your Installer. b) Is there a build-up of dust in the bottom of the hopper? If so, this dust MUST be removed from the hopper and auger, and the auger then must be re-primed. Refer to Section 7. **NOTE** Pellets that contain an excessive amount of dust will prevent the auger from pulling the pellets out of the hopper. The hopper will need to be cleaned of any dust. • With the burner STANDBY/ON switch set to the STANDBY position, remove the pellet feed tube from the burner and open the combustion chamber door. • Is the brazier blocked with ash/clinker? If yes, is the correct grade of pellets being used? If not, empty the hopper and refill with correct grade of pellet. If, after checking the above, there is still a problem then contact your Installer for assistance.
STEP 6	SERVO MOTOR BLOCKED is scrolling across the bottom of the burner control panel display. Check the following: • With the burner STANDBY/ON switch set to the STANDBY position, remove the pellet feed tube from the burner and open the combustion chamber door. • Is the brazier blocked with ash/clinker? If yes, remove the blockage and close the combustion chamber door. Reset the STANDBY/ON switch to ON and wait for the cleaning process to be completed. If, after checking the above, there is still a problem then contact your Installer for assistance.
STEP 7	PROBE FAULT is scrolling across the bottom of the burner control panel display. Check the following: • Are the three plugs correctly fitted to the left side of the burner? • Press the RESET button on burner control panel to clear error message. If, after checking the above, there is still a problem then contact your Installer for assistance.
STEP 8	AIR PRESSURE ERROR is scrolling across the bottom of the burner control panel display. Check the following: • Press the RESET button on the burner control panel to clear error message. If there is still a problem then contact your Installer for assistance.

WARNING
Do not under any circumstances enter a bulk pellet store or pellet hopper that has been in operation as there may be a build-up of fumes within the enclosure if the boiler has malfunctioned.

10 Emptying the Ash Pan

It is essential that the ash pan (located inside the boiler combustion chamber) is periodically emptied.

This simple task must be carried out by the user at MONTHLY intervals for the FIRST THREE MONTHS after the boiler is installed.

After that the ash pan should be emptied regularly, on at least a MONTHLY basis, or as indicated by the amount of ash found during the first three months.

NOTE
The amount of ash produced varies between the different pellet brands and this will affect the frequency of cleaning and maintenance required.

To remove and empty the ash pan you will need the following items (supplied with the boiler):

- The removable door handle – to open the combustion chamber door. Refer to Figure 10-1.
- The ash pan carrying handles – to remove and carry the ash pan when hot. Refer to Figure 10-2.

To remove and empty the ash, follow the procedure below:

Step 1
Set the burner STANDBY/ON switch to 'STANDBY'.

Step 2
If the boiler is running at the time, wait for it to complete the burner shut-down sequence, i.e. until the burner control panel display screen reads 'WAIT PELLET THERMOSTAT'.

WARNING
After the burner has been switched off (either manually using the burner ON/STANDBY switch on the control panel, automatically by the boiler temperature control, or the heating system controls) the burner needs to burn-down the remaining pellets in the brazier.

Do not AT ANY TIME open the front combustion chamber access door until the burner display reads "WAIT BOILER THERMOSTAT"

Step 3
Allow the burner to cool down, for a period of at least 30 minutes.

Step 4
Disconnect the pellet delivery hose from the pellet feed tube on the burner. Refer to Figure 10-3.

Step 5
Fit the removable door handle into the slot in the door catch. Refer to Figure 10-4.

Figure 10-1: Removable door handle

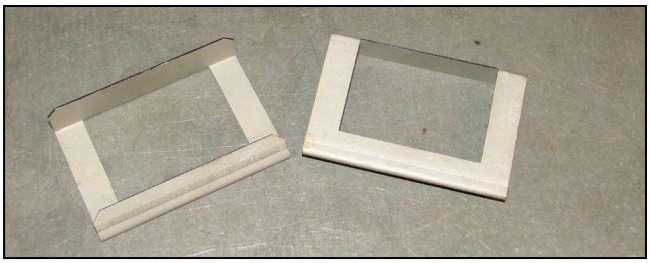

Figure 10-2: Carrying handles

Figure 10-3: Disconnect pellet hose from burner

Figure 10-4: Fitting the removable door handle

Step 6
Lift the handle to disengage the catch and fully open the combustion chamber door. Refer to Figure 10-5.

WARNING
The interlock on the combustion chamber door automatically disconnects the power supply to the burner if the door is opened.

IT DOES NOT IMMEDIATELY EXTINGUISH THE BURNER FLAME.

If the burner door is opened during the operation of the burner there can be a large uncontrollable flame from the brazier.

Step 7
Hook one of the two carrying handles (supplied with the boiler) under the front edge of the ash pan and carefully pull the ash pan forward by about 300mm (12inches). Refer to Figure 10-6.

Figure 10-5: Opening combustion chamber door

Step 8
Brush/scrape any ash resting on the burner into the ash pan below.

Step 9
Using both of the carrying handles, one at the front and the other at the back, carefully lift the ash pan out of the boiler. Refer to Figure 10-7.

Do NOT use the centre cross bar of the ash pan as a carrying handle.

Figure 10-6: Removal of ash pan from boiler

Step 10
Safely dispose of the ash.

WARNING
Extreme care is required when emptying the ash pan as smouldering ash could be present and can cause serious damage to persons or property.
Ensure the ash is disposed of in a safe manner.

Step 11
Remove any remaining ash that may be left in the base of the boiler before putting the ash pan back into the combustion chamber.

Step 12
Close the combustion chamber door and ensure that the door catch is fully engaged.
Remove the door handle and keep in a safe place for future use, along with the carrying handles.

Figure 10-7: Lifting ash pan using carrying handles

11 Cleaning and Servicing your Boiler

The boiler MUST be serviced either ANNUALLY or when a service is indicated on the burner control panel display, whichever comes FIRST. Refer to Section 5.

Servicing should only be carried out by a Grant trained installer or Grant service engineer, and details of each service should be recorded in the Service Log in Section 17 of these User Instructions.

CAUTION
Failure to regularly service the boiler will invalidate the terms of the Grant product guarantee.

Failure to maintain a clean flue may result in the release of flue gases into the dwelling or damage from potential fire in the flue. It is therefore essential that your flue is inspected annually and cleaned as necessary by either a Grant trained installer or a suitably qualified chimney sweep.

12 Ventilation

As an 'open flued' appliance, your Grant Spira boiler draws the air it requires for combustion from the room in which it is located. In turn, this air comes from outside via a permanently open air vent (or vents) correctly sized to meet the air requirements of your boiler.

WARNING
Any permanently open combustion air vents in the room containing the boiler MUST NOT be blocked off or obstructed in any way. Do not attempt to 'box in' the boiler, or build a compartment around it, without contacting your installer first for guidance.

Do NOT place any combustible material against, around or on the boiler or flue pipe.

Current Building Regulations require that a Carbon Monoxide alarm (conforming to BS EN 50291:2001) must be fitted in the room where the boiler is located.

This should be positioned between 1 and 3metres horizontally from the boiler either:

a) On the ceiling, at least 300mm from any wall
   or
b) On a wall as high up as possible (above any windows or doors) at least 150mm from the ceiling.

13 Electricity Supply

If the electricity supply fails, the boiler will cease to operate. It should automatically relight when the electrical supply is restored. However, it may first burn off any smouldering pellets still present in the brazier before starting the lighting sequence again.

If a remote programmer is connected to your boiler, it may have a 'battery back-up' of some kind that will retain the on/off time settings you previously entered. It may also resume operation with the correct time of day and thus require no re-setting of time and on/off settings when the supply is restored. Refer to the instructions supplied with your programmer for further details. It is recommended that you check that the on/off and time settings after a power failure has occurred.

WARNING
The electricity connections to the boiler must be earthed.

14 Sealed Heating System

If your boiler is operating on a sealed heating system, the installer will have adjusted the pressure in the system and should have told you (or set it on the pressure gauge) the system pressure when cold. This is normally between 0.5 and 1.0 bar, which will increase slightly when hot. If the pressure (when cold) is below the set pressure mentioned above, you can re-pressurize the system. If this is frequently required, ask your Installer or service engineer to check the heating system for leaks and to check the expansion vessel air charge.

The boiler or system will be fitted with an automatic air vent to remove any air from the system. Any trapped air in the radiators should be removed by venting the radiators using the vent screw at the top of each radiator. Only vent a radiator if the top is cool and the bottom is hot.

Excessive venting will reduce the system pressure, so only vent when necessary and check the system pressure as mentioned above.

Re-pressurise the system as necessary.

The sealed system is fitted with a safety valve to release excess pressure from the system. If water or steam is emitted from the end of the safety valve discharge pipe, switch off the boiler and contact your Installer for assistance.

15 Frost Protection

Your installer may have fitted a frost thermostat. If not, and you are likely to be away for a short time, leave the boiler on with the room thermostat set at a low setting. For longer periods, the boiler should be turned off and the system drained down. Contact your Installer for draining and re-filling the system. Alternatively, a suitable anti-freeze may have been added to the heating system water. Check with your installer.

16 Corrosion Protection

In order to prevent corrosion within your heating system and boiler, your installer should have flushed the system and added a suitable corrosion inhibitor.

NOTE

The Grant Guarantee on the boiler shell (heat exchanger) requires that the heating system is flushed or chemically cleaned, following installation, and the required quantity of corrosion inhibitor is added to the heating system water.

Grant strongly recommends that an in-line magnetic filter (either a Grant Mag-One or equivalent*) is fitted in the heating system pipework.

This should be installed and regularly serviced in accordance with the filter manufacturer's instructions.

***The Grant Mag-One magnetic filter has a Gauss measurement of 12000.**

17 Service Log

	Service 1	Service 2	Service 3	Service 4	Service 5
Heating System					
System pressure – check/top up					
Pressure relief valve operation - check					
Expansion vessel charge pressure – check					
Magnetic filter – inspect/clean					
Corrosion inhibitor in system – check					
Flue System					
Flue terminal – check condition					
Flue system – check clean					
Draught stabilizer – check operation					
Smoke test (Smoke test II Part J. Section E15)					
Combustion ventilation – check					
Boiler					
Temperature probe – check					
Overheat thermostat – check					
Primary heat exchanger – inspect/clean					
Secondary heat exchanger – inspect/clean					
Wash system – inspect/clean					
Combustion chamber – inspect/clean					
Fan – inspect/clean					
Shaker mechanism - grease					
Shaker system – check operation					
Condensate trap – inspect/clean					
Condensate discharge pipe – inspect/clean					
Burner					
Brazier – dismantle/clean					
Photocell – inspect/clean					
Ignition element – inspect/clean					
Boiler settings – check					
Safety devices					
Hopper lid switch – check operation					
Combustion door switch – check operation					
Pellet Hopper					
Check for dust build-up					
Auger – check for blockages					
Combustion					
Combustion chamber draught – check/adjust					
Flue gas analysis – check/adjust					
Customer handover					
Service Date					
Service Company					
Signature					

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Installation and Servicing Instructions - contents

1 Introduction 21
- 1.1 How the Condensing Wood Pellet Boiler Operates 22
- 1.2 Boiler Description 22
- 1.3 Boiler Models 22
- 1.4 Boiler Components 23
- 1.5 Boiler Cleaning and Servicing 24
- 1.6 Removable Door Catch Handle 24

2 Technical data 25
- 2.1 Boiler and Hopper Technical Data 25
- 2.2 Boiler Input and Output Data 26
- 2.3 Flue Gas Analysis 26
- 2.4 Boiler and Hopper Dimensions and Clearances 27

3 Pellet Specification, Storage and Delivery 30
- 3.1 Pellet Specification 30
- 3.3 Biomass Suppliers List 30
- 3.2 Pellet Storage 31

4 Installation information 33
- 4.1 Introduction 33
- 4.2 Boiler Location 33
- 4.3 Preparation for Installation 33
- 4.4 Installing the Boiler 33
- 4.5 Regulations 33
- 4.6 Heating System Design Considerations 33
- 4.7 Pipework Materials 33
- 4.8 Pipe Connections 34
- 4.9 Wash System 34
- 4.10 Fan Box and Flue Starter 34
- 4.11 Pellet Feed Tube 35
- 4.12 Pellet Hoppers 36
- 4.13 Pellet Feed Auger 36
- 4.14 Before you Commission 36
- 4.15 Completion 36

5 Condensate disposal 37
- 5.1 General Requirements 37
- 5.2 Connections 37
- 5.3 Pipework 37
- 5.4 External Pipework 37
- 5.5 Condensate Trap 38
- 5.6 Inspection and Cleaning of Trap 38

6 Sealed Systems 39
- 6.1 Sealed System Requirements 39
- 6.2 Filling the Sealed System 40
- 6.3 Venting the Pump 40
- 6.4 Pressure Relief (Safety) Valve Operation 40

7 Flue System and Air Supply 41
- 7.1 Air Supply 41
- 7.2 Flue Terminal Position and Clearances 41
- 7.3 Flue System Specification 43
- 7.4 Flue System Assembly 43
- 7.5 Flue Testing 46
- 7.6 Flue Notice Plate 46
- 7.7 Carbon Monoxide Alarm 46
- 7.8 Typical Flue Systems 47
- 7.9 Flue Component Dimensions 48
- 7.10 Flue System Components 49
- 7.11 Flexible Flue Liner 51

8 Electrical 52
- 8.1 General Requirements 52
- 8.2 Hopper Electrical Connections 52
- 8.3 Boiler/Hopper Plug Connections 53
- 8.4 Heating System Controls 54
- 8.5 Connecting the Power Supply 54
- 8.6 Wiring Diagrams 55

9 Burner 61
- 9.1 Burner Operation 61
- 9.2 Burner Operating Modes 61
- 9.3 Burner Operating Sequence 62
- 9.4 Burner Display Screen 63
- 9.5 Burner Control Buttons 63
- 9.6 Burner Menu Navigation Chart and Factory Default Settings 64
- 9.7 Burner Menu 65

10 Commissioning 68
- 10.1 Equipment Required 68
- 10.2 Preliminary Inspection 68
- 10.3 Boiler 68
- 10.4 Pellet Hopper 69
- 10.5 Safety Device Checks 69
- 10.6 Burner Settings 70
- 10.7 Priming the Pellet Feed Auger 70
- 10.8 Lighting the Boiler 71
- 10.9 Combustion Chamber Draught 71
- 10.10 Flue Gas Analysis 72
- 10.11 Customer Handover 73
- 10.12 Commissioning Report Form 73
- 10.13 Commissioning Check List 73

11 Servicing 74
- 11.1 General 74
- 11.2 Checks Before Servicing 74
- 11.3 Heating System 74
- 11.4 Flue System 75
- 11.5 Combustion Ventilation 75
- 11.6 Boiler 75
- 11.7 Burner Brazier 77
- 11.8 Burner Components 78
- 11.9 Refitting the Burner 79
- 11.10 Condensate Disposal System 79
- 11.11 Cleaning Function Test 79
- 11.12 Burner Settings 80
- 11.13 Safety Device Checks 80
- 11.14 Combustion Checks 80

12 Fault Finding 81
- 12.1 General 81
- 12.2 Normal Screen Display 82
- 12.3 No Screen Display 83
- 12.4 Boiler Overheat Thermostat 85
- 12.5 Pellet Feed Tube Thermostat 87
- 12.6 Failed Pellet Lighting 89
- 12.7 Servo Motor Blocked 91
- 12.8 Probe Fault 92
- 12.9 Air Pressure Error 93

13 Spare Parts 95
- 13.1 Boiler 95
- 13.2 Boiler Parts List 96
- 13.3 Burner 98
- 13.4 Burner Parts List 99
- 13.5 110kg Pellet Hopper 100
- 13.6 200kg Pellet Hopper 100
- 13.7 140kg Pellet Hopper 101
- 13.8 Pellet Hopper Parts List 101

14 Clean Air Act and Declaration of Conformity 102
- 14.1 Clean Air Act 102
- 14.2 Declaration of Conformity 102

15 Health and Safety Information 103
- 15.1 Insulation Materials 103
- 15.2 Sealant and Adhesive 103

16 Guarantee 104

1 Introduction

Figure 1-1: Grant Spira Condensing Wood Pellet Boiler and Intermediate Hopper

This manual is intended to guide Installers who have completed the Grant Wood Pellet Boiler Installer training course on the installation, commissioning and servicing of the Grant Spira Condensing Wood Pellet Boiler.

A separate manual is available to guide users in the operation of the boiler.

The following special text formats are used in this manual for the purposes listed:

WARNING

Warning of possible human injury as a consequence of not following the instructions in the "warning".

CAUTION

Caution concerning likely damage to equipment or tools as a consequence of not following the instructions in the "Caution".

NOTE

Used for emphasis or information not directly concerned with the surrounding text but of importance to the reader.

1.1 How the Condensing Wood Pellet Boiler Operates

On start up, the auger feeds the wood pellets from the hopper into the burner where they are lit by an ignition element. The burner output is modulated to achieve the set temperature by controlling the feed rate of pellets. The fan in the burner propels hot gases generated from the fuel into the Spira's primary heat exchanger. The heat energy is then transferred to water from the central heating system, before being circulated around the property to radiators/underfloor heating. It is important to note that in non-condensing biomass boilers, up to 20% of the energy that is produced is lost to the atmosphere through waste gases exhausted by the flue system.

The Spira contains a unique extra (secondary) condensing heat exchanger which has been designed to capture some of this lost heat energy that would otherwise be lost, so it maintains extremely high efficiencies.

It does this by cooling the flue gases to their dew point (below 55°C) thus extracting more sensible heat.

The boiler has been independently tested to BS EN303-5 and will achieve the following full load (nett) efficiencies when both the boiler and system are correctly set:

Model	Nominal output	Reduced output
Spira 5-18	95.5%	90.2%
Spira 6-26	97.4%	96.4%
Spira 9-36	93.1%	98.1%

To ensure maximum efficiency from the Grant Spira boiler, the boiler return temperature should be 55°C or less (but NOT less than 40°C) at maximum operating temperature. This will enable the latent heat to be condensed out of the flue gases.

The boiler is capable of a maximum flow temperature with a maximum set point of 75°C.

To achieve the required return temperature (55°C or less), it is recommended that the heating system is designed and balanced to operate with a temperature differential of 20°C between flow and return. The use of modulating circulating pumps and effective control systems should be considered.

Grant Spira condensing wood pellet boilers will still operate at extremely high efficiencies even when not in condensing mode and are therefore suitable for fitting to an existing heating system without alteration to the radiator sizes.

1.2 Boiler Description

The Grant Spira boiler uses a drop feed type burner with modulated heat output. The burner output is determined by varying the feed and pause times of the pellet feed auger supplying pellets to the burner. See Section 9 for details of burner operation.

The boiler is suitable for use on a sealed or open vented central heating system. When commissioned and set correctly, Grant Spira condensing wood pellet boilers will operate automatically, using a typical heating control system.

All models are supplied with the control panel and burner factory fitted. The fan box, pellet feed auger and hopper are supplied separately and are fitted by the installer. See Section 4 for boiler installation. The boiler needs to be connected to a conventional flue system. There is no provision for connection to a balanced flue system as there is draught stabiliser fitted to the appliance.

The boiler is not designed specifically for operation on a system with a buffer tank/ thermal store, however when used on such a system there is no effect on the boiler performance.

! NOTE

The only flue suitable for use with the Grant Spira condensing wood pellet boiler is the Grant Biomass twin-wall insulated conventional flue system.

This 125mm (5") diameter flue system is suitable for the 5-18kW, 6-26kW and 9-36kW Spira models.

For the 44kW, 52kW, 62kW and 72kW double boiler installations each boiler must have a separate flue system. Refer to Section 7.

1.3 Boiler Models

The Grant Spira condensing wood pellet boiler is available in sixteen different models:

Product code	Model	Description
WPS518 RH110	5-18	1 x 5-18kW boiler + 110kg right hand hopper
WPS518 LH110	5-18	1 x 5-18kW boiler + 110kg left hand hopper
WPS518 RH200	5-18	1 x 5-18kW boiler + 200kg right hand hopper
WPS518 LH200	5-18	1 x 5-18kW boiler + 200kg left hand hopper
WPS626 RH110	6-26	1 x 6-26 boiler + 110kg right hand hopper
WPS626 LH110	6-26	1 x 6-26 boiler + 110kg left hand hopper
WPS626 RH200	6-26	1 x 6-26 boiler + 200kg right hand hopper
WPS626 LH200	6-26	1 x 6-26 boiler + 200kg left hand hopper
WPS936 RH110	9-36	1 x 9-36 boiler + 110kg right hand hopper
WPS936 LH110	9-36	1 x 9-36 boiler + 110kg left hand hopper
WPS936 RH200	9-36	1 x 9-36 boiler + 200kg right hand hopper
WPS936 LH200	9-36	1 x 9-36 boiler + 200kg left hand hopper
WPS1144	11-44	1 x 5-18kW and 1 x 6-26kW boilers + 140kg double boiler hopper
WPS1252	12-52	2 x 6-26kW boilers + 140kg double boiler hopper
WPS1562	15-62	1 x 6-26kW and 1 x 9-36kW boilers + 140kg double boiler hopper
WPS1872	18-72	2 x 9-36kW boilers + 140kg double boiler hopper

1.4 Boiler Components

1.4.1 Burner. The burner is supplied factory-fitted to the boiler. All burners are supplied with factory default settings. During commissioning each burner parameter will need to be checked (see Section 9), and adjusted if necessary as the flue length can have a significant effect on the boiler performance. Refer to commissioning in Section 10.

The burner is equipped with a self cleaning device to prevent a build up of ash and clinker in the burner brazier.

All Spira boilers are fitted with a flame viewing window, located on the right hand side of the front combustion chamber door, just above the burner.

The burner output is determined by the feed / pause times of the pellet feed auger supplying the burner. See Section 9 for full burner operation details.

1.4.2 Boiler. The Spira condensing boiler is supplied with a combined primary and secondary heat-exchanger. Both heat exchangers are equipped with a self cleaning system.

1.4.3 Boiler controls. The set-point temperature of the boiler is user adjustable via two push buttons on the burner control panel - see Section 9.4 for details.

The boiler control panel (see Figure 1-2) is located at the top of the boiler and is fitted with three controls, as follows:

ON/STAND-BY switch – to switch off the burner when required, by interrupting the switched live supply to the burner. This switch does not isolate the electrical supply to the burner.

OVERHEAT thermostat - this allows the boiler to be used on a sealed central heating system and will automatically switch off the boiler if the pre-set temperature of 100°C is exceeded.

CLEANING switch - when pressed and held in the TEST position, it allows the cleaning system to be manually operated and tested. When released it will automatically return to the default AUTO position to allow the boiler cleaning system to perform automatically. Only operate the cleaning switch when the boiler is not operating - when 'WAIT BOILER THERMOSTAT' is showing on the burner display screen.

NOTE

'TEST' does NOT operate the burner cleaning function, but only that of the two heat exchangers.

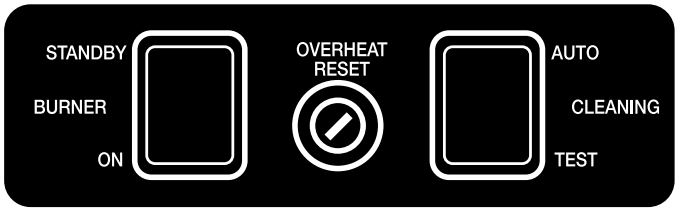


Figure 1-2: Boiler control panel

WARNING

After the burner has been switched off (either manually by the switch on the control panel, or automatically by the boiler control stat, or the heating system controls) the burner needs to burn-down the remaining pellets in the brazier. Do not open the front combustion chamber access door until the burner display reads "WAIT BOILER THERMOSTAT".

1.4.4 Boiler Pellet Hoppers. All single boilers (Spira 5-18, 6-26 and 9-36 models) come with a pellet hopper. Two sizes of hopper are available for use with single boilers, as follows:

- 110 kg hopper – for storing a maximum of 110kg (≈170 litres) of wood pellets
- 200kg hopper – for storing a maximum of 200kg (≈308 litres) of wood pellets.

There are two versions of both the 110kg and 200kg pellet hopper available for use with a single boiler:

Left hand hopper – to be positioned on the left hand side of the boiler.

Right hand hopper – to be positioned on the right hand side of the boiler.

NOTE

The hopper type must be specified when ordering.

Both hoppers are supplied with a single 1.2m pellet feed auger, to be fitted to the hopper on site by the installer.

All 'double boiler' installations (Spira 11-44, 12-52, 15-62 and 18-72 models) come with one 'double' hopper to feed both boilers with two 1.2m pellet feed augers.

This hopper is positioned between the two boilers and stores a maximum of 140 kg (≈215 litres).

All the Grant pellet hoppers are for indoor use only and must be positioned in a dry environment.

Hopper contents switch
All hoppers are fitted with a contents switch. This detects when the level of pellets in the hopper falls to a pre-set minimum value. If a bulk store is used, this triggers the operation of either a bulk store auger, or vacuum system, to delivery pellets from the bulk pellet store.

If no bulk store is used, the contents switch will stop the burner operating when the minimum pellet level is reached or low level warning light.

Topping up the hopper with more pellets will automatically operate the contents switch and the burner will restart (if there is a demand for the boiler to run).

The minimum quantity of pellets required to restart the boiler is 20kg for the single boiler hoppers and 30kg for the double boiler hoppers.

All boiler pellet hoppers are for indoor use only and MUST be positioned in a dry environment free from dampness. They must be located on the same floor level as the boiler or boilers, they are supplying.

All hoppers are mounted on castors (with the two front castors lockable) to allow it to be easily moved when required. Allow sufficient area in front of the hopper for it to be moved out and away from the boiler(s) during servicing.

The electrical connections to the boiler(s) are all made to the 4-way electrical plug on one of the three factory-fitted 'flying leads' at the rear of the hopper. Refer to Section 8 for details.

All hoppers are supplied with a rectangular blanking plate fitted on the top rear panel. This can be removed, as required, to allow the fitting of the Grant SpiraVac pellet feed system. Refer to installation instructions supplied with the Grant SpiraVac system for further details.

This blanking plate has a single round 'knock-out' to provide an entry into the hopper from an auger supplying pellets from a bulk hopper system. This knockout is positioned to ensure the pellets drop into the hopper and operate the hopper contents switch. Only this opening MUST be used as making another opening in the intermediate hopper could affect the operation of the contents switch.

Electrical connection for either a bulk auger or Grant SpiraVac system, if required, is made using the 6-way electrical plug and flying lead supplied factory-fitted at the rear of the hopper. Refer to Section 8 for connection details.

Always ensure that the door and top panel of the boiler hopper are fitted to ensure no foreign debris enters the hopper. If a bulk system with an auger is fitted, ensure that the bulk auger does not impede the opening of the hopper door.

1.4.5 Pellet Feed Auger. All Grant hoppers are supplied with either one or, on double boiler hoppers, two 1.2m pellet feed augers. These are set at a fixed angle of 45° to maintain a consistent feed. If the pellet feed auger angle is altered the input to the boiler will also be altered.

The pellet feed auger is a hollow spiral type. Its function is to deliver the pellets from the hopper to the burner. The output of the boiler is determined by varying the on/off periods of the pellet feed auger motor. Refer to Section 3.2 for pellet feed data.

1.5 Boiler Cleaning and Servicing

Grant Spira condensing wood pellet boilers are equipped with an automatic cleaning system for each of the two heat exchangers and also for the burner brazier.

CAUTION

The ash pan (located inside the combustion chamber) will need to be periodically emptied. This simple task must be carried out by the user at MONTHLY intervals for the FIRST THREE MONTHS. Thereafter, the ash pan should be emptied regularly, on at least a monthly basis, or as indicated by the amount of ash found during the first three months. Two carrying handles are supplied with the boiler to allow removal of the ash pan when hot. Refer to Figure 1-3

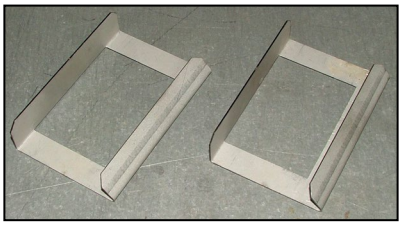


Figure 1-3: Removable carry handles

WARNING

Care must be taken to avoid contact with hot surfaces.

Always wait for the boiler to cool down before opening the combustion chamber door and removing the ash pan.

The boiler MUST be serviced either ANNUALLY or when a service is indicated on the burner control panel display, whichever comes first. Servicing should only be carried out by a Grant UK trained Installer and details of each service should be recorded in the Service Log in the back of the user instructions.

NOTE

The amount of ash produced varies between the different pellet brands and this will affect the frequency of cleaning and maintenance required.

1.6 Removable Door Catch Handle

All Grant Spira boilers are supplied with a removable handle for the combustion chamber door catch. This must be removed when the door is shut. Refer to Figure 1-4.

To open the combustion chamber door:

- Fit the removable door handle into the slot in the door catch.
- Lift handle to disengage the catch and open the door.

When closing the combustion chamber door:

- Fully engage the door catch to remake the door cut-out switch.
- Remove the handle and keep in a safe place for future use.

Figure 1-4: Removable door catch handle

2 Technical Data

2.1 Boiler and Hopper Technical Data

	Units	5-18	6-26	9-36
Maximum heat output	kW Btu/h	18 61 400	26 88 700	36 122 800
Flow connection	-	1" BSP (female)	1" BSP (female)	1¼" BSP (female)
Return connection	-	1" BSP (female)	1" BSP (female)	1¼" BSP (female)
Water content	litres	51.5	51.5	60
Minimum flow rate	litres/hour	756	1 080	1 512
Water resistance ΔT = 10°C	mbar		50	
Water resistance ΔT = 20°C	mbar		40	
Mains water (cleaning system)	bar		1 bar operating pressure	
Minimum dynamic pressure	bar		0.8	
Maximum mains inlet water pressure	kPa		800 (8 bar)	
Minimum mains inlet water pressure	kPa		100 (1 bar)	
Condensate connection	-		1¼" BSP (female)	
Conventional flue	-		125mm (5") system	
Combustion chamber draught requirement	mbar		0.10 to 0.15 (running)	
Maximum static head	m		25	
Minimum circulating head	m		1	
Boiler temperature set point range	°C		55° to 75°C	
Boiler temperature cut out point	°C		65° to 80°C	
Minimum return temperature	°C		40°C	
Water system overheat cut-out temperature	°C		100°C	
Burn-back overheat thermostat cut-out	°C		90°C	
Electrical supply	-		230V~50Hz single phase	
Max. operating pressure - sealed system / open system	bar		2.0 bar	
Max. operating pressure - pressure relief valve	bar		2.5 bar	
Maximum auger length (bulk hopper)	metres		6.0	
Maximum auger speed (bulk hopper)	rpm		30	
Minimum flue length	metres		1.6	
Maximum flue length	metres		12.0	
Heating element rating	Watts		450	
Intermediate auger motor power	Watts		55	
Intermediate auger motor starting current	Amps		0.64	
Intermediate auger motor running current	Amps		0.64	
Intermediate auger speed	rpm		8.1	
Flue fan motor power	Watts		32	
Flue fan motor starting current	Amps		0.27	
Flue fan motor running current	Amps		0.13	
Cleaning solenoid power	Watts		10	
Cleaning solenoid current	Amps		0.087	
Burner fan motor power	Watts		56	
Total burner start current	Amps		2.5	
Total burner run current	Amps		0.60	

2.2 Boiler Input and Output Data

The settings in the table below are based on the boiler using the Grant fixed angle pellet feed auger at 45° with an auger motor fixed speed of 8.1 rpm.

Only EN Plus Grade A1 (BS EN ISO 17225-2) pellets MUST be used with the Grant Spira boilers. These pellets must be bark and sand free AND approved by Grant BEFORE being used in the Spira boilers. Failure to use approved pellets will invalidate the product guarantee.

2.2.1 Burner settings

All burner settings must be checked as part of commissioning and servicing. Refer to Section 9.6 for full details of the burner settings and how to access, check and, where necessary, how to adjust them.

Boiler and Hopper Weights

	Units	5-18	6-26	9-36
Weight boiler - less burner and fan box (empty)	kg	201	201	231
Weight burner	kg	25.5	25.5	25.5
Weight fan box	kg	5	5	5
Total weight of boiler (empty)	kg	232	232	262
Total weight of boiler (full)	kg	283	283	322
Weight 110kg pellet hopper (empty) - incl. auger	kg	41	41	41
Weight 110kg pellet hopper (full) - incl. auger	kg	151	151	151
Weight 200kg pellet hopper (empty) - incl. auger	kg	77	77	77
Weight 200kg pellet hopper (full) - incl. auger	kg	277	277	277
Weight of auger	kg	8	8	8
Weight 140kg double boiler hopper (empty) - incl. 2 augers	kg	42	42	42
Weight 140kg double boiler hopper (full) - incl. 2 augers	kg	182	182	182

Model	Pellet feed auger angle	MAX flame								MIN flame	
		Burner setting		Heat output	Heat input	Full eff. %	Input kg/ hr*	Draught	CO_2	Burner setting	Heat output
		TIME LOAD MAX	TIME PAUSE	kW (Btu/h)	kW (Btu/h)			mbar (in.wg)	%	TIME PAUSE MIN	kW (Btu/h)
5-18	45°	0025 (2.5 sec)	0048 (4.8 sec)	17.8 (60 769)	18.6 (63 500)	95.5	3.87	0.1-0.15 (0.04-0.06)	10-12	0220 (22.0 sec)	5.6 (19 050)
6-26	45°	0025 (2.5 sec)	0025 (2.5 sec)	26.3 (89 735)	27.1 (92 500)	97.4	5.70	0.1-0.15 (0.04-0.06)	10-12	0140 (14.0 sec)	6.5 (22 100)
9-36	45°	0065 (6.5 sec)	0025 (2.5 sec)	36 (122 832)	38.7 (132 000)	93.1	7.78	0.1-0.15 (0.04-0.06)	10-12	0250 (25 sec)	9 (30 700)

Notes
*Heat input is based on a calorific value of 4.81 kWh/kg.
Heat input and output data given above is approximate only.
All burner settings must be checked as part of commissioning and servicing. Refer to Section 9.6 for full details of the burner settings and how to access, check and, where necessary, how to adjust them.

2.3 Flue Gas Analysis

As part of both the commissioning and servicing procedures, the CO_2 content of the flue gases must be checked. To enable this to be done, the boiler is supplied with a combustion test point in the top rear cleaning door. Refer to Figure 10-16.

To gain access to this test point, first remove the top casing panel from the boiler. The test point should be at the back left corner of the rear cleaning door. If it is located at the front right corner of the cleaning door, then remove the door and refit it with the test point in the correct position.

NOTE

Use only a calibrated flue gas analyser with a 'Wood Pellet' fuel setting. Setting the fuel to anything other than wood pellets will give an incorrect reading.

CAUTION

To ensure correct combustion, the burner settings given in the table below must NOT be changed unless instructed to do so by Grant UK.

CAUTION

Do not sample the flue gases through either the draught stabiliser, or from within the flue, as they will have been diluted with air entering through the draught stabiliser.

Only use the combustion test point in the top rear access door to check the CO_2 content of the flue gases. See Figure 10-16.

2.4 Boiler and Hopper Dimensions and Clearances

2.4.1 Single Boiler with Left Hand Hopper

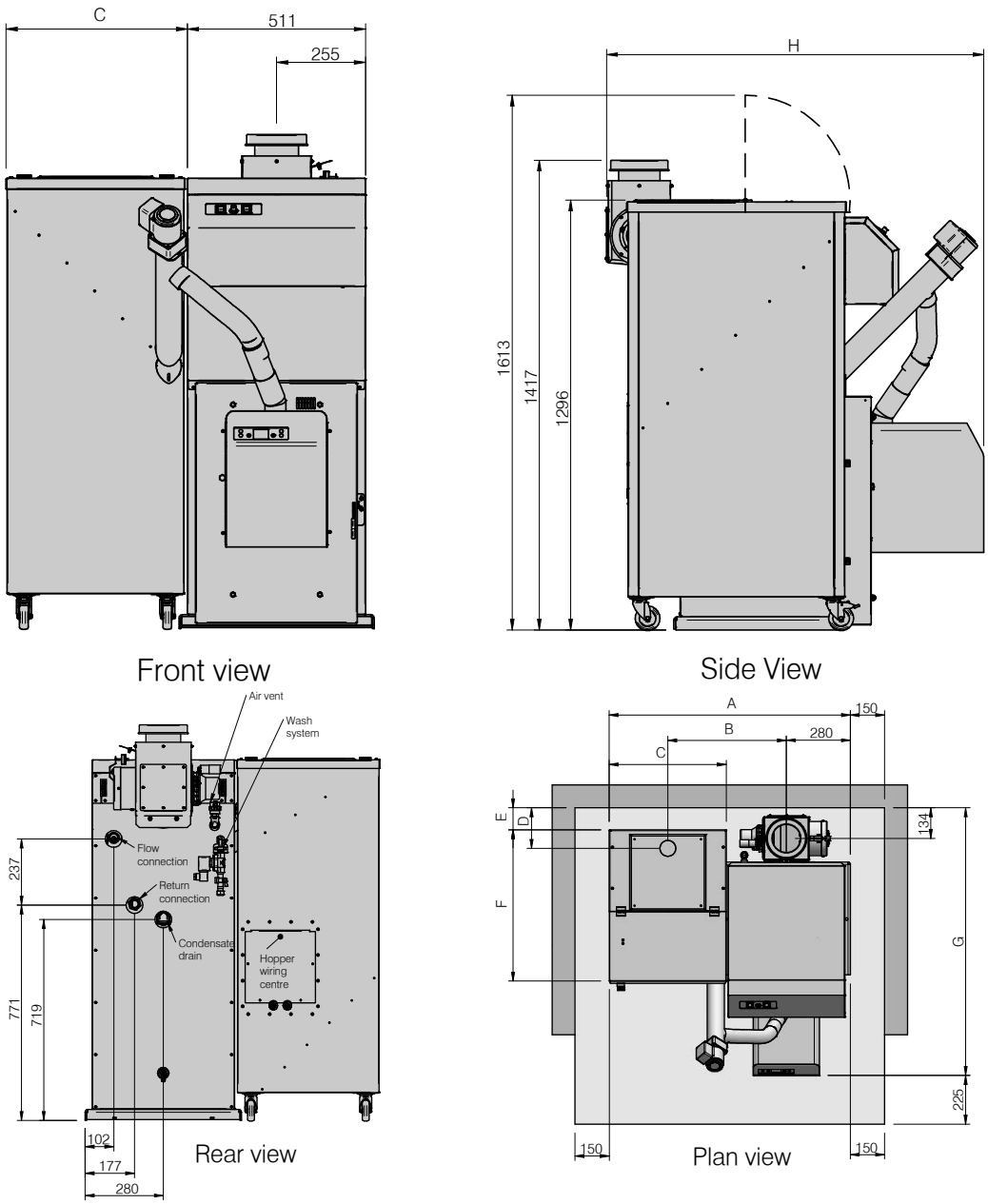


Figure 2-1: Boiler and hopper dimensions and clearances – single boiler with left hand hopper

Spira wood pellet boiler model	Dimensions							
	A	B	C	D*	E*	F	G*	H
5-18 110kg left hand hopper	1056	518	513	177	96	661	1160	1120
5-18 200kg left hand hopper	1256	618	713	125	44	713	1160	1120
6-26 110kg left hand hopper	1056	518	513	177	96	661	1160	1120
6-26 200kg left hand hopper	1256	618	713	125	44	713	1160	1120
9-36 110kg left hand hopper	1056	518	513	277	196	661	1260	1220
9-36 200kg left hand hopper	1256	618	713	225	144	713	1260	1220

* If the measurement from the flue centre line to the rear wall is increased (shown as 134 in the plan view), then the dimensions D, E and G will have to be increased by the same increment. All units in millimetres.

2.4.2 Single Boiler with Right Hand Hopper

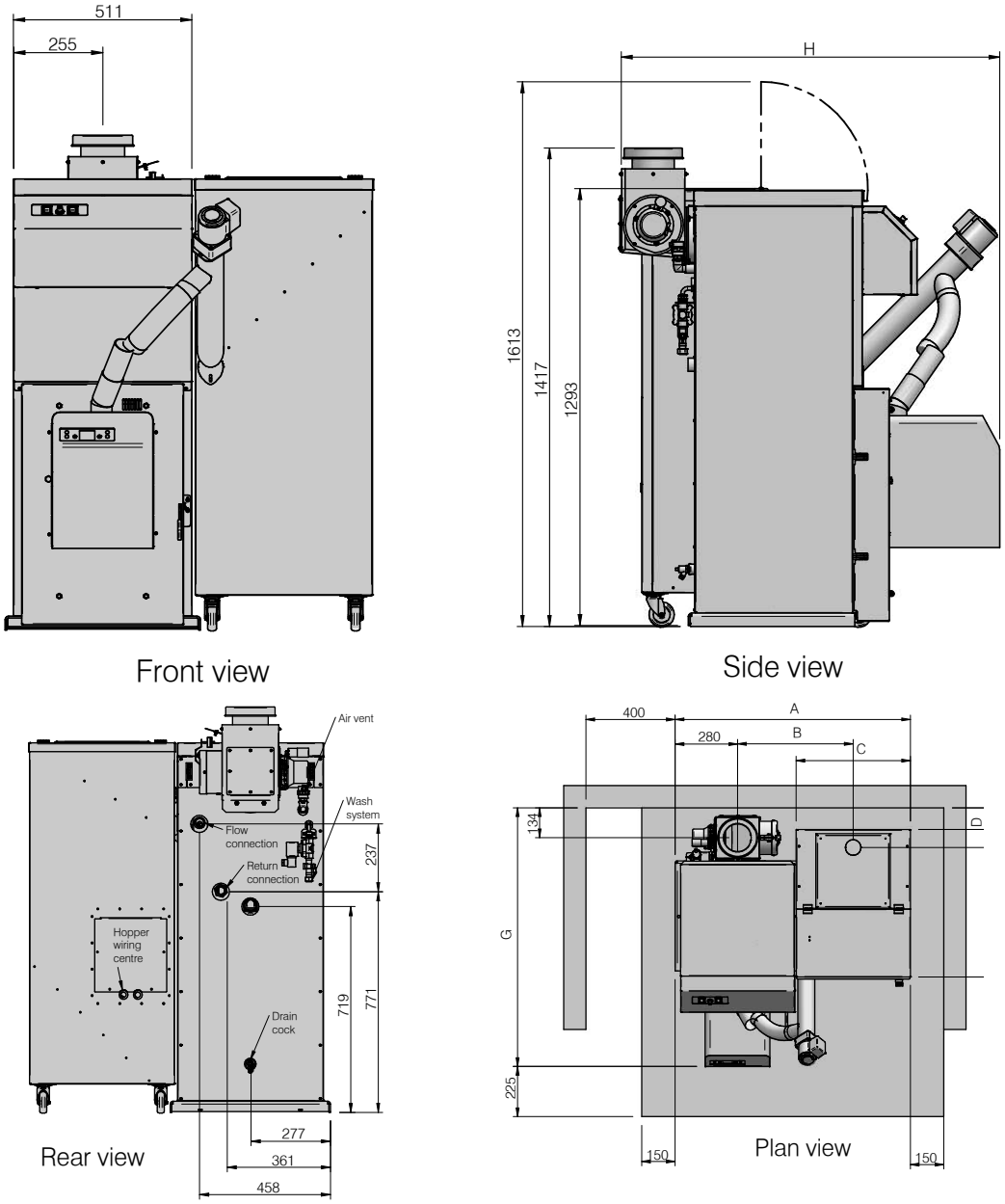


Figure 2-2: Boiler and hopper dimensions and clearances – single boiler with right hand hopper

Spira wood pellet boiler model	Dimensions							
	A	B	C	D	E	F	G	H
5-18 110kg right hand hopper	1056	518	513	177	96	661	1160	1120
5-18 200kg right hand hopper	1256	618	713	125	44	713	1160	1120
6-26 110kg right hand hopper	1056	518	513	177	96	661	1160	1120
6-26 200kg right hand hopper	1256	618	713	125	44	713	1160	1120
9-36 110kg right hand hopper	1056	518	513	277	196	661	1260	1220
9-36 200kg right hand hopper	1256	618	713	225	144	713	1260	1220

* If the measurement from the flue centre line to the rear wall is increased (shown as 134 in the plan view), then the dimensions D, E and G will have to be increased by the same increment. All units in millimetres.

2.4.3 Double Boiler with Central Hopper

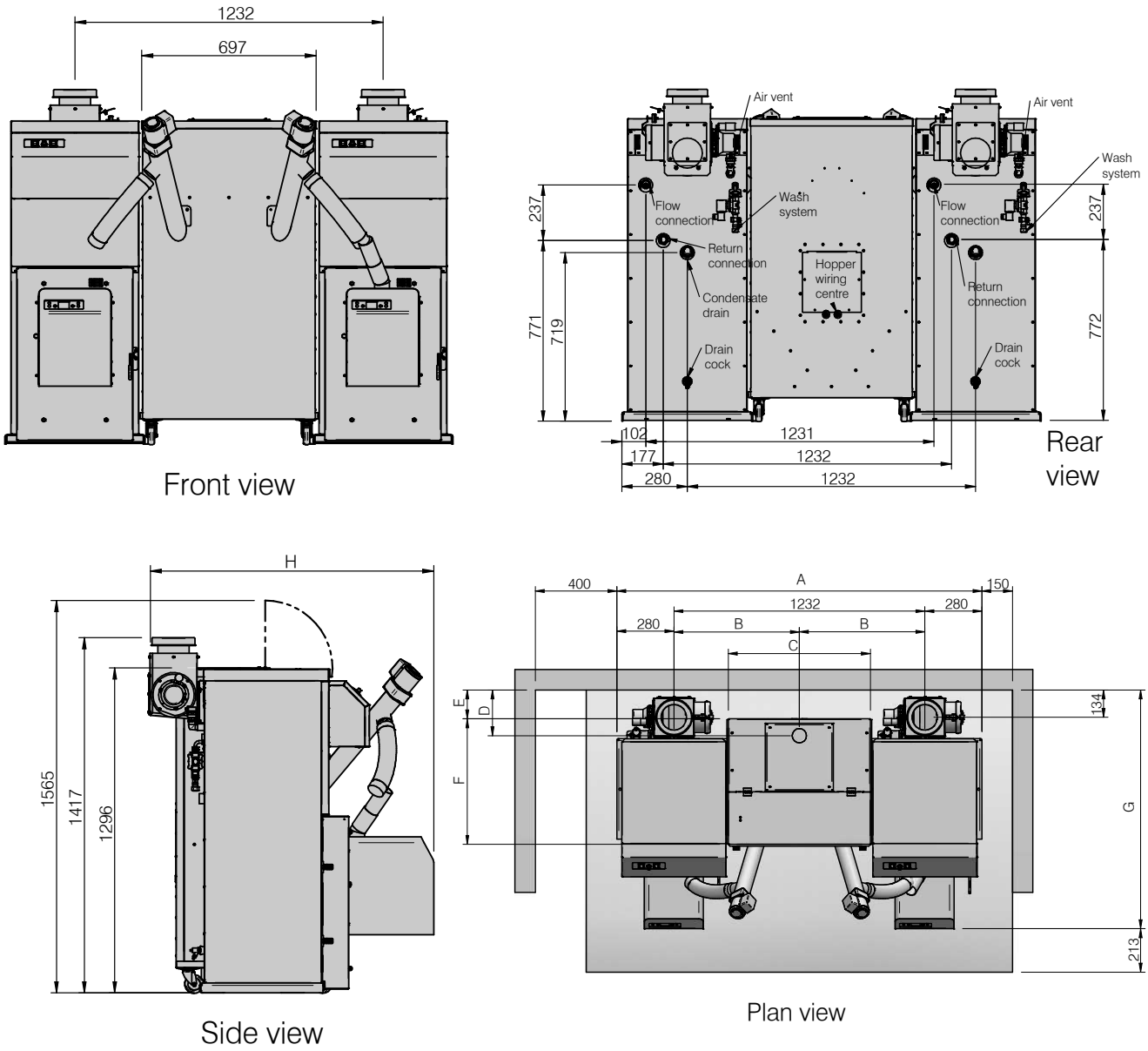


Figure 2-3: Boiler and hopper dimensions and clearances – double boiler with central hopper

Spira wood pellet boiler model	Dimensions							
	A	B	C	D*	E*	F	G*	H
11-44 (5-18 and 6-26) with double hopper	1792	616	697	224	141	616	1160	1120
12-52 (2 x 6-26) with double hopper	1792	616	697	224	141	616	1160	1120
15-62 (6-26 and 9-36) with double hopper	1792	616	697	324	241	616	1260	1220
18-72 (2 x 9-36) with double hopper	1792	616	697	324	241	616	1260	1220

* If the measurement from the flue centre line to the rear wall is increased (shown as 134 in the plan view), then the dimensions D, E and G will have to be increased by the same increment. All units in millimetres.

3 Pellet Specification, Storage and Delivery

3.1 Pellet Specification

Grant Spira boilers are designed to ONLY run on EN Plus Grade A1 wood pellets that comply with BS EN ISO 17225-2:2014 and meet the following criteria. Failure to use approved pellets will invalidate the product guarantee.

Property class	Unit	Limits as per BS EN ISO 17225-2
Origin and source		1.13 Stemwood 1.2.1 Chemically treated wood residues[a]
Diameter (D)	mm	6 ± 1
Length (L)		3.15 < L ≤ 40
Moisture (M)	w-%	≤ 10
Ash (A)	w-% dry	≤ 0.7
Mechanical durability (DU)	w-%	≥ 97.5
Fines (F)[b]	w-%	≤ 1.0
Additivies[c]	w-%	≤ 2 Type and amount to be stated
Net calorific value (Q)	MJ/kg or	≥ 16.5
	kWh/kg	≥ 4.6
Bulk density (BD)[d]	kg/m^3	≥ 600
Chlorine (Cl)	w-% dry	≤ 0.02

Footnotes

[a] Negligible levels of glue, grease and other timber production additives used in sawmills during production of timber and timber product from virgin wood are acceptable, if all chemical parameters of the pellets are clearly within the limits and/or concentrations are too small to be concerned with.

[b] At factory gate in bulk transport (at time of loading) and in small (up to 20kg) and big bags (at time of packing) or when delivering to end-user.

[c] Type of additives to aid production, delivery or combustion.

[d] It is recommended actual value of bulk density to be stated.

The following terms are commonly used when describing the properties of wood pellets:

Additives	Additives are used to improve the stability of the pellets. If manufactured correctly, and of a sufficiently low moisture content, quality pellets will require no additives.
Ash	Ash represents the non-combustible content of the pellet. Higher ash content reduces the calorific value of the pellet and requires the appliance to be cleaned more frequently.
Average length	To provide a predictable flow of fuel into the burner, the recommended length of a pellet is between 3.15 and 40mm.
Bulk density	Bulk density is the ratio between the weight of the pellet and the amount of space they take up. A good quality pellet will have a density of 650 kg/m^3.
Chlorine	High levels of chlorine in the flue gases emissions can give rise to corrosion.
Diameter	The most common diameter is 6mm with some 8mm also available. This boiler is designed for 6mm only.
Fines	Pellets are made from compressed wood. As pellets rub together they can break down slightly, producing dust or fines. Too many fines indicate a poor quality pellet and can impede pellet flow in addition to causing dust problems when delivering and storing the pellets.
Mechanical durability	This is a measure of how stable the pellet is and how likely it is to produce fines from normal handling. A high durability percentage is an indicator of a good quality pellet.
Moisture content	Moisture affects the calorific value of the pellet. Low moisture content guarantees constant and predictable combustion efficiency. Higher moisture contents can result in pellet breakdown.
Net Calorific Value	This is the useful energy contained in a kilogram of fuel. This value is affected by the amount of non-combustible materials (ash) and the moisture content of the pellet. Typical values range from 4.8 kWh/kg to 5.2 kWh/kg.
Nitrogen and Sulphur	High levels of Nitrogen and Sulphur in the flue gases emissions can give rise to corrosion.

3.2 Biomass Suppliers List

The Biomass Suppliers List (BSL) is a list of suppliers of wood fuel who have been accredited as demonstrating that their fuel meets the sustainability criteria required under the RHI.

Recipients of the Domestic RHI will be obliged to source their fuel from suppliers on the BSL unless they are supplying themselves. To find an approved supplier in your area go to www.biomass-suppliers-list.service.gov.uk/find-a-fuel

3.3 Pellet Storage

3.3.1 Pellet Hoppers and Pellet Feed Auger

All Grant Spira boilers are supplied with a pellet hopper. Refer to Section 1.4.4 for further details of the hoppers.

All Grant hoppers are supplied with either one or, on a double boiler hopper, two 1.2 m pellet feed augers, to deliver the pellets from the hopper to the boiler. Refer to Section 1.4.5.

The pellet hopper, along with the boiler (or boilers) it is supplying, MUST be installed in a dry indoor environment free from dampness. The hopper and boiler(s) must be located on the same floor level. The hopper must be located adjacent/between the boiler/s as shown in Section 2.

If a bulk hopper is to be used, there are two methods of transferring the pellets from the bulk store to the intermediate hopper:

a) Via a bulk pellet feed auger
b) Via the Grant SpiraVac vacuum pellet feed system

All boiler pellet hoppers are supplied to accept either of these two pellet supply systems, as required. Refer to Section 1.4.4 for further details on the hoppers.

The electrical connections to the boiler(s) are all made to the 4-way electrical plug on one of the three factory-fitted 'flying leads' at the rear of the hopper.

Electrical connection for either a bulk auger or Grant SpiraVac system, if required, is made using the 6-way electrical plug and flying lead supplied factory-fitted on the hopper. Refer to Section 8 for details.

3.3.2 Bulk Hopper

It is advisable to fit a bulk pellet store to take advantage of the lower cost of pellets purchased in bulk.

! NOTE

The boiler must be switched off before the bulk pellet store is re-filled. The boiler must only be switched back on again after the filling is completed.

Figure 3-1: Bulk auger inlet in hopper

The pellet hopper (supplied with the boiler/s) must still be used, situated between the bulk hopper and the boiler, as the auger fitted to the hopper delivers the precise quantity of pellets required by the burner.

The pellet hopper also allows any problems with bulk pellet quality to be isolated and the intermediate hopper can be used temporarily as the source of pellets for the boiler.

! NOTE

Each bulk pellet supplier has clear guidelines on the requirements of a bulk storage hopper used to store their pellets, together with requirements on positioning, access, and minimum deliveries.

The information given in this manual is for guidance purposes only and you should ALWAYS check with the pellet supplier you wish to use BEFORE installing a bulk storage system.

It is essential to only use a bulk storage unit that is:

a) Waterproof
b) Specifically designed to store wood pellets
c) Supplied with appropriate connections for pellet delivery, which are within the drivers reach
d) Fitted with a vent connection (for dust extraction) during filling
e) Permanently vented (if located outside) or unvented (if installed indoors)
f) Fitted with a rubber arrester mat (or similar) to limit pellet damage during filling
g) Is electrically earthed

A range of suitable bulk pellet stores are available from Grant UK. These are supplied either pre-assembled or flat packed for on-site assembly. Refer to assembly instructions supplied with each kit. For details of capacities and dimensions visit our website or contact Grant UK.

The use of a self constructed wood pellet storage facility should be pre-approved by the fuel supplier before any pellets are delivered and must meet

relevant building and fire regulations.

The ONORM M7137 standard should be used as a guideline for DIY bulk storage units.

A storage unit should not be positioned where it would result in a fire risk.

The store should be located on a suitable base (e.g. concrete) capable of supporting the weight of the store when full of pellets.

3.3.3 Bulk Pellet Feed Auger

When installing a bulk pellet store with a bulk pellet feed auger, consideration must be given to the position of the store in relation to the hopper as this will dictate the length of the auger.

The length of the pellet feed auger, supplying pellets from the bulk store, is limited to a maximum of 6 metres in length, as a longer auger can damage the pellets.

Grant UK offer a range of eight bulk pellet augers, from 2.5m to 6m in length in 0.5m steps, as given in the following table:

Product Code	Bulk Auger Length m	Auger Weight kg
WPAUG25	2.5m	21.3
WPAUG3	3.0m	24.1
WPAUG35	3.5m	26.9
WPAUG4	4.0m	29.7
WPAUG45	4.5m	32.5
WPAUG5	5.0m	35.3
WPAUG55	5.5m	38.1
WPAUG6	6.0m	40.9

To determine the length of auger required the following factors must be determined:

- Difference in height between the ground/floor level (on which the store will stand) and the floor level (on which the hopper will stand).
- Horizontal distance between the back of the hopper and the store.

If the store is to be situated outside, this horizontal distance will be made up from:

- The distance from the rear of the hopper to the inner face of the wall
- The thickness of the wall
- The distance to the store from the outside face of the wall.

4 Installation Information

4.1 Introduction

For the 5-18, 6-26 and 9-36 models, the appliance comes supplied on two pallets:

- Pallet 1 contains the intermediate hopper, auger and auger feed hose
- Pallet 2 contains the boiler, burner and accessory box.

For the 11-44, 12-52, 15-62 and 18-72 models ('double boiler' installations), the appliance comes supplied on two pallets:

- Pallet 1 contains the intermediate hopper, augers and auger feed hoses
- Pallet 2 contains both boilers, each with burner and accessory box.

An accessories box is packed with each boiler and this includes the following:

- Fan box (complete with exhaust fan, draught stabiliser and flue connection
- Inspection pipe (product code: WPB/IP)
- Condensate drain trap items
- Wash system manifold assembly (complete with bracket)
- Pellet feed tube (supplied in two parts)
- Pellet delivery hose
- Brazier clearance gauge plate
- AAV (complete with elbow and bush)
- 2.5 bar PRV
- Ash pan lifting handles
- Removable (door) handle

The Grant Biomass flue system comes separately and its configuration will depend on the installation requirements.

4.2 Boiler Location

The boiler must be installed in a damp free environment.

Refer to Section 2.4 for boiler and hopper clearances. These clearances are to allow for access during servicing. Also if fitting a bulk hopper system refer to Section 3.2.2 as the location of the bulk hopper can influence the boiler location.

4.3 Preparation for Installation

With the units on the pallet, remove all outer packaging from the units. Unpack the accessories box supplied with the boiler and check the packing list against all items present.

4.4 Installing the Boiler

The boiler and hopper must be positioned on a level, solid, non-combustible base of at least 125mm thick. This must also extend past the boiler and hopper by 225mm at the front and 150mm on the remaining sides. The boiler position must comply with clearances shown in Section 2.4.

4.5 Regulations

Installation of a Grant Spira wood pellet boiler and hopper must be in accordance with the following recommendations:

- National Building Regulations and any local Bylaws which you must check with the local authority for the area, e.g. Approved Document J
- Model and local Water Undertaking Bylaws
- MCS Installer Standards, i.e. MIS 3004 (if applying for the Renewable Heat Incentive)

The installation should also be in accordance with the latest edition of the following standards and codes of Practice:

- BS EN 12828:2012. Heating systems in buildings. Design for water-based heating systems
- BS EN 12831:2003. Heating systems in buildings. Method for calculation of the design heat load.
- BS EN 14336: 2004. Heating systems in buildings. Installation and commissioning of water based heating systems.
- BS 7593:2006 Code of Practice for treatment of water in heating systems.
- BS 7671:2008 Requirements for electrical installations, IET wiring regulations.
- ONORM M7137 standard should be used as a guideline for DIY bulk storage units.

NOTE

Failure to install and commission the appliance correctly will invalidate the boiler guarantee.

WARNING

Before starting any work on the boiler or fuel supply please read the Health and Safety information given in Section 14.

4.6 Heating System Design Considerations

To achieve the maximum efficiency possible from the Grant Spira wood pellet boiler, the heating system should be designed to the following parameters:

Radiators

- Flow temperature 70°C
- Return temperature 50°C
- Differential 20°C

Size the radiators using a mean water temperature of 60°C.

Design system controls with programmable room thermostats, or use weather compensating controls, to maintain return temperatures below 55°C.

NOTE

The boiler should not be allowed to operate with a return temperature of less than 40°C when the system is up to operating temperature.

The use of a pipe thermostat is recommended to control the return water temperature when using weather compensating controls.

Underfloor Heating

- Flow temperature 50°C
- Return temperature 40°C
- Differential 10°C

In underfloor systems it is essential that the return temperature must be maintained at or above 40°C to prevent internal corrosion of the boiler water jacket.

4.7 Pipework Materials

Grant Spira boilers are compatible with both copper and plastic pipe. Where Plastic pipe is used it must be of the oxygen barrier type and be the correct class (to BS 7291 - Part 1:2010) for the application concerned.

WARNING

On either sealed or open-vented systems; where plastic pipe is used a minimum of ONE metre of copper pipe MUST be connected between both the boiler flow and return connections and the plastic pipe. DO NOT CONNECT PLASTIC PIPE DIRECTLY TO THE BOILER. Grant UK do not accept any responsibility for any damage, however caused, to plastic piping or fittings.

Sealed Systems
If plastic pipe is to be used, the installer must check with the plastic pipe manufacturer that the pipe to be used is suitable for the temperature and pressures concerned.

Plastic pipe must be Class S to BS 7291 - Part 1:2010.

WARNING

The system MUST incorporate a low-level pressure switch to shut off power to the boiler if the system pressure drops below 0.2 bar. A suitable low pressure switch kit is available to purchase from Grant UK (product code MPCBS62). refer to Figure 8-11 for the electrical connection details on this switch.

Underfloor Pipework
Plastic pipe may be used on underfloor floor systems where the plastic pipe is fitted after the thermostatic mixing valve.

Copper tube must be used for at least the first metre of flow and return primary pipework between the boiler and the underfloor mixing/blending valves.

4.8 Pipe Connections

Flow and return connections:
The flow and return connection are at the rear of the boiler (see Section 2.4) and the sizes are as follows:

Spira 5-18	Flow 1" BSP Female
	Return 1" BSP Female
Spira 6-26	Flow 1" BSP Female
	Return 1" BSP Female
Spira 9-36	Flow 1" ¼ BSP Female
	Return 1" ¼ BSP Female

Drain Cock:
Fit the ½" drain cock to the bottom rear ½" BSP connection. Fit the automatic air vent assembly into the ½" connection on the rear of the boiler (this is to vent the secondary unit only), the flow pipe from the boiler must be vented.

Condensate Connection:
The 1¼" BSP female condensate outlet connection is located at the rear of the boiler. Refer to Section 5 for details on condensate connection and disposal pipework.

4.9 Wash System

The Grant Spira boiler is supplied with an automatic cleaning system to wash any ash build up from the tubes of the condensing (secondary) heat exchanger.

NOTE

A minimum water inlet water pressure of 100 kPa (1 bar) is required to maintain an adequate supply for cleaning purposes. The maximum inlet water pressure is 800 kPa (8 bar).

This factory fitted wash system consists of two spray jets, mounted on the underside of the heat exchanger access cover. They are connected by a manifold pipe located on the upper side of the cover. Refer to Figure 4-1.

This manifold is fed with mains cold water via a solenoid valve located at the rear of the boiler.

This solenoid valve is supplied loose in the boiler components kit and must be fixed to the back panel of the boiler using the two self-tapping screws provided. Refer to Figure 4-2.

The valve is connected to the wash system manifold via flexible hose, supplied already fitted within the boiler casing. Connect one end of the hose to the outlet of the solenoid valve and the other to the inlet connection of the wash system manifold.

Connect the mains water supply to the 15mm compression inlet connection of the isolating/check valve, mounted on the solenoid valve inlet.

NOTE

In hard water areas an anti-scale device should be fitted on the cold water supply to the wash system to prevent scale build-up in the manifold pipe and jets.

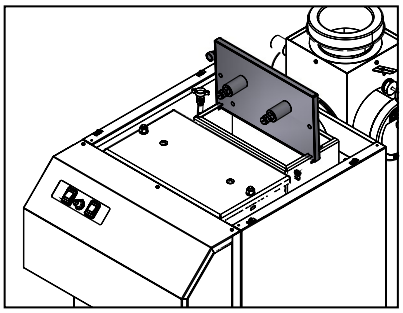


Figure 4-1: Spray jets (manifold omitted)

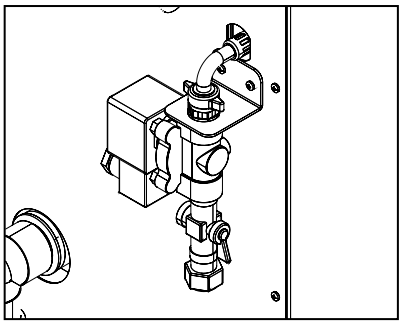


Figure 4-2: Solenoid valve self-tapping screws (wiring omitted)

4.10 Fan Box and Flue Starter

Fit the fan box to the flanged flue outlet on the back of the boiler so that the flue starter outlet is at the top.

Remove the nuts and washers from the four studs around the flanged flue outlet of the boiler. Refer to Figure 4-3.

Remove the access panel from the rear face of the fan box.

With the neoprene gasket in place on the fan box, locate the four studs through the corresponding holes in the gasket/fan box. Two of the studs pass through the flange at the base of the fan box. The other two are inside the fan box and are reached via the rear access opening.

Secure the fan box in position using the four nuts and washers previously removed.

When tightening these nuts, ensure that the fan box/flue starter section is vertical

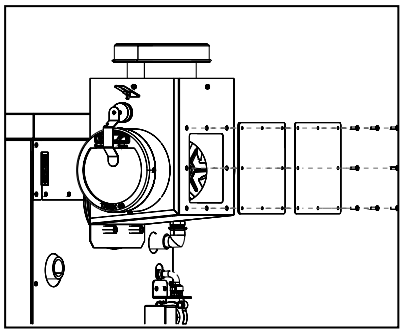


Figure 4-3: Fan box access panel

and the neoprene gasket is evenly compressed to give an adequate seal between the fan box and the flanged boiler outlet.

Replace the access panel on the rear face of the fan box and secure with the screws previously removed.

Fit the 5-way plug from the flue fan/ solenoid valve into the socket at the top right rear of the boiler. Ensure that the plug is fully pushed home. See Figure 4-4.

Figure 4-4: Flue fan/solenoid valve plug connection

Figure 4-5: Pellet feed auger fixing

4.11 Pellet Feed Tube

The 2-part pellet feed tube is supplied loose in the accessories box for fitting on site in either one of two possible positions, depending on the location of the pellet hopper. The pellet tube gasket and three fixing screws are supplied fitted to the burner.

With hopper located on the left side of the boiler - the pellet feed tube must be fitted to point towards the left side. Refer to Figure 4-6.

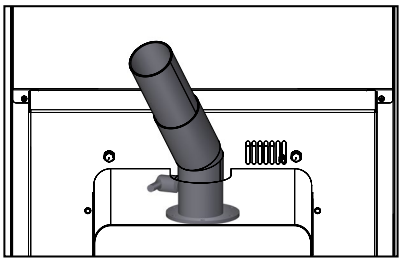


Figure 4-6: Pellet feed tube - left-hand hopper

With hopper located on the right side of the boiler - the pellet feed tube must be fitted to point towards the right side. Refer to Figure 4-7.

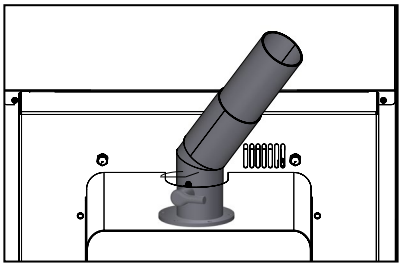


Figure 4-7: Pellet feed tube - right-hand hopper

With hopper located between two boilers (in a 'double boiler' installation) - the right hand boiler must have the pellet feed tube pointing to the left, and the left hand boiler must have the pellet feed tube pointing to the right.

To fit the pellet feed tube to the burner:

- First, remove the burner from the combustion chamber door
- Remove the red burner cover by loosening the four M5 screws (two on each side of the cover) and lifting it off the burner.
- Disconnect the plugs from the left side of the burner. Loosen the four screws (two on either side of the burner) and lift off the red burner cover.
- Whilst supporting the burner, unscrew and remove the two M8 burner securing nuts and washers, one each side of the burner.
- Carefully withdraw the burner from the combustion chamber door, taking care not to damage the burner door gasket, and place it on a suitable surface to work on it.

WARNING

Ensure the pellet delivery hose forms an air tight seal at each end and that the pellet delivery hose is not damaged. Leakage of air could cause increased temperature in the pellet delivery hose and result in the pellet feed tube (burn back) thermostat operating and shutting down the burner.

Then, fit the pellet feed tube:

- Using a 4mm Allen key, remove the three pellet tube fixing screws and locking washers. Take care not to drop them into the rectangular pellet feed opening in the top of the burner.
- Check the circular gasket is correctly positioned around the pellet feed opening and that the three cutouts in the gasket are aligned with the threaded holes in the burner.
- Position the flange of the pellet feed tube on the gasket.
- Align the holes in the flange with those in the gasket and burner such that the open end of the pellet feed tube points either to the

right or left, as required.

- Re-fit the three screws and washers. Tighten them down evenly to secure the pellet feed tube to the burner.
- Fit the pellet feed tube thermostat lead on to the thermostat terminals.
- Fit the pellet feed tube.

With the gasket correctly located, re-fit the burner to the combustion chamber door:

- Carefully insert the burner brazier through the opening and locate the holes in the burner flange onto the M8 studs (on either side of the burner).
- Secure the burner to the door with the two M8 nuts previously removed.
- Re-connect the plugs to their corresponding sockets on the left side of the burner.
- Ensure that each plug is fully pushed home until the small catch clicks into place. Refer to Figure 4.8.

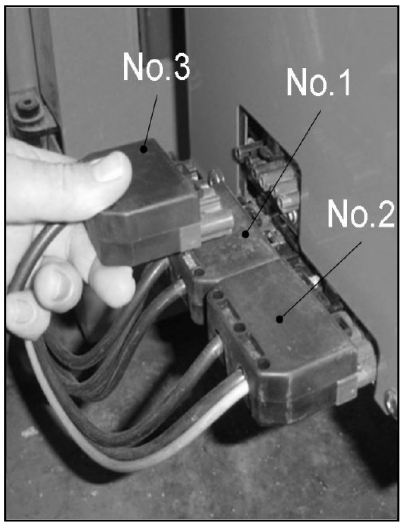


Figure 4-8: Auger plug connection

4.12 Pellet Hoppers

4.12.1 Single Boiler Installation

Position the pellet hopper on the same firm level surface as the boiler, on either the left-hand or right-hand side of the boiler (depending on hopper type used), with the top access door facing forwards. Refer to Figure 2-1 or 2-2 as required, for clearance dimensions and position.

4.12.2 Double boiler installation

Position the pellet hopper on the same firm level surface as, and in between, the two boilers, with the top access door facing forwards. Refer to Figure

2-3 for clearance dimensions and position.

Failure to adhere to these measurements can cause blockage of the pellets in the pellet delivery hose or can prevent access for servicing at a later date. The hopper is supplied with castors which allows the hopper be moved during servicing. Once in the correct position, engage the brakes on the front castors to maintain this position.

4.13 Pellet Feed Auger

4.13.1 Single Boiler Hoppers

The pellet feed auger is supplied packed with the hopper but not factory-fitted to it.

To fit, unpack the hopper and auger. Remove the M5 screw fitted below the auger opening on the front of the hopper. Fit the end of the auger into opening in the front of the hopper as far as it will go and secure by fitting the M5 screw through the auger fixing flange and tighten. See Figure 4-5.

4.13.2 Double Boiler Hoppers

Both augers on the 'double boiler' Intermediate hoppers are supplied factory-fitted to the hopper.

To connect the hopper to the boiler, fit one end of the pellet delivery hose onto the pellet feed auger outlet and the other end onto the pellet feed tube. The pellet delivery hose may need to be cut if too long. A sachet of lubricant is supplied in the accessories carton; apply the lubricant to the joint to ensure the pellet delivery hose is easily fitted. Ensure the pellet delivery hose is not kinked in any way.

Fit the 6-way plug (No.3), from the pellet feed auger motor, into the corresponding 6-way socket on the left side of the burner. Ensure that the plug is fully pushed home until the small catch it clicks into place. See Figure

4-6. Refer to Section 8.3 for all boiler plug connections.

4.14 Before you Commission

To avoid the danger of dirt and foreign matter entering the boiler the complete heating system should be thoroughly flushed out – both before the boiler is connected and then again after the system has been heated and is still hot.

This is especially important where the boiler is to be installed on an old system.

For optimum performance after installation, the boiler and the associated heating system must be flushed in accordance with the guidelines given in BS 7593:2006 'Treatment of water in domestic hot water central heating systems'. This must involve the use of a proprietary cleaner, such as Betz Dearborn's Sentinel x300 or x400, or Fernox Restorer. Full instructions are supplied with the products but for more details visit either www.sentinel-solutions.net for Betz Dearborn products or www.fernox.com for Fernox products.

After flushing the system, an inhibitor such as Sentinel X100 or Fernox MB-1 should be used in accordance with the guidelines given in BS 7593:2006 for long term protection against corrosion and scale.

Grant Engineering (UK) Limited strongly recommends that a Grant Mag One in-line magnetic filter/s (or equivalent*) is fitted in the heating system pipework. This should be installed and regularly serviced in accordance with the filter manufacturer's instructions.

** As measured by gauss. The Mag-One magnetic filter has a gauss measurement of 12000.*

4.15 Completion

Please ensure that the Grant Spira Commissioning form (supplied with the boiler) is completed in full and that it is signed by the householder/user.

Leave the white copy with the user, retain the pink copy for your own records, and return the yellow copy to Grant UK. Refer to Section 10-12.

Ensure that these Instructions are handed over to the householder.

5 Condensate Disposal

5.1 General Requirements

When in condensing mode the Grant Spira condensing wood pellet boilers produce condensate from the water vapour in the flue gases. This condensate is slightly acidic with a pH value of around 6. Provision must be made for the safe and effective disposal of this condensate.

Condensate can be disposed using one of the following methods:

- Into a soil stack – either directly or via an existing waste system
- Into an external gulley

MCS Product Certification Scheme Requirements for Biomass (MCS 008) state that:
"*Because of the volume of wash-down/condensate discharge, it is NOT recommended to discharge into a purpose-made soakaway.*"

All condensate disposal pipes must be fitted with a trap whether they are connected internally or externally to a domestic waste system/soil stack or run externally to a gully or hopper. Every Grant Spira boiler is supplied with a trap and this MUST be used. Refer to Section 5.5 for trap details.

5.2 Connections

Connections into a rainwater hopper, external drain or gulley should be terminated inside the hopper/drain/gulley below the grid level but above the water level.

Condensate disposal pipes can be connected directly into waste/soil systems connected to septic tanks.

Condensate **must not be discharged** into 'grey water' systems that re-use water used in the home (not including water from toilets).

It should be noted that connection of a condensate pipe to the drain may be subject to local Building Control.

5.3 Pipework

Condensate disposal pipework must be plastic. **Copper or steel pipe is not suitable and must NOT be used.**

All condensate disposal pipes connected to a Grant Spira boiler must have a minimum 'nominal' diameter of 38mm (1 ½") plastic pipe.

Condensate disposal pipes should be kept as short as possible and the number of bends kept to a minimum.

Pipes should be adequately fixed to prevent sagging, i.e. at no more than 0.5 metre intervals.

Condensate disposal pipes must be fitted with a fall (away from the boiler) of at least 2.5° (≈45mm fall per metre run).

NOTE

Where it is not possible for the pipe to fall towards the point of discharge – either internally into a waste system or externally to a gulley (e.g. for boilers installed in a basement), it will be necessary to use a condensate pump.

When using a condensate pump with a Grant Spira boiler, a condensate holding tank of at least 40 litres is required. This is to ensure that when the boiler cleaning cycle has operated the holding tank can collect the total volume of the water used in the wash system and the condensate pump can then discharge the waste water effectively.

A boiler interlock should be fitted to shut off the boiler in the event of a malfunction of the condensate pump.

WARNING

When using a condensate pump and holding tank, the burner settings for 'TIME CLEAN PERIOD' (time boiler cleaning is in operation) must not be set greater than 60 (60 seconds) and the 'TIME CLEAN BOILER' (time between boiler cleaning operations) must not be set less than 180 minutes, as modifying these times could result in larger and more frequent wash system of the boiler which could exceed the capabilities of the tank and condensate pump. Refer to Section 9 for further details of the burner settings.

5.4 External Pipework

Ideally, external pipework, or pipework in unheated areas, should be avoided. If unavoidable, external pipework should be kept as short as possible (less than 3 metres) and 38mm (1½") waste pipe used to minimise the risk of ice blocking the pipe in freezing conditions.

The number of bends, fitting and joints on external pipes should be kept to a minimum to reduce the risk of trapping condensate.

NOTE

For a boiler installed in an unheated area such as an outhouse or garage, all condensate pipework should be considered as 'external'.

5.5 Condensate Trap

Grant Spira condensing boilers are supplied with condensate trap. This trap must be used. No alternative trap should be used in place of the trap supplied with the boiler. The 1¼" BSP female condensate outlet connection is located at the rear of the boiler.

Fit the 1¼" 311 fitting (supplied) into this connection. Using the elbow and pipe (supplied), connect the trap to the condensate outlet on the boiler, as shown in Figure 5-1.

A condensate discharge pipe with a minimum diameter of 38mm (1½") must be fitted to the outlet connection at the base of the trap.

In all cases the overflow pipe (see Figure 5-1) must be fitted to the trap and the end left open. This will protect the boiler from becoming blocked with condensate in the event of the condensate discharge pipe blocking or frozen.

CAUTION

All condensate pipework must be adequately protected against freezing, however if the condensate pipe is frozen, water will build up and discharge through the overflow on the trap.

If connecting the condensate discharge into a waste system or soil stack, either internally or externally, a second trap must be fitted in the condensate discharge pipe. This trap must provide the required 75mm water seal. It must be located between the boiler condense trap and the connection to the soil stack, in a position accessible for checking and cleaning.

5.6 Inspection and Cleaning of Trap

The boiler condensate trap (and any second trap fitted) must be checked at regular intervals (e.g. on every annual service) and cleaned as necessary to ensure it is clear and able to operate.

CAUTION

Failure to regularly check and clean the condensate trap (or traps) may result in damage to the boiler and this will not be covered by the product guarantee.

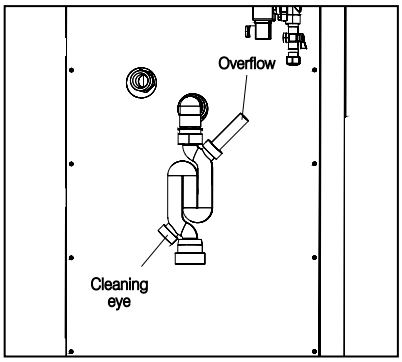


Figure 5-1: Overflow pipe

6 Sealed Systems

6.1 Sealed System Requirements

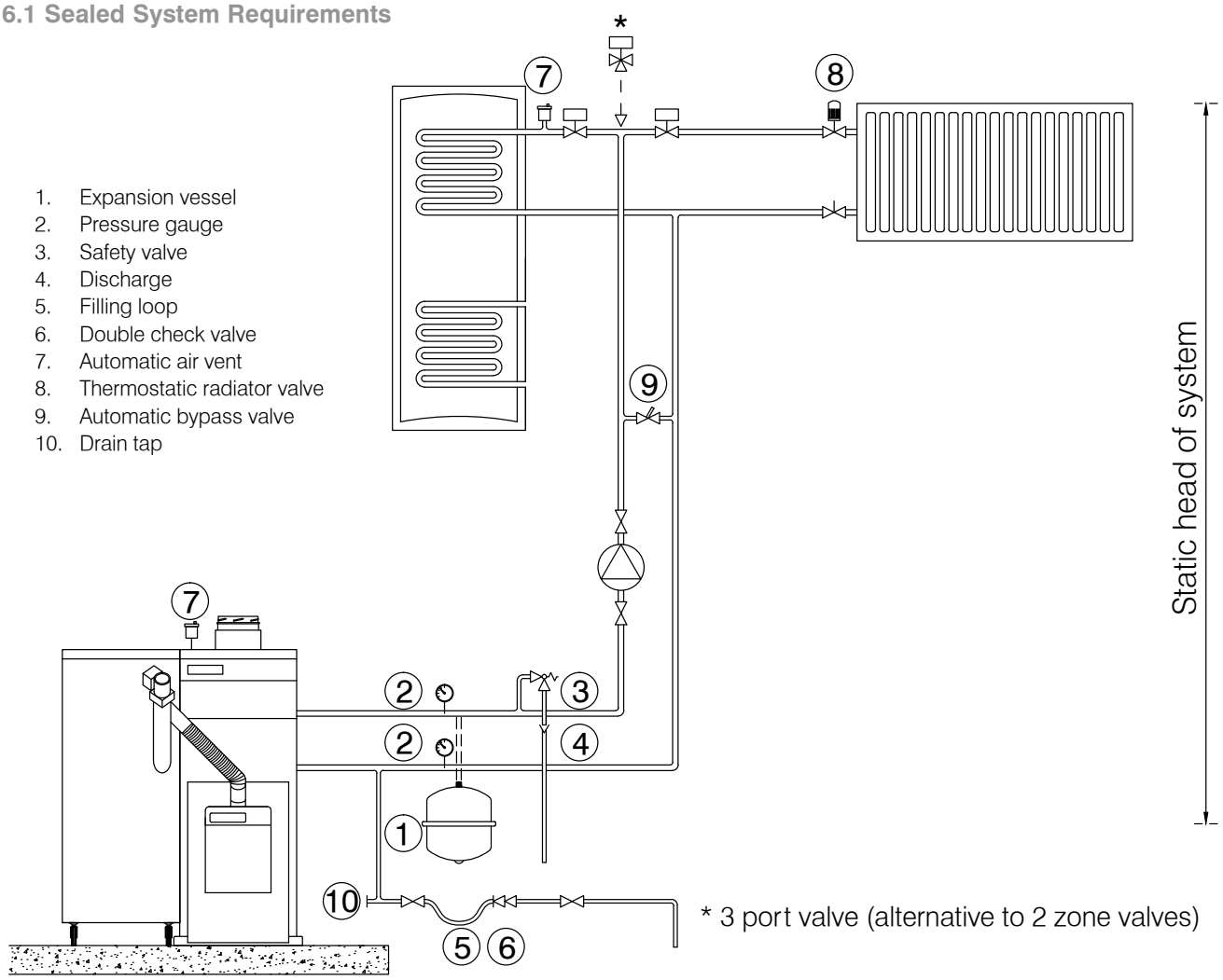


Figure 6-1: Sealed heating system components

All Grant Spira boilers are suitable for use with sealed systems complying with the requirements of BS EN 12828:2003, BS EN 12831:2003 ad BS EN 14336:2004.

The system must be provided with the following items:

- Diaphragm expansion vessel complying with BS EN 13831:2007.
- Pressure gauge.
- Pressure relief (safety) valve.
- Approved method for filling the system.

Expansion vessel
The expansion vessel can be fitted in either the return or flow pipework in any of the recommended positions as shown in Figure 6-1. To reduce the operating temperature of the expansion vessel, position it below the pipe to which it is connected.

The expansion vessel may be positioned away from the system, providing the connecting pipe is not less than 13 mm diameter. If the expansion vessel is connected via a flexible hose, care must be taken to ensure that the hose is not twisted.

Pressure Gauge
The pressure gauge must have an operating range of 0 to 4 bar.

It must be located in an accessible place next to the filling loop for the system.

Safety Valve
The safety valve (provided with the boiler) is set to operate at 2.5bar. It should be fitted in the flow pipework near to the boiler.

The pipework between the safety valve and boiler must be unrestricted, i.e. no valves. The safety valve should be connected to a discharge pipe which will allow the discharge to be seen, but cannot cause injury to persons or damage to property.

NOTE

Ensure that the expansion vessel used is of sufficient size for the system volume.
Refer to BS 7074:1:1989 or The Domestic Heating Design Guide for sizing the required vessel.

Filling Loop
Provision should be made to replace water lost from the system. This can be done manually (where allowed by the local water undertaking) using an approved filling loop arrangement incorporating a double check valve assembly.
The filling loop must be isolated and disconnected after filling the system.

Heating System
The maximum set point temperature for the central heating water is 75°C. Refer to Section 1.1.

An automatic air vent should be fitted to the highest point of the system.

If thermostatic radiator valves are fitted to all radiators, a system by-pass must be fitted. The by-pass must be an automatic type.

All fittings used in the system must be able to withstand pressures up to 3 bar. Radiator valves must comply with the requirements of BS 2767:1991.

One or more drain taps (to BS 2879) must be used to allow the system to be completely drained.

6.2 Filling the Sealed System

Filling of the system must be carried out in a manner approved by the local Water Undertaking.

WARNING

Only ever fill or add water to the system when it is cold and the boiler is off. Do not overfill.

The procedure for filling the sealed system is as follows:

1. Check the air charge pressure in the expansion vessel BEFORE filling the system.

The expansion vessel charge pressure should always be slightly greater than the maximum static head of the system, in bar, at the level of the vessel (1 bar = 10.2 metres of water). See Figure 6-1. **The charge pressure must not be less than the actual static head at the point of connection.**

2. Check that the small cap (or screw) on all automatic air vents (including the one fitted at the left rear of the boiler) is open at least one turn. The cap (or screw) remains in this position from now on.
3. Ensure that the flexible filling loop is connected and that the double check shut off valve connecting it to the water supply is closed. A valve is open when the operating lever is in line with the valve, and closed when it is at right angles to it.
3. Open the fill point valve.
4. Gradually open the double check valve from the water supply until water is heard to flow.
5. When the needle of the pressure gauge is between 0.5 and 1.0 bar, close the valve.
6. Vent each radiator in turn, starting with the lowest one in the system, to remove air.
7. Continue to fill the system until the pressure gauge indicates between 0.5 and 1.0 bar. Close the fill point valve. The system fill pressure (cold) should be 0.2 - 0.3 bar greater than the vessel charge pressure – giving typical system fill pressures of approx 0.5 bar for a bungalow and 1.0 bar for a two storey house. Refer to the Domestic Heating Design Guide for further information if required.
8. Repeat steps 5 and 6 as required until system is full of water at the correct pressure and vented.
9. Water may be released from the system by manually operating the safety valve until the system design pressure is obtained.
10. Close the fill point and double check valves either side of the filling loop and disconnect the loop.
11. Check the system for water soundness, rectifying where necessary.

NOTE

The air charge pressure may be checked using a tyre pressure gauge on the expansion vessel Schraeder valve. The vessel may be re-pressurised, when necessary, using a suitable pump. When checking the air pressure, the water in the heating system must be cold and the system pressure reduced to zero.

6.3 Venting the Pump

For those heating circulating pumps fitted with a vent plug, it is important that the pump is properly vented to avoid an air lock and also prevent it running dry and damaging the bearings.

Unscrew and remove the plug from the centre of the pump motor. Using a suitable screwdriver, rotate the pump spindle about one turn. Replace the plug in the motor. Do not over tighten.

NOTE

Some heating circulating pumps are not fitted with a vent plug so it is not possible to vent these pumps in the manner described above.

6.4 Pressure Relief (Safety) Valve Operation

Check the operation of the pressure relief (safety) valve as follows:

1. Turning the head of the valve anticlockwise until it clicks. The click is the safety valve head lifting off its seat allowing water to escape from the system.
2. Check that the water is escaping from the system.
3. Top-up the system pressure, as necessary.

NOTE

The expansion vessel air pressure, system pressure and operation of the pressure relief valve must be checked on an annual service. Refer to Section 11.

7 Flue System and Air Supply

7.1 Air Supply

The Grant Spira wood pellet boiler draws air for combustion from the room in which it is located.

Any room or space containing an appliance must have sufficient permanent air supply to ensure correct combustion of the fuel and effective operation of the flue system (i.e. to discharge of combustion products to the open air).

NOTE

The ventilation area provided must be in accordance with the requirements of The Building Regulations Approved Document J – Section 2: Appliances burning solid fuel.

For a boiler operating with a draught stabiliser:

- If design air permeability >5.0m³/(h.m²) then:
  - 300mm²/kW for the first 5kW of appliance rated output
  - 850mm²/kW for balance of appliance rated output.
- If design air permeability ≤5.0m³/(h.m²) then:
  - 850mm²/kW of appliance rated output*.

** It is unlikely that a dwelling constructed prior to 2008 will have an air permeability of less than 5.0m³(h.m²) at 50 Pa unless extensive measures have been taken to improve air-tightness. See Appendix F of The Building Regulations Approved Document J.*

To achieve this, the following minimum vent openings are required:

Boiler model	Minimum vent open area	
	>5.0m³/(h.m²)	≤5.0m³/(h.m²)
5-18kW	125.5 cm² (20 in²)	153 cm² (24 in²)
6-26kW	193.5 cm² (30 in²)	221cm² (35 in²)
9-36kW	278.5 cm² (44 in²)	306 cm² (48 in²)
11-44kW	346.5 cm² (54 in²)	374 cm² (58 in²)
12-52kW	414.5 cm² (65 in²)	442 cm² (69 in²)
15-62kW	499.5 cm² (78 in²)	527 cm² (82 in²)
18-72kW	584.5 cm² (91 in²)	612 cm² (95 in²)

7.2 Flue Terminal Position and Clearances

The Grant Spira wood pellet boilers have high operating efficiencies and low flue gas temperatures. Only the Grant Biomass twin-wall insulated flue system must used with the Grant Spira boilers.

NOTE

The flue installation must be in accordance with the requirements of The Building Regulations Approved Document J – Section 2: Appliances burning solid fuel.

The following points MUST be taken into consideration with regard to the design and installation the flue system:

- Grant recommends that the flue is vertical for a minimum distance of 600mm (measured from the top of the boiler) before any elbow. However, this is not essential for the operation of the boiler.
- There must NOT be any change of direction greater than 45° from the vertical, e.g. two 45° elbows must not be used together to form a 90° elbow.
- The flue system must NOT include any horizontal sections of flue.
- Grant recommends that an adjustable flue extension be fitted in the flue system as close to the boiler as possible, to enable the flue system to be disconnected from the boiler flue connection, as and when required, for future boiler maintenance.
- The weight of the flue system must NOT be carried by the boiler, but must be supported using the various support options available in the Grant 'Biomass' flue system. Refer to Section 7.4.5.
- The minimum distance between the outer surface of any part of the flue system and any combustible material is 60mm. Refer to Section 7.3 for flue system designation. A minimum clearance of 25mm around the flue is required for the fitting/removal of locking bands.
- The flue terminal should be located in a downdraught free area, i.e. above the roof, where it can discharge freely and not present a fire hazard whatever the wind conditions. The flue outlet positions shown in Figure 7-1 (from Approved Document J) can meet this requirement.
- The heights and separation distances shown in Figure 7-1 may have to be increased in particular cases, e.g. where high wind exposure, surrounding tall buildings, or adjacent trees can cause adverse wind effects.
- The boiler flue cannot terminate into an existing brick or clay lined chimney. All masonry flues must be lined using the Grant 'Biomass' system stainless steel flexible flue liner.
- No other appliance can be connected to the boiler flue.
- Any condensate in the flue can run back into the boiler. A condensate drain at the base of the flue system is not required as the flue system is designed to allow the condensate to run back into the boiler.

NOTE

The only flue suitable for use with the Grant Spira condensing wood pellet boiler is the Grant Biomass twin-wall insulated conventional flue system.

This 125mm (5") 'Biomass' flue system is suitable for the 5-18kW, 6-26kW and 9-36kW Spira models.

For the 44kW, 52kW, 62kW and 72kW double boiler installations each boiler must have a separate flue system.

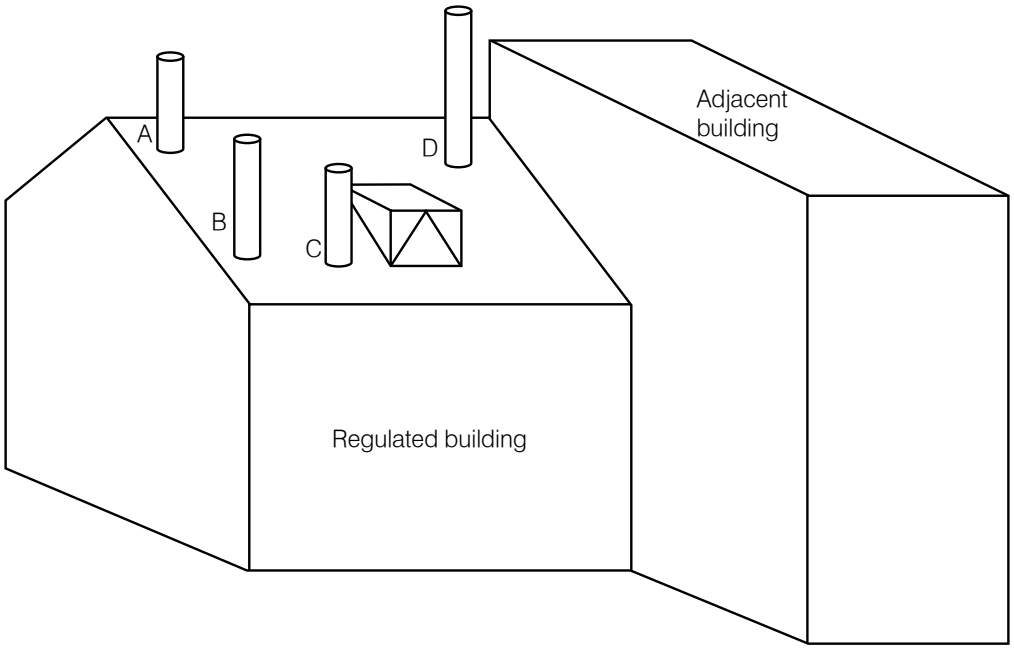


Figure 7-1: Flue terminal positions

Point where flue passes through weather surface (Notes 1, 2)		Clearances to flue outlet
A	At or within 600mm of the ridge	At least 600mm above the ridge
B	Elsewhere on a roof (whether pitched or flat)	At least 2300mm horizontally from the nearest point on the weather surface and: a) at least 1000mm above the highest point of intersection of the chimney and the weather surface; or b) at least as high as the ridge.
C	Below (on a pitched roof) or within 2300mm horizontally to an openable rooflight, dormer window or other opening (Note 3)	At least 1000mm above the top of the opening.
D	Within 2300mm of an adjoining or adjacent building, whether or not beyond the boundary (Note 3)	At least 600mm above any part of the adjacent building within 2300mm.

Notes
1) The weather surface is the building external surface, such as its roof, tiles or external walls.
2) A flat roof has a pitch less than 10°.
3) The clearance given for A or B, as appropriate, will also apply.
4) A vertical flue fixed to an outside wall should be treated as equivalent to an inside flue emerging at the nearest edge of the roof.

The above clearances are as specified in Building Regulations Approved Document J. Also refer to Approved Document J of either the England and Wales Building Regulations for further requirements on the installation of flue systems for solid fuel appliances.

7.3 Flue System Specification

The Grant 'Biomass' 125mm (5in) flue system is a fully insulated stainless steel twin-wall flue finished with a Black Polyester Powder paint finish.
This insulated flue system reduces the possibility of the condensate freezing in the flue, and also has a high corrosion resistance suitable for solid fuel.

The CE designation of this 'Biomass' flue system (to BS EN 1856-1) is:
T450 N1 W V2 L50 G 60
Where:
T450 – Temperature rating – 450°C maximum temperature for continuous operation
N1 – Pressure rating – negative pressure
W – Condensate resistance – able to contain condensate within the flue
V2 – Corrosion resistance – resistant to attack from products of combustion from natural wood
L50 – Liner material – 316L stainless steel
05 – Material thickness – 0.5mm
G – Soot fire resistance – tested at 1000°C for 30mins
60 – Distance to combustibles – 60mm minimum clearance is required from combustibles.

Masonry chimneys MUST be lined using the 125mm stainless steel flexible 'smoothbore' liner – available as part of the Grant 'Biomass' flue system. Refer to Section 7.4.9 for further information and the flue designation.

7.4 Flue System Assembly

7.4.1 Fan Box and Inspection Pipe

The fan box supplied with the boiler (packed in the accessories box) incorporates:

- Exhaust fan
- Draught stabiliser
- Flue connection (to fit Grant 'Biomass' flue system)

The fan box is supplied with a neoprene gasket for connection to the boiler. This neoprene gasket is to accommodate the low temperature wet flue system of the Grant Spira boilers. Refer to Section 4.10 for fitting details.

The lead for the flue fan (supplied factory-fitted to the fan box) is connected to the same 5-way plug as the lead for the wash system solenoid valve. Refer to Section 8.3 for connection details.

The flue system must include the Grant Inspection Pipe (product code: WPB/IP) supplied with the boiler. This should be fitted to the outlet of the fan box. Refer to Section 7.4.2 for guidance on how to join flue components. The Inspection Pipe incorporates a flue inspection hatch and combustion test point. The Inspection Pipe should be positioned such that the cover plate faces to the same side as the pellet hopper - but not to the front or rear.

When fitting the Inspection Pipe to the fan box, check the lip seal is fitted to the inner flue liner of the flue connector and the locking band is fitted to secure the joint.

When installed, the draught stabiliser must not be boxed in or obstructed from operation in any way.

A condensate drain at the base of the flue is not required as the 'Biomass' flue system is designed to allow the condensate to run back into the boiler.

NOTE

The combustion test point in the flue inspection pipe must NOT be used to monitor and adjust the % CO_2 when commissioning the Spira boiler. The combustion test point, located at the left rear corner of the rear access cover (on the secondary heat exchanger) must only be used for this purpose. Refer to Section 10.10 of these instructions for further details.

7.4.2 Joining Components

All the 'Biomass' system twin-wall flue components (with the exception of the elbows) use a 'twist lock' jointing system. The 'male collar' end of the flue component MUST always be uppermost when fitted.

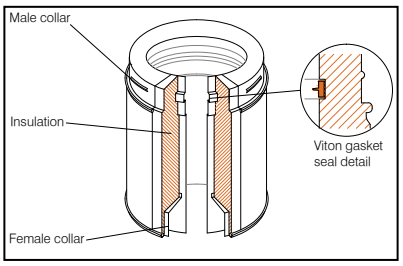


Figure 7-2: Male and female flue connections

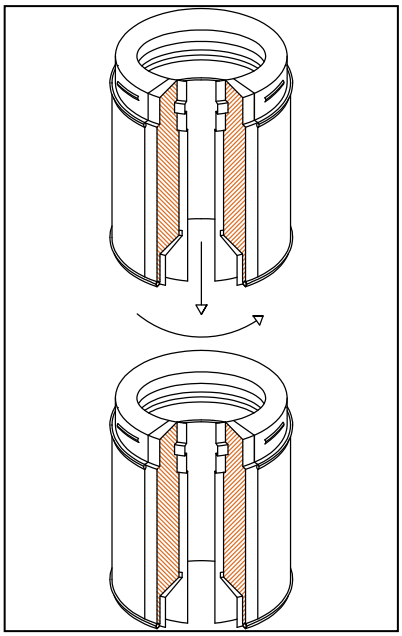


Figure 7-3: Twist lock joint between components

To join two components together:
All flue joints must have a lip seal gasket fitted. This seal is supplied with the flue component.

First fit the lip seal supplied into the groove (in the inner flue liner) at the 'male collar' end of the flue component. Refer to Figure 7-2. The lip seal should be fitted 'dry', i.e. with no lubricating grease applied at this stage. The lubricating grease (also supplied with the component) should be applied to the seal after it is fitted but before fitting the two flue components together.

Loosen the locking band at the 'female collar' end. Insert the 'male collar' into the 'female collar' and twist through 1/6 of a turn to lock in place. Refer to Figure 7-3.

Ensure that the two beaded ends of the flue components are in contact with each other all round. Position the locking and so that it grips the beaded edge of both components and fasten using the spring clip. The locking bands provided MUST be fitted at ALL flue joints. Refer to Figure 7-4.

To allow for alignment, the female collars of the elbows do NOT have the twist lock flutes, but the locking band MUST still be used to secure the two flue components together.

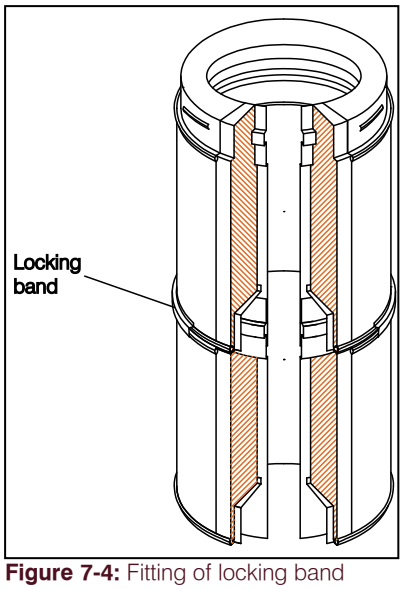


Figure 7-4: Fitting of locking band

To temporarily assemble the flue system components, to check component lengths, alignment of connections, etc. DO NOT fit the lip seals. However, for FINAL assembly the lip seals provided MUST be fitted at EVERY joint.

WARNING

All joints in the flue system must be accessible for inspection. No joints should be located within a wall, floor or ceiling spaces or any other inaccessible place.

7.4.3 Adjustable Length

The Grant 'Biomass' flue system includes an Adjustable flue extension. Refer to Section 7.9. This allows any of the straight flue extension components to be extended in length by between 100mm to 280mm (this does not apply to the 200mm extension) - refer to Section 7.9. This adjustable extension must be used in conjunction with any straight extension (1000mm, 500mm, 333mm or 200mm) to achieve the actual straight length required.

To fit the adjustable extension, first remove insulation from between the inner and outer walls of the component, as necessary. Fit the open end over the 'male collar' end of the fixed extension and adjust to achieve the required overall length. Secure the two components together using the wide locking band supplied.

NOTE

The adjustable section is NOT load bearing, therefore adequate support of the flue system MUST be provided immediately above the adjustable extension.

7.4.5 Support Components

The weight of the flue system is considerable. It must NOT be carried by the flue connection on the appliance, but requires independent support using one or more of the various flue support options available in the Grant 'Biomass' flue system.

Ventilated Support Plate (product code: WPB/SP)

On internal systems, the weight can often be supported where the flue passes through an upstairs floor, using the Support Plate with clamp band. A four-sided square opening, formed by timber stringers between the joists, is required to support the plate. Ensure that the minimum distance of 60mm is achieved between the flue outer surface and the any combustibles (e.g. timber joists). A Ventilated Fire Stop Plate (Grant Ref. WPW/FP or WPB/FP) should be fixed to the ceiling below.

Ventilated Fire Stop Plate (product code: WPB/FP)

This is not a support but a Ventilated Fire Stop Plate is required to be fixed to the ceiling below a Ventilated Support Plate. When passing through a second upstairs floor (in a 3-storey house) either a second support plate can be fitted or alternatively two ventilated fire-stop plates (one above and one below) need be fitted if the flue is adequately supported at the first upstairs floor level.

The slots in the Stop Plate allow air to pass through but will not allow the passage of flame. Also, the slots enable the distance from combustibles to be checked. If no combustible material is visible though the slots, then the minimum clearance distance of 60mm has been met.

Intermediate Top Plate (product code: WPB/TP)

Flue systems running up against either an Internal or external wall surface can be supported using the Intermediate Top Plate. This is mounted on either a pair of Wall Support Side Plates (Grant Ref. WPW/WS or WPB/WS) or a pair of Cantilever brackets (Grant Ref. WPB/CANT), which are fastened to the wall, to provide support at either the base, or part way up, a vertical section of flue.

The 'female collar' (on the underside of the plate) is fitted into the flue below and the 'male collar' (on the upper side of the plate) is a twist-lock connection into the flue above. Both joints are secured using the clamp bands provided.

Wall Brackets (product code: WPB/WB60)

Both the Wall bracket and the Adjustable Wall Bracket (Grant Ref. WPW/WB300 and WPB/WB300) are NOT load-bearing but are designed to give lateral support only. Wall brackets should be fitted with a maximum spacing of 3m on straight runs of flue and at any offset to ensure the system is rigidly supported.

Roof Support Band (product code: WP/RS)

As with the Wall Brackets, the Roof Support Band is not load bearing but is designed to give lateral support only.

Guy Wire Bracket (product code: WPB/GB)

Where the flue is free standing above the roof and its height exceeds 1.5m beyond the last support of the roof (e.g. Roof Support Band) a Guy Wire Bracket MUST be used and at every 1.5m thereafter. Grant does not supply the guy wires or tie rods to use with this bracket.

Structural Locking Band (product code: WPB/LBEXT)

A height of up to 3m above the last support at the roof can be achieved, without the need for guy wires, by using an extended Structural locking band at the joint immediately below, and at every joint above, the last flue support.

7.4.6 Elbows

Two elbows are available - 30° (product code: WPB/30) and 45° (product code: WPB/45). To allow for alignment, the female collars of these elbows do NOT have the twist lock flutes, but the locking band MUST still be used to secure the two flue components together.

There should be no more than 2 elbows – of maximum angle 45° from the vertical – fitted between the inspection hatch of the flue Inspection pipe (at the boiler) and the terminal. This can be increased to a maximum of four elbows (maximum 45°) between the boiler and terminal if there is a second flue Inspection Pipe fitted between the second and third elbows. Any Inspection hatch must be accessible for checking and cleaning purposes.

WARNING

Failure to maintain a clean flue can result in the emission of flue gases into the dwelling or damage from fire in the flue. Refer to Section 11.4.

7.4.7 Wall Sleeves

In accordance with the Building Regulations Approved Document J, a wall sleeve should be used where the flue system passes through a wall. A suitable wall sleeve is available as part of the Grant 'Biomass' flue system (product code: WP/SLE).

This 45° angled wall sleeve is available in 230mm diameter - giving a 25mm clearance all round from the 180mm diameter outer surface of the flue passing through it.

The sleeve is 45° mitred at one end. The other end of the sleeve should be cut on site to the correct length, to leave it flush with the wall on both sides. The sleeve should be adequately weatherproofed using a good quality mastic and fibre rope.

Oval one-piece trim collars are available to be fitted at either end of the wall sleeve (product code: WPB/TC). These should be fastened to the inside or outside wall using a suitable method of fixing. The trim collars should be adequately weatherproofed back to the wall using a good quality building mastic or similar.

7.4.8 Firestop Plates

Ventilated Fire Stop Plate (product code: WPB/FP)

A Ventilated Fire Stop Plate should be fixed to the ceiling below a Ventilated Support Plate. When passing through a second upstairs floor (in a 3-storey house) either a second support plate can be fitted or alternatively two ventilated fire-stop plates (one above and one below) need be fitted if the flue is adequately supported at the first upstairs floor level.

The slots in the Stop Plate allow air to pass through but will not allow the passage of flame. Also, the slots enable the distance from combustibles to be checked. If no combustible material is visible though the slots, then the minimum clearance distance of 60mm has been met.

Magnetic Fire Stop Plate Cover Plate (product code: WPB/MF)

This can be fixed below a Ventilated Fire Stop Plate to cover the ventilation slots but still allow air flow through them. The Cover Plate is held in place by the four circular magnets provided in the kit. These are fixed using the four screws securing the Ventilated Fire Stop Plate to the ceiling. The cover can be lowered for inspection purposes by pulling it downwards and off the four magnets.

The Magnetic Fire Stop Plate can also be used as a 'Bungalow' Fire Stop Plate. This unventilated fire stop plate may only be used on a combustible ceiling in a bungalow where there is a minimum distance of 60mm between the flue and any combustibles, where the flue penetrates the ceiling area and the roof space above the ceiling is open and ventilated. Within the roof space a protective wire mesh guard must be built around the flue to ensure a minimum distance of 60mm from combustibles is maintained.

To fix the plate to the ceiling: drill four equi-spaced holes 25mm in from the outer edge and use suitably sized screws to secure to ceiling.

7.4.9 Flexible Flue Liner Kit

A 125mm diameter twin skin stainless steel flexible flue liner is available to line a masonry chimney, if required. Both inner and outer layers are made from corrosion resistant 316L stainless steel. The outer is corrugated for high crush resistance and the inner is smooth to allow easy drain down of condensate, less opportunity for deposits to collect and ease of sweeping.

The CE designation for this flexible flue liner (to BS EN 1856-2) is:
T600 N1 W V2 L50012 G

This flexible flue liner must be installed as one continuous length with NO joints.

The liner is supplied in three standard lengths of 6m, 8m and 10m as part of a Flexible Flue Liner kit, as follows:

Grant product code	Liner length
WPKIT6/125	6 m
WPKIT8/125	8 m
WPKIT10/125	10 m

Prior to Installation

In all cases the chimney should be inspected for deterioration and, if necessary, and remedial work required should be carried out. The chimney should be swept, preferably by a member of the National Association of Chimney Sweeps (NACS) or a suitably qualified chimney sweep who would provide a certificate after sweeping and checking, which should be retained for future reference.

The flaunching at the top of the stack should be checked to ensure it is not cracked and if so it must be replaced. The brickwork pointing and flashings should be checked to ensure they are in good order and corrected as necessary. This is required to prevent the ingress of rainwater which, if mixed with the carbon deposits on the inside wall of the chimney, could damage the flue liner and the fabric of the building.

Installation

Prior to installation of the flexible liner, it is recommended that a test length (approximately 1.5m long), with a nose cone attached to each end, is pulled through the chimney to ensure that the chimney is suitably sized and free from obstructions. Failure to do so may lead to the guarantee on the liner being invalidated if damage has occurred due to snagging on an obstruction. The flue liner should be pulled down the chimney using a nose cone and string/ rope.

Care must be taken to avoid overbending or kinking of the liner during installation. The minimum bend radius for the liner is 375mm.

Orientation

It is essential that the flexible flue liner is installed the right way up. The arrow on the outside of the liner indicated the direction of the flue gas flow and must be pointing upwards, i.e. towards the terminal.

Cutting the Liner

Extreme care must be taken when cutting the liner, Strong industrial gloves and long sleeved overalls should be worn as the cut edges are very sharp. Any tape on the ends of the liner, provided for safe handling prior to installation, must be removed before connecting the flue liner.

In addition to the liner, the Flexible Flue Liner Kit also contains the following components:

Anchor Plate (product code: WPB/AP)

This is located on the top of the chimney with the male collar on the top and the spigot below the plate. Fit the flexible liner onto the spigot. Seal with high temperature mastic sealant and secure in place with self-tapping screws.

The plate should then be bolted to the chimney and sealed using Fire cement.

Flex flue adaptor (product code: WPB/CA)

This is located at the bottom end of the flexible flue liner, where it connects to the rigid twin-wall flue section of the flue system. The adaptor is fitted vertically with the socket uppermost. The flexible liner is pushed fully into this socket, sealed with high temperature mastic and secured with self-tapping screws.

Roof Cowl (product code: WPB/RC)

The Rain Cap type terminal is fitted either directly to the Anchor Plate on the top of the chimney or, if necessary (i.e. to achieve the required distance between the terminal and the roof surface), to a length of flue that is, in turn, connected to the Anchor Plate.

Fit the Terminal to either the Anchor Plate or flue extension and twist through 1/6 of a turn to lock in place. Ensure that the locking band (supplied with the terminal) is correctly fitted to secure the terminal in place. Refer to Section 7.4.2 for further details on connecting the flue components.

7.5 Flue Testing

Once installed, the flue system should be tested in accordance with the requirements of The Building Regulations Approved Document J, Appendix E, Section E13 – Smoke Test I.

7.6 Flue Notice Plate

The Building Regulations Approved Document J requires a notice plate that conveys essential information regarding the flue installed to be permanently displayed. A suitable self-adhesive notice plate is supplied with the Grant 'Biomass' flue system and this must be completed by the installer and displayed in an unobtrusive but obvious position within the building concerned, e.g. next to the flue system/boiler.

7.7 Carbon Monoxide Alarm

The Building Regulations Approved Document J requires a Carbon Monoxide alarm to be fitted in the room where the boiler is located.

This should be positioned between 1 and 3m horizontally from the boiler either:

- On the ceiling at least 300mm from any wall, or
- On a wall as high up as possible (above any windows or doors) at least 150mm from ceiling.

7.8 Typical Flue Systems

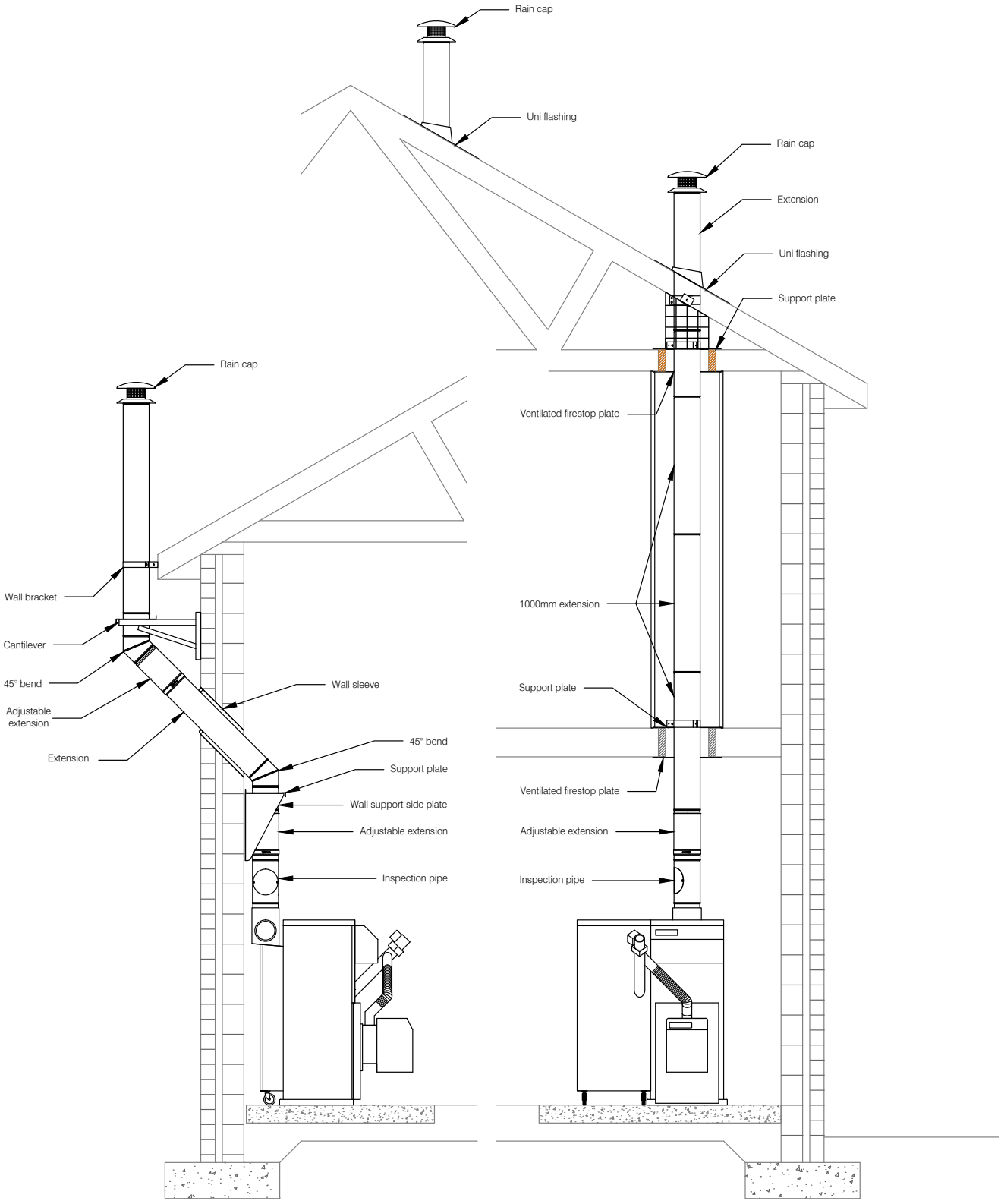


Figure 7-5: Typical flue installations details

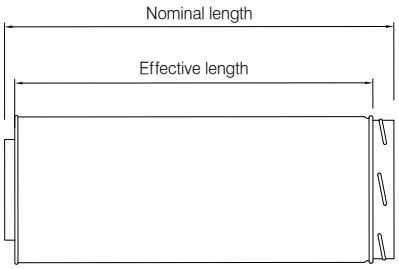
7.9 Flue Component Dimensions

200mm

333mm

500mm

1000mm

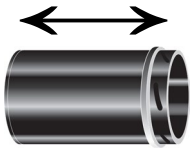


Straight pipe length		
Product code	**Nominal length (mm)**	**Effective length (mm)**
WPB/EXT200	200	160
WPB/EXT333	333	293
WPB/EXT500	500	460
WPB/EXT1000	1000	960

Adjustable pipe length		
Product code	**Nominal length (mm)**	**Effective length (mm)**
WPB/ADJ250	75 - 250 mm	50 - 230mm

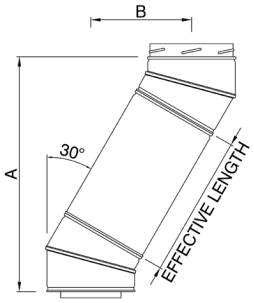
Complete with locking band.
Telescopes over pipe below.
Minimum engagement should be half the diameter.
This component is NOT load-bearing.

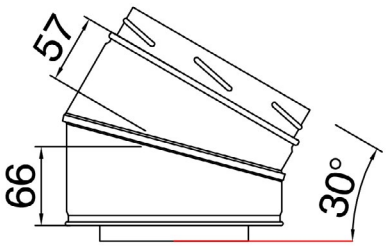
Effective lengths using a straight and adjustable extension		
Product codes	**Minimum (mm)**	**Effective length (mm)**
WPB/EXT200 + adjustable	350	440
WPB/EXT333 + adjustable	393	573
WPB/EXT500 + adjustable	560	740
WPB/EXT1000 + adjustable	1060	1240



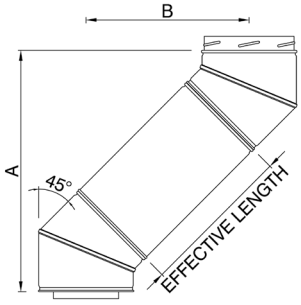
Adjustable 75 - 250mm

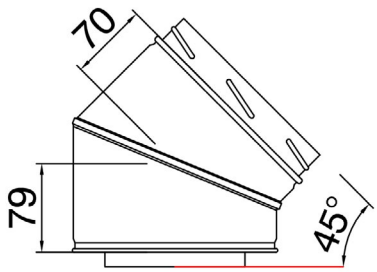
Double 30° bend and straight pipe length		
Effective length	**Dimension**	**Length**
960	A / B	1061 / 542
460	A / B	628 / 292
293	A / B	483 / 208
160	A / B	368 / 142



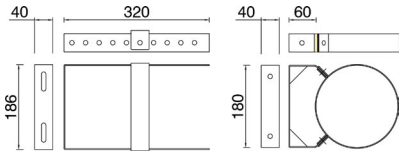


Double 45° bend and straight pipe length		
Effective length	**Dimension**	**Length**
960	A / B	933 / 784
460	A / B	580 / 431
293	A / B	462 / 313
160	A / B	367 / 218

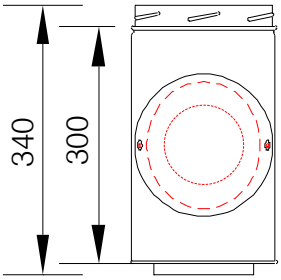




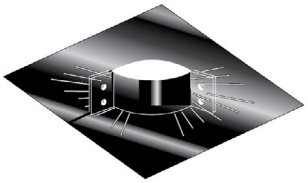
7.10 Flue System Components



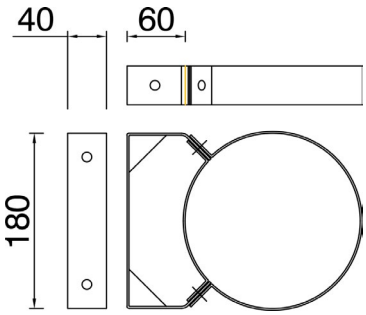
WPB/WB300 - Wall bracket (50 - 300mm)



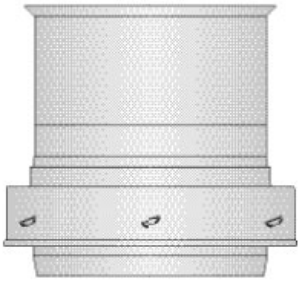
WPB/IP - Inspection pipe



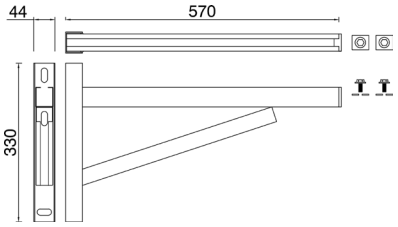
Support plate (2 pieces)



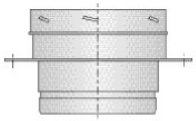
WPB/WB60 - Wall bracket (60mm)

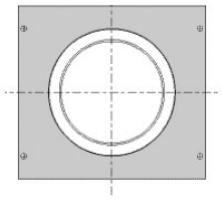


WPB/CA - Flue adaptor

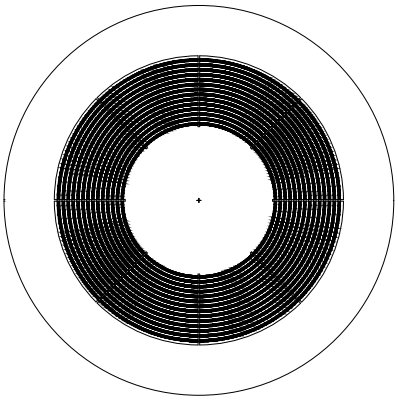


WPB/CANT - Cantilever (570mm)

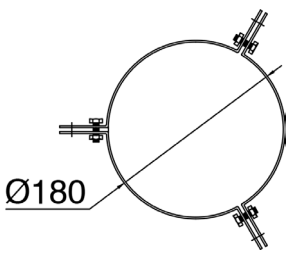




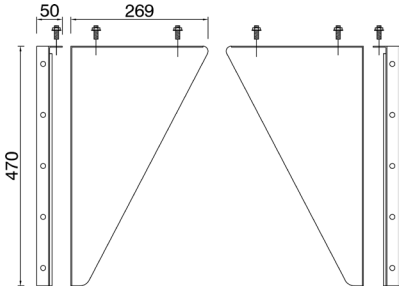
WPB/AP - Anchor plate



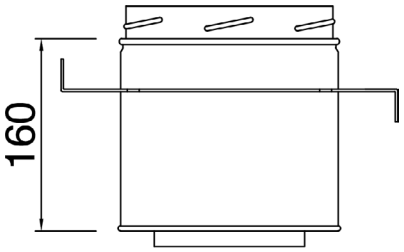
WPB/FP - Firestop plate (1 piece)

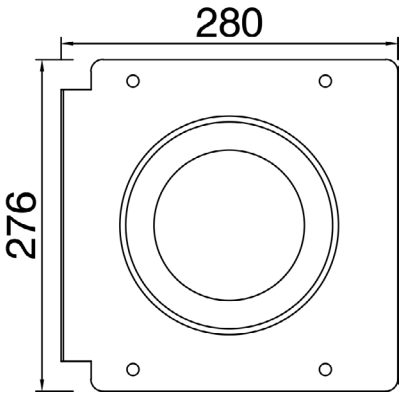


WPB/GB - Guy wire bracket

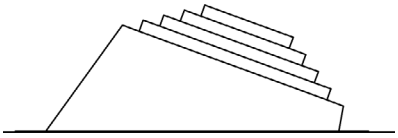


WPB/WS - Wall support side plate

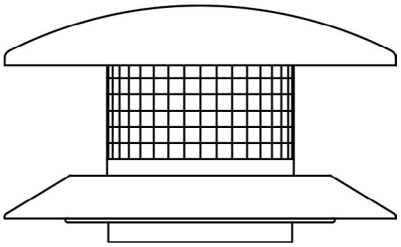




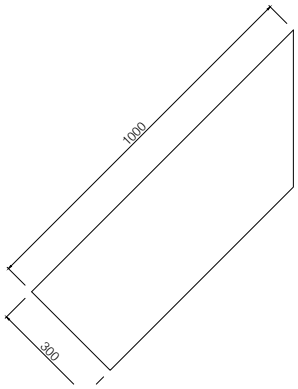
WPB/TP - Intermediate top plate



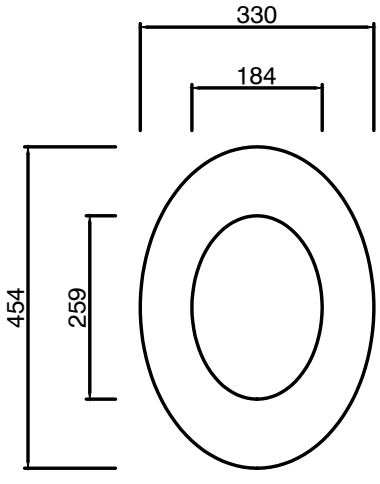
WPB/UF200 - Uni flashing (80 - 200mm)



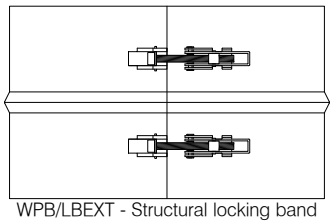
WPB/RC - Rain cap



WP/SLE - Wall sleeve (45°)
Also requires WPB/TC or WPW/TC x 2)

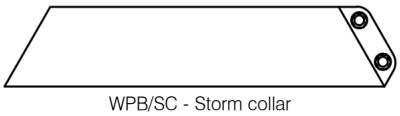


WPB/TC - Trim collar for Wall Sleeve (45°)

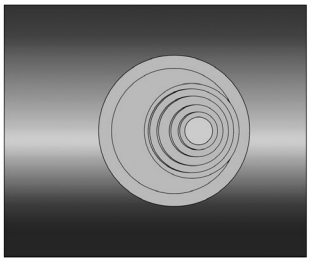


WPB/LBEXT - Structural locking band

WPB/RS - Roof support (stainless steel) band



WPB/SC - Storm collar



WP/PFL - Pitched lead flashing

7.11 Flexible Flue Liner

Flexible Flue Liner Kit Contents

6/8/10 metre liner, Anchor plate/flex adaptor, Flue system to flex adaptor, Rain cap, Locking band x 3, Viton gasket x 3, Lubricant, Packing list and instructions

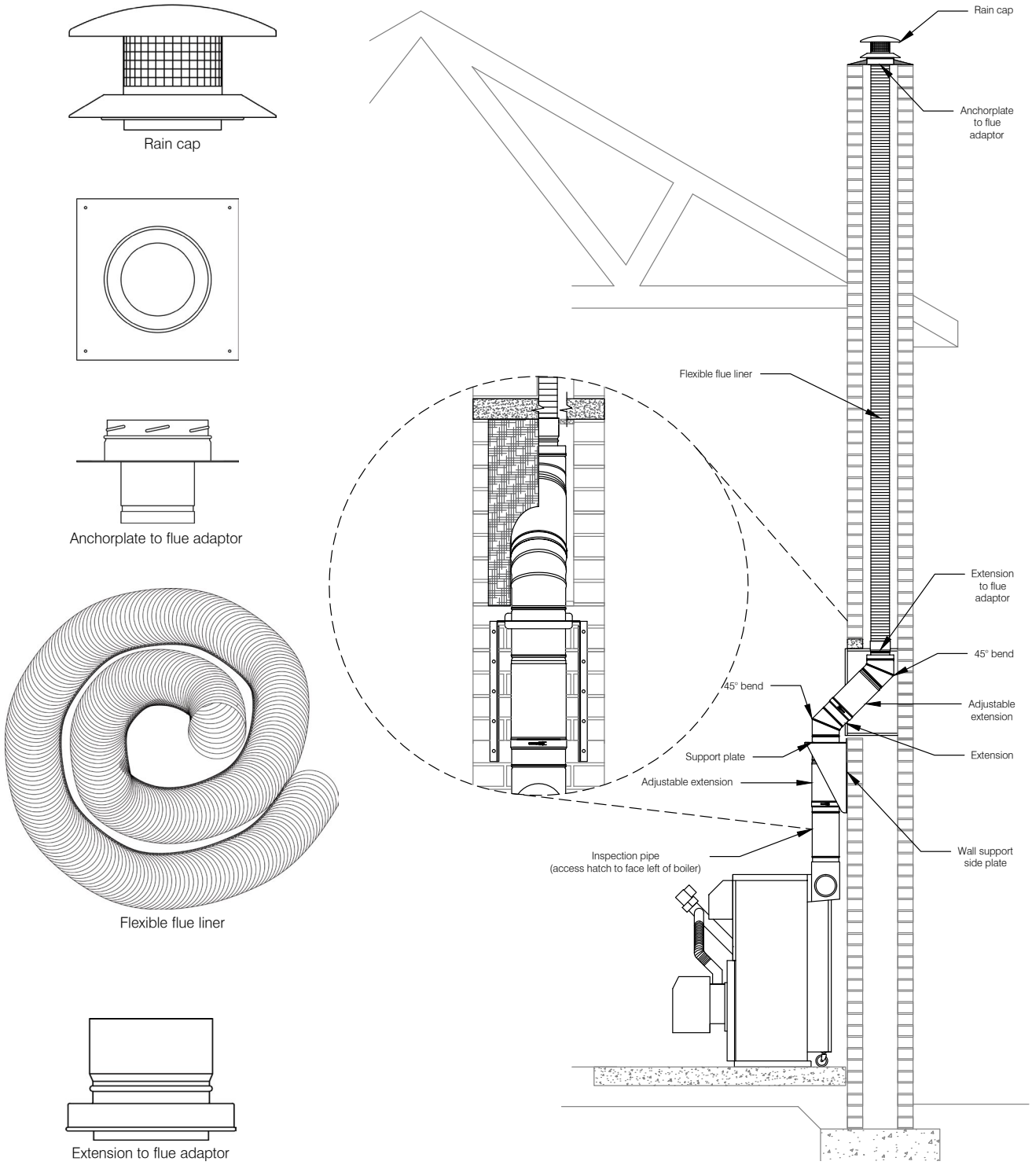


Figure 7-6: Typical flue installation (flexible flue liner)

8 Electrical

8.1 General Requirements

The Grant Spira Condensing Wood Pellet boiler requires a 230 V ~50 Hz electrical supply. The unit must be connected to a mains power supply via a fused spur that is protected by a 30mA RCD.

The boiler requires both a permanent mains supply and a switched live supply to control the boiler.

The fused spur of the power supply to the boiler and controls must be fitted with a 13A fuse.

A second fused spur (5A fuse) fed from the first fused spur is included to supply the heating system controls circulating pump. Refer to Figure 8-9 and 8-10.

For the UK, the electrical installation must be carried out by a competent installer in accordance with the requirements of the Electricity at work Regulations 1989 and BS 7671:2008 – IET Wiring Regulations 17th Edition (including all amendments).

All the wiring and supplementary earth bonding external to the boiler must be in accordance with the current IET wiring regulations.

Any heating system controls, e.g. room thermostat , frost thermostat, etc. connected to this boiler must be suitable for use on mains voltage.

8.2 Hopper Electrical Connections

All Grant Spira boiler pellet hoppers are fitted with two in-line 5A fuses. These are located inside the electrical wiring enclosure in the back of the pellet hoppers.

8.2.1 Single Boiler Hopper

(with a single auger) – in either a left hand or right hand version as required, to supply a single boiler.

This hopper is fitted with three pre-wired flying leads with factory-fitted plugs:

- 4-way plug – for connection of the permanent live, earth and neutral and also the switched live from the heating controls system.
- 5-way plug – to connect the hopper to the boiler.
- 6-way plug – to connect either a bulk pellet store auger or Grant SpiraVac vacuum system to the hopper and boiler.

Refer to Figure 8-7 for hopper wiring diagram.

8.2.2 Double Boiler Hopper

(with two augers) – to supply two boilers in a 'double boiler' installation.

This hopper is fitted with four pre-wired flying leads with factory-fitted plugs:

- 4-way plug – for connection of the permanent live, earth and neutral and also the switched live from the heating controls system.
- Two 5-way plugs – one to connect to each of the two boilers.
- 6-way plug – to connect either a bulk pellet store auger or Grant SpiraVac vacuum system to the hopper and boiler.

Refer to Figure 8-8 for double hopper wiring diagram.

8.2.3 For Installations with a Bulk Pellet Store only

Both single boiler and double boiler hoppers are supplied with the 6-way plug parked inside the wiring enclosure. See Figure 8-1.

If a bulk pellet store is to be used:

- Remove the wiring centre cover from the rear of the hopper.
- Unclip the 6-way plug from diaphragm switch bracket.
- Pass the 6-way plug lead through the grommet just below the wiring centre cover.

Figure 8-1: Hopper selector switch and 6-way plug

- Set the toggle switch on the diaphragm switch bracket to 'BULK STORE'. See Figure 8-1.
- Replace the wiring centre cover and fasten in place using the screws previously removed.
- Connect the 6-way plug to the corresponding 6-way connector on the pre-wired flying lead fitted to either the bulk pellet auger or Grant SpiraVac system.
- If using the Grant SpiraVac system, refer to the installation instructions supplied with the system for further details on its installation and operation.

8.2.4 For Installations using the Pellet Hopper only

The pellet hopper is supplied with the toggle switch set to 'HOPPER ONLY'. When used without a bulk pellet store, the pellet hopper has the facility for the connection of a 230V 'low pellet' indicator lamp (not supplied). This will indicate to the householder that the pellets in the hopper have reached the minimum level and the hopper needs to be topped up.

The indicator lamp should be positioned so it can be easily viewed by the householder. See either Figure 8-7 or 8-8, as applicable, for the connection details.

If a bulk store is used, with either the Grant SpiraVac system or a Grant bulk auger, a 'low pellet' indicator lamp **cannot** be fitted to the pellet hopper.

8.3 Boiler/Hopper Plug Connections

Before making any electrical connections to the hopper (by connecting the 4-way plug and socket together) ensure that all the plug connections have been correctly made between the hopper, boiler and (if fitted) the bulk pellet supply system, as follows:

1. Fit the 5-way plug from the flue fan and solenoid valve into the socket at the top right rear of the boiler. See Figure 8-2. Ensure it is fully pushed home.

Figure 8-2: Flue fan/solenoid valve plug connection

2. Fit the 5-way plug from the hopper into the socket at the top left rear of the boiler. See Figure 8-3. Ensure it is fully pushed home.

Figure 8-3: Hopper plug connection

3. On a double boiler installation, fit the second 5-way plug from the double hopper into the top left rear of the second boiler. Ensure it is fully pushed home.

   Item number 1 needs to be repeated for double hopper/ second boiler.

4. Fit the two 7-way plugs (No.1 and No.2) from the boiler control panel into the two lower connections on the left side of the burner. These plugs are male and female and cannot be fitted into the wrong connections. Refer to Figure 8-4. Ensure that both plugs are fully pushed home until the small catch on each of them clicks into place.

5. Fit the 6-way plug (No.3) from the pellet feed auger motor into the upper connection on the left side of the burner. Refer to Figure 8-4. Ensure that the plug is fully pushed home until the small catch it clicks into place.

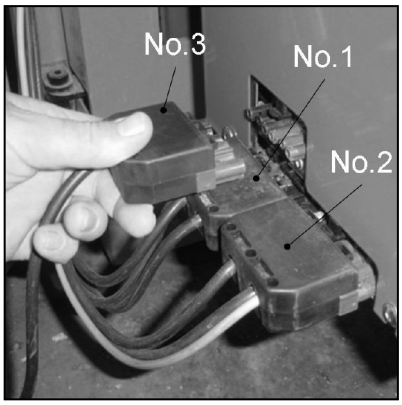


Figure 8-4: Auger plug connection

6. If a bulk pellet store is to be used, connect the 6-way plug to the corresponding connection on the flying lead from either the Grant SpiraVac system or Grant bulk pellet store auger. Ensure that the plug and socket are fully pushed together until the small catch clicks into place.

   Refer to instructions supplied with either the Grant SpiraVac or Grant bulk store auger for further details.

8.4 Heating System Controls

The boiler can be used in conjunction with typical heating control system, e.g. 'S-Plan' or 'Y-Plan' type controls. Refer to Figures 8-9 and 8-10 and for typical control system wiring diagrams.

As the electrical connection (permanent mains supply and switched live from the heating control system) to the boiler is made via the flying lead with 4-way plug connection it will be necessary to provide a 4-core flying lead either

a) Directly from the heating controls wiring centre – if suitable located adjacent to the boiler/hopper, or

b) Via a junction box situated adjacent to the boiler hopper.

The length of 4-core flex required (between the wiring centre or junction box and the 4-way plug connection) must be sufficient to allow the hopper to be moved out enough to allow disconnection the 4-way plug.

Frost Protection

For additional protection of either the entire heating system, or the boiler and localised pipework, it is recommended that a frost thermostat be installed. It is also recommended that it be used in conjunction with a pipe thermostat to avoid unnecessary and wasteful overheating of the property.

The pipe thermostat should be located on the boiler return pipe, and set to operate at 25°C. Refer to Figures 8-7 or 8-8 as appropriate for connection details.

8.5 Connecting the Power Supply

WARNING

Before making any connections to the heating systems controls ensure that the electrical supply is isolated at the fused spur serving the controls and boiler, that the fuse has been removed and the isolator is locked off.

Do NOT connect the electrical supply to the hopper, by connecting the 4-way plug and socket together, until ALL plug connections have been correctly made between the hopper, boiler and (if fitted) the bulk pellet supply system.

The boiler requires a permanent mains supply and a switched live supply to control the boiler. For details of Controls refer to Section 8.4 and Figures 8-9 or 8-10.

Do NOT interrupt the permanent supply to the hopper/boiler with any external controls.

The power supply cable and flex should be at least 1.5mm^2 PVC.

NOTE

The fused spur of the power supply to the boiler and controls must be fitted with a 13A fuse when a Grant SpiraVac vacuum system is fitted; otherwise a 5A fuse is required.

Connect the mains supply using the following procedure:

1. Press down on the small catch (between the two parts of the factory-fitted 4-way plug/socket connector) to release it.
2. Separate the two parts and remove the cover from the male 4-way plug.
3. Connect the flex to the 4-way male plug as follows:
   - Terminal L2 – Switched live (from heating system controls)
   - Terminal N – Mains neutral
   - Terminal (earth) – Mains earth
   - Terminal L1 – Mains (permanent) live

   Refer to Figures 8-9 or 8-10
4. Replace the cover, ensuring outer sheath of the flex is held in the cable grip of the plug, and secure using the screws previously removed.
5. Connect the other end of the 4-core flex to the either the heating system controls wiring centre or junction box. Refer to either Figures 8-9 or 8-10, as appropriate, for details of the connections required.
6. Fit the two parts of the 4-way connector back together. Ensure the plug and socket are fully pushed together until the small catch clicks into place.

WARNING

The Grant wood pellet boiler and intermediate hopper contains electrical switching equipment and must be earthed; also any bulk hopper system fitted should also be earthed.

In the event of an electrical fault after installation of the boiler, the following electrical system checks must be carried out.

- Short circuit
- Polarity
- Earth continuity
- Resistance to earth

8.6 Wiring Diagrams

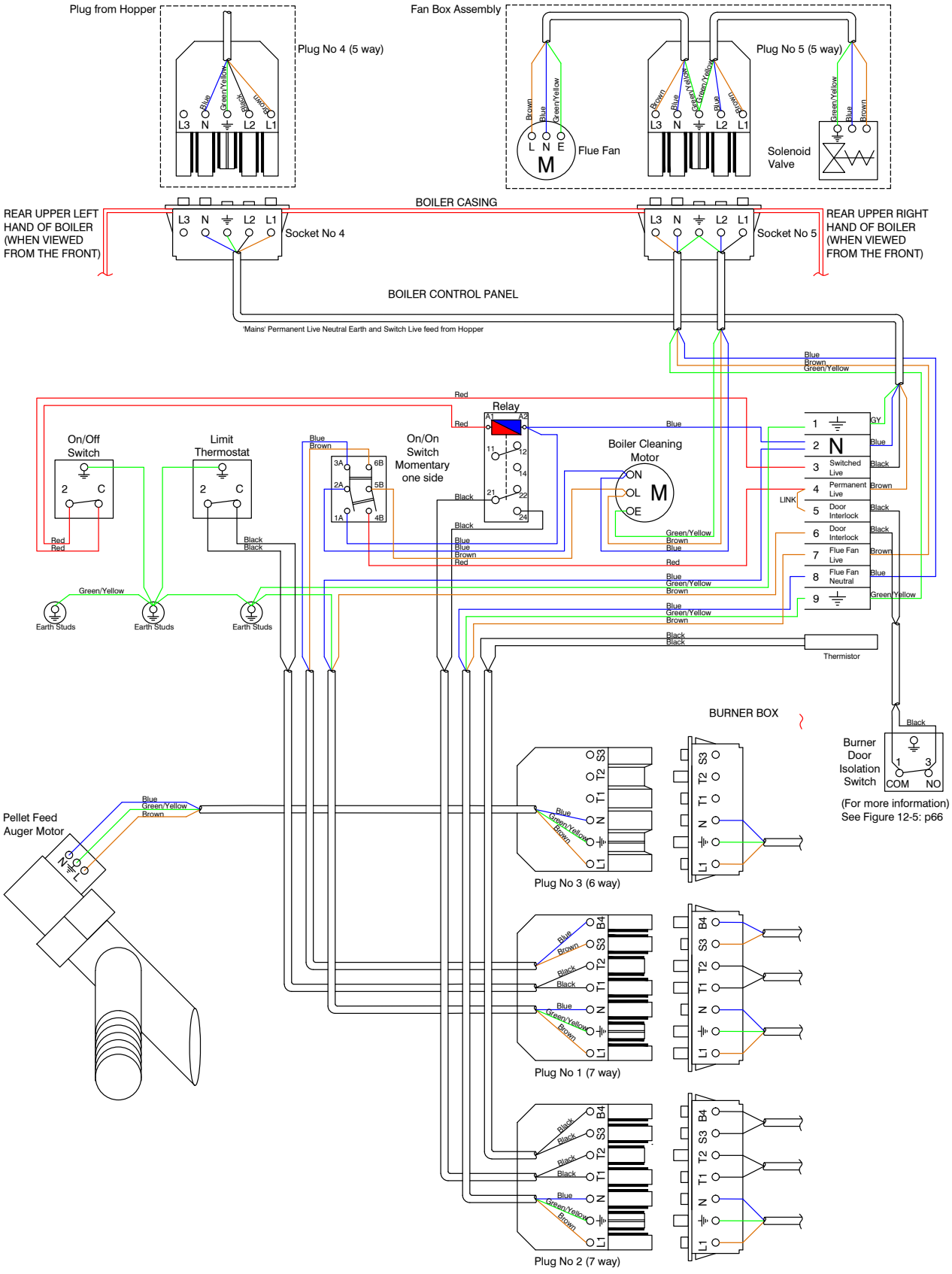


Figure 8-5: Boiler internal wiring diagram

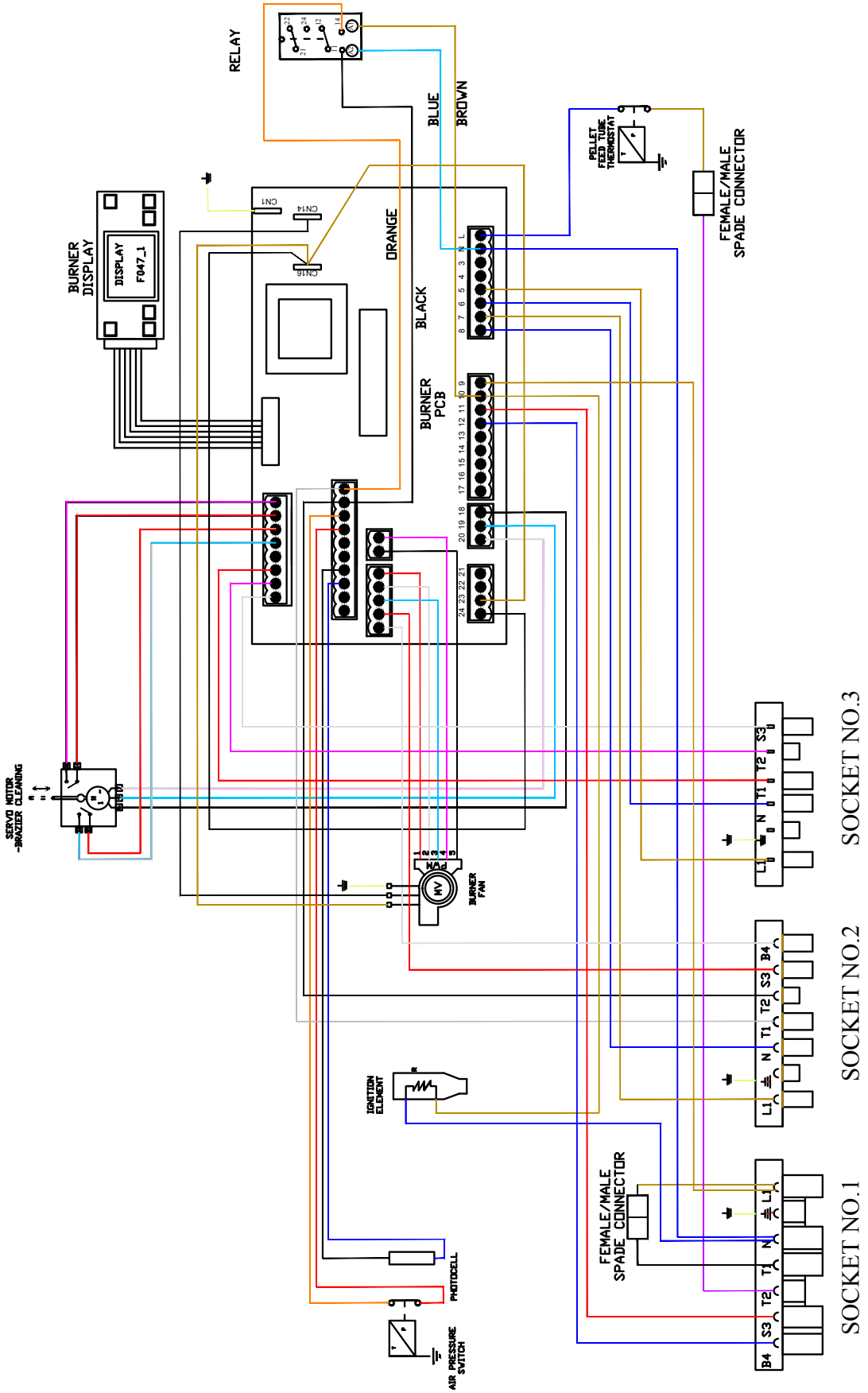


Figure 8-6: Burner wiring diagram

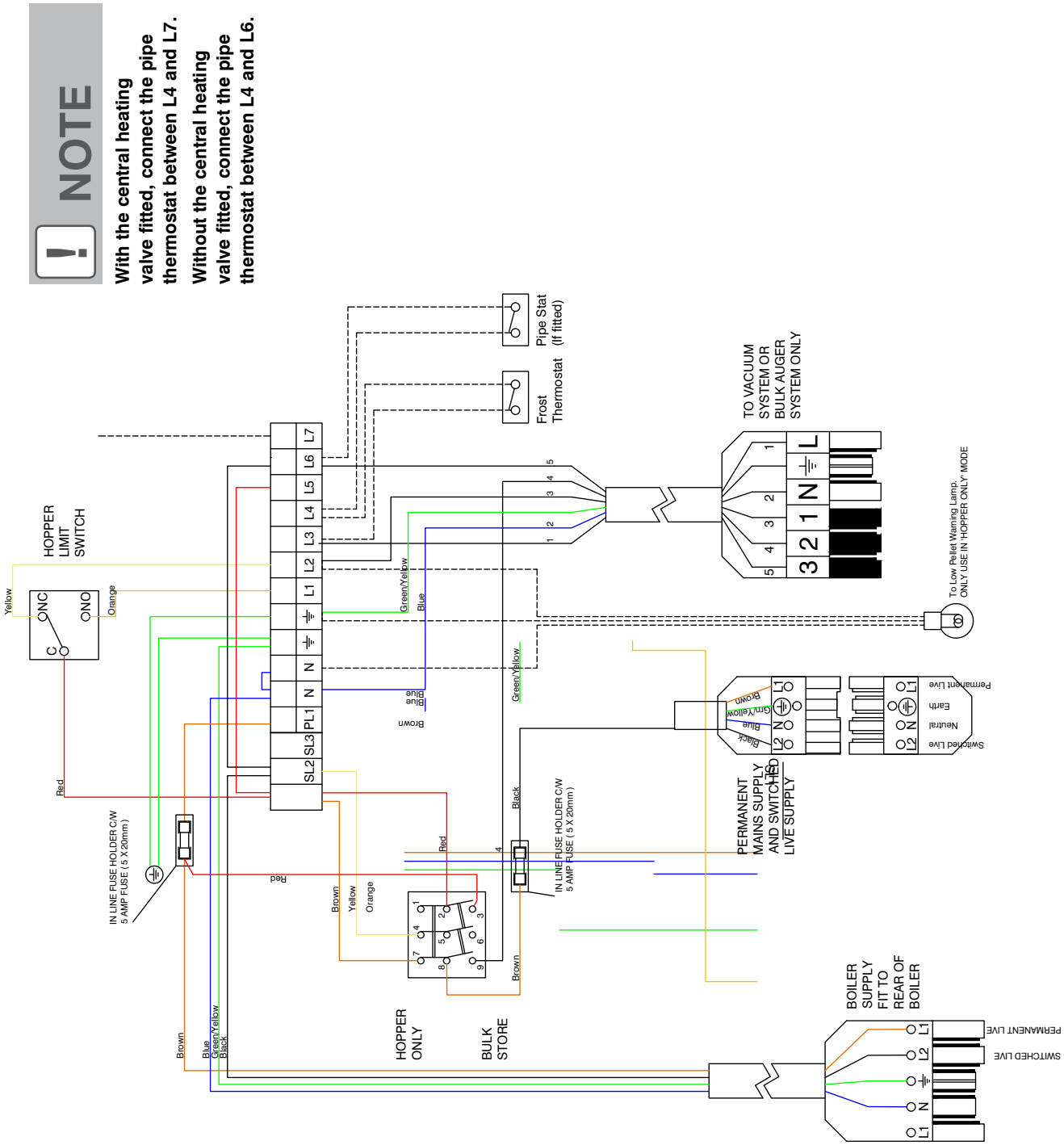


Figure 8-7: Hopper wiring diagram – single boiler hopper

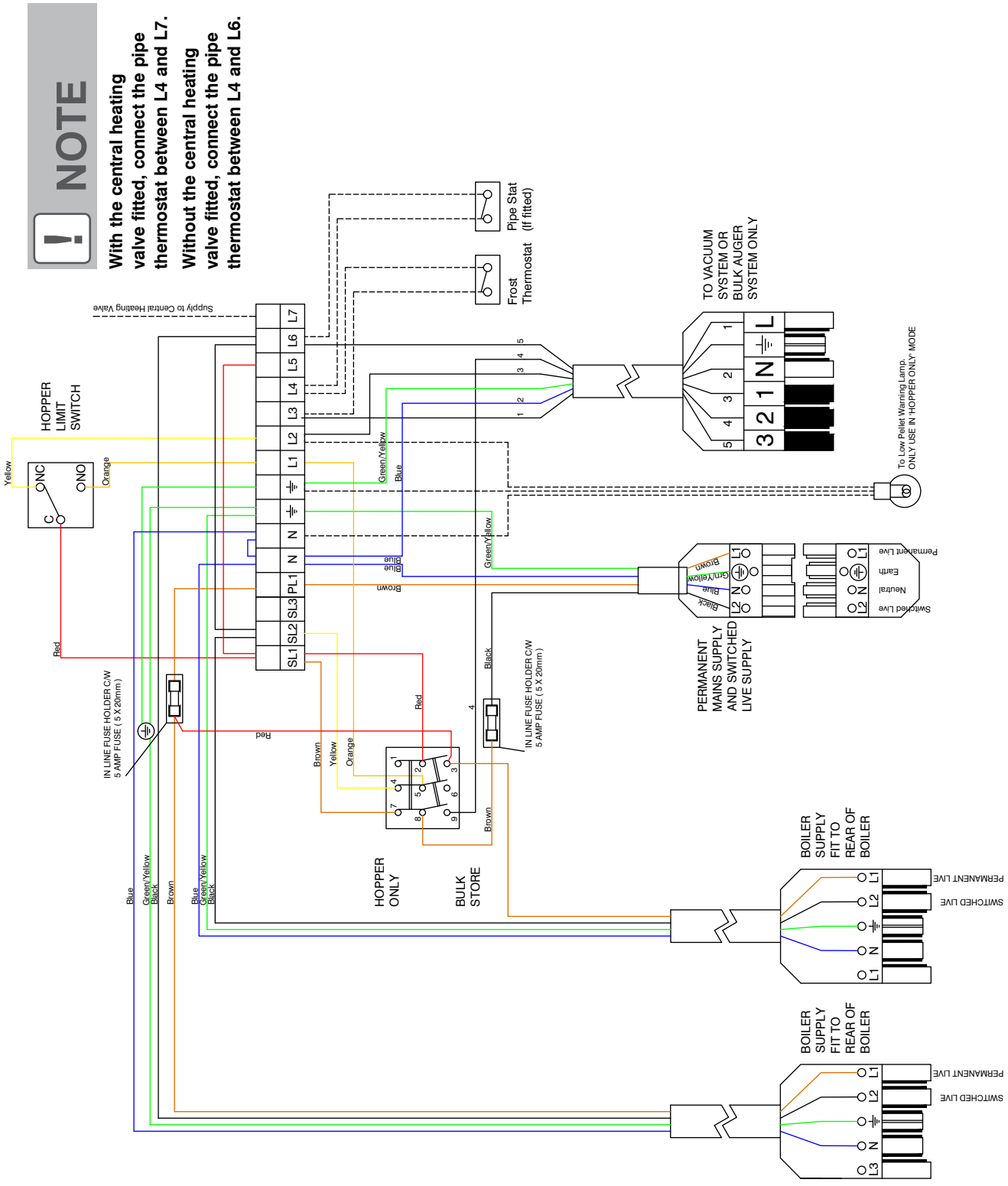
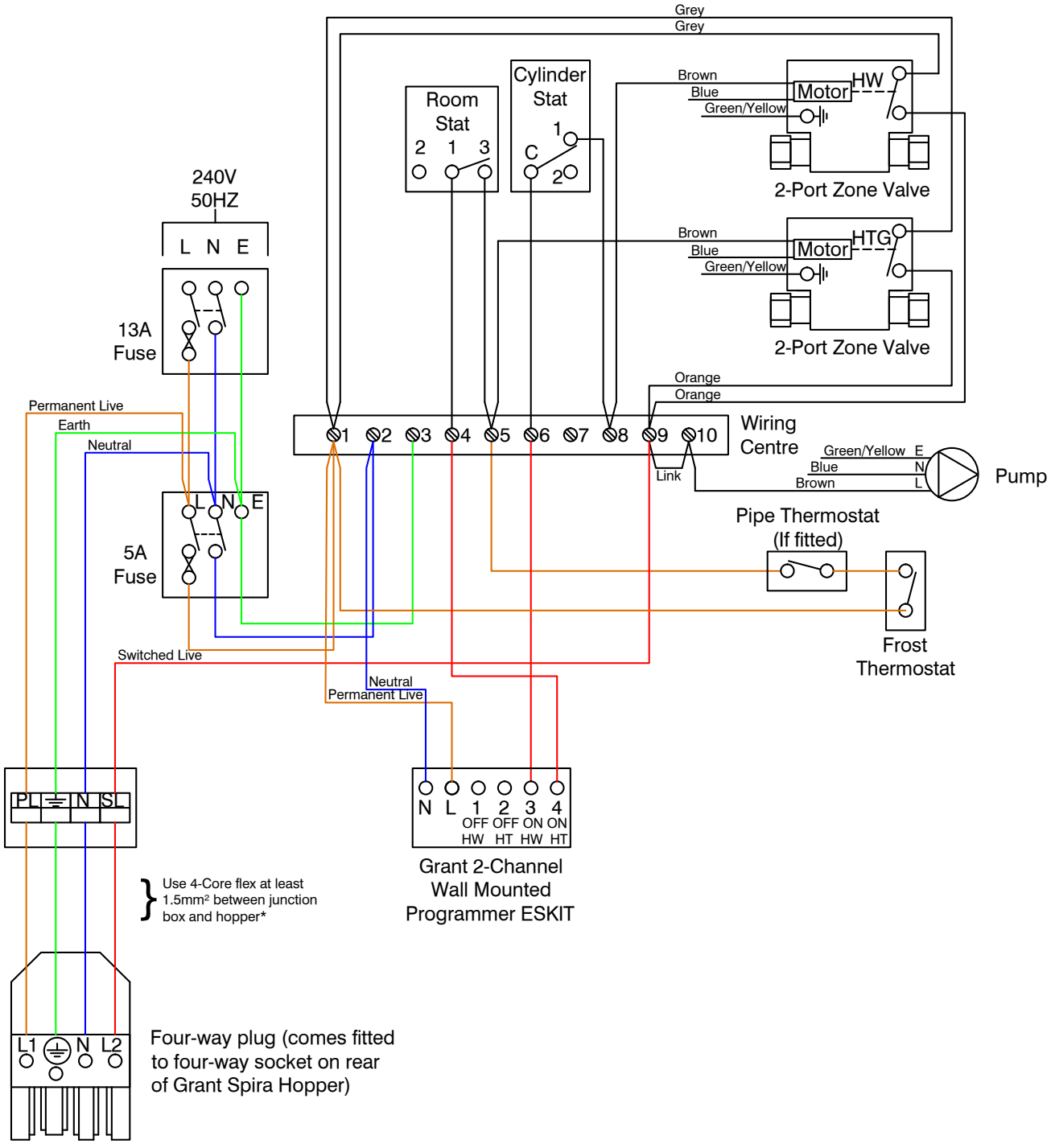


Figure 8-8: Hopper wiring diagram – double boiler hopper

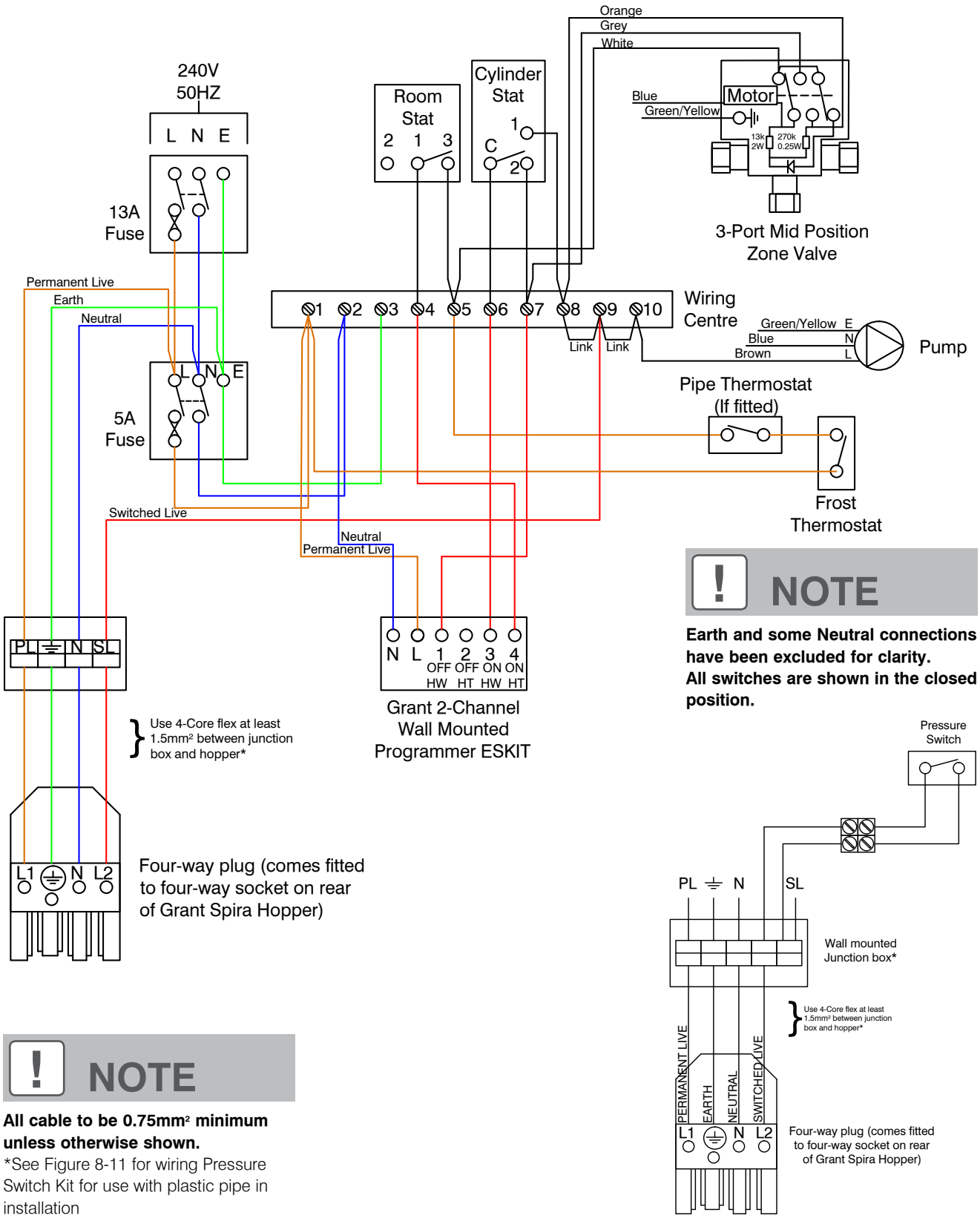


NOTE

All cable to be 0.75mm² minimum unless otherwise shown.

*See Figure 8-11 for wiring Pressure Switch Kit for use with plastic pipe in installation

Figure 8-9: Heating system controls – S-plan type system connection diagram



NOTE

Earth and some Neutral connections have been excluded for clarity.
All switches are shown in the closed position.

NOTE

All cable to be 0.75mm² minimum unless otherwise shown.
*See Figure 8-11 for wiring Pressure Switch Kit for use with plastic pipe in installation

Figure 8-10: Heating system controls – Y-plan type system connection diagram

Figure 8-11: Connection of Grant low water pressure switch (product code: MPCBS62)

9 Burner

9.1 Burner Operation

The burner controls the pellet feed auger, flue fan, boiler temperature and also the boiler and brazier cleaning systems. The burner comes with a display screen and six control buttons. These buttons are to access the menus and control the burner functions.

The burner is equipped with a brazier where the combustion of the wood pellets takes place within the boiler. The self cleaning device on the brazier is automatically activated after the pellet feed auger run time has exceeded a predetermined set time. The pellet feed auger run time for brazier and boiler cleaning is pre-set in the burner menu.

The temperature of the water within the boiler is controlled via a thermistor to the burner. The thermistor is inserted into the boiler water jacket and is used by the burner to control the modulation of the boiler output.

The boiler has a set point temperature. This is the target flow temperature from the boiler. As the temperature of the boiler increases and reaches the set point less the 'TEMP DELTA' temperature (default value 5°C) the output of the boiler is reduced by one modulation step.

Each subsequent 1°C increase in boiler temperature reduces the output of the boiler by one further modulation step until the temperature reaches the set point plus the 'TEMP DELTA' temperature.

At this point the boiler output is 'MINIMUM FLAME' which is minimum output setting of the boiler. The percentage increase or decrease in power is calculated on the rate of temperature change. The sequence of operation is shown in Section 9.3.

9.2 Burner Operating Modes

'BOILER WAIT THERMOSTAT':

(operation code 03) Boiler is in standby awaiting the following;

- A switched live input signal from the control system.
- The boiler temperature to drop below the set point less the 'DELTA RESTART' temperature. ('DELTA RESTART' is the temperature below the set point the burner restarts after maximum temperature has been reached).
- If required, the boiler temperature to drop below the set point less the 'DELTA RESTART' temperature. 'DELTA RESTART' (default value 5°C) is the temperature below the set point at which the burner restarts, after maximum temperature has been reached).

'WAIT PRELOAD BRAZIER':

(operation code 40) Initial loading of pellets into the brazier to enable combustion to start.

- Activated with a switched live input signal and/or temperature drops below the set point less 'DELTA RESTART' temperature.
- Deactivated after time exceeds 65 seconds.

'WAIT LIGHTING' – IGNITION: (operation code 41) Period of time given for pellets to light.

- Activated after 'PRE LOAD' operation is complete.
- Deactivated once photocell lux reading reaches 2 lux.

'WAIT LIGHTING'–FLAME STABILISATION: (operation code 45) Period of time to allow flame to stabilise after pellets have ignited.

- Activated after ignition mode.
- Deactivated after time exceeds 30 seconds.

'WAIT LIGHTING' –LIGHTING FEED REDUCED: (operation code 42) Period of time intermittent quantities of pellets supplied to the brazier to increase the flame.

- Activated after -'WAIT LIGHTING' flame stabilisation mode.
- Deactivated after time exceeds 120 seconds.

'PELLET BURNER FIRING': Power 100% (operation code 13) Flame is fully developed and boiler is operating on full power.

- Activated after –'WAIT LIGHTING' lighting feed reduced mode
- Deactivated after boiler temperature is higher than the set point less 'TEMP DELTA'.

'PELLET BURNER FIRING': Power modulating (operation code 13) Flame is reduced and boiler output is modulating.

- Activated when the boiler temperature is higher than the set point less 'TEMP DELTA'.
- Deactivated after the boiler temperature exceeds the set point plus 'TEMP DELTA'.

'PELLET BURNER FIRING': Power minimum (operation code 13) Flame is reduced and boiler is at minimum output.

- Activated once the boiler temperature exceeds the set point plus 'TEMP DELTA'.
- Deactivated after the temperature exceeds 'TEMP OFF H2o' (default value 80°C).

'TURNING OFF BRAZIER': (operation code 14). Burn down period to remove any pellets remaining in the brazier.

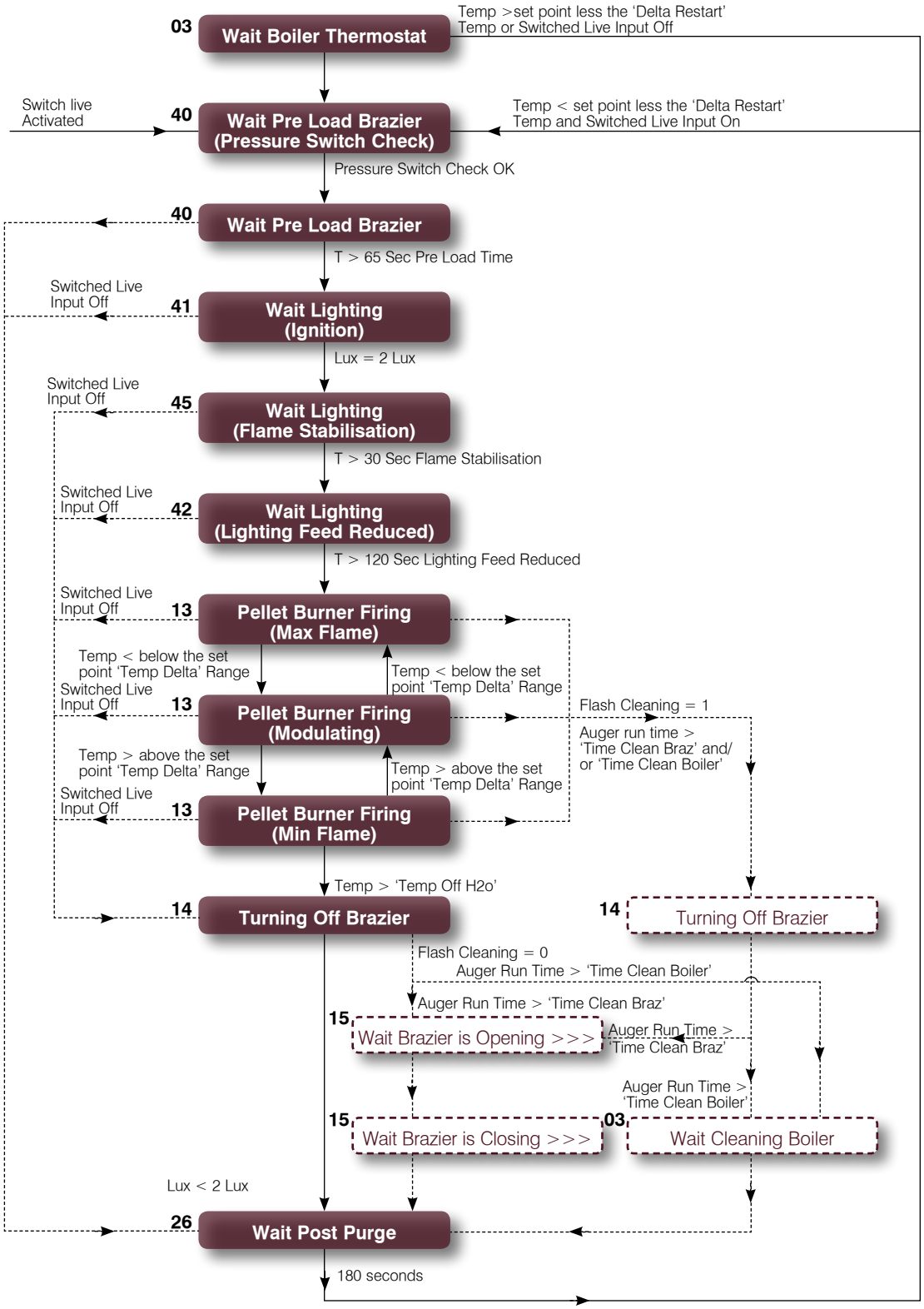
- Activated when switched live input signal from control system is switched off or the boiler temperature exceeds 'TEMP OFF H2o' setting or the ON/STANDBY switch on the control panel is set to the 'STANDBY' position.
- Deactivated once photocell lux reading has dropped to 1 lux.

'WAIT POST PURGE': (operation code 26) Period of time after burn down is complete to ensure no unburnt pellets ignite.

- Activated after 'TURNING OFF BRAZIER' is complete.
- Deactivated after time exceeds 180 seconds.

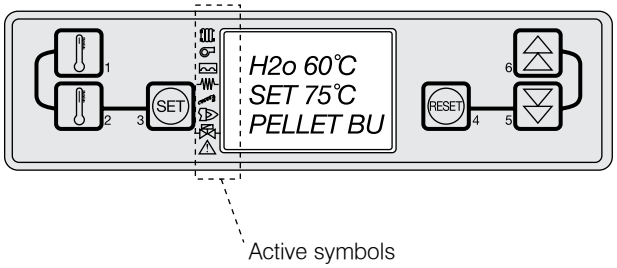
9.3 Burner Operating Sequence

Flow Chart of Operation of Wood Pellet Boiler



For 'STEP AUTO' function (the two digit code allocated to each function). Refer to Section 9.7.3.

9.4 Burner Display Screen



= Heating demand (from control system)
= Burner fan operational
= Pressure switch closed
= Ignition element operational
= Feed auger operational
= Photocell lux reading >'Flame On' setting
= n/a
= Error

9.5 Burner Control Buttons

The burner has six control buttons, these perform the following tasks.

Button No.1

1 Normal Mode; Increase temperature set point by 1˚C - up to 75°C maximum
Menu mode; Scroll up

Button No.2

2 Normal mode; Decrease temperature set point by 1˚C - down to 55°C maximum
Menu mode; Scroll down

Button No.3

3 (SET) Menu mode; Scroll forward

Button No.4

4 (RESET) Normal mode; Reset fault
Menu mode; Scroll back

Button No.6

6 Menu mode; Increase parameter value

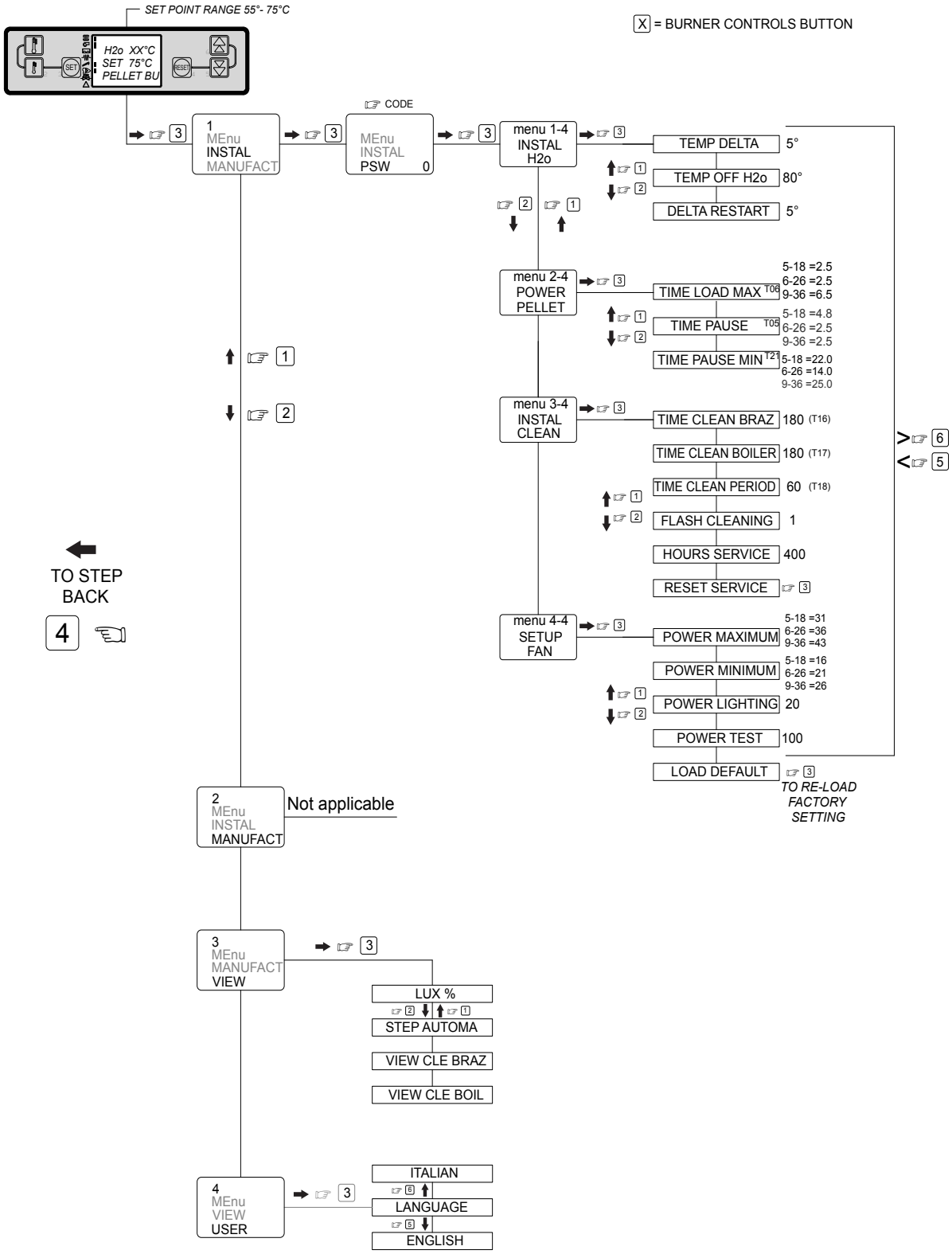
Button No.5

5 Menu mode; Decrease parameter value

! NOTE

These buttons are presented as they appear on the burner control panel, i.e. buttons 5 and 6 are not sequentially ordered.

9.6 Burner Menu Navigation Chart and Factory Default Settings



9.7 Burner Menu

Using the main menu flow chart shown in Section 9.6 navigate the menus using the buttons as described in Section 9.5.

Each of the four main folders is described in further detail as follows;
'INSTAL', Installer folder, see Section 9.7.1
'MANUFACT' not applicable.
'VIEW' folder, see Section 9.7.3.
'USER' folder, see Section 9.7.4.

Press button **'3'** to open the menu settings. Once the menu settings option is activated there are four folders to choose from as shown below.

9.7.1 'INSTAL' menu folder

'INSTAL' represents the Installer folder. It enables the installer access relevant parameters for adjustment during the installation / commissioning of the appliance. Only accessible with an access code.

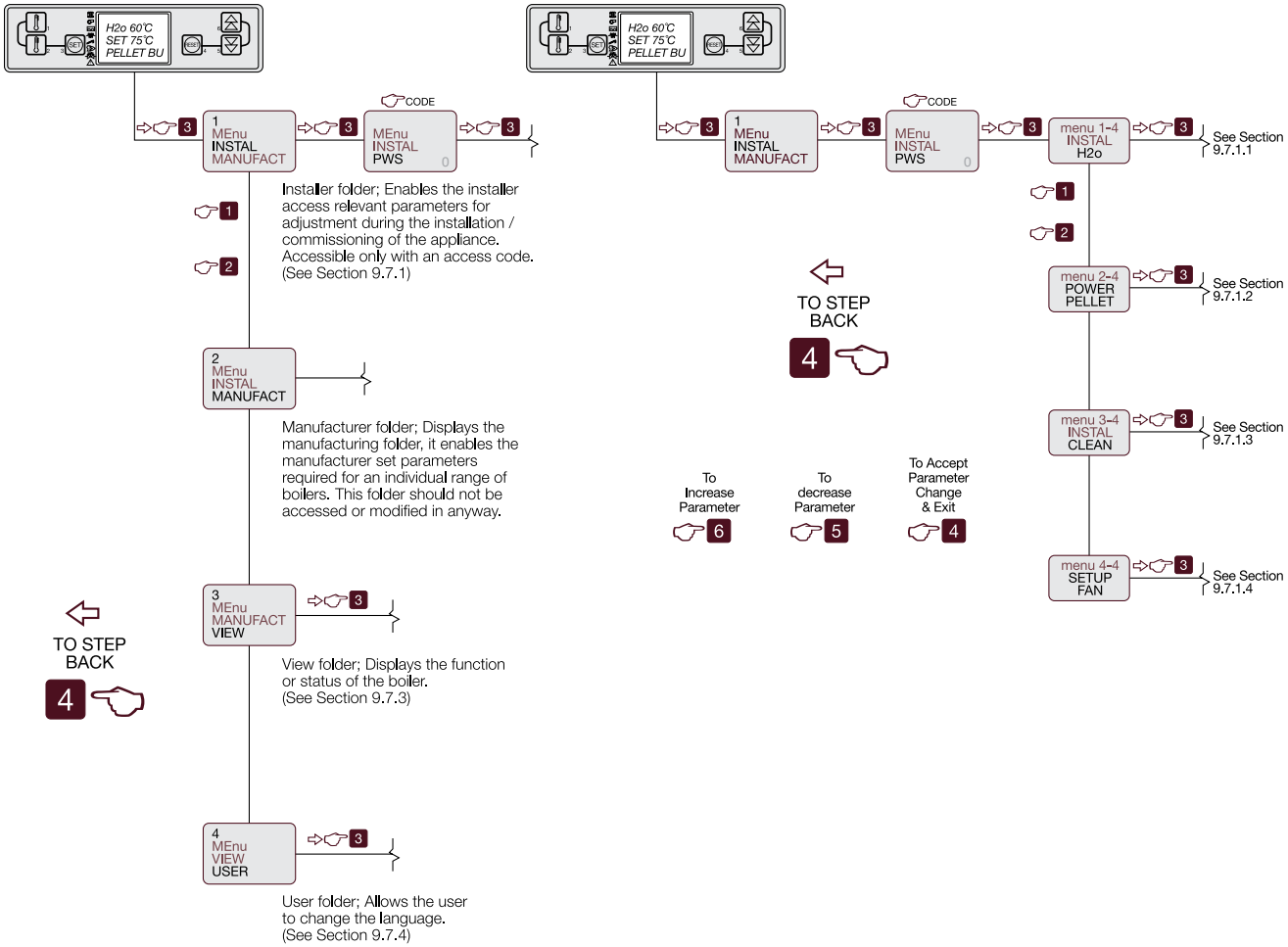
The **'INSTAL'** folder has four sub folders:

- menu 1-4, H2o
- menu 2-4, POWER PELLET
- menu 3-4, CLEAN
- menu 4-4, SETUP FAN

To access the parameters within the **'INSTAL'** folder from the main burner display, navigate as follows:

9.7.1.1 'menu 1-4- H2o' sub folder contains three parameters stored within this folder:

- **TEMP DELTA:** Defines the boiler temperature either side of the Set-point in which the boiler will modulate
  Units - °Celsius.
  Default setting:
  5-18, 6-26 and 9-36 = 5 (5°C)
- **TEMP OFF H2o:** Temperature the burner' shuts down.
  Units -°Celsius.
  Default setting:
  5-18, 6-26 and 9-36 = 80 (80°C)
- **DELTA RESTART:** Temperature drop below the set-point before burner re-starts.
  Units - °Celsius.
  Default setting:
  5-18, 6-26 and 9-36 = 5 (5°C)



CAUTION

Settings in the burner menu's below are based on the boiler using the Grant fixed angle pellet feed auger at 45° and an auger motor fixed speed of 8.1 rpm. Only EN Plus Grade A1 (BS EN ISO 17225-2) pellets MUST be used with the Grant Spira boilers. These pellets must be bark and sand free AND approved by Grant UK BEFORE being used in the Spira boilers. Failure to use approved pellets will invalidate the product guarantee.

9.7.1.2 'menu 2-4- POWER PELLET'

The parameters stored within this folder are:

- **TIME LOAD MAX:** Time the pellet feed auger operates to deliver pellets to the brazier when the burner is in max flame mode. Adjusting this time adjusts the boiler input in max flame, i.e. the larger the load time, the greater the input, alternatively the smaller the load time the lower the input (see table Section 2.2.1).
  Units 000.0 seconds.
  Default setting:
  5-18 and 6-26 = 25 (2.5 seconds)
  Default setting:
  9-36 = 65 (6.5 seconds)
- **TIME PAUSE MAX:** Time between pellet feed auger operations when the burner is in max flame mode. Adjusting this time adjusts the boiler input in max flame, i.e. the larger the pause time, the lower the input, alternatively the smaller the pause time the higher the input (see table Section 2.2.1).
- **TIME PAUSE MIN:** Time between pellet feed auger operations in min flame. Adjusting this time adjusts the boiler input in min flame, i.e. the larger the pause time, the lower the input, alternatively the smaller the pause time the higher the input (see table Section 2.2.1).
  Units 000.0 seconds.
  Default setting 5-18:
  0220 (22.0 seconds)
  Default setting 6-26:
  0140 (14.0 seconds)
  Default setting 9-36:
  0250 (25 seconds)

NOTE

Adjusting this setting will also result in the input during the modulation period being adjusted as the modulation input is automatically calculated on the max/min and load/pause settings.

9.7.1.3 'menu 3-4- CLEAN'

The parameters stored within this folder are:

- **TIME CLEAN BRAZ:** Total pellet feed auger run time before burner brazier cleaning operation activates. Default setting:
  5-18, 6-26 and 9-36 =180 (180 minutes)
- **TIME CLEAN BOILER:** Total pellet feed auger run time before boiler cleaning operation activates. Default setting:
  5-18, 6-26 and 9-36 =180 (180 minutes)
- **TIME CLEAN PERIOD:** Time period boiler cleaning function is operational once 'TIME CLEAN BOILER' has elapsed. Default setting:
  5-18, 6-26 and 9-36 =60 (60 seconds)
- **FLASH CLEANING:** Setting determines when the burner brazier and boiler cleaning operations start after the 'TIME CLEAN BRAZ' and 'TIME CLEAN BOILER' periods have elapsed.
  1 = Burner firing interrupted and shut down, brazier and boiler cleaned immediately auger run time exceeds '**TIME CLEAN BRAZ**' and '**TIME CLEAN BOILER**' periods.
  0 = Burner firing not interrupted. Brazier and boiler cleaned at next burner shut-down after auger run time exceeds '**TIME CLEAN BRAZ**' and '**TIME CLEAN BOILER**' periods.
  Default setting:
  5-18, 6-26 and 9-36 = 1.

  Consideration must be given to the demand of the heating system before adjusting this setting. For example, if the boiler is to be installed in a hotel, you may choose to change this setting to 0 to ensure there is an uninterrupted supply.
- **HOURS SERVICE:** Time lapse period before the burner screen displays 'SERVICE'. This is to indicate a service is now due. Default setting 5-18, 6-26 and 9-36 = 400 (400 hrs).
  RESET SERVICE: to cancel the '**SERVICE**' display on the burner screen after the boiler has been serviced. Press button 3 ('SET') followed by button 4 ('RESET') five times to exit the menu.
  IT IS ESSENTIAL TO RESET THE SERVICE DISPLAY AFTER EACH SERVICE.

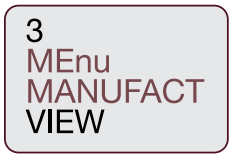
9.7.1.4 'Menu 4-4- SETUP FAN'

- **POWER MAXIMUM:** Burner fan speed setting when burner in 'max' output mode.
  Default setting: 5-18 = 31
  Default setting: 6-26 = 36
  Default setting: 9-36 = 43
- **POWER MINIMUM:** Burner fan speed setting when burner in 'min' output mode.
  Default setting: 5-18 = 16
  Default setting: 6-26 = 21
  Default setting: 9-36 = 26
- **POWER LIGHTING:** Burner fan speed setting when burner in lighting mode.
  Default setting:
  5-18, 6-26 and 9-36 = 20
- **POWER TEST:** Used to simulate the burner fan speed for test purposes only. Once the '**POWER TEST**' is cancelled from the screen the burner fan reverts to its required operational speed.
- **LOAD DEFAULT:** Load factory default settings. Press button 3 to activate factory default settings.

9.7.2 'MANUFACT' Menu Folder

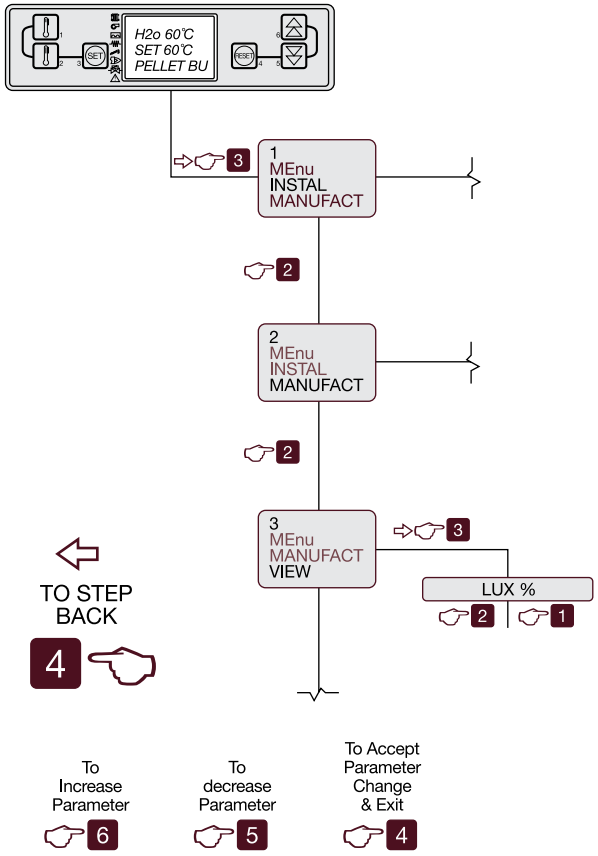
'**MANUFACT**' displays the manufacturer folder; this folder cannot be accessed or modified by the installer or service engineer.

9.7.3 VIEW Menu Folder



'**VIEW**' folder displays the function or status of the boiler.

To access the menu displays within the '**VIEW**' folder from the main burner display, navigate as follows;



The '**VIEW**' menu folder has 4 readout displays as follows;

a. **LUX %:** Light illumination measured by the Photocell. Readout is instantaneous.

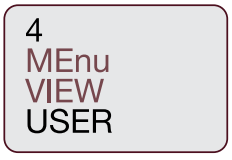
b. **STEP AUTO:** Each boiler function is allocated a two digit number. This menu displays the function the boiler is in when viewing. The list of the functions are as follows:

03 - Wait Boiler Thermostat
13 - Pellet Burner Firing
14 - Turning Off Brazier
15 - Brazier is moving back
15 - Brazier is moving forward
26 - Post Purge
29 - Air Pressure Error
33 - Failed Pellet Lighting
34 - Servo Motor Blocked
40 - Pre-load
41 - Wait Lighting (Ignition)
42 - Wait Lighting (Lighting Feed Reduced)
45 - Wait Lighting (Flame Stabilisation)
47 - Probe Fault

c. **VIEW CLE BRAZ** Total pellet feed auger run time since brazier last cleaned. When ≥ 180 Min brazier cleaning operation will commence. Resets after each brazier clean.

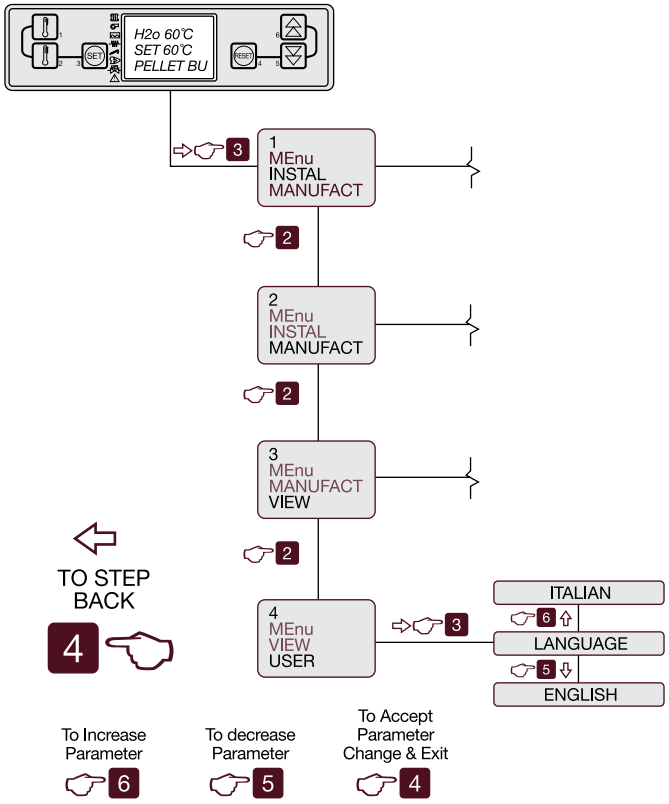
d. **VIEW CLE BOILER** Total pellet feed auger run time since boiler last cleaned. When ≥ '180 Min boiler cleaning operation will commence. Resets after each boiler clean.

9.7.4 USER Menu Folder



'**USER**' folder; allows the user change the language on the burner display.

To access the menu displays within the '**USER**' folder from the main burner display, navigate as follows;



The language options are Italian or English. Once exited, the language selection shown on screen becomes the displayed language.

10 Commissioning

It is important that the following commissioning procedure is carried out following installation to ensure safe and efficient operation of the boiler.

For double boiler installations this procedure must be carried out in full on both boilers.

10.1 Equipment Required

To carry out a complete and comprehensive commissioning of the Grant Spira wood pellet boiler the following equipment is required:

- Draught gauge.
- Flue gas analyser (with “wood pellet” fuel setting).
- Container of at least 1 litre capacity.

10.2 Preliminary Inspection

Before switching on the power supply to the hopper and boiler, check the following:

10.2.1 Heating System

Check the following:

- That corrosion inhibitor and, where necessary antifreeze, is present in the system water. Refer to Section 4.14.
- That a magnetic in-line filter has been fitted in the system. Refer to Section 4.14.
- The auto air vent (supplied with the boiler) is open.
- The boiler drain cock (supplied with the boiler) is closed.
- Both the boiler and heating system is filled and vented.
- On sealed systems the expansion vessel charge pressure is correct and system is filled to correct pressure.
- For any leaks at joints, fittings, etc.

10.2.2 Electrical Connections

Check the following:

- The 5-way plug (from the hopper) is fully inserted in the socket at the top left rear of boiler. Refer to Figure 8-3.
- The 5-way plug (from the flue fan and wash system solenoid valve) is fully inserted in the socket at the top right rear of the boiler. Refer to Figure 8-2.
- The two 7-way plugs (from the boiler control panel) are fully inserted into the corresponding two lower connections on the left side of the burner. Refer to Figure 8-4.
- The 6-way plug (from the pellet auger) is fully inserted into the upper connection on the left side of the burner. Refer to Figure 8-4. On double boiler installations, repeat the process for the second boiler.

10.2.3 Wash System

Check the following:

- The wash system flexible hose is correctly fitted to the outlet of the solenoid valve at the rear of the boiler.
- The solenoid valve head is correctly fitted and secured in position with the steel clip provided with the boiler.
- The solenoid valve is connected to an uninterrupted mains water supply. Refer to Section 4.9.
- All valves in this water supply are open.

On double boiler installations, repeat the process for the second boiler.

10.2.4 Condensate Disposal System

Check the following:

- The condensate trap (supplied with the boiler) and condensate disposal pipework has been fitted correctly. Refer to Section 5.
- If a condensate pump is fitted, that a condensate holding tank of at least 40 litres capacity has also been installed. Refer to Section 5.

10.2.5 Flue System

Check the following:

- The draught stabiliser damper, on the fan box, is unobstructed and free to move. Ensure that the damper locking lever is in the ‘unlocked’ position’. Refer to Figure 10-1.
- The flue system conforms to the relevant requirements of The Building Regulations Approved Document J for solid fuel appliances.

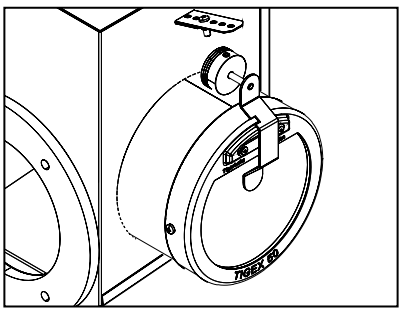


Figure 10-1: Draught stabiliser

10.2.6 Combustion Ventilation

Check that the combustion air supply conforms to the relevant requirements of The Building Regulations Approved Document J, for solid fuel appliances with a draught stabiliser. Refer to Section 7.1.

10.3 Boiler

10.3.1 Control Panel

Isolate the electrical power to the hopper and boiler.

Unscrew and remove the six self tapping screws securing the boiler control panel cover and lift the cover off the control panel.

Check the following:

- That both the overheat thermostat probe and thermistor bulb are fully inserted in the boiler waterway pocket, and the retaining clip is fitted. Refer to Figure 10-2.
- The condition of thermistor cable and thermostat capillary, i.e. not damaged, broken or kinked.

Refit the control panel cover and secure with the six screws previously removed.

Figure 10-2: Boiler control panel (cover removed)

10.3.2 Combustion Chamber

Fit removable handle into slot in door catch.

Lift handle to disengage catch.

Open front access cleaning door.

Check ash pan is empty and correctly positioned on base of combustion chamber.

Close the front access cleaning door and ensure that door catch is fully engaged (to activate door cut-out switch).

Remove handle and keep in safe place for future use.

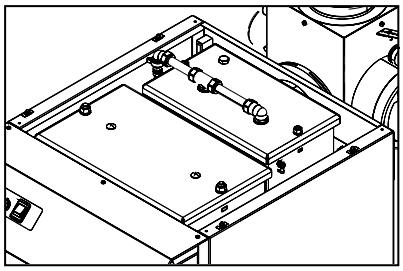


Figure 10-3: Front and rear access covers

10.3.3 Heat Exchangers

- Shut off the cold water supply to the wash system.

To gain access to the top of both heat exchangers:

- Remove the boiler top casing panel.
- Unscrew and remove the two nuts (and washers) securing the front access cover and remove it from the primary heat exchanger. Figure 10-3.
- Unscrew and remove the two nuts (and washers) securing the rear access cover and remove it from the secondary (condensing) heat exchanger. The wash system manifold is attached to a length of flexible hose and does not need to be detached to lift.
- Check that the spiral baffles in the primary heat exchanger are all in place. Lift and drop each one to check all are free to move in their respective tubes.
- Check that the spiral baffles in the secondary heat exchanger are all in place and are all aligned with the top edges running 'front to back'.

Secondary Heat Exchanger

- Check the two jet sprays are not blocked.
- Refit the rear access cover only and secure with the nuts (and washers) previously removed. Do not over tighten.
- Turn on the cold water supply to the wash system.

Test the automatic cleaning functions as follows:

- Set the **ON/STANDBY** switch to **STANDBY**.
- Switch on the electrical supply to the hopper and boiler. The burner fan should briefly run.

WARNING

Ensure that fingers are clear of all moving parts inside the top of the primary heat exchanger BEFORE operating 'CLEANING TEST' switch.

- Press and hold down the '**CLEANING**' switch, on the boiler control panel, in the '**TEST**' position.
- Release switch to automatically reset cleaning function back to '**AUTO**'.
- Note that setting this switch to '**TEST**' does NOT operate the burner cleaning function, but only that of the two heat exchangers.

Primary Heat Exchanger

- Check the shaker unit (located in the top of the primary heat exchanger) is operating freely and that the spirals are moving up and down with two intermittent vertical motions.
- Refit the front access cover and secure with the nuts (and washers) previously removed. Do not over tighten.

10.4 Pellet Hopper

Check the pellet feed auger is fully inserted into the pellet hopper and secured with the single screw through the auger fixing flange. Refer to Figure 10-4. **Do NOT fill hopper with pellets until AFTER the auger is fitted and secured.**

Figure 10-4: Auger fixing

WARNING

Before filling the pellet hopper for the first time with pellets, ensure that hopper is empty of all other debris or objects, e.g. screws, nuts, etc.

Ensure that only pellets that comply with EN Plus Grade A1 standard, to BS EN 17225-2:2014, are used with the Grant Spira boiler. Refer to Section 3.

Fill the hopper with pellets either:

- By hand from bags, or
- Automatically from a bulk pellet store, via a bulk auger or Grant SpiraVac vacuum pellet feed system.

When using a Grant SpiraVac system, refer to the Installation instructions supplied with the Grant SpiraVac vacuum pellet feed system.

10.5 Safety Device Checks

WARNING

This procedure involves disconnecting a live mains connection. Do NOT insert any item into the opening of the moulded cap on the end of the thermostat lead.

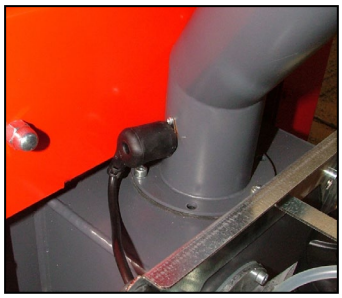


Figure 10-5: Location of thermostat

10.5.1 Pellet Feed Tube Thermostat
When the burner display reads '**WAIT BOILER THERMOSTAT**' check the operation of the pellet feed tube ('burn-back') thermostat as follows:

- Remove the red burner cover by loosening the four M5 screws (two on each side of the cover) and lifting it off the burner.
- The thermostat is located on the pellet feed tube. Refer to Figure 10-5.
- Disconnect the lead from the thermostat terminals. Refer to Figure 10-6.

The burner display screen should automatically go blank, as all power to the burner has been interrupted.

To make the burner operational again:

- Re-connect the lead.
- Refit the burner cover and tighten the four fixing screws.

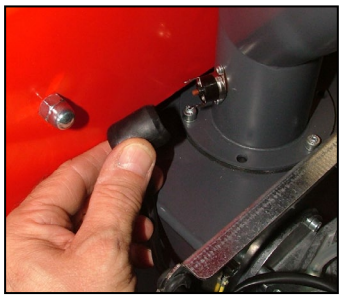


Figure 10-6: Removal of thermostat lead

10.5.2 Combustion Chamber Door Switch
When the burner display reads '**WAIT BOILER THERMOSTAT**' check the operation of the combustion chamber door interlock as follows:

- The interlock is activated by opening the combustion chamber door.
- Fit removable door handle into slot in door catch. Lift handle to disengage catch and open the door.

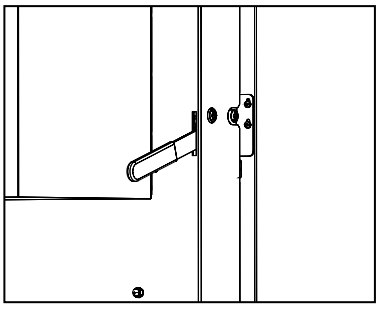


Figure 10-7: Combustion door catch

- The burner display screen should automatically go blank, as all power to the burner has been interrupted.

To restart the display; close the door and fully engage the door catch to re-make the cut-out switch. Refer to Figure 10-7.

Closing the door will reconnect the power supply to the burner and the display will return, confirming that the door interlock is operating correctly.

Remove handle and keep in a safe place for future use.

WARNING

The interlock on the combustion chamber door interrupts the power supply to the burner if the door is opened. IT DOES NOT IMMEDIATELY EXTINGUISH THE BURNER FLAME. If the burner door is opened whilst the burner is firing, there can still be a large uncontrolled flame from the brazier.

10.6 Burner Settings

The boiler comes with the burner pre-set from the factory. However, the burner settings should be checked as part of the commissioning process and recorded on the Commissioning Report form. Refer to Section 10-12.

With the electrical power to the hopper and boiler Switched on, and the burner ON/STANDBY switch set to STANDBY, check that ALL burner settings in the 'INSTAL' (Installer) menu are as given in Section 9.6.

Refer to Section 9.7 for details of how to access and check these settings.

Set the boiler temperature set point using buttons 1 or 2 on the burner control panel. Refer to Section 1.1 for required flow and return temperatures.

10.7 Priming the Pellet Feed Auger

The pellet feed auger MUST be fully primed BEFORE attempting to start the boiler.

Prime the auger as follows:

- Disconnect the 6-way plug (No.3), from the pellet feed auger, from the upper socket on the left side of the burner. Refer to Figure 10-8.

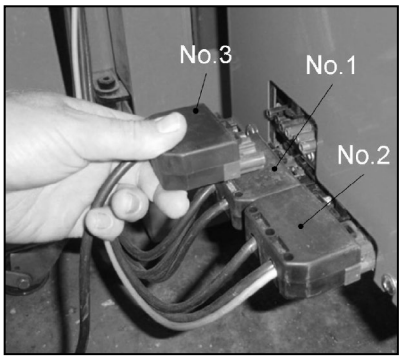


Figure 10-8: Pellet feed auger plug (3)

- Disconnect the 7-way plug (No.1) from the socket on the left side of the burner. Refer to Figure 10-8.
- Disconnect the pellet delivery hose from the pellet feed tube (on the burner) and place in a container of at least 1 litre capacity. Refer to Figure 10-9.

Figure 10-9: Pellet delivery hose

- Insert the 6-way plug into the 7-way plug. Refer to Figure 10-10. It is not possible to connect these two plugs incorrectly as they will only fit together one way. The feed pellet feed auger will now run continuously until the plug and socket is disconnected.

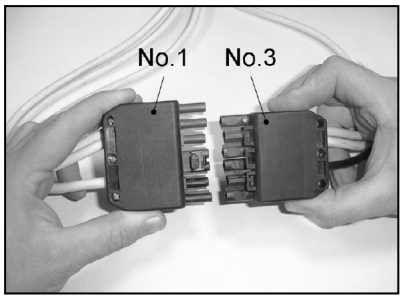


Figure 10-10: Connection of the two plugs

- Leave the auger running until there is a continuous flow of pellets from the pellet delivery hose. This will take between 15 to 20 minutes.
- Disconnect the two plugs from each other and the auger will stop. The pellet feed auger is now fully primed.
- Refit the pellet delivery hose onto the pellet feed tube of the burner.
- Check the condition of the pellet delivery hose and ensure it forms an air tight seal each end. Check for damage and replace if necessary.

A damaged pellet delivery hose can allow a back draught through the boiler resulting in the pellet tube (burn back) thermostat operating and shutting down the burner.

- Finally, re-fit both the 6-way and then 7-way plugs to their corresponding sockets on the left side of the burner. Ensure that both plugs are fully pushed home until the small catch clicks into place. Refer to Figure 10-8.

WARNING

Ensure the pellet delivery hose forms an air tight seal each end and that the hose is not damaged. Leakage of air could cause increased temperature in the pellet delivery hose and result in the pellet tube thermostat shutting down the burner.

10.8 Lighting the Boiler

Ensure that the electrical supply to the hopper and boiler is switched on connected and that the heating system controls are operating and are calling for heat.

NOTE

If the boiler ON/STANDBY switch is set to STANDBY during the initial pellet pre-load period, the pellet feed will stop. The burner will then complete the shut-down sequence before it can start-up again, even if the ON/STANDBY switch is reset to ON.

If the ON/STANDBY switch is set to STANDBY during the start-up sequence, but AFTER the pre-load is finished, then the burner will immediately enter and complete the shut-down sequence before it can start-up again, even if the ON/STANDBY switch is reset to ON.

Set the burner ON/STANDBY switch to ON. The flue fan will start and pellets will be delivered to the burner.

Refer to Section 9.1 for details of the burner start-up, running and shut down sequences.

After completing the start-up sequence, the burner should be firing at maximum output and the display on the burner control shows 'BURNER FIRING 100%'.

10.9 Combustion Chamber Draught

10.9.1 Draught Measurement

The combustion chamber draught must be checked and adjusted (where necessary) as follows:

- Allow the boiler to run for a period of at least 15 minutes, until the boiler and flue system are warmed up.
- Ensure the burner display is showing 'BURNER FIRING 100%'.
- Remove the screw from the draught test point, located to the left of the burner on the combustion chamber door. Refer to Figure 10-11.
- After setting the zero on the draught gauge, insert the end of the draught gauge sample tube into the test point on the door. Ensure that it is pushed through the door insulation and into the combustion chamber.
- A draught reading of between 0.1 and 0.15mbar is required (0.04 and 0.06 in.wg).

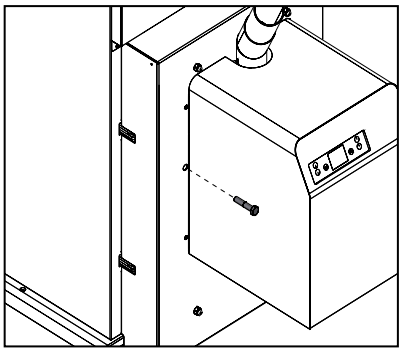


Figure 10-11: Draught test point

10.9.2 Draught Stabiliser Adjustment

The combustion chamber draught should be between of 0.1 to 0.15mbar (0.04 and 0.06 in.wg) with the boiler firing at maximum output (i.e. the burner display is showing '**BURNER FIRING 100%**').

To adjust the combustion chamber draught reading, slacken the grub screw re-position the weight on the stabiliser door arm as follows:

- To increase draught – move the weight away from the damper (or add extra weights if necessary – see below).
- To decrease draught –move the weight closer to the damper. Refer to Figure 10-12.

If it is necessary to increase the draught, but the weight fitted is already at the end of the damper arm, extra slotted disc weights (supplied with the boiler) can be used.

These weights are fitted on the 'flue end' of the damper arm, as follows:

- Slacken the grub screw and slide the fitted weight along the arm towards the damper.
- Fit one of the slotted weights onto the arm.
- Secure by inserting a flat bladed screwdriver into the slot and twisting it. Refer to Figure 10-12.
- Slide both the weights to the end of the shaft and secure by tightening the grub screw in the fitted weight. Refer to Figure 10-13.

Repeat this process as necessary to achieve the required draught.

NOTE

Ensure that the grub screw is tightened to secure the weight(s) to the shaft after adjusting the draught.

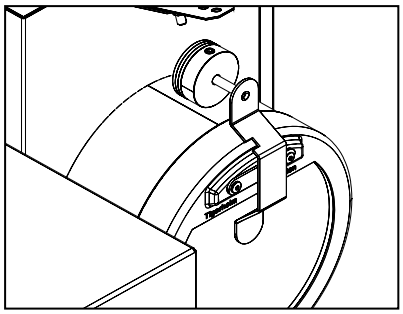


Figure 10-12: Draught stabiliser arm

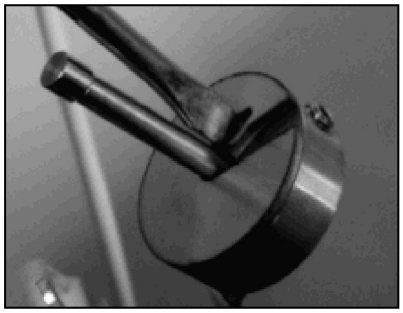


Figure 10-13: Fitting slotted disc weight

10.9.3 Fan Box Slider Adjustment

In order to minimise the possibility of tar-like deposits forming in the fan box and flue, it is important to reduce the opening of the draught stabiliser door to a minimum.

If, after setting the draught (as described in section 10.9.2), the gap between lowest point of the door and the draught stabiliser opening is more than 10mm, it will be necessary to use the fan box slider plate.

Remove the screw from the slider plate arm. Refer to Figure 10-14. Slowly pull out the slider plate arm (to open the slider plate) until the draft stabiliser door is almost fully closed, i.e. there is only a gap of around 5mm between the lowest point of the door and the draught stabiliser opening.

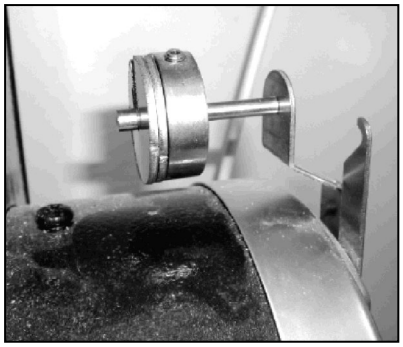


Figure 10-14: Draught stabiliser weights

Check the draught and, if required, adjust the position of the weight to achieve a draught within the required range of 0.1 to 0.15mbar (0.04 and 0.06 in.wg).

It may be necessary to make further adjustments to both the position of the slider arm and the draught stabiliser weight until the correct draught of between 0.1 to 0.15mbar is achieved with the minimum opening of the draught stabiliser door.

Secure the slider arm to the fan box by re-fitting the screw previously removed from the slider arm.

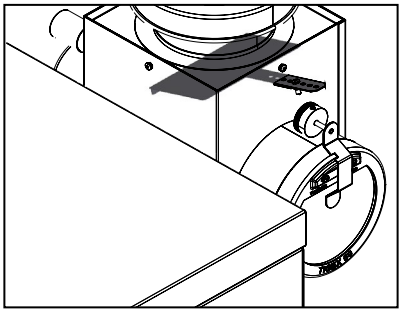


Figure 10-15: Fan box slider plate

10.10 Flue Gas Analysis

Check the $\%CO_2$ in the flue gases at maximum output as follows:

- Ensure the burner display is showing 'BURNER FIRING 100%'.
- Remove the screw from the combustion test point, located at the left rear corner of the rear access cover (on the secondary heat exchanger). Refer to Figure 10-16.

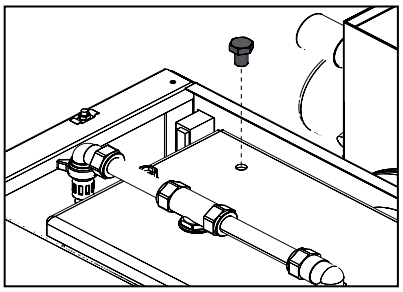


Figure 10-16: Combustion test point

NOTE

The combustion test point in the flue inspection pipe must NOT be used to monitor and adjust the $\%CO_2$ when commissioning the Spira boiler. Only use the combustion test point at the left rear of the rear access cover (on the secondary heat exchanger) for this purpose.

- Insert the analyser probe a minimum of 100mm into the test point.
- Monitor the $\%CO_2$ for a few minutes to see the maximum and minimum values reached.
- The $\%CO_2$ measured should range between a maximum of 12% and a minimum of 10%.
  If necessary the $\%CO_2$ may have to be adjusted to be within these limits, as follows:
- Access the 'INSTAL' (Installer) menu in the burner control settings and go to the 'SETUP FAN' sub menu.
- Go to the 'POWER MAXIMUM' value and adjust the burner fan speed using buttons 5 and 6 on the burner control panel. Refer to Section 9.4.
- To decrease the $\%CO_2$ – increase the fan speed using button 6.

- To increase the $\%CO_2$ – decrease the fan speed using button 5.
- To confirm the change in the 'POWER MAXIMUM' fan setting, press button 4 twice, to exit the 'SETUP FAN' and 'INSTAL' menus and return to the normal control panel display (showing H2o and SET temperature).
- Monitor the $\%CO_2$ for a few minutes to see if the maximum and minimum values are 12% and 10% as required.
- If necessary make a further adjustment of the fan speed and check the resulting $\%CO_2$ as described above, until it remains within the required maximum and minimum limits.
- Record the maximum and minimum CO_2 values on the Commissioning Report form. Refer to Section 10.12.

! NOTE

It is essential to continue to monitor the combustion chamber draught, whist adjusting the CO_2 in the flue gases, and to adjust the draught stabiliser to keep it within the required limits. Refer to Section 10.9.

On double boiler installations, the above process – as covered in Sections 10.3 to 10.10 – must be fully carried out on BOTH boilers.

10.11 Customer Handover

The customer/user must be informed of the correct operation and use of their Grant Spira wood pellet boiler installation. This must include the following information:

- The use of the boiler controls – how to switch the boiler off and on, as required. Refer customer to the User Instructions supplied with the boiler/s. The use of the heating system controls – how to set the programmer, room and cylinder thermostats, etc.
- The importance of using the correct type of wood pellet.
- The need to routinely check the pellet level in the pellet hopper and how to re-fill it (hopper only installations)
- The need to routinely check the pellet level in the bulk pellet store (bulk pellet store installations only). The customer must also be made aware that is can take several days or longer, depending on the time of year, before the store can be re-filled.
- How to turn the boiler off and back on (bulk pellet store installations only) prior/after a bulk delivery.
- How to access the ash pan and the need to periodically empty the ash pan. Refer to Section 1.5 and the User instructions.
- The need to have the boiler serviced either annually or when '**SERVICE**' is shown on the burner control panel display (whichever comes first). Refer to Section 1.5 and User Instructions.
- That servicing should only be carried out by a Grant trained installer.

10.12 Commissioning Report Form

The Commissioning Report form (supplied with the boiler) must be completed at the end of the commissioning process. Refer to Section 4.15.

For a double boiler installation, a commissioning form must be completed for each of the two boilers.

The following information must be entered on the form:

- Boiler details (model, serial number, etc.)
- Combustion readings
- Installation details
- Burner settings
- Customer handover details

The completed form must be signed by both installer and customer/user.

A copy of the completed form must be left with the customer/user, one must be returned to Grant UK and the remaining third copy retained by the Installer. Refer to Section 4-15.

10.13 Commissioning Check List

The following checklist must be used in conjunction with the preceding information given in this section:

Preliminary Inspection	**Tick box**
Heating system	☐
Electrical connections	☐
Condensate disposal	☐
Flue system	☐
Combustion ventilation	☐
Boiler	
Control panel	☐
Combustion chamber	☐
Heat exchanger – primary	☐
Heat exchanger – secondary	☐
Pellet Hopper	
Auger	☐
Pellets	☐
Safety Device Checks	
Pellet feed tube thermostat	☐
Combustion chamber door switch	☐
Priming Pellet Feed Auger	☐
Lighting the Boiler	☐
Combustion Chamber Draught	☐
Flue Gas Analysis	☐
Customer Handover	☐
Commissioning Report Form	☐

11 Servicing

11.1 General

It is essential that the Grant Spira boiler is serviced at regular intervals of no longer than 12 months OR when the '**SERVICE**' is shown on the burner control panel display.

The burner will automatically indicate 'SERVICE' on the burner control panel display once the pre-set period of pellet feed auger run time ('**HOURS SERVICE**') is achieved. Refer to Section 9.7 for details on how to access and check this setting in the '**INSTAL CLEAN**' sub-menu of the burner settings.

This interval is based on the auger running time, i.e. the actual quantity of pellets used based on the pellet feed auger rate and pellet delivery settings. Refer to Section 9.7 for details on how to access and check this setting in the '**POWER PELLET**' sub-menu of the burner settings.

The ash pan (located inside the combustion chamber) will need to be periodically emptied. This simple task must be carried out by the user at **MONTHLY** intervals for the **FIRST THREE MONTHS**. Thereafter, the ash pan should be emptied regularly, on at least a monthly basis, or as indicated by the amount of ash found during the first three months. Two carrying handles are supplied with the boiler to allow removal of the ash pan when hot.

Servicing and replacement of parts must only be carried out by a Grant trained installer who has successfully completed the Grant Spira wood pellet boiler training course.

NOTE

Details of every service should be entered in the Service log in the User Instructions supplied with the boiler.

11.2 Checks Before Servicing

BEFORE starting any service work on the boiler or pellet storage/supply installation:

- Set the **ON/STANDBY** switch, on the boiler control panel, to **STANDBY**. If the boiler was operating, wait for it to shut-down and 'WAIT BOILER THERMOSTAT' is shown on the burner control panel display before proceeding further.
- Isolate the electrical supply to the hopper and boiler and remove the fuse from the fused spur.
- Disconnect the 5-way plug (on the lead from the hopper) from the socket at the left rear of the boiler. Refer to Figure 11-1.

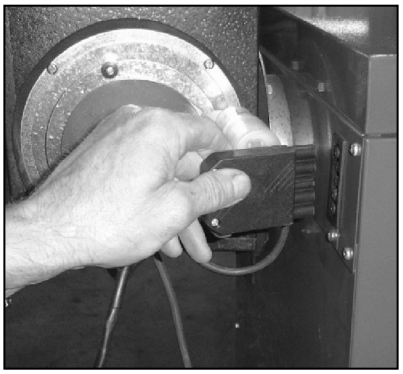


Figure 11-1: Disconnecting hopper 5-way plug

- If a double boiler installation, remove the 5-way plug from both boilers.
- Disconnect the 5-way plug (on the lead from the flue fan and solenoid) from the socket at the right rear of the boiler. Refer to Figure 11-2.

Figure 11-2: Disconnecting fan/ solenoid 5-way plug

- Disconnect the 4-way plug from the socket (on the flying lead) at the rear of the hopper.

This will allow the hopper to be moved to give easy access to the rear of the boiler for servicing.

11.3 Heating System

Check the boiler for any indication of leaks from:

- Flow and return connections
- Automatic air vent (at rear of boiler)
- Drain cock (at lower rear of boiler)

Remake any joints and re-check tightness of any fitting that may be leaking.

If boiler is part of a sealed heating system, check the following:

- System pressure
- Pressure relief valve operation
- Expansion vessel air charge pressure (when the system pressure is zero)

Re-fill and vent the system to the required pressure. Refer to Section 6.

On either sealed or open-vented systems:

- Inspect and clean the in-line magnetic filter in accordance with the filter manufacturer's instructions.
- Ensure that adequate corrosion protection is present in system.

WARNING

Before starting any work on the boiler, or on the pellet storage and supply installation, please read the health and safety information in Section 14.

11.4 Flue System

11.4.1 Flue Terminal

Check the flue terminal and ensure that it is not blocked or damaged.

11.4.2 Inspection Pipe (product code: WPB/IP - supplied with boiler)

Undo and remove the two screws and remove the outer cover plate.

To remove the inspection hatch, turn the knurled knob (in the centre of the hatch) approximately one turn anti-clockwise and pull the hatch out of the flue. Refer to Figure 11-3.

Inspect inside flue. Clean inside and remove ALL ash deposits by sweeping as required.

Replace the hatch and outer cover plate using the reserve procedure.

Figure 11-3: Inspection pipe

11.4.3 Draught Stabiliser

Check draught stabiliser damper is free to move. Remove draught stabiliser from fan box and clean if required. Refer to Figure 11-4.

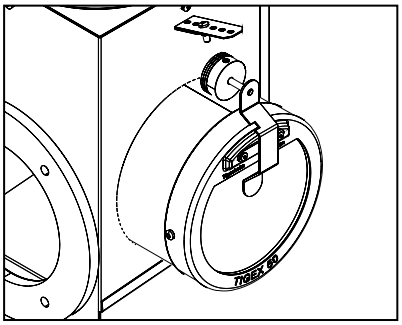


Figure 11-4: Draught stabiliser

Re-fit draught stabiliser to fan box and check damper is free to move.

Draught stabiliser setting must be checked when boiler is operational. Refer to Section 10.9.

CAUTION

When cleaning the fan blades ensure they are all thoroughly cleaned. Uneven cleaning will result in the fan being 'out of balance' and could cause damage to the fan motor.

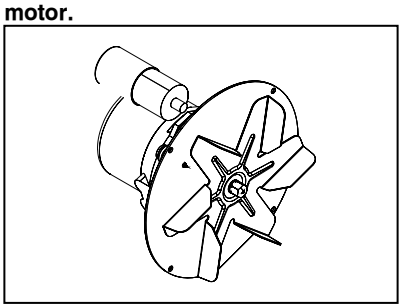


Figure 11-5: Flue fan

WARNING

Failure to maintain a clean flue can result in the emission of flue gases into the dwelling or damage from potential fire in the flue.

11.4.4 Flue Fan

Unscrew the four screws securing the flue fan to the fan box and remove the fan. Thoroughly clean ALL ash deposits from the fan blades and mounting plate. Refer to Figure 11-5.

This may require the removal of the fan impeller from the motor shaft. The nut securing the impeller to the shaft has a LEFT HAND thread and must be undone by turning CLOCKWISE. When re-fitting impeller, turn the nut ANTICLOCKWISE TO TIGHTEN.

11.5 Combustion Ventilation

Check that the combustion air supply conforms to the relevant requirements of The Building Regulations Approved Document J, for solid fuel appliances with a draught stabiliser. Refer to Section 7.1.

Check that all ventilation openings are free from any obstructions, both inside and outside. If necessary remove any blockages (e.g. fluff, dog hair, leaves, etc.).

11.6 Boiler

11.6.1 Control Panel

WARNING

Ensure the electrical supply to the hopper and boiler is isolated before proceeding.

Unscrew and remove the six self tapping screws securing the boiler control panel cover and lift the cover off the control panel.

Proceed as follows:

- Check both the overheat thermostat probe and thermistor bulb are fully inserted in the boiler waterway pocket, and the retaining clip is fitted. Refer to Figure 11-6.

Figure 11-6: Boiler control panel (cover removed)

- Check the condition of thermistor cable and thermostat capillary, i.e. not damaged, broken or kinked.
- Grease the edge of the shaker motor cam with high temperature grease. Refer to Figure 11-7.
- Refit the control panel cover and secure with the six screws previously removed.

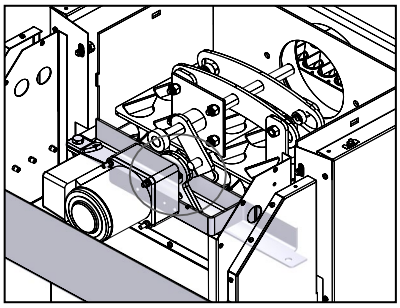


Figure 11-7: Cross-section of shaker motor cam location (covers omitted for clarity)

11.6.2 Heat exchangers

Shut off the cold water supply to the wash system.

To gain access to the top of both heat exchangers. (Refer to Figure 11-8):

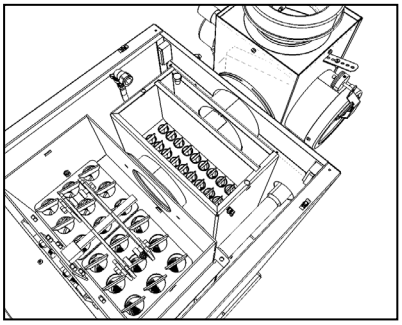


Figure 11-8: Top of heat exchangers

- Remove the boiler top casing panel.
- Unscrew and remove the two nuts (and washers) securing the front access panel and remove it from the top of the primary heat exchanger.
- Unscrew and remove the two nuts (and washers) securing the rear access cover and remove it from top of the secondary (condensing) heat exchanger.

Primary heat exchanger – clean as follows:

- Remove all of the mild steel spiral baffles by lifting them vertically up and out from the primary heat exchanger tubes.
- Clean down any ash inside tubes, using a suitable pipe brush, into the combustion chamber and ash pan below.
- Clean all ash deposits from top chamber of the primary heat exchanger (above tubes) and shaker mechanism/plates, using brush and vacuum.
- Clean and check condition of all spiral baffles.
- Re-fit spiral baffles into heat exchanger tubes, fitting them through shaker plates.
- Lift and drop each spiral to check that all spirals are free to move in their respective tubes.

Secondary heat exchanger – clean as follows:

- Disconnect the flexible hose from the wash system manifold.
- Check and clean (if required) the two wash system jets.
- Remove all of the stainless steel Spiral baffles from the secondary heat exchanger tubes.
- Clean all ash deposits from top chamber of secondary heat exchanger (above tubes) and from rear flue gas duct (at rear of secondary heat exchanger) using brush and vacuum.
- Clean down any ash inside tubes, using a suitable pipe brush, into the base of the condensing heat exchanger below.
- Ensure that ALL ash deposits are removed from base of rear flue gas duct.
- Clean and check condition of all spiral baffles. Replace if necessary.
- Re-fit spiral baffles into heat exchanger tubes, such that all the top edges of the baffles are running 'front to back'. Refer to Figure 11-9.

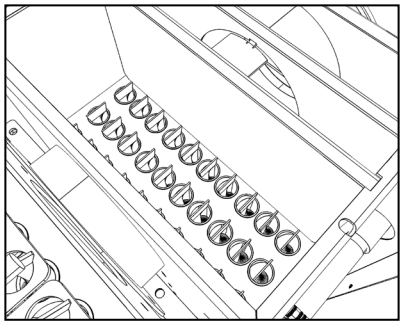


Figure 11-9: Spiral baffles

- Check the two wash system spray jets on the underside of the rear access panel are not blocked.
- Inspect the condition of the REAR access panel before re-fitting. Replace any damaged or worn rope seals if necessary
- Re-fit REAR access panel and secure with the nuts (and washers) previously removed. Do not overtighten.
- Ensure that the rear access panel is fitted with the flue gas sample point in the rear left-hand corner.
- Reconnect the flexible hose.
- Turn on the cold water supply to the wash system.
- Check the operation of the automatic cleaning of the heat exchanger. Refer to Section 10.3.3.

11.6.3 Combustion Chamber

WARNING

Ensure the electrical supply to the hopper and boiler is isolated before proceeding.

Disconnect the pellet delivery hose from the burner pellet feed tube. Fully open the combustion chamber door on the front of the boiler and clean as follows:

- Clean the underside of upper rear section of the primary heat exchanger (at the rear of combustion chamber).
- Remove the ash pan and dispose of the ash in a safe manner.

WARNING

Ensure ash has cooled before removing ash pan. Extreme care is required when emptying the ash pan as smouldering ash could be present and cause serious damage to persons or property.

- Clean down the combustion chamber side, back and base surfaces, removing all ash deposits.
- Clean any ash deposits from the top of the burner hood and the inner face of the combustion chamber door.
- Clean out the burner brazier to remove as much loose ash as possible using a vacuum.
- Refit the ash pan in the base of the combustion chamber.
- Grease the front cleaning door latch mechanism and close the door.

11.7 Burner Brazier

WARNING

Ensure that electrical supply to the hopper and boiler is isolated before proceeding.

11.7.1 Removal of Burner

To clean the burner thoroughly it will be necessary to remove it from the boiler, as follows:

- Disconnect the three plugs from the left side of the burner. Refer to Figure 11-10.

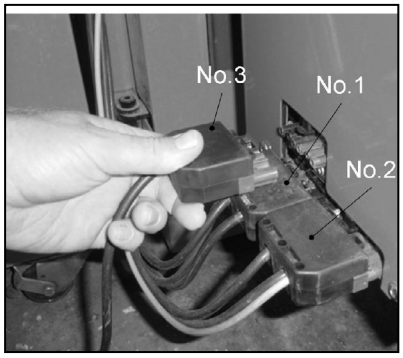


Figure 11-10: Burner plugs

- Remove the red burner cover by loosening the four M5 screws (two each side of the cover) and lift it off the burner.
- Whilst supporting the burner, unscrew and remove the two M8 burner securing nuts, one on each side of the burner.
- Carefully withdraw the burner from the combustion chamber door taking care not to damage the burner door gasket.
- Place the burner on a suitable bench (e.g. portable 'workmate' type bench or similar) to work on.

11.7.2 Cleaning Burner Brazier

Dismantle and clean the burner as follows:

- Remove the burner hood by loosening the two M5 bolts (highlighted below) each side of the brazier. Slide the hood forwards and then up to disengage the hood from the burner. Refer to Figure 11-11.

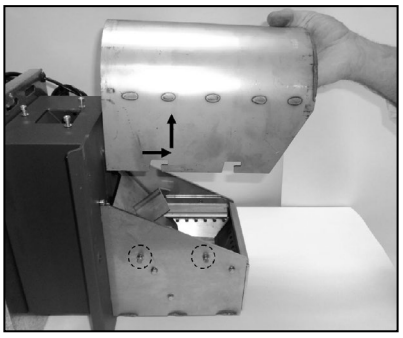


Figure 11-11: Removal of burner hood

- Clean and inspect the hood for any damage or distortion. Replace if necessary. Remove all ash deposits and check that all air holes (on the inside surface of the hood) are clear. Open the brazier manually by operating the release switch on the servo motor and carefully pulling on the end wall of the brazier.

WARNING

After a period of time in use, the semi circular end wall of the brazier hood may distort or show minor cracks. This does not affect the operation of the burner. The hood should only be changed if there is considerably deterioration.

- To operate the switch and release the motor, press and hold the switch down. Refer to Figure 11-12.

Failure to operate the servo motor release switch WILL result in damage to the servo motor gears.

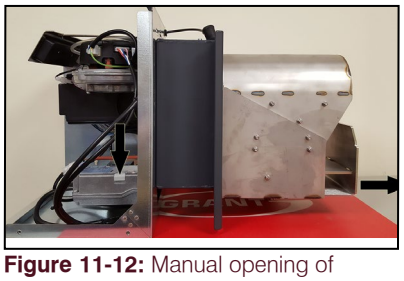


Figure 11-12: Manual opening of brazier

WARNING

DO NOT ATTEMPT TO FORCE THE BRAZIER OPEN WITHOUT OPERATING THE SERVO MOTOR RELEASE SWITCH.

- With the brazier open, dismantle the brazier to thoroughly clean all parts as follows, referring to Figure 13-2:
- Unscrew and remove the upper two M6 nuts and washers on either side of the brazier chassis, securing the two brazier flame plates.
- Remove the four M6 screws from the inside of the brazier.
- Unscrew and remove the two M6 screws securing the photocell back plate to the burner.
- Remove both the two brazier flame plates and photocell back plate from brazier.
- Unscrew and remove the two M6 nuts and washers on either side of the brazier chassis securing the 3-sided grate enclosure
- Remove the four M6 screws from inside the brazier and remove the grate enclosure.
- Unscrew and remove the two M6 screws and washers (one each side of the brazier chassis) securing the ignition element mounting plate, and remove it from the brazier chassis.
- From below the burner, unscrew and remove the single cap screw attaching the push rod of the moveable brazier base to the shaft of the servo motor.
- Disengage the push rod from the motor shaft and remove brazier base assembly from the brazier chassis.

Inspect all components for distortion or damage and replace if necessary.

Clean all ash and clinker deposits from all surfaces (in particular the upper surface of the brazier chassis and the underside of the brazier base assembly) using wire bush and, where necessary, a flat scraper.

Ensure that all air holes are clear.

Reassemble the brazier using the following procedure:

- Fit the moveable brazier base assembly to the burner and reconnect the pushrod to the motor shaft using the cap screw.
- Whilst operating the servo motor release switch, push the brazier base assembly fully back into the brazier chassis.
- Insert the brazier clearance gauge plate (supplied with the boiler) between the brazier chassis and brazier base assembly. Refer to Figure 11-13.

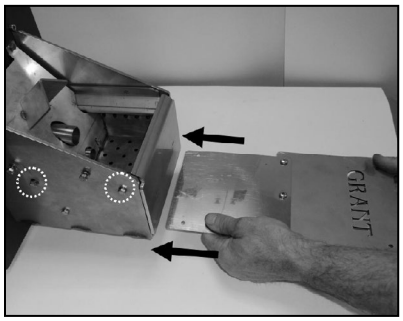


Figure 11-13: Fitting brazier clearance gauge

- The clearance gauge should slide in using manual force only. **DO NOT FORCE THE GAUGE INTO THE BRAZIER!**
- Reassemble the remainder of the brazier, using the reverse of the dismantling procedure.
- Leave all screws loose until all components (excluding the burner hood) are assembled correctly.
- BEFORE fitting the burner hood, tighten the two screws securing the photocell back plate to the front of the burner.
- Fit the burner hood and then finally tighten all remaining burner fixings.
- Remove brazier clearance gauge from burner brazier.
- Operate servo motor release switch and manually open and close brazier to check it is free to move.

11.8 Burner Components

11.8.1 Burner Fan

Check the burner fan inlet is clear of debris.

If there is a build-up of debris remove fan from burner and clean the fan blades and fan housing. Refer to Figure 11-14 and 11-15.

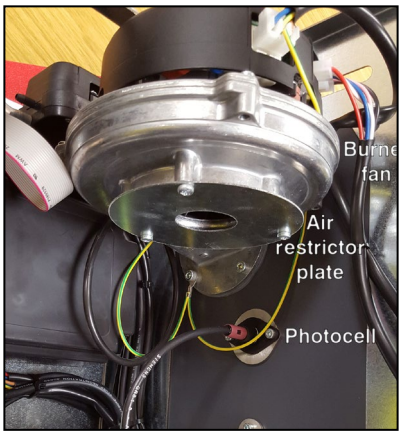


Figure 11-14: Burner fan, photocell and ignition element (5-18kW model shown with air restrictor plate)

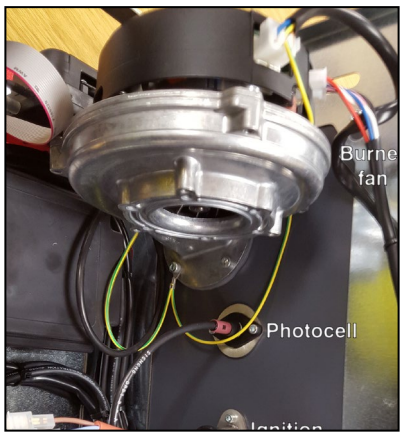


Figure 11-15: Burner fan, photocell and ignition element (6-26 and 9-36kW models)

11.8.2 Ignition Element

Remove and check the condition of the ceramic heating element. Replace if damaged.

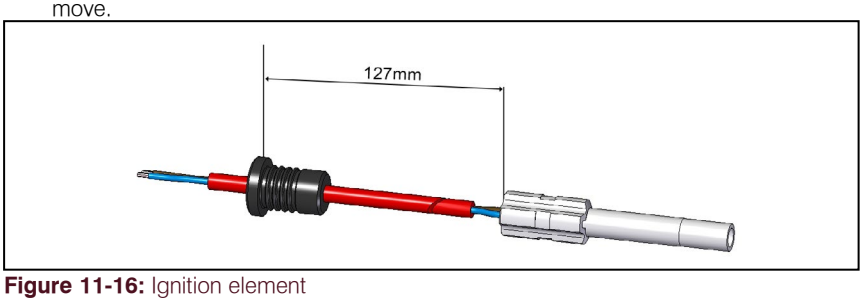


Figure 11-16: Ignition element

To remove the element from the tube, grasp the black grommet and pull out of the tube. Do NOT pull on the element power cable.

Unscrew and remove the single screw securing the ignition element tube and pull it out of the burner.

Check the condition and thoroughly clean the inside of the tube. Replace the tube in the burner and secure with the screw.

Check that the ceramic element is correctly fitted into the ceramic socket.

Replace the ignition element in the tube, ensuring that the element is correctly positioned inside the tube, i.e. with a distance of 127mm between the grommet flange and the ceramic socket. Refer to Figure 11-16.

11.8.3 Photocell

Remove photocell from mount. Check and clean the photocell. Replace if damaged.

Remove the two screws securing the photocell mount and pull out the photocell tube. Check the condition and thoroughly clean the inside of the tube. Refit tube to burner.

Ensure the photocell clamp is fitted 25mm from end as shown in Figure 11-17. Refit into photocell mount.

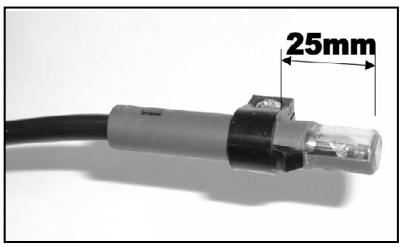


Figure 11-17: Photocell clamp position

11.8.4 Pellet Feed Tube

Unscrew the three fixing screws and remove the feed pipe and gasket from the top of the burner.

Check the condition of the gasket and replace if necessary.

Check the condition of the feed tube and thoroughly clean the inside.

Check that the pellet feed tube thermostat is correctly mounted on the side of the tube.

Replace on burner, ensuring gasket is correctly fitted, and secure with the three screws.

11.9 Refitting the Burner

Before re-fitting the burner, check the condition of the burner door gasket. Replace if necessary.

- With the gasket correctly located, re-fit the burner to the combustion chamber door.
- Carefully insert the burner brazier through the opening and locate the holes in the burner flange onto the M8 studs (on either side of the burner).
- Secure the burner to the door with the two M8 nuts previously removed.
- Re-connect the three plugs to their corresponding sockets on the left side of the burner. Ensure that each plug is fully pushed home until the small catch clicks into place. Refer to Figure 11-10.
- Check the condition of the pellet delivery hose and ensure it forms an air tight seal each end.
- Check for any damage to the hose and replace if necessary.
  A damaged pellet delivery hose can allow a back draught through the boiler, resulting in the pellet tube (burn-back) thermostat operating and shutting down the burner.
- After completing the Safety Device Checks (refer to Section 11.13), re-fit the burner cover and tighten the four screws to secure in place.

11.10 Condensate Disposal System

11.10.1 Condensate Trap

Disconnect the condensate disposal system from the outlet at the back of the boiler. Check that the boiler condensate outlet is clear. Remove any blockage or ash build-up.

Remove the condensate trap (supplied with the boiler) from the condensate disposal system. Dismantle and check the condition of the trap.

Thoroughly clean out the trap to remove any deposits and re-fit to condensate disposal system.

Reconnect the disposal system to boiler outlet.

NOTE

The condensate trap(s) and condensate outlet MUST be checked on EVERY service and cleaned as necessary. Failure to regularly check and clean the condensate trap (or traps) may result in damage to the boiler and this will not be covered by the product guarantee.

11.10.2 Condensate Disposal Pipe

Check entire length of discharge pipe, for any leaks or blockages. Clean or replace as necessary.

Check any other traps in the condensate disposal pipework. Dismantle and thoroughly clean to remove any deposits. Re-fit to condensate disposal system pipework.

Check that any outlets to a gully or hopper are not obstructed. Remove any blockages.

11.10.3 Condensate Pump (if fitted)

If a condensate pump is fitted to the system, check:

- The condition of the holding tank. Thoroughly clean to remove any deposits.
- Operation of the overflow cut-out float switch.
- The pump is operating correctly.

11.11 Cleaning Function Test

Test the automatic heat exchanger cleaning functions as follows:

- Check the **ON/STANDBY** switch, on the boiler control panel, is set to **STANDBY**.
- Re-connect the 5-way plug (on the lead from the hopper) to the socket at the left rear of the boiler. Refer to Figure 11-1.
- If a double boiler installation, re-connect the 5-way plugs to both boilers.
- Re-connect the 4-way plug to the socket (on the flying lead) at the rear of the hopper.
- Replace the fuse in the 13A fused spur and switch on the electrical supply to the hopper and boiler. The burner fan should briefly run.
- Press and hold down the **'CLEANING TEST'** switch on the boiler control panel for about 60 seconds.

WARNING

Ensure that fingers are clear of all moving parts inside the top of the primary heat exchanger BEFORE operating 'CLEANING TEST' switch.

- To end test of cleaning functions - release switch to automatically reset cleaning function back to **'AUTO'**.

NOTE

Note that setting this switch to 'TEST' does NOT operate the burner brazier cleaning function, but only that for the two heat exchangers.

Primary heat exchanger
Check the shaker unit (located in the top of the primary heat exchanger) is operating freely and that the spirals are moving up and down with two intermittent vertical motions.

If there is no movement of the shaker system, isolate the electrical supply and check that:

- the motor and cam is rotating.
- the cam follower is in contact with the cam.
- the condition of the cam follower spring (located in the rear of the control panel). Replace if necessary.

Inspect the condition of the FRONT access panel before re-fitting. Replace any damaged or worn rope seals if necessary.

Re-fit FRONT access panel and secure with the nuts (and washers) previously removed. Do not overtighten.

11.12 Burner Settings

With the electrical power to the hopper and boiler Switched on, and the burner **ON/STANDBY** switch set to **STANDBY**, check that **ALL** burner settings in the **'INSTAL'** (Installer) menu are as given in Section 9.6.

Check the burner control settings match those set on commissioning (i.e. as recorded on the Commissioning Report form), a copy of which was left with the householder/user.

Refer to Section 9.7 for details of how to access and check these settings.

Reset the SERVICE timer as follows:

- Go to the **'CLEAN'** sub menu in the installer ('INSTAL') menu
- Go to the **'RESET SERVICE'** setting.
- Press button 3 to reset timer to zero.

Refer to Section 9.7.1.3 for further details on settings.

11.13 Safety Device Checks

The following safety checks must be made before putting the boiler back into operation:

11.13.1 Pellet Feed Tube Thermostat
Check operation of pellet feed tube thermostat. Follow the procedure given in Section 10.5.1.

11.13.2 Combustion Chamber Door Switch
Check operation of combustion chamber door switch. Follow the procedure given in Section 10.5.2.

11.14 Combustion Checks

To ensure safe and efficient operation of the boiler, it is essential that the boiler combustion is re-checked and adjusted as necessary.

11.14.1 Combustion Chamber Draught
Check the combustion chamber draught, and adjust the draught stabiliser setting as required. Follow the procedure given in Section 10.9.

11.14.2 Flue Gas Analysis
Check the $\%CO_2$ in the flue gases and adjust the burner fan setting as required. Follow the procedure given in Section 10.10.

To ensure safe and efficient operation of the boiler it is important that boiler/burner is re-commissioning as detailed in Section 10.

12 Fault Finding

12.1 General

If a fault occurs with the boiler, the display screen on the burner control panel helps to identify the nature and cause of that fault.

There are **THREE** basic screen displays that can be seen in the event of a fault, as follows:

- Normal screen display (with '**WAIT BOILER THERMOSTAT**' continuously scrolling across the lower part of the screen). Refer to Figure 12-1.
  If this is the case go to **Section 12.2** for fault finding procedure.
- No display – screen is BLANK. Refer to Figure 12-2.
  If this is the case go to **Section 12.3** for fault finding procedure.
- An ERROR message is displayed.
  If this is the case refer to '**Error Messages**' below.

It is essential, at this stage, to check and identify which of these three displays is shown on the burner control panel screen, before proceeding to attempt to diagnose the fault.

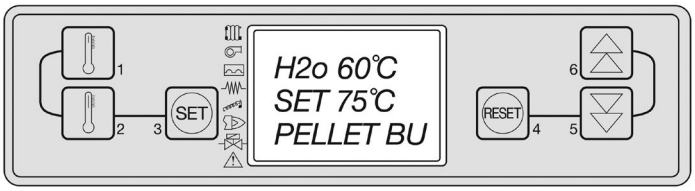


Figure 12-1: Normal screen display

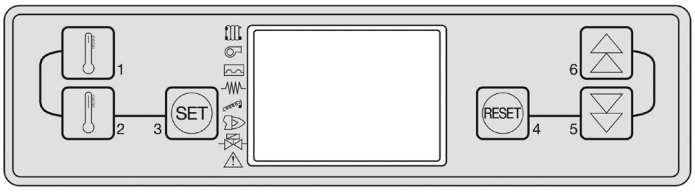


Figure 12-2: Blank screen display

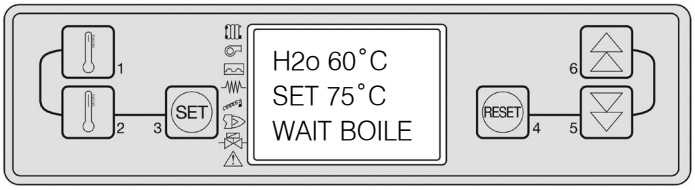


Figure 12-3: Error message screen display

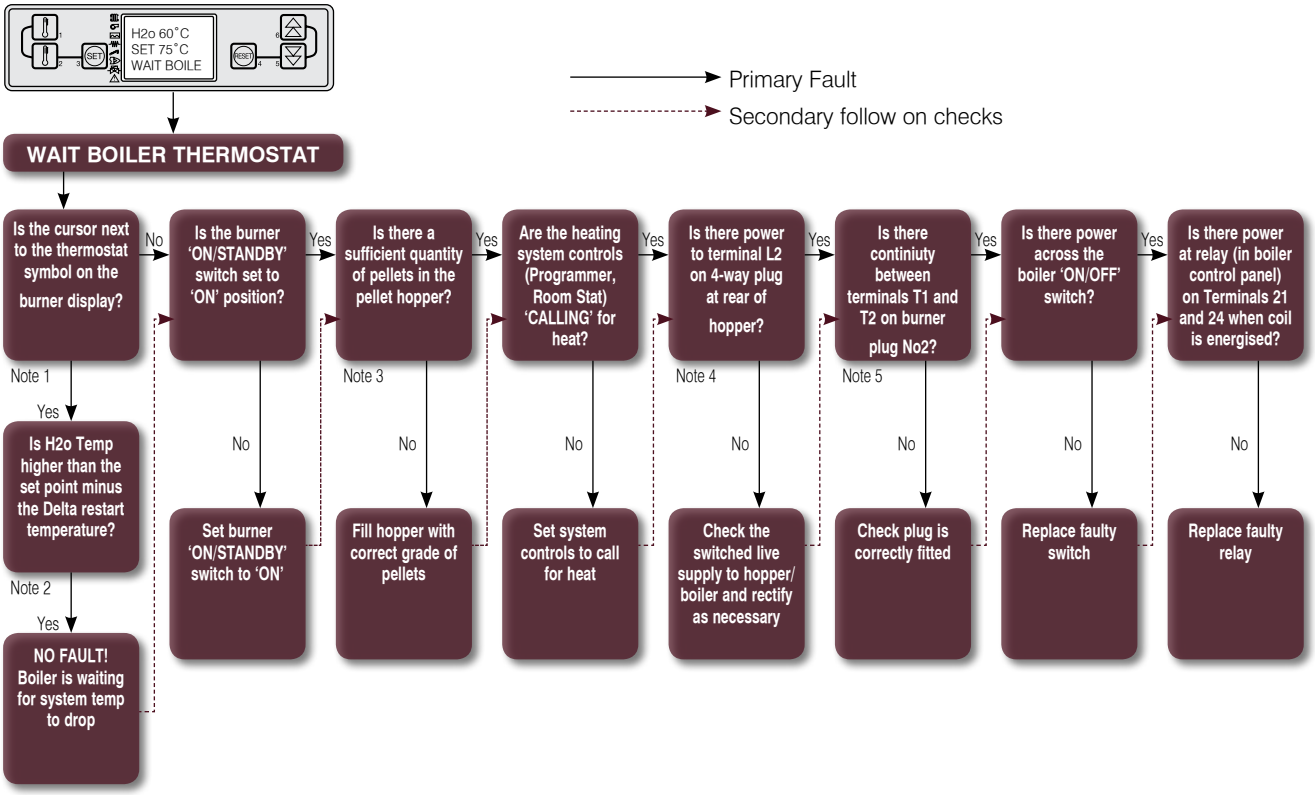
Error Messages

There are **FOUR** possible error messages that can be displayed on the burner control panel screen in the event of a fault. In all cases the cursor will be next to the error symbol (at the lower left corner of the display). Refer to Figure 12-3.

The four possible error messages that can be displayed (continuously scrolling across the lower part of the screen) are listed below. Each one identifies a particular fault. Refer to the relevant section of this manual for detailed guidance to diagnose and rectify the fault, as follows:

- FAILED PELLET LIGHTING -
  Go to **Section 12.6**
- SERVO MOTOR BLOCKED -
  Go to **Section 12.7**
- PROBE FAULT -
  Go to **Section 12.8**
- AIR PRESSURE ERROR -
  Go to **Section 12.9**

12.2 Normal Screen Display - Boiler will not fire – but NO error message is displayed



Note 1 - Is the cursor next to the thermostat symbol on the burner display?

When there is a switched live supply to the burner (i.e. when the heating system controls are 'calling' and the ON/STANDBY switch is set to ON), the burner screen display shows a cursor highlighted next to the boiler thermostat symbol. Refer to Figure 12-4.

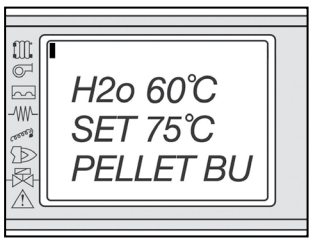


Figure 12-4: Burner screen display

Note 2 - Is the boiler above set point less the 'DELTA RESTART' temperature?

If the boiler has exceeded the 'TEMP OF H2o' setting (80°C) the boiler will shut down. The boiler temperature will have to fall to below the set point less the **'DELTA RESTART'** (5°C below the boiler set point temperature) before it can start again. Refer to Section 9.1.

Note 3 - Is there a sufficient quantity of pellets in the pellet hopper?

The effect of insufficient pellets will depend on the type of pellet storage used, as follows:

Using a pellet hopper only – (with toggle switch set to **'HOPPER ONLY'**) if there are insufficient pellets, the hopper contents switch will break the switched live to the boiler, causing **'WAIT BOILER THERMOSTAT'** to be displayed. Refill the hopper to start the boiler. Refer to Section 1.4.4 for further details.

Using a bulk pellet store – (with toggle switch set to **'BULK STORE'**) the hopper contents switch will control the operation of either the bulk store auger or Grant SpiraVac system. When used with a bulk store auger it will NOT interrupt the switched live to the boiler and thus **'WAIT BOILER THERMOSTAT'** will NOT be displayed. The boiler will continue to operate until ALL pellets in the hopper are used and then stop, with **'FAILED PELLET LIGHTING'** displayed on the burner control screen.
In this case, check that:

- there are pellets in the bulk store
- the bulk store auger, or Grant SpiraVac system, is operating correctly (refer to instructions supplied with the SpiraVac system).

Rectify as necessary.
When used with a Grant SpiraVac refer to instructions supplied with unit.

Note 4 - Is there a switched live from the heating system controls connected to the hopper/boiler?

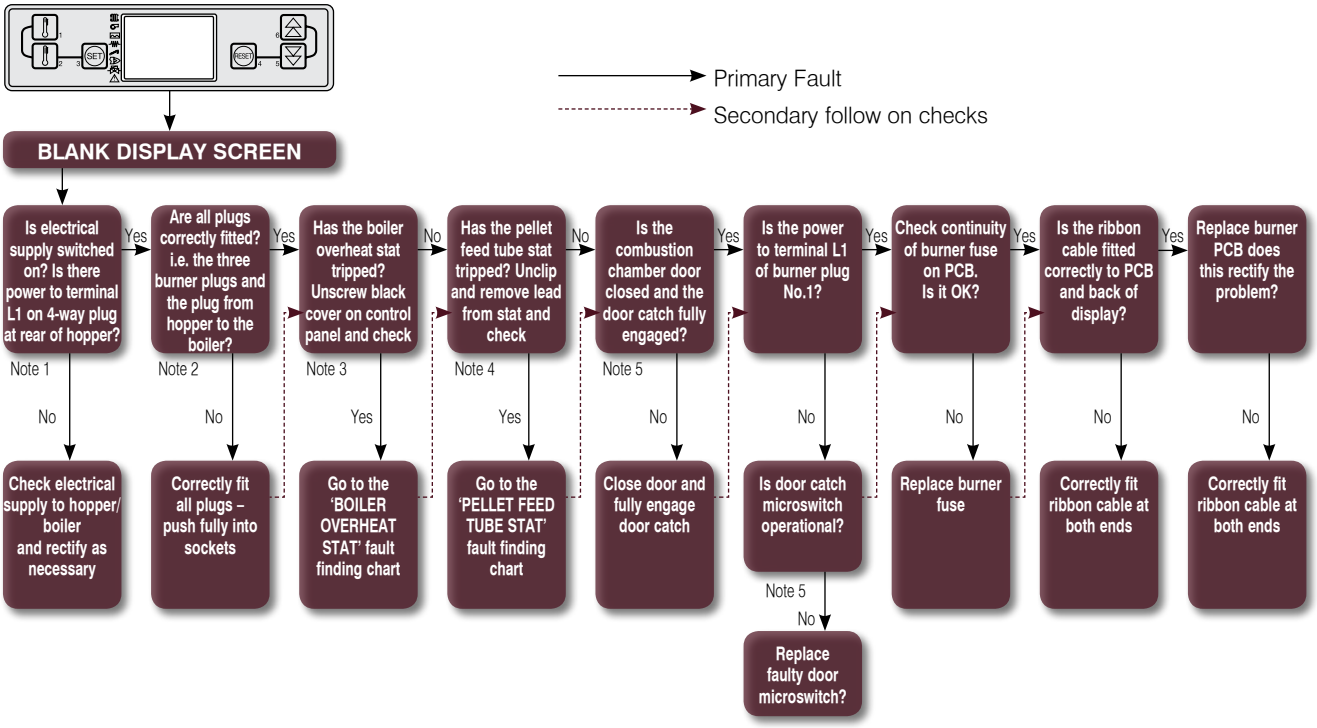
Check that switched live from the controls is correctly connected to terminal L2 on the 4-way plug at the rear of the hopper. Also check that this 4-way plug is fully pushed into the socket on the flying lead, at the rear of the hopper. Refer to Sections 8.4 and 8.5 for further details.

Check that ALL controls (programmer and room thermostats) are 'calling' and that there is a 230V output to the boiler.

Note 5 - Is there continuity between terminals T1 and T2 on burner plug No.2?

Disconnect the plug from left side of burner and check for continuity between terminals T1 and T2. Refer to Figure 8-5 for wiring details.

12.3 No Screen Display - Boiler will not fire – blank screen



Note 1 - Is there a permanent mains live supply connected to the hopper/boiler?

Check that the permanent live from the fused spur is correctly connected to terminal L1 on the 4-way plug at the rear of the hopper. Also check that 4-way plug is fully pushed into the socket on the flying lead, at the rear of the hopper. Refer to Sections 8.4 and 8.5 for further details.

Also check that 5-way plug from hopper is fully pushed into the socket at the top left rear of the boiler.

Check that the fused spur is switched ON and, if necessary, check the fuse is OK.

Note 2 - Is there a permanent mains live supply connected to the burner?

Check that the two 7-way plugs are fully pushed into the two lower sockets on the left side of the burner.

Also check for permanent live on terminal L1 of burner plug No.1. Refer to Figure 8-5.

Note 3 – Has the boiler overheat thermostat tripped?

Unscrew and remove the black cover from the overheat reset button on the boiler control panel to check if boiler overheat thermostat has tripped. If YES, go to Section 12.4 for further guidance.

Note 4 – Has the pellet feed tube thermostat tripped?

Remove top section of burner cover and disconnect the lead from the pellet feed tube thermostat. Check the reset button to see if thermostat has tripped, if YES, go to Section 12.5 for further guidance.

Note 5 - Is the combustion chamber door closed and catch fully engaged?

The combustion chamber door is fitted with a safety interlock. Once the door catch is disengaged all power to the burner is interrupted. Refer to Section 10.5.2. Check that catch is FULLY engaged when door is closed.

Note 6 - Is the door microswitch operational?

Check electrical continuity of door micro-switch. Replace if faulty. Refer to Figure 8-5 and 12-5.

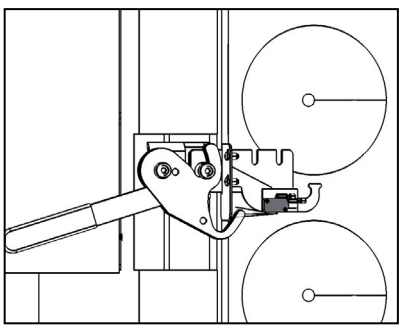


Figure 12-5: Location of door microswitch (side panel removed)

Note 7 - Is the fuse on the PCB OK?

Remove fuse from holder on PCB and check. Replace if necessary. Fuse type F5AL250V. Refer to Figure 12-6.

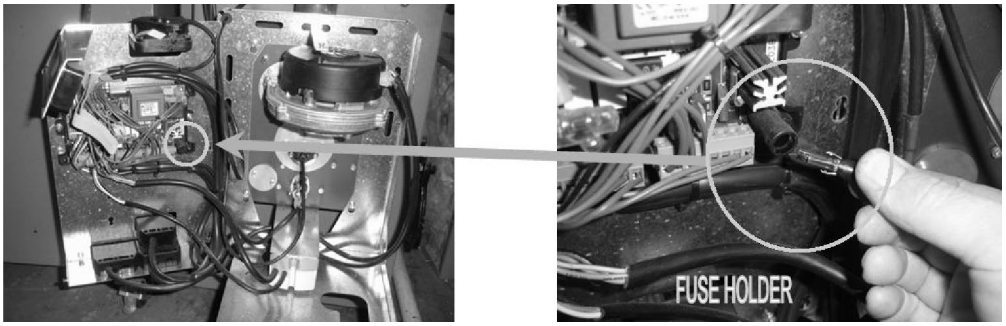
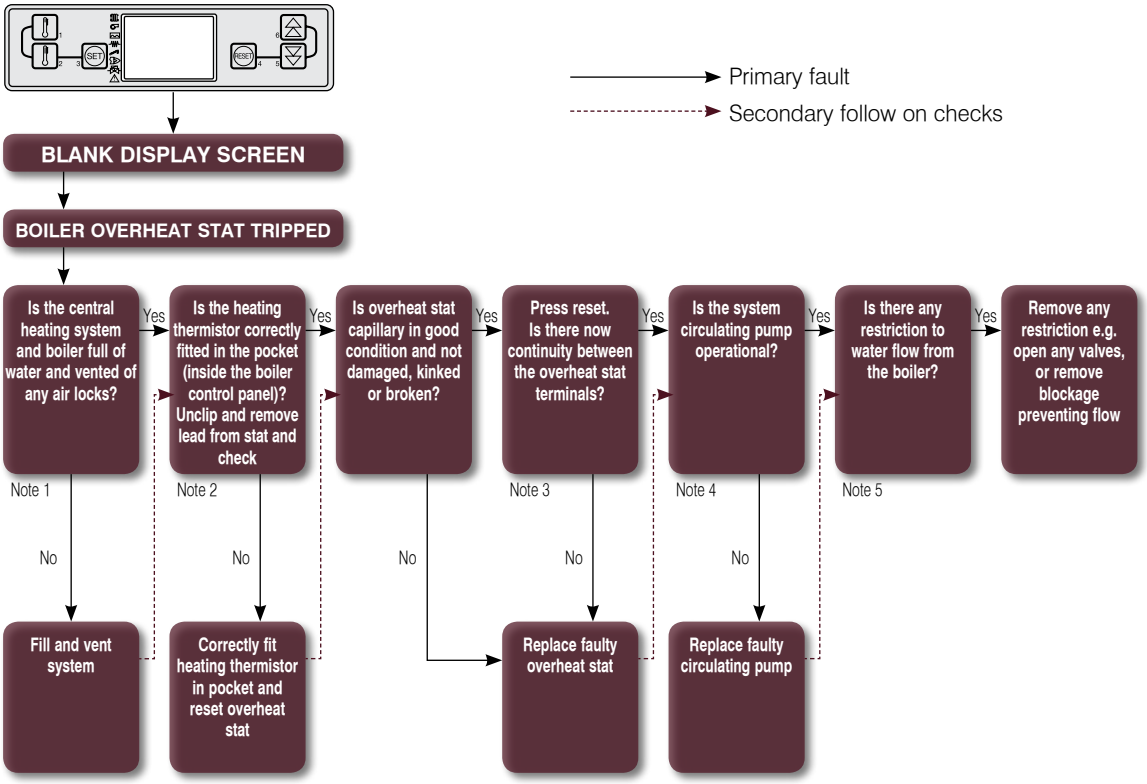


Figure 12-6: Location of fuse on PCB

12.4 Boiler Overheat Thermostat



Note 1 - Is heating system and boiler full of water and vented?

The central heating system must be free of any air locks. Ensure auto air vent on secondary heat exchanger (at left rear of the boiler) is open and vented. Vent the primary heat exchanger on the heating flow pipe.
If installed on a sealed system: check expansion vessel charge pressure and correct as necessary. Check system pressure and top-up as necessary. Refer to Section 6 for sealed system details.

Note 2 - Is the heating thermistor correctly fitted?

Isolate electrical supply and remove boiler control panel cover.
Check that the heating thermistor, and the overheat thermostat sensor, are correctly fitted into the pocket (inside the boiler control panel). Refer to Section 10.3.1. Ensure that both are held in place with the retaining clip supplied.

Also, check the condition of the thermistor and the overheat thermostat capillary for any damage, replace if necessary.

Note 3 - Is there continuity between the overheat thermostat terminals?

With electrical supply isolated, reset the overheat thermostat and check electrical continuity across the terminals. If no continuity found, replace the overheat thermostat.

Note that the thermostat continuity can be checked by removing the 7-way plug (plug No. 1) from the socket on the left of the burner and testing between terminals T1 and T2. Refer to Section 8 and Figure 8-5.

Note 4 - is the circulating pump operational?

With the burner ON/STANDBY switch set to 'STANDBY', reconnect the power supply to the boiler and check that the heating system controls are 'calling'. Set the switch to ON and the pump should be running.

If not check that:

- the pump is vented
- there is power to the pump
- that the pump is not seized/stuck

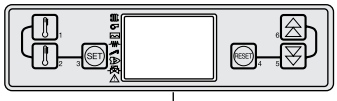
If pump has failed then replace it.

Note 5 - Is there any restriction to flow from the boiler?

Check that all valves on the heating circuit are open and that there are no blockages.

Rectify as necessary.

12.5 Pellet Feed Tube Thermostat



Primary fault

Secondary follow on checks

BLANK DISPLAY SCREEN

PELLET FEED TUBE STAT TRIPPED

When pellet feed tube has cooled - does pressing RESET button on stat correct the fault? — Yes → Is the pellet delivery hose damaged? — No → Is the pellet delivery hose air tight at both ends? — Yes → Is the ash pan overflowing? Is there a build up of ash on the combustion chamber baffle? — No → Is the combustion chamber draught correct? — No → Is the condensate trap and/or discharge pipe blocked or frozen? — No → Is the flue used the correct type? Is it correctly installed and not blocked? — Yes → Is the flue fan (in flue fan box) operational and clean?

Note 1

No → Is the lead correctly connected?

No → Is there continiuty between the terminals?

Note 2

No → Replace pellet feed tube stat

Note 3

Yes → Replace pellet delivery hose

Note 3

No → Correctly fit pellet delivery hose or replace if necessary

Note 4

No → Clean out the ash pan and boiler. Clean all ash from the combustion chamber baffle

Note 5

No → Check the switched live supply to hopper/ boiler and rectify as necessary

Note 6

No → Clean condensate trap and pipe to clear blockage

Note 7

No → Rectify or replace flue if necessary. Remove any flue blockage

Note 8

No → Rectify fan fault or replace if necessary. Clean fan if required

Is the room ventilation adequate? — Yes → Is the mains water supply to boiler connected and switched on? — Yes → Is the boiler wash system operating correctly when tested (using the test switch)? — Yes → Is the shaker cleaning system operating correctly when tested (using the test switch)? — Yes → Is the boiler cleaning interval correctly set? — Yes → Is the duration of the boiler cleaning period correctly set?

Note 9

No → Unblock or increase ventilation as required

Note 10

No → Connect the mains water supply and switch on

Note 10

No → Is solenoid valve operating correctly?

Yes → Check that manifold jets are clear?

Note 6

No → Check operation of cleaning motor and shaker mechanism

Note 11

No → In burner menu reset 'TIME CLEAN BRAZIER' and 'TIME CLEAN BOILER' settings

Note 11

No → In burner menu reset 'TIME CLEAN PERIOD' setting

Note 1 - Is the fault cleared by pressing the reset button?
Is the pellet feed tube less than 90°C? If not then allow it to cool before proceeding.

When cool, remove the steel retaining clip and disconnect the lead from the pellet feed tube (burn back) thermostat. Press the reset button on the thermostat.

Note 2 - Is feed pipe thermostat (burn back sensor) damaged or faulty?
Check the electrical continuity and condition of the thermostat. Replace if necessary.

Note 3 - Is the pellet delivery hose damaged/correctly fitted?
Check the condition of the hose. Is it damaged? If so replace it.

Is it fitted correctly at both ends – with an air tight fit onto both pellet feed pipe and pellet auger outlet? Rectify as necessary.

A damaged (or incorrectly fitted) pellet delivery hose can allow a back draught through the boiler, resulting in the pellet tube (burn back) thermostat operating and shutting down the burner.

Note 4 - Is the ash pan overflowing?
An overflowing ash pan, and ash build-up on the baffle, can block the passage of the combustion gases from the burner, causing them to back-up through the burner into the pellet feed tube. This will activate the pellet feed tube (burn back) thermostat. The ash pan must be periodically emptied, and also any ash build-up on the baffle removed, by the user at MONTHLY intervals for the FIRST THREE MONTHS. After this the ash pan should be emptied, and ash on the baffle removed, regularly, on at least a monthly basis, or as indicated by the amount of ash found during the first three months cleaning. Refer to Section 1.5.

The combustion chamber baffle is no longer fitted to the current versions of the Spira boilers. If fitted, it can be removed from earlier versions when the boiler is serviced. Removal of the baffle will require the combustion chamber draught and flue gas CO^2 to be checked and reset as necessary.

Note 5 - Is combustion chamber draught correct?
Check combustion chamber draught. Refer to Section 10.9 for procedure. If it is incorrect, **BEFORE** making any adjustment to the draught stabiliser, carry out the following checks as per the flow chart:

- Is condensate trap or pipework blocked or frozen? Defrost/remove blockage as necessary.
- Is ash pan overflowing? Empty and clean ash pan as necessary.
- Is the flue system incorrectly installed or blocked? Rectify as necessary.
- Is the flue fan operational?
- Is the room ventilation adequate?

If all the above are OK, then adjust the draught stabiliser as necessary to achieve the required combustion chamber draught. Refer to Section 10.9 for procedure.

Note 6 - Is condensate trap/pipe blocked?
Thoroughly check the entire condensate disposal system, including all the pipework and the trap(s), to ensure that it is not blocked or frozen (even partially).

If the condensate backs-up into the condensing heat exchanger, it can block the passage of the combustion gases from the burner, causing them to back-up through the boiler and burner into the pellet feed tube. This will activate the pellet feed tube (burn back) thermostat.

Note 7 - Is the flue correct type and correctly installed?
Only the Grant 'Biomass' flue system can be used with the Grant Spira wood pellet boilers. Check that the flue has been correctly assembled and that the terminal position complies with the requirements of The Building Regulations – Approved Document J. Refer to Sections 7.2 for guidance.

Note 8 - Is flue fan operational and clean?
If the flue fan is not running, or is coated with ash, the draught in the combustion will be reduced causing the combustion gases from the burner to back-up through the burner into the pellet feed tube. This will activate the pellet feed tube (burn back) thermostat.

Note 9 - Is the room ventilation adequate?
Check that sufficient permanent ventilation is present in the room containing the boiler(s). Refer to Section 7.1 for guidance.

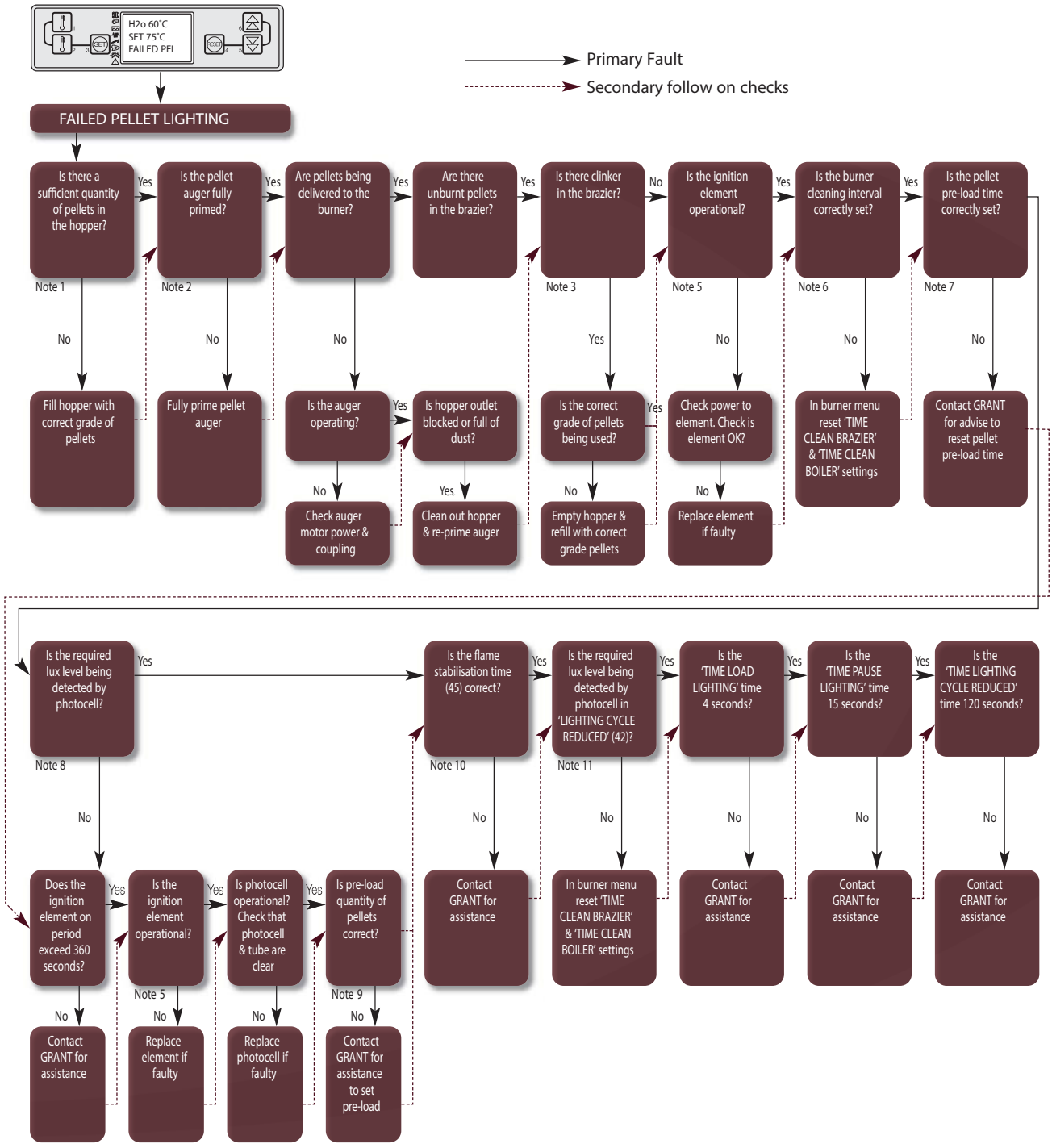
Lack of ventilation will lead to incomplete combustion, and an increased temperature in the pellet feed tube that will activate the burn back thermostat.

Note 10 - Is the wash system operating correctly?
Check the water supply to the wash system is connected and turned on. Operate the **CLEANING** switch and check the solenoid valve is opening and the water jets are all clear. Refer to Section 10.3.3.

In hard water areas an anti-scale device should be fitted on the cold water supply to the wash system to prevent scale build-up in the manifold and jets.

Note 11 - Is the boiler cleaning period correct?
Go to the **'CLEAN'** sub menu of the burner control settings and check that both **'TIME CLEAN PERIOD'** and **'TIME CLEAN BOILER'** are correctly set. If not, re-set to the correct value. Refer to 9.7.1.3.

12.6 Failed Pellet Lighting



Note 1 - Is there a sufficient quantity of pellets in the pellet hopper?

The effect of insufficient pellets will depend on the type of pellet storage used, as follows:

Using a pellet hopper only – if there are insufficient pellets, the hopper contents switch will break the switched live to the boiler, causing **'WAIT BOILER THERMOSTAT'** to be displayed. Refill the hopper to start the boiler. Refer to Section 1.4.4 for further details.

Using a bulk pellet store – the hopper contents switch will control the operation of either the bulk store auger of Grant SpiraVac system. It will **NOT** interrupt the switched live to the boiler and thus **'WAIT BOILER THERMOSTAT'** will NOT be displayed.

The boiler would continue to operate until **ALL** pellets in the hopper are used and then stop, with **'FAILED PELLET LIGHTING'** displayed on the burner control screen.

In this case, check that:

- there are pellets in the bulk store
- the bulk store auger, or Grant SpiraVac system, is operating correctly (refer to instructions supplied with the SpiraVac system)

Rectify as necessary.

Note 2 - Is the pellet auger fully primed?

Refer to Section 10.7 for procedure to prime the auger.

Note 3 - Is there 'clinker' in the burner brazier?

Clinker is the hard deposits of solidified ash, containing sand particles, which the automatic burner cleaning system is unable to remove. Clinker is caused by using unsuitable pellets. See note 4.

If there is no clinker, but brazier is full of unburnt pellets, remove all pellets and clean brazier.

Note 4 - Are the correct pellets being used?

Check the pellets being used. Only EN Plus Grade A1 pellets conforming to BS EN ISO 17225-2 must be used with the Grant UK Spira boilers. Refer to Section 3.1 for detailed pellet specification.

Check the brazier cleaning setting – **'TIME CLEAN BRAZIER'**. Refer to Section 9.7.1.3 for settings.

Note 5 - Is the ignition element operational?

To check, isolate electrical supply and disconnect the two leads from the element cable. Grasp the black grommet and pull the complete element and cable from the tube. Check the condition of the ceramic element and that it is correctly fitted into the ceramic socket. Also check it is correctly positioned inside the tube. Refer to Section 11.8.3 for details.

Check across the two terminals for electrical continuity. Resistance of element ≈89Ω. If no continuity is found, then replace the element.

Note 6 - Is the burner cleaning interval correct?

Go to the **'CLEAN'** sub menu of the burner control settings and check that **'TIME CLEAN BRAZIER'** and **'TIME CLEAN BOILER'** are correctly set. Refer to 9.7.1.3.

Note 7 - Is the pellet pre-load time correct?

Measure the duration of the pellet pre-load period (i.e. whilst the **'STEP AUTO'** function is 40 in the **'VIEW'** menu), at the beginning of the burner lighting sequence. Refer to Section 9.3 for burner operating sequence and also Section 9.7.3 for **'VIEW'** menu folder. Pre-load should be 65 seconds. If not, contact Grant UK for technical advice on how to adjust the pre-load period.

Note 8 - Is the required LUX level being detected by the photocell?

In the **'WAIT LIGHTING (IGNITION)'** period of the burner lighting sequence (i.e. whilst the **'STEP AUTO'** function is 41 in the **'VIEW'** menu), if the LUX value fails to reach 2 after a time of 360 seconds, then the error message **'FAILED PELLET LIGHTING'** is displayed. Refer to Section 9.7.3 for procedure to access LUX value in **'VIEW'** menu.

Note 9 - Is the preload quantity of pellets correct?

When the pre-load operation is complete, the pellets should cover the heating element but not cover the opening at the end of the photocell tube.

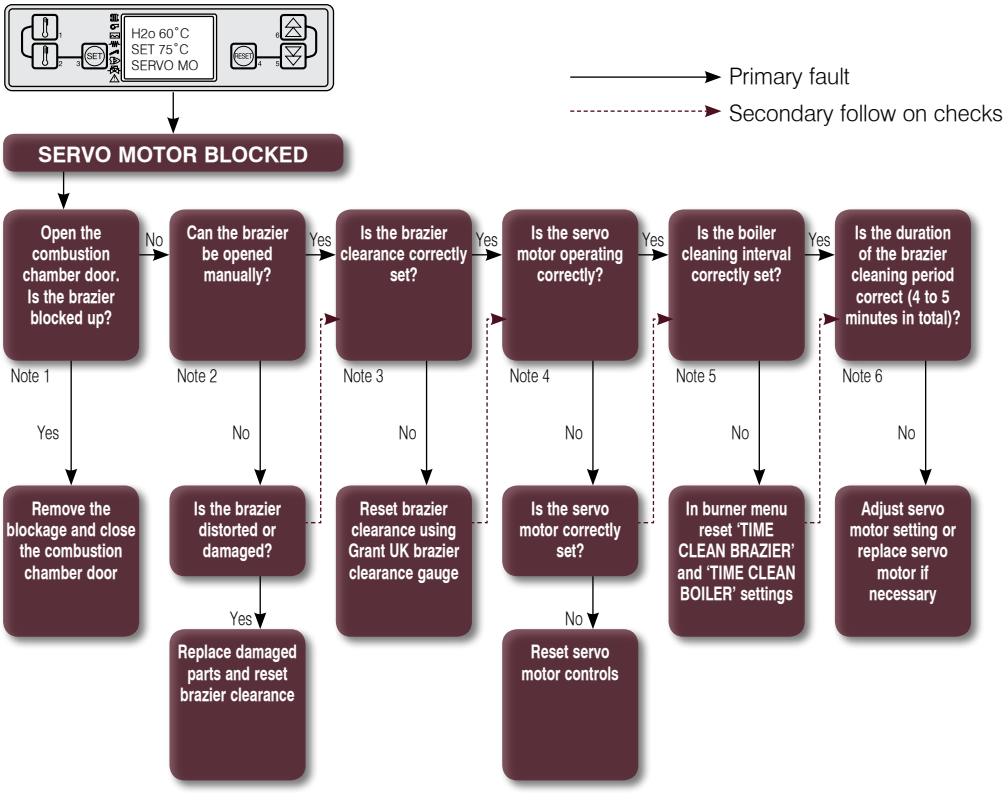
Note 10 - Is the flame stabilisation period correct?

The **'FLAME STABILISATION'** period (i.e. 'step auto' function 45 in the **'VIEW'** menu) is an over-run of the ignition element on period AFTER the 2 lux has been detected. This is factory set at 30 seconds.

Note 11 - Is the required LUX level being detected by the photocell?

In the **'LIGHTING CYCLE REDUCED'** period of the burner lighting sequence (i.e. whilst the **'STEP AUTO'** function is 42 in the **'VIEW'** menu), if the flame drops to or below 1 lux then the error message **'FAILED PELLET LIGHTING'** is displayed. Refer to Section 9.7.3 for procedure to access LUX value in **'VIEW'** menu.

12.7 Servo Motor Blocked



Note 1 - Opening the combustion chamber door.

Before attempting to open the combustion chamber door, set the **ON/STANDBY** switch to **STANDBY**.

Note 2 - Can the brazier be opened manually?

First clear any blockage (clinker/ash) from the brazier. To open the brazier manually, operate the release switch on the servo motor. Refer to Section 11.7.2.

DO NOT FORCE THE BRAZIER OPEN WITHOUT OPERATING THE SERVO MOTOR RELEASE SWITCH OR THE SERVO MOTOR GEARS WILL BE DAMAGED AS A RESULT!

Note 3 - Is the brazier clearance correctly set?

To check the gap between the fixed and moving part of the brazier, use the brazier clearance gauge (supplied with the boiler). Refer to Section 11.7.2. If it is necessary to dismantle the brazier, the burner must be removed from the combustion chamber door. Refer to Section 11.7.

Note 4 - Is the servo motor operating correctly?

Set the **ON/STANDBY** switch to **STANDBY**. Go to the **'CLEAN'** sub menu of the burner control settings and set **'TIME CLEAN BRAZIER'** to 0.

Set the **ON/STANDBY** switch to **ON** and start the boiler. When the burner display shows **'100% POWER'** set the **ON/STANDBY** switch back to **STANDBY**. When the burner has completed the shut down process the brazier cleaning operation will start automatically. The burner control screen will first show **'BRAZIER CLEANING FORWARD'** for between 2 to 2½ minutes. Then the burner fan will start and the screen will show **'BRAZIER CLEANING BACK'** for between a further 2 to 2½ minutes. Thus the total time for the brazier cleaning operation is between 4 to 5 minutes.

Ensure 'TIME CLEAN BRAZIER' is then reset to its original setting or the brazier cleaning operation will be repeated every time the burner shuts down.

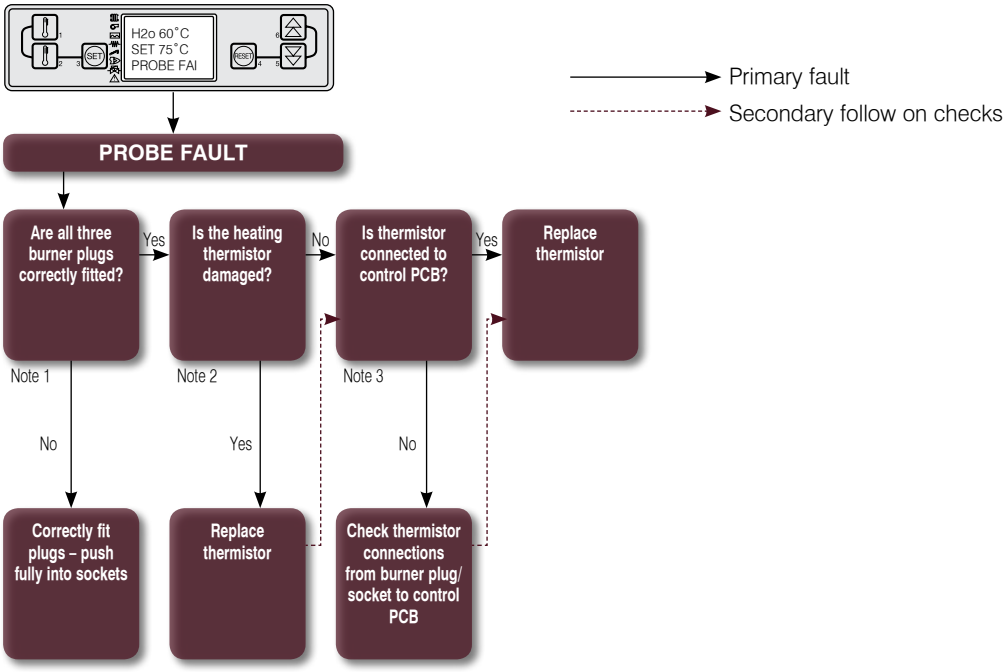
Note 5 - Is the servo motor correctly set?

The stroke of the servo motor is factory set and should not be adjusted. Check with Grant UK for correct setting.

Note 6 - Is the boiler cleaning interval correct?

Go to the **'CLEAN'** sub menu of the burner control settings and check that **'TIME CLEAN BRAZIER'** and **'TIME CLEAN BOILER'** are correctly set. Refer to 9.7.1.3

12.8 Probe Fault



Notes 1 - Are burner plugs correctly fitted?

Check that all three plugs are fully pushed into sockets on the left side of the burner – in particular plug No.2. Refer to Section 8 and Figure 8-5.

Note 2 - Is heating thermistor damaged?

Isolate electrical supply to boiler and remove boiler control panel cover. Check the condition of the thermistor for any damage and replace if necessary.

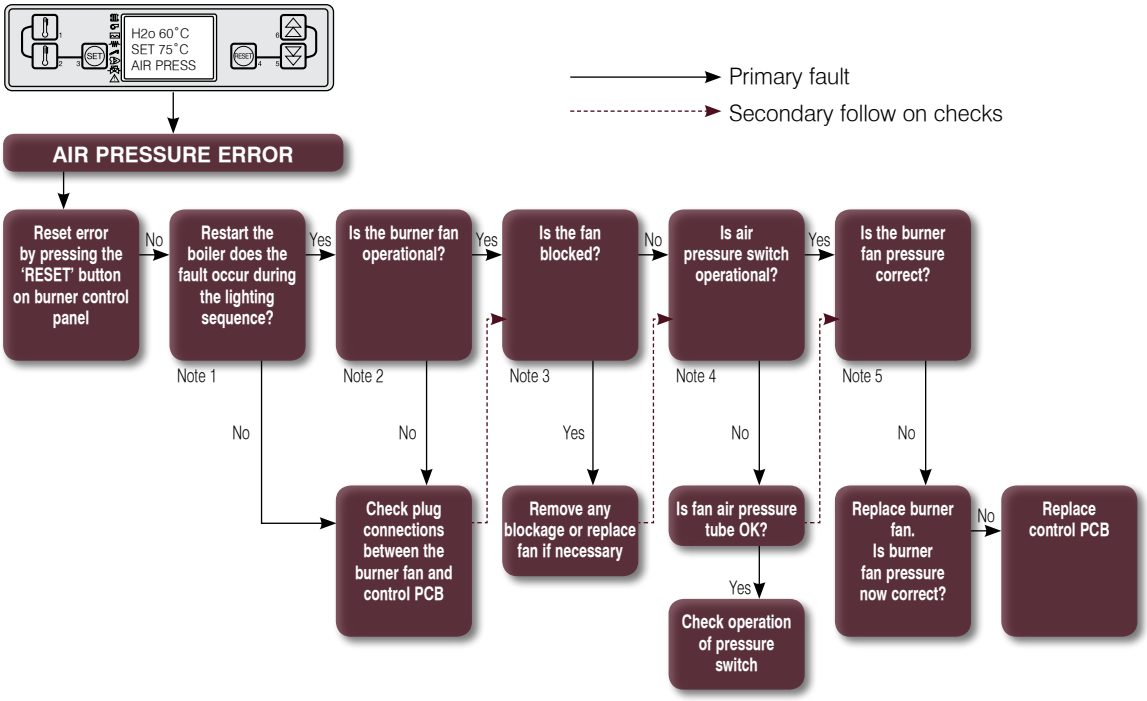
Check that the heating thermistor is correctly fitted into the pocket (inside the boiler control panel). Refer to Section 10.3.1. Ensure that both thermistor and thermostat sensor are held in place with the retaining clip supplied.

Note 3 - Is thermistor connected to burner PCB?

With electrical supply to boiler still isolated, remove both the burner cover and PCB cover. Check the thermistor connections to the PCB – from terminals S3 and B4 on plug/socket No.2. Refer to Section 8 and Figure 8-6.

If fault still exists, replace thermistor.

12.9 Air Pressure Error



Note 1 - Does fault occur during lighting sequence?

During the **'PRE-LOAD'** operation, the burner controls check that burner fan is generating enough air pressure to close the air pressure switch. If the pressure switch is not closed during pre-load, then the warning **'AIR PRESSURE ERROR'** is displayed on the burner screen.

Figure 12-7: Air pressure switch and fan

Note 2 - Is the burner fan operational?

During the **'PELLET BURNER FIRING'** operation the burner controls checks that the burner fan speed is correct. It does not check if the fan is generating enough air pressure. If during the **'PELLET BURNER FIRING'** operation the burner fan speed is not correct then the warning **'AIR PRESSURE ERROR'** is displayed on the burner screen.

Check that the fan inlet is not blocked and that the fan blades are free to rotate. If necessary, thoroughly clean and remove any dust or debris. If fan still does not rotate freely, replace fan.

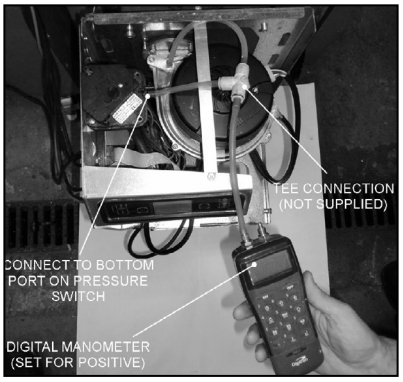


Figure 12-8: Checking air pressure from fan

Note 3 - Is the air pressure switch operational?

Check that air supply tube is correctly connected to the pressure switch and not blocked or twisted. Refer to Figure 12-7. Rectify as necessary. Check condition of tube and replace if damaged. Check operation of air pressure switch.

Note 4 - Is fan air pressure tube OK?

Check that the plastic tube from the fan is not twisted, kinked or blocked. Check that it is correctly connected to the both the fan and pressure switch (lower of the two connections on the pressure switch).

Note 5 - Is burner fan pressure correct?

Using a digital manometer (set for positive pressure) check the pressure generated by the burner fan is the minimum of 0.8mbar required to activate the air pressure switch. Refer to Figure 12-8. If fan pressure is incorrect, replace fan.

If correct pressure is still not achieved, replace burner PCB.

13 Spare Parts

13.1 Boiler

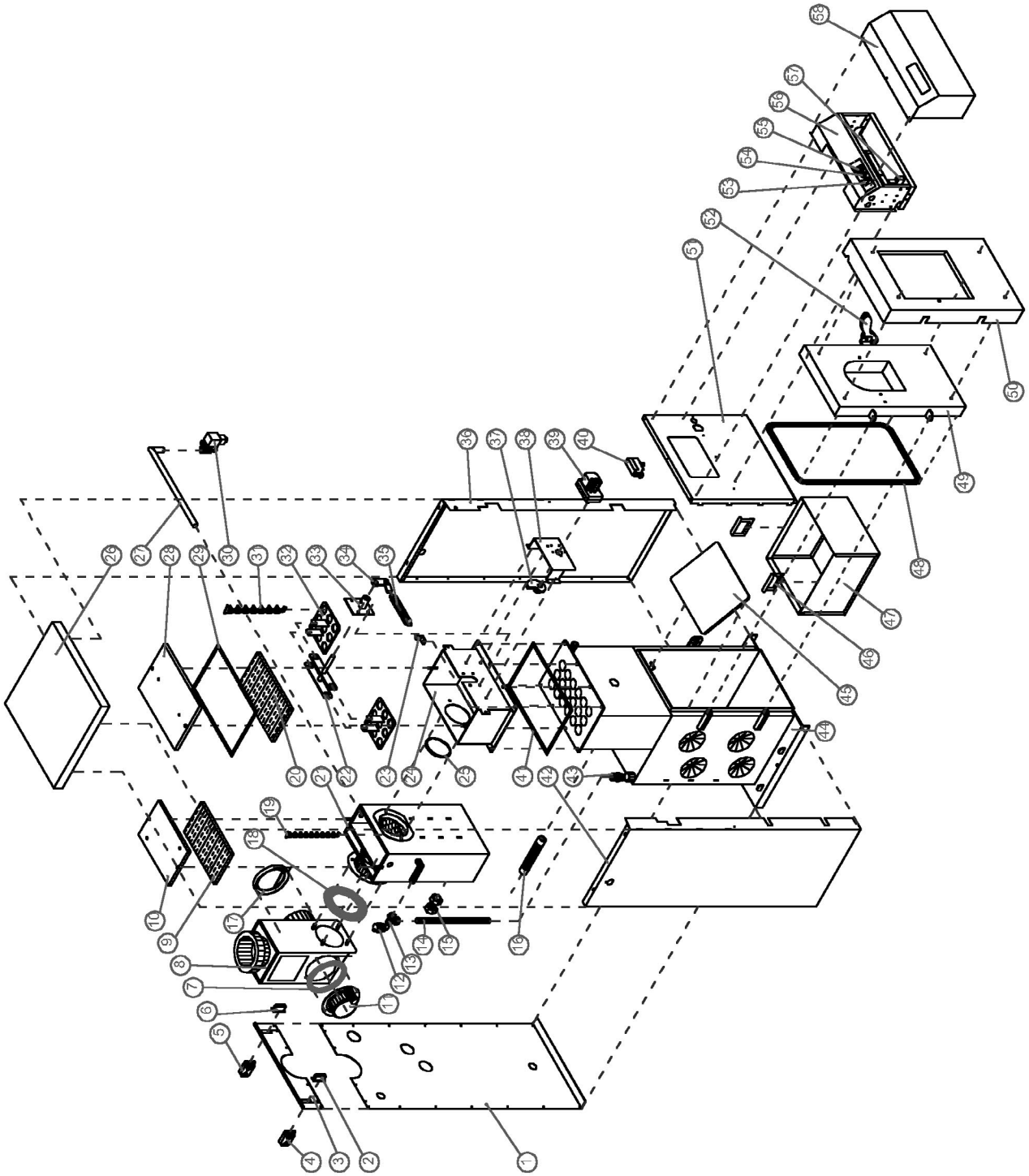


Figure 13-1: Boiler components – exploded view

13.2 Boiler Parts List

Item	Description	Product code	Qty - 5-18kW	Qty - 6-26kW	Qty - 9-36kW
1	Rear lower panel	WPS34	1	1	1
2	5 way mains connection - male fixed	WPS35	1	1	1
3	Rear upper panel	WPS36	1	1	1
4	5 way mains connection - female detechable	WPS37	1	1	1
5	5 way flue fan / cleaning solenoid connection - male detachable	WPS38	1	1	1
6	5 way flue fan / cleaning solenoid connection - female fixed	WPS39	1	1	1
7	Flue fan sealing gasket	WPS40	1	1	1
8	Fan box	WPS41	1	1	1
9	Cleaning door sealing gasket - secondary	WPS42	1	1	
		WPS43			1
10	Cleaning door - secondary	WPS44	1	1	
		WPS145			1
11	Flue fan	WPS46	1	1	1
12	Air vent	MPCBS29	1	1	1
13	Air fold manifold	WPS48	1	1	1
14	22mm secondary to primary pipe	WPS49	1	1	
		WPS50			1
15	Return assembly	WPS51	1	1	
		WPS52			1
16	1” BSP flow pipe (5-18 and 6-26kW)	WPS53	1	1	
	1¼” BSP flow pipe (9-36kW)	WPS54			1
17	Draught stabiliser	WPS55	1	1	1
18	Fan box/secondary gasket	WPS56	1	1	1
19	Secondary heat exchanger spiral baffle	WPS57	30	30	40
20	Cleaning door sealing gasket - primary	WPS58	1	1	
		WPS59			1
21	Secondary heat exchanger	WPS60	1	1	
		WPS61			1
22	Shaker arm assembly	WPS62	1	1	
		WPS63			1
23	Spring anchor - fixed	WPS64	1	1	1
24	Shaker chamber	WPS65	1	1	
		WPS66			1
25	Primary/secondary gasket	WPS67	1	1	1
26	Top panel	WPS68	1	1	
		WPS69			1
27	Cleaning pipe manifold	WPS70	1	1	
		WPS71			1
28	Cleaning door - shaker chamber	WPS72	1	1	
		WPS73			1
29	Fibre rope - shaker chamber door	WPS74	1	1	
		WPS75			1

Boiler Parts List continued

Item	Description	Product code	Qty - 5-18kW	Qty - 6-26kW	Qty - 9-36kW
30	Solenoid valve	WPS76	1	1	1
31	Primary heat exchanger spiral baffle	WPS77	18	18	24
32	Spiral hanger	WPS78	1	1	
		WPS79			1
33	Shaker assembly mounting flange	WPS80	1	1	1
34	Spring anchor - movable	WPS81	1	1	1
35	Cleaning mechanism spring	WPS82	1	1	1
36	Right side panel	WPS83	1	1	
		WPS84			1
37	Cleaning mechanism cam	WPS85	1	1	1
38	Cleaning motor mounting flange	WPS86	1	1	1
39	Cleaning mechanism motor	WPS87	1	1	1
40	Door interlock	WPS88	1	1	1
41	Shaker chamber mounting gasket	WPS89	1	1	
		WPS90			1
42	Left side panel	WPS91	1	1	
		WPS92			1
43	Brass fitting 1" BSP x 22mm (311)	WPS93	1	1	
	Brass fitting 1¼" BSP x 28mm (311)	WPS94			1
44	Primary heat exchanger	WPS95	1	1	
		WPS96			1
45	Combustion chamber baffle	WPS97	1	1	
		WPS98			1
46	Ash pan handles	WPS99	2	2	2
47	Ash pan	WPS100	1	1	
		WPS101			1
48	Combustion chamber cleaning door rope	WPS102	1	1	1
49	Combustion chamber cleaning door	WPS103	1	1	1
50	Combustion chamber cleaning door panel	WPS104	1	1	1
51	Front panel	WPS105	1	1	1
52	Combustion chamber cleaning door handle	WPS106	1	1	1
53	On / off switch	EFBS22	1	1	1
54	Limit stat	WPS107	1	1	1
55	Momentary switch (double pole on / off)	WPS108	1	1	1
56	Control panel chassis	WPS109	1	1	1
57	Relay	MPCBS72X	1	1	1
58	Control panel cover	WPS110	1	1	1
N/A	Circuit board (5-18kW)	WPS112C	1		
N/A	Circuit board (6-26kW)	WPS112		1	
N/A	Circuit board (9-36kW)	WPS112B			1

13.3 Burner

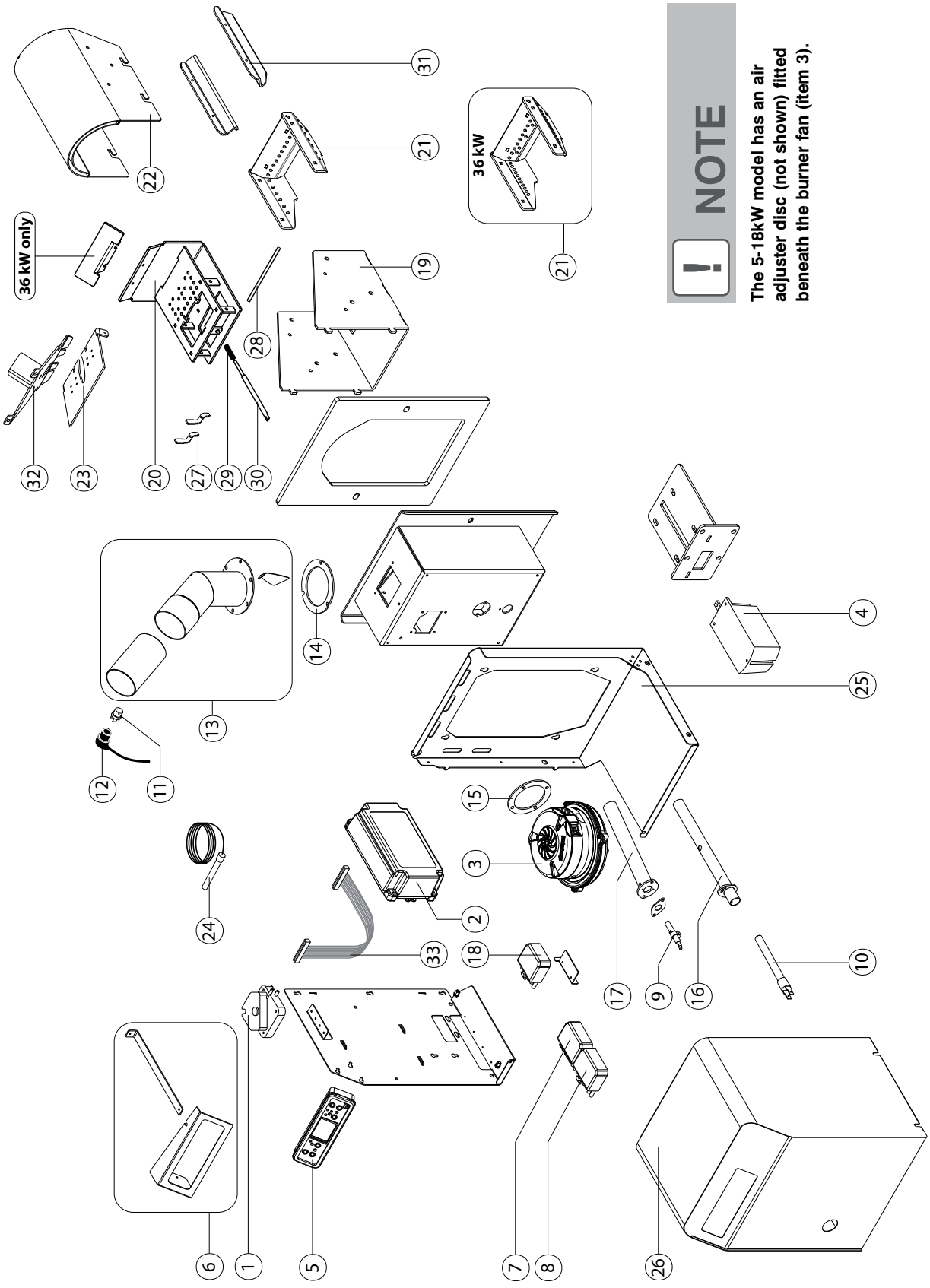


Figure 13-2: Burner – exploded view

13.4 Burner Parts List

Item	Description	Product code	Qty - 5-18kW	Qty - 6-26kW	Qty - 9-36kW
1	Air pressure switch	WPS111	1	1	1
2A	Primary printed circuit board (5-18)	WPS112C	1	-	-
2B	Primary printed circuit board (6-26)	WPS112	-	1	-
2C	Primary printed circuit board (9-36)	WPS112B	-	-	1
3	Burner fan and motor	WPS03	1	1	1
N/A	Air restriction plate (5-18kW only)	WPS178	1	-	-
4	Servo motor (for brazier)	WPS04X	1	1	1
5	LED display unit	WPS05	1	1	1
6	LED display support	WPS06	1	1	1
7	Electrical connector (7-way female) - burner plug No. 2	WPS07	1	1	1
8	Electrical connector (7-way male) - burner plug No. 2	WPS08	1	1	1
9	Photocell	WPS09	1	1	1
10	Ignition element (no housing)	WPS10A	1	1	1
11	Pellet feed tube thermostat	WPS11	1	1	1
12	Pellet feed tube thermostat cover	WPS12	1	1	1
13	Pellet feed tube (one piece)	WPS174	1	1	1
	Pellet feed tube (two piece)	WPS174A	1	1	1
N/A	Pellet feed (flexi) tube	WPS13	1	1	1
14	Pellet feed tube gasket	WPS14	1	1	1
15	Burner fan gasket	WPS24	1	1	1
16	Ignition element housing (housing only)	WPS10B	1	1	1
17	Photocell tube	WPS17	1	1	1
18	Electrical connector (6-way male) - burner plug No. 3	WPS18	1	1	1
19	Brazier - chassis	WPS19	1	1	1
20A	Brazier - bottom (5-18 and 6-26 kW)	WPS33A	1	1	-
20B	Brazier - bottom (9-36kW)	WPS33B	-	-	1
21A	Brazier - angle plate (5-18 and 6-26 kW)	WPS32A	1	1	-
21B	Brazier - angle plate (9-36kW)	WPS32B	-	-	1
22A	Burner hood (5-18 and 6-26kW)	WPS29X	1	1	-
22B	Burner hood (9-36kW)	WPS29Y	-	-	1
23	Ignition element mounting plate	WPS22	1	1	1
24	Boiler water thermistor	WPS25	1	1	1
25	Burner back plate and base	WPS27	1	1	1
26	Burner cover	WPS28	1	1	1
27	Special - contact Grant UK	N/A	1	1	1
28	Special - contact Grant UK	N/A	1	1	1
29	Cleaning mechanism spring	WPS82	1	1	1
30	Special - contact Grant UK	N/A	1	1	1
31	Special - contact Grant UK	N/A	1	1	1
32	Back plate for photocell	WPS23	1	1	1
33	Special - contact Grant UK	N/A	1	1	1
N/A	Brazier measuring tool	WPS199	1	1	1

13.5 110kg Pellet Hopper

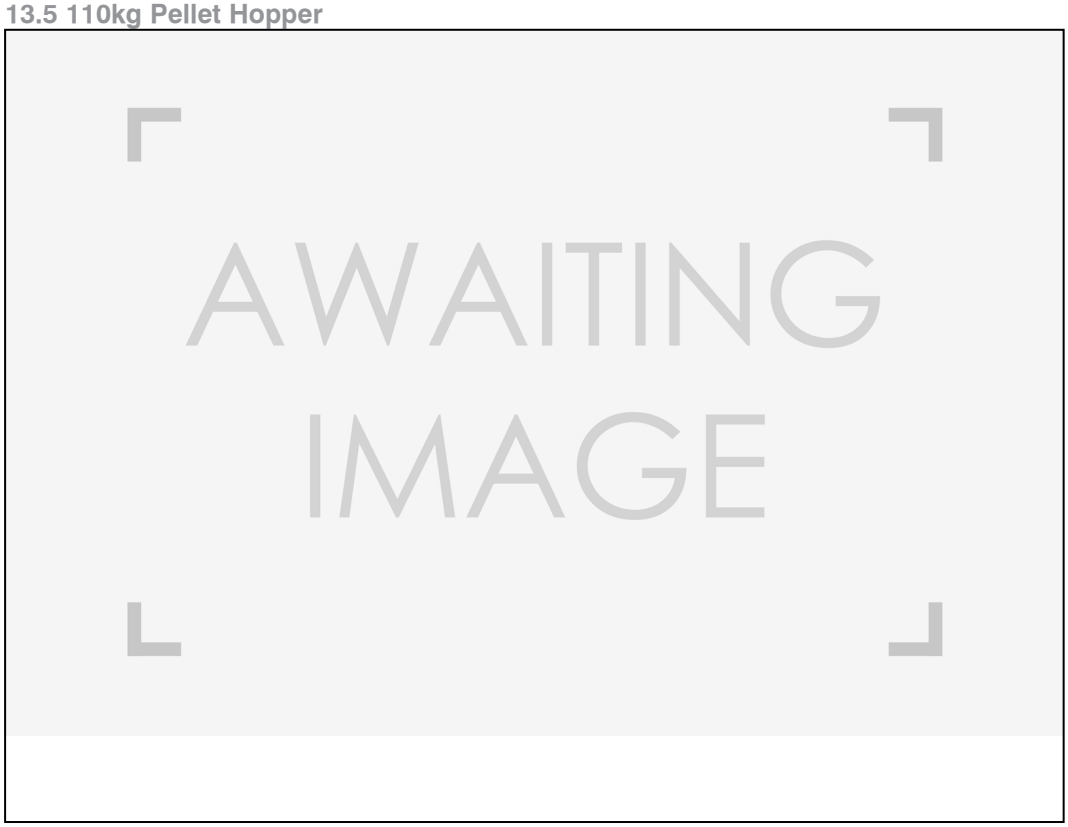


Figure 13-3: 110kg Pellet hopper components - exploded view

13.6 200kg Pellet Hopper Parts List

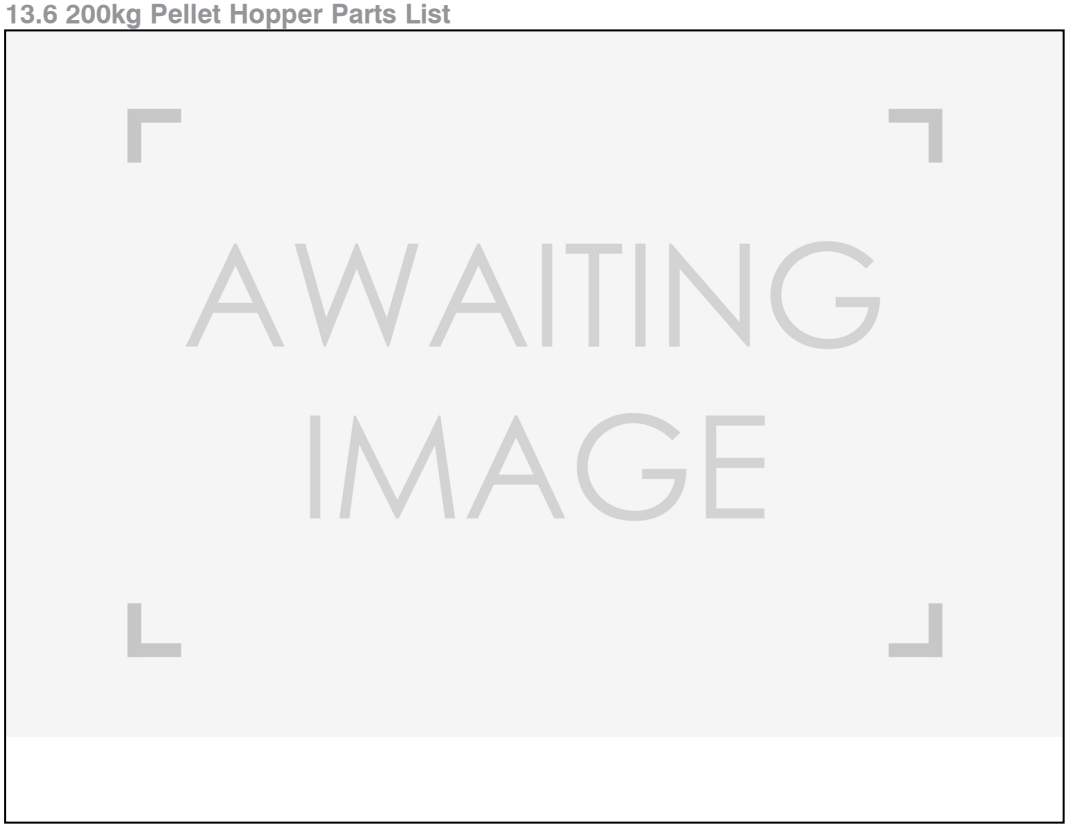


Figure 13-4: 200kg Pellet hopper components - exploded view

13.7 140kg Pellet Hopper Parts List

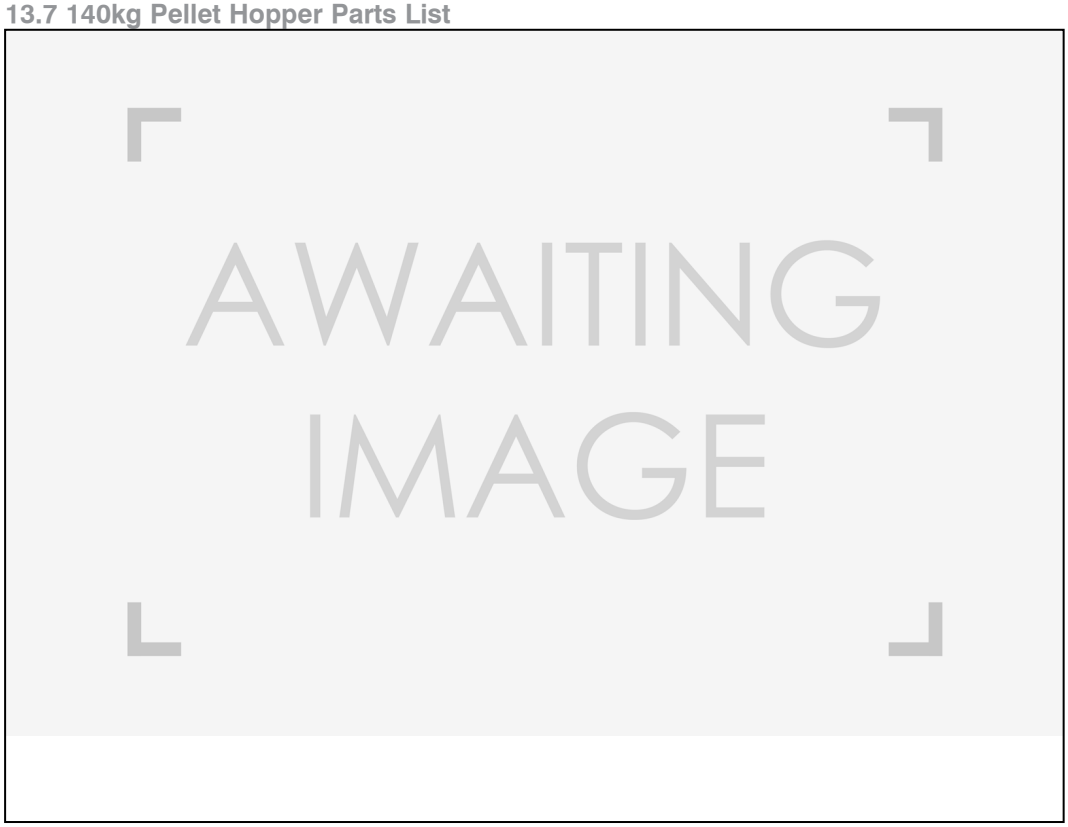


Figure 13-5: 140kg Pellet hopper components - exploded view

13.8 Pellet Hopper Parts List

Item	Description	Product code	Qty - 110kg	Qty - 200kg	Qty - 140kg
1	Castor wheel (c/w brake)	WPS146	2	2	2
2	Caster wheel flange	WPS147	4	4	4
3	Right side panel	Special	1	1	1
4	Pellet feed auger shield	Special	1	1	1
5	Base	Special	1	1	1
6	Front panel	Special	1	1	1
7	Grid	Special	1	1	1
8	Top front panel	Special	1	1	1
9	Door hinge	WPS154	2	2	2
10	Top rear panel	Special	1	1	1
11	Left side panel	Special	1	1	1
12	Castor wheel	WPS157	2	2	2
13	Rubber diaphragm flange	Special	1	1	1
14	Rubber diaphragm	Special	1	1	1
15	Wiring centre	Special	1	1	1
16	Pellet damper	Special	1	1	1
17	Rear panel	Special	1	1	1
18	Wiring centre access cover	Special	1	1	1
19	Low level limit switch	WPS164	1	1	1
20	Limit switch	WPS165	1	1	1

14 Clean Air Act and Declaration of Conformity

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.

Further information on the requirements of the Clean Air Act can be found at www.gov.uk/smoke-control-area-rules
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"

The Grant Spira 5-18, 6-26, 9-36 Condensing Wood Pellet Boiler has been recommended as suitable for use in smoke control areas when burning EN Plus A1 pellets.

Declaration of Conformity

In accordance with BS EN ISO/IEC 17050-1:2004

We	Grant Engineering (IRL)
Of	Crinkle, Birr, Co. Offaly Ireland
Telephone:	057 912 0089
Fax:	057 912 1060
Email:	info@grantengineering.ie
Website:	www.grantengineering.ie

Declare that	
Equipment:	Floor Standing Domestic Wood Pellet Boiler
Model Name/Number:	Grant Spira 5-18, 6-26, 9-36 Wood Pellet Boiler

In accordance with the following EC Directives:

2006/42/EC	Conforms with the requirements of the Machinery Directive.
2006/95/EC	Conforms with the safety objectives of the Low Voltage Directive and its amending Directives.
2004/108/EC	Conforms with the essential protection requirements of the Electromagnetic Compatibility Directive and its amending Directives.

Has been designed and manufactured to the following Specifications:

EN60335-1:2012	Household and similar electrical appliances. Safety – General requirements.
EN60335-2-102:2006+A1:2010	Household and similar electrical appliances. Safety. Particular requirements for gas, oil and sold fuel burning appliances having electrical connections.
EN55014-1:2006	Electromagnetic Compatibility. Requirements for household appliances.
EN303-5:2012	Heating Boilers for solid fuels. Manually or automatically stoked. Nominal heat output up to 500kW.
MCS008	Product Certification scheme requirements - Biomass

15 Health and Safety Information

Under the Consumer Protection Act 1987 and Section 6 of the Health and safety at Work Act 1974, we are required to provide information on substances hazardous to health (COSHH Regulations 1988).

Adhesives, sealants and paints used in the manufacture of the product are cured and present no known hazards when used in the manner for which they are intended.

The following other materials are present in the product:

14.1 Insulation Materials

Material types:
Ceramic fibre board, mineral wool.

Description:
Rigid board, slabs, sleeves, gaskets, ropes.

Known Hazards:
May cause temporary irritation or rash to skin. High dust levels may irritate eyes and upper respiratory system.

Precautions:
Avoid unnecessary or rough handling, or harsh abrasion of boards. Normal handling and use of material should not produce high dust levels.
Avoid inhalation and contact with skin and eyes.
After handling always follow normal good hygiene practices.

Protection:
Use disposable gloves, face mask and eye protection.

First Aid:
Eyes – if irritation occurs, wash eyes with copious amounts of water. If symptoms persist, seek immediate medical advice.

Skin:
If irritation occurs, wash under running water before washing with soap and water.

Inhalation:
Remove to fresh air, drink water to clear throat and blow nose to remove dust/ fibres.

Ingestion:
Drink plenty of water.

14.2 Sealant and Adhesive

Material Types:
Silicone elastomer.

Description:
Sealant and adhesive.

Known Hazards:
Irritation to eyes.

Precautions:
Avoid inhalation of vapour, contact with eyes and prolonged or repeated contact with skin.
After handling always follow normal good hygiene practices.

Protection:
Use eye protection. Rubber or plastic gloves should be worn where repeated contact occurs and a face mask worn when working in confined spaces.

First Aid:
Eyes – flush eyes with water for 15 minutes. Seek immediate medical attention.

Skin:
Wipe off and wash with soap and water.

Inhalation:
Remove to fresh air.

16 Guarantee

You are now the proud owner of a wood pellet boiler from Grant Engineering (UK) Limited, which has been designed to give years of reliable, trouble free, operation.

Grant Engineering (UK) Limited guarantees the manufacture of the boiler including all electrical and mechanical components for a period of **twelve months from the date of installation**[4], provided that the boiler has been installed in full accordance with the installation and servicing instructions issued.

This will be extended to a total period of **two years** if the boiler is registered with Grant Engineering (UK) Limited within **thirty days of installation**[4] and it is serviced at regular intervals[3]. See main Terms and Conditions below.

Registering the product with Grant Engineering (UK) Limited
Please register your wood pellet boiler with Grant Engineering UK Limited **within thirty days of installation**[4]. To do so visit www.grantuk.com and follow the links to the 'Homeowners Zone', where you can register your boiler for a further **twelve months** guarantee (giving **two years** from the date of installation). This does not affect your statutory rights[1].

If a fault or defect occurs within the manufacturer's guarantee period
If your boiler should fail within the guarantee period, you must contact Grant Engineering (UK) Limited who will arrange for the repair under the terms of the guarantee, providing that the boiler has been correctly installed, commissioned and regularly serviced by a competent person and the fault is not due to tampering, running out of fuel, the use of unapproved wood pellets, contamination, debris, system water contamination, misuse, trapped air or the failure of any external components not supplied by Grant Engineering (UK) Limited, e.g. motorised valve, etc.

This two year guarantee only applies if the boiler is registered with Grant Engineering (UK) Limited within thirty days of installation[4] and is regularly serviced[3].

In the first instance
Contact your installer or commissioning engineer to ensure that the fault does not lie with the system components or any incorrect setting of the system controls that falls outside of the manufacturer's guarantee otherwise a service charge could result. Grant Engineering (UK) Limited will not be liable for any charges arising from this process.

If a fault covered by the manufacturer's guarantee is found
Ask your installer to contact Grant Engineering (UK) Limited Service Department on +44 (0)1380 736920 who will arrange for a competent service engineer to rectify the fault.

Remember - before you contact Grant Engineering (UK) Limited:
- Ensure the boiler has been installed, commissioned and serviced by a competent person in accordance with the installation and servicing instructions.
- Ensure there is an adequate quantity of the approved type of pellets in the hopper (and bulk store if fitted) to supply the burner.
- Ensure the problem is not being caused by the heating system or its controls. Consult the installation and servicing instructions supplied with the boiler for guidance.
- Ensure the problem is not being caused by poor quality or incorrect pellets.

Free of charge repairs
During the **two year** guarantee period no charge for parts or labour will be made provided that the boiler has been installed and commissioned correctly in accordance with the manufacturer's installation and servicing instructions, it was registered with Grant Engineering (UK) Limited within thirty days of installation[4] and details of regular servicing is available[3].

The following documents must be made available to Grant Engineering (UK) Limited on request:
- Proof of purchase
- Commissioning Report Form
- Service documents

Chargeable repairs
A charge may be made (if necessary following testing of parts) if the cause of the breakdown is due to any fault(s) caused by the plumbing or heating system, e.g. contamination of parts due to system contamination, sludge, scale, debris or trapped air. See 'Extent of manufacturer's guarantee' below.

Extent of manufacturer's guarantee:
The manufacturer's guarantee does not cover the following:
- If the boiler has been installed over **two years**.
- If the boiler has not been installed, commissioned, or serviced by a competent person in accordance with the installation and servicing instructions.
- The serial number has been removed or made illegible.
- Fault(s) due to accidental damage, tampering, unauthorised adjustment, neglect, misuse or operating the boiler contrary to the manufacturer's installation and servicing instructions.
- Damage due to external causes such as bad weather conditions (flood, storms, lightning, frost, snow, ice), fire, explosion, accident or theft.
- Fault(s) due to incorrectly sized expansion vessel(s), incorrect vessel charge pressure or inadequate expansion on the system.
- Fault(s) caused by external electrics and external components not supplied by Grant Engineering (UK) Limited.
- Problems caused by lack of pellets, the use of unapproved pellets or faults with the pellet storage and supply system (if not supplied by Grant Engineering (UK) Limited).
- Removing any pellet store or hopper contamination or blockages in the pellet augers, pellet hopper or bulk pellet store.
- Removal of dust from the pellet augers, pellet hopper or bulk pellet store.
- Problems due to the flue system being incorrectly fitted or not installed to meet installation requirements.
- Boiler servicing, de-scaling or flushing.
- Cleaning out condensate traps/ discharge pipework or thawing frozen condensate pipework.
- Checking or replenishing system pressure.
- Electrical cables and plugs, heating system controls not supplied by Grant Engineering (UK) Limited.
- Heating system components, such as radiators, pipes, fittings, pumps and valves not supplied by Grant Engineering (UK) Limited.
- Instances where the wood pellet boiler has been un-installed and re-installed in another location.
- Use of spare parts not authorised by Grant Engineering (UK) Limited.
- Consumable items including, but not limited to, gaskets, seals, etc.

IMPORTANT
Do not wait until your wood pellet supply runs out before you re-order.

Dust in the bottom of the pellet store or hopper may prevent the supply of pellets to the burner. It is important that this is checked for and, if dust is present, removed on the regular service to prevent nuisance stoppage of the boiler.

Terms of manufacturer's guarantee:

- The Company shall mean Grant Engineering (UK) Limited.
- The boiler must be installed by a competent installer and in full accordance with the relevant Codes of Practice, Regulations and Legislation in force at the time of installation.
- The boiler is guaranteed for **two years** from the date of installation[4], providing that regular servicing has been completed[3] and the boiler registered with the Company within thirty days of installation. Any work undertaken must be authorised by the Company and carried out by a competent service engineer.
- The boiler must be installed by an engineer that has attended and passed a Grant Engineering (UK) Limited accredited training course.
- The shell (heat exchanger) of the wood pellet boiler is covered by a **five year parts only** guarantee from the date of installation[4]. This is subject to the following:
    - The boiler is operated correctly, in accordance with the installation and servicing instructions.
    - Proof is provided that the system has been flushed or chemically cleaned where appropriate (refer to BS 7593) and that the required quantity of a suitable corrosion inhibitor added.
    - Proof of regular servicing (including the checking of any expansion vessels and pressure relief valves) must be provided if and when requested by the Company.

    IMPORTANT
    Grant Engineering (UK) Limited ***strongly recommends*** *that a Grant Mag-One in-line magnetic filter/s (or equivalent[5]) is fitted in the heating system pipework. This should be installed and regularly serviced in accordance with the filter manufacturer's instructions.*
- This guarantee does not cover breakdowns caused by incorrect installation, neglect, misuse, accident or failure to operate the boiler in accordance with the manufacturer's installation and servicing instructions.
- The boiler is registered with the Company within thirty days of installation[4]. Failure to do so does not affect your statutory rights[1].
- The balance of the guarantee is transferable providing the installation is serviced prior to the dwelling's new owners taking up residence. Grant Engineering (UK) Limited must be informed of the new owner's details.
- The Company will endeavour to provide prompt service in the unlikely event of a problem occurring, but cannot be held responsible for any consequences of delay however caused.
- This guarantee applies to Grant Engineering (UK) Limited boilers purchased and installed on the UK mainland, Isle of Wight, Channel Islands and Scottish Isles only[2]. Provision of in-guarantee cover elsewhere in the UK is subject to agreement with the Company.
- All claims under this guarantee must be made to the Company prior to any work being undertaken. Invoices for call out/repair work by any third party will not be accepted unless previously authorised by the Company.
- Proof of purchase and date of installation, commissioning and service documents must be provided on request.
- If a replacement boiler is supplied under the guarantee (due to a manufacturing fault) the product guarantee continues from the installation date of the original boiler, and **not** from the installation date of the replacement[4].
- Breakdown/failure due to lime scale will not be covered by this guarantee.
- The replacement of a boiler under this guarantee does not include any consequential costs.
- The boiler must not be sited in a location where it may be subjected to frost.
- The ceramic ignition element is covered by a two year guarantee.

Hard water advice
If you live in a hard water area, protection against scaling of the wash system manifold in your boiler must be provided.

You should fit an appropriate scale inhibitor or water softener as any breakdown caused by water scaling is not covered by either the manufacturer's guarantee. Ask your installer for advice.

Foot notes:

1. Your statutory rights entitle you to a one year guarantee period only.
2. The UK mainland consists of England, Scotland and Wales only. Please note that for the purposes of this definition, Northern Ireland, Isle of Man and Scilly Isles are not considered part of the UK mainland.
3. Your wood pellet boiler must be regularly serviced as per the installation and servicing instructions, (even when the guarantee has expired) to prolong the lifespan and ensure it is operating safely and efficiently.
4. The guarantee period will commence from the date of installation, unless the installation date is more than six months from the date of purchase, in which case the guarantee period will commence six months from the date of purchase.
5. As measured by gauss. The Mag-One magnetic filter has a gauss measurement of 12000.

Notes

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