



Greenflame Eco Wood Pellet Boiler 10-60kW



Installation, Operation and Servicing Instructions

PLEASE NOTE:

This product MUST be commissioned by a T R Engineering Ltd approved engineer.

INSTALLER

**Have you been trained by T R Engineering Ltd to commission this appliance?
If you intend to commission and do not have a T R Engineering Ltd Cert No. Call now to
arrange training on 0114 257 2300**

**Please read these instructions carefully before installing and operating this appliance.
TO BE RETAINED BY THE HOUSEHOLDER**

Contents

1. Introduction	3	9.2.3 Service	23
2. Warnings and Guarantee/Warranty Information	3-5	9.3 Settings	23
2.1 Safety Instructions	3	9.3.1 Date and Time	23
2.2 Operating Warnings	3-4	9.3.2 Language	23
2.3 Guarantee/Warranty Information	4	9.3.3 General Settings	23
2.3.1 Limitations	4	9.4 Burner	23-24
2.3.2 Exclusions	4	9.4.1 State	23
2.4 Clean Air Act 1993	4-5	9.4.2 Settings	23
2.5 Customer Handover	5	9.4.3 Service	23-24
3. After Sales Service Information	5	9.5 Alarms	24
3.1 How to Report a Fault	5	9.5.1 Alarm Codes	24
3.2 Technical Assistance	5	9.6 Controller Technical Data	24
4. Basic Usage Guide	5-6	10. Restarting of the Boiler after Interruption caused by Lack of Fuel	24
4.1 Users Responsibilities	6	11. Final Information regarding Installation and Boiler Start-Up	24-25
5. Technical Data	6-13	12. Cleaning and Maintenance of the Boiler	25
5.1 Pellets	6	13. Replacement Leister Igniter Cartridge	25
5.2 Connection of the Flue	6-9	14. Spares List	25
5.2.1 15-40kW Internal Boiler Flue Kit (Code: 3810)	7	15. Commissioning Report	26-27
5.2.2 15-40kW External Boiler Flue Kit (Code: 3810/E)	8	16. Service Schedule	28-29
5.2.3 60kW Internal & External Boiler Flue Kit (Code:3811)	9		
5.3 Boiler Parameters	10		
5.4 Construction of the Boiler	11-13		
5.5 Boiler Equipment	13		
6. Setting Up and Installation of the Boiler	14-22		
6.1 Engineers Responsibilities	14		
6.2 Boiler Room	14		
6.3 Ventilation and Exhaust- Flue System	14		
6.4 Plumbing and Electrical Schematics	14-22		
6.4.1 Electrical Schematics	15-16		
6.4.2 Plumbing Schematic	17		
6.4.3 Auger Set-Up (Optional)	18		
6.4.4 Vacuum System Set-Up (Optional)	18-19		
7. Overview of the Basic Functions	20-		
7.1 Control Panel	20		
7.1.1 The Status LED	20		
7.1.2 Buttons	20		
7.1.3 Graphic Display	20		
7.2 Statuses of the Burner	20		
7.3 Navigation in the Menu	20-21		
7.4 Time Scheduling	21		
8. Simple Menu	21		
8.1 Simple Menu Screens	21		
9. Main Menu	22-24		
9.1 Hot Water	22		
9.1.1 Selection of Circuit	22		
9.1.2 State	22		
9.1.3 Settings	22		
9.1.4 Time Program	22		
9.1.5 Service	22		
9.2 Boiler	23		
9.2.1 State	23		
9.2.2 Settings	23		

1. Introduction

Dear Customer,

We wish to thank you for choosing this Greenflame wood pellet boiler product from T R Engineering Ltd. **In order to get the best performance from your appliance we recommend that you read this booklet carefully before lighting the appliance for the first time.**





While thanking you again, may we remind you that the appliance **MUST NOT** be used by children and that they must always be kept at a safe distance from it.

Revisions to the publication

In order to improve the product, to keep this publication up to date the manufacturer reserves the right to make notifications without any advanced notice. Any reproduction, even in part, of this manual without the consent of T R Engineering Ltd is prohibited.

Care of the manual and how to consult it

- Take good care of this manual and keep it in a place which can be easily reached.
- If this manual should be lost or destroyed, or if it is in poor condition, ask for a copy from your retailer or directly from the manufacturer, providing product identification data.
- Information which is essential or that requires special attention is shown in bold text.
- Italic text is used to call your attention to other paragraphs in the manual or for any additional clarifications.

	ATTENTION This warning sign indicates that the message to which it refers should be carefully read and understood, because failure to comply with what these notices say can cause serious damage to the boiler and put the user's safety at risk.
	INFORMATION This symbol is used to highlight information which is important for proper boiler operation. Failure to comply with these provisions will compromise use of the boiler and its operation will not be satisfactory.
	OPERATING SEQUENCES Indicates a sequence of buttons to be pushed to access menus or make adjustments.
	MANUAL Indicates that you should carefully read this manual or the related instructions.

T R Engineering Ltd

T R Engineering Ltd operates a policy of continuous development and improvement of our products and welcomes any feedback from our customers. Please forward your comments to:

T R Engineering Ltd
Unit 7, Newton Chambers Way
Thornciffe Industrial Estate
Chapelton
Sheffield
S35 2PH

Tel: 0114 257 2300

Fax: 0114 257 1419

E-mail: info@trianco.co.uk

Web: www.trianco.co.uk

2. Warnings and Guarantee/Warranty Conditions

2.1 Safety Instructions

Installation of the boiler, making electrical connections, checking its operation and maintenance are all tasks which should be carried out by qualified and authorised personnel.

Install the boiler in accordance with the regulations in force in your local area, region and country.

For the correct use of the appliance and to prevent accidents, the instructions given in this booklet must always be followed.

Use, adjustment and programming must be carried out by adults.

Errors or incorrect settings may cause hazardous conditions and/or poor operation.

Before beginning any operation the user, or whoever is preparing to operate the appliance, must have read and understood the entire contents of this instruction booklet.

All responsibility for improper use is taken entirely by the user and such use relieves T R Engineering Ltd of any civil or criminal responsibility.

Most of the surfaces of the appliance are extremely hot (the boiler door, the handle, smoke discharge pipes, etc). Avoid coming into contact with these parts, without adequate protective clothing or suitable implements such as gloves with thermal protection or implements which keep the hands cool.

Carefully explain this hazard to elderly people, disabled people and particularly to all children, keeping them away from the appliance while it is running.

Under no circumstances should the appliance be run with the door open.

Do not touch the appliance with wet hands, in view of the fact that it is an electrical appliance.

Before carrying out any cleaning or maintenance operation, make sure in advance that the appliance is isolated from the mains electricity supply, by removing the mains isolator fuse.

The appliance must be connected to an electrical system which is equipped with an earth conductor, as laid down in directive 73/23 EEC and 93/98 EEC.

The fuse must be of adequate rated capacity for the stated electrical power of the appliance.

Incorrect installation or faulty maintenance (not conforming to the requirements set out in this booklet) can cause harm to people, animals or property. In such cases T R Engineering Ltd is absolved from any civil or criminal responsibility.

Adhesive 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 were intended. The appliance contains no asbestos.

2.2 Operating Warnings

Shut the appliance down in the event of a breakdown or bad running.

Pellet must not be fed manually into the burner.

Accumulated un-burnt pellets in the burner after repeated failed ignitions must be removed before re-lighting.

Do not wash the inside of the heat exchanger with water.

Do not wash the appliance with water. The water could get inside the unit and damage the electrical insulation and cause electric shocks.

Do not put any fuel, other than wood pellets, in the hopper.

Install the appliance in a location which is suitable for fire-fighting and equipped with all services such as air and electricity supply and provision for discharging combustion gases.

If there is a fire in the flue pipe, extinguish the appliance, disconnect it from the power supply and never open the door. Then contact the competent authorities.

If the appliance is in storage, it should be in a place that is free of damp, and it should not be exposed to extremes of temperature.

It is inadvisable to base the appliance directly on a floor (if located indoors), and if the floor is made of flammable material, it must be suitably insulated.

Do not light the appliance with flammable materials if the ignition system breaks down.



Information

In case of any problems, get in touch with your dealer, or a qualified engineer authorised by T R Engineering Ltd and if a repair is necessary, insist on the use of original spare parts.

Use only fuel recommended by T R Engineering Ltd (ENplus-A1) may be used with this appliance. Failure to do so will invalidate the warranty.

Periodically check and clean the smoke outlet ducts (connection to flue pipe).

Accumulated un-burnt pellets in the burner after repeated failed ignitions must be removed before re-lighting.

Always keep the cover of the fuel hopper closed.

Keep this instruction manual safe because it must stay with the appliance throughout its working life. If the appliance is sold or transferred to another user, always make sure that the booklet goes with the product.

If it gets lost, ask T R Engineering Ltd or your authorised dealer for another copy.

2.3 Guarantee/Warranty Information

T R Engineering Ltd offers the following warranties on this appliance:

Leaks in the heat exchanger – **5 years**

Faulty electrical components (motors, fan, controller) – **1 year**

Pump, ignition element – **1 year**

From the date of first ignition of the appliance as proved by a valid commissioning report which the name of the installer/commissioning engineer and the date on which the commissioning took place. The guarantee is conditional on the commissioning report being filled in and returned to the manufacturer within 10 days and requires that the product be installed and commissioned by an approved T R Engineering Ltd installer according to the detailed instruction given in the instruction booklet supplied with the product.

The term 'guarantee' is to be understood to denote the free of charge replacement or repair of parts only, recognised to have been defective at the start by reason of manufacturing defects.

2.3.1 Limitations

The above guarantee does not cover parts subject to normal wear such as gaskets, fibre board on doors and any parts which can be removed from the firebox such as burner pot, baffles and ash box.

The replacement will be guaranteed for the remainder of the guarantee period starting from the date of commissioning of the product.

2.3.2 Exclusions

The warranty excludes all ancillary products associated with the system (e.g. flue pipes, external circulation pumps, bulk hoppers and augers, plumbing and electrical system). The warranty does not cover third party damage to the product or damage caused by the plumbing (an example would be an appropriately sized expansion vessel) or electrical system. Warranty does not cover issues arising from pellets that do not conform to ENplus-A1.

Recommendations advised to the customer to be carried out during commissioning must be completed and advised to your local dealer in order to validate the warranty.

The requirement for the flue installation, particularly in relation to draught, is the responsibility of the system owner. Compliance with Local Building Regulations must be adhered to. The warranty does not cover misuse of the product or sabotage.

T R Engineering Ltd refuses to accept responsibility for any damage which may be caused, directly or indirectly, by persons, animals or things in consequence of the failure to observe all prescriptions laid down in the instruction booklet, especially those concerning warnings on the subject of installation, use and maintenance of the appliance.

Damage caused transport and/or handling is excluded from the guarantee.

The guarantee will be invalidated in the event of damage caused by tampering with the appliance, atmospheric agents, natural disasters, electrical discharges, fire, defects in the electrical system and caused by lack of, or incorrect, maintenance in terms of the manufacturer's instructions.

Claims under the Guarantee



The request for action under the guarantee must be addressed to the dealer/retailer, who will forward the claim to T R Engineering Ltd's technical assistance service. **T R ENGINEERING LTD DECLARES THAT THE APPLIANCE WHICH YOU HAVE PURCHASED COMPLIES WITH THE EEC DIRECTIVE 2004/108 EC AND SUCCESSIVE 2006/95/EEC AND SUCCESSIVE AMENDMENTS.**



T R Engineering Ltd refuses to accept any responsibility in the event that the appliance or any other accessory has been improperly used or modified without authorisation. For all replacement of parts, only original T R Engineering Ltd spare parts must be used.

2.4 Clean Air Act 1993

Under the Clean Air Act 1993 local authorities may declare the whole 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 as 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 1993 can be found here: <http://smokecontrol.defra.gov.uk/>

Your local authority is responsible for implementing the Clean Air Act 1993 including designation and supervision.

The Greenflame ECO wood pellet boiler 10, 15, 25, 40 and 60kW have been recommended for exemption under section 21 of the Clean Air Act 1993 for use within UK Smoke Control Areas.

2.5 Customer Handover

After every commission the customer must be provided with training by the commissioning engineer. The following is a list of items which should be covered during product the induction with the customer:

- Provide a general overview of the product and identify the main components and their function.
- Illustrate how to turn on and off the appliance and adjust water temperature through the user menu.
- Demonstrate where and how to fill the appliance with fuel and advise of the correct quality of fuel to be used.
- Demonstrate how to clean down the combustion chamber by removing and replacing the baffles, emptying the ash containers in the main combustion chamber and lower ash chamber.
- Explain how to remove the burner grate and clear the air holes to ensure good combustion.
- Explain the various error codes that may appear and provide instruction on how to manage and clear messages. Provide warnings on which error codes are system critical codes and should not be reset by the customer.
- The customer must be warned of the safety implications when handling hot ash and that heat proof gloves should be used.

The product warranty must be explained to the customer and they shall sign the commissioning report confirming that they have received instructions on how to operate the appliance, understand the risks when handling hot ash and agree to product warranty.

The warranty card and commissioning report shall be returned to T R Engineering Ltd by fax, email or post within 30 days from the commissioning date.

3. After Sales Service Information

A qualified field service engineer is available to attend a breakdown occurring during the boiler’s guarantee period.

The boiler must be made available for attendance during normal working hours, Monday to Friday.

3.1 How to report a Fault

Step 1

Contact your installation or service engineer, who should assess the unit and works carried out on the appliance prior to requesting the attendance of an engineer from T R Engineering Ltd.

Step 2

Please note that upon attendance by T R Engineering Ltd engineer, a charge will be made where:

- The engineer finds no fault with the boiler.
- The cause of the breakdown is due to parts of the system not manufactured or supplied by T R Engineering Ltd.
- The boiler has not been commissioned by a qualified engineer.
- The boiler has not been serviced annually since installation.
- The breakdown occurs outside the guarantee period.
- The appliance has not been maintained correctly.
- A breakdown occurs as a result of work on the appliance by an unauthorised third-party.

Important:

Invoices for attendance and repair work by a third-party will not be accepted unless authorised in advance by T R Engineering Ltd.

3.2 Technical Assistance

A team of trained technical advisors are available to discuss any problem with the appliance. In many cases, the problem may be solved over the telephone, eliminating the need for an engineer’s visit.

Before making contact, please have the following information ready:

- The appliance serial number or your unique customer identification number (issued upon registration of the appliance with T R Engineering Ltd).
- A description of the fault and any unusual behaviour by the boiler before failure occurred.
- The installation and commissioning dates and the details of any annual services.

Appliance Serial No: _____ Cust. ID No: _____ Installation Date: __/__/____ Commissioning Date: __/__/____

Service Centre and Technical Support

Tel: 0114 257 2300 Fax: 0114 257 1419

Hours of Business

Monday – Thursday: 8:30am – 17:00pm

Friday: 8:30am – 14:30pm

4. Basic Usage Guide

To ensure correct and prolonged operations of the boiler please comply with the following rules:

- Only fuel approved by T R Engineering Ltd (ultimately ENplus-A1) may be used with this appliance.
- It is strictly forbidden to make any changes to the construction or settings of the boiler, this can result in damage of the auger supplying the fuel.
- The boiler must always be fitted with water circulation. Not providing water flow will cause overheating of the boiler, which in consequence may result in injury or damage to the material goods.
- Before starting up please make sure that the boiler room is properly ventilated and that air and exhaust ducts are always clean and permeable.
- It is crucial to follow all rules and instructions regarding installation (both central heating as well as electrical) and boiler usage.

4.1 User's Responsibilities

- The user is fully responsible for the usage and maintenance of the boiler.
- Not complying with rules might result in boiler malfunction, decrease efficiency as well as shorter life span.
- The boiler should only be operated by a competent person.

5. Technical Data

5.1 Pellets

Wood pellets are manufactured by hot-extruding compressed sawdust which is produced during the working of natural dried wood. The compactness of the material comes from lignin which is contained in the wood itself and allows the production of pellets without the use of glues or binders.

The market offers different types of pellet with characteristics which vary depending on what mixture of woods is used. The diameter varies between 6mm and 8mm, with a standard length in the range 5mm to 30mm. Good quality pellets have density which varies between 600kg/m³ and 750kg/m³, with a moisture content which varies from 5% to 8% by weight.

Besides being an ecological fuel (exploiting timber residues to the maximum and achieving cleaner combustion than is possible with fossil fuel), the pellets also have technical advantages. While good quality timber has a calorific power of 4.4kW/kg (with 15% moisture, therefore after about 18 months seasoning), the equivalent figure for pellets is 4.9kW/kg.

To ensure good combustion, the pellets must be stored in an area that is free of humidity and protected from dirt. The pellets are usually supplied in 10kg bags, so storing them is very convenient.

Good quality pellets ensure good combustion, thus lowering the emission of harmful agents into the atmosphere.

The poorer the quality of fuel, the more frequently intervention will be necessary for cleaning the internal parts, such as the grate and the combustion chamber.

The main certifications of quality for pellets in the European market are ENplus-A1 and these ensure respect of:

- ✓ **Calorific Power:** 4.9kW/kg
- ✓ **Water Content:** max 10% of weight
- ✓ **Percentage of Ashes:** max 0.5% by weight
- ✓ **Diameter:** 6mm
- ✓ **Length:** max 30mm
- ✓ **Contents:** 100% untreated wood, with no added bonding substances (bark percentage 5% max)
- ✓ **Packaging:** in sacks made from ecologically compatible or biologically decomposing material.



T R Engineering Ltd recommends using certified fuel in its appliances to ENplus-A1. The use of fuel of inferior quality or not conforming to the specification given above compromises the running of your appliance and can therefore lead to the termination of the guarantee and of the manufacturer's responsibility for the product.

T R Engineering Ltd domestic pellet appliances run exclusively on pellets with a diameter of 6mm. It is recommended that the brand of pellets used during commissioning are used during normal operation.

If you change your pellet supplier or brand, re-calibration may be necessary and a call-out charge will apply.

The Greenflame Eco has been recommended as suitable for use in smoke control areas when burning ENplus-A1 wood pellets.

5.2 Connection to the Flue

The proper draught conditions in the flue are critical for the efficient working of wood pellet boilers. The flue can exit the boiler house/garage through the roof or through the wall by using a bend on the flue. The combustion chamber works in negative pressure. The smoke duct for the discharge of fumes will also be under negative pressure when connected to an efficient flue pipe as directed.

All sections of the flue must be capable of inspection and removable to enable periodic internal cleaning.

Position the appliance bearing in mind all instructions and considerations above.

IMPORTANT!

THE FLUE IS AN INTEGRAL AND CRITICAL COMPONENT IN ANY SUCCESSFUL BIOMASS BOILER INSTALLATION. IN ORDER FOR YOUR BOILER TO OPERATE CORRECTLY, EFFICIENTLY AND SAFELY IT HAS TO BE CONNECTED TO A FLUE SYSTEM WHICH IS SUITABLE, CORRECTLY DESIGNED AND INSTALLED.



INCORRECT FLUE CONNECTIONS CAN LEAD TO CONDITIONS BEING CREATED WHICH CAN BE UNSAFE, DAMAGING TO YOUR BOILER AND INVALIDATE THE WARRANTY.

- Check for adequate ventilation. This must be clear at ALL times. You must make the customer aware of the needs to avoid any obstruction of the air inlet facility. If an internal boiler is asked to operate without sufficient ventilation for fresh air it will lead to potentially dangerous and damaging consequences.
- Ensure that the flue installation meets all requirements in terms of the use of bends, tees and restrictions.
- Every flue MUST include draught stabilisation, explosion relief, condensate collection and the correct protective cowl or terminal as required.
- Commissioning – the flue draught must be checked under both full load and part load conditions to ensure that there is the correct amount of draw in both cases. It is essential that the correct draw is achieved for both specified flue gas temperatures and that a draught stabiliser is used to avoid over drawing of the flue. Correct setting of the draught stabiliser is critical.
- All flues must be correctly insulated. A poorly insulated flue can lead to issues during operation of the boiler which may be damaging.
- Flue termination must be in accordance with Building Regulations and pay attention to pressure zones which may be induced by the building and surrounding topography.

IMPORTANT!

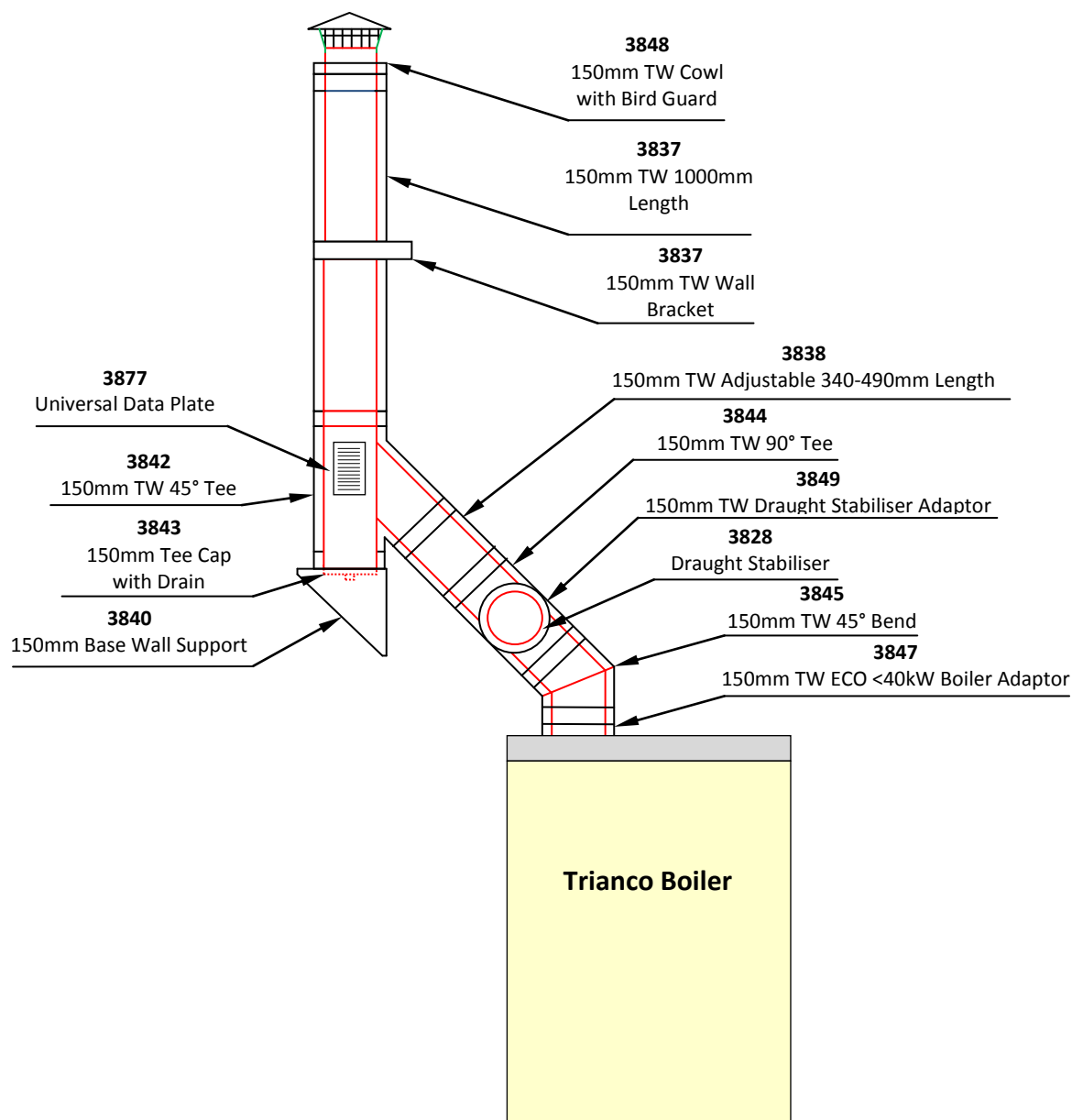
All 90° changes of direction in the flue pipe must be either removable or capable of inspection. For locating the boiler against a wall ensure adequate flue support using approved wall brackets.



IT IS ADVISABLE NOT TO EXCEED 8 METRES IN LENGTH AND REQUIRES A MINIMUM OF 3 METRES.

THE BOILER REQUIRES A MINIMUM FLUE DRAUGHT OF 8Pa AND A MAXIMUM OF 20Pa.

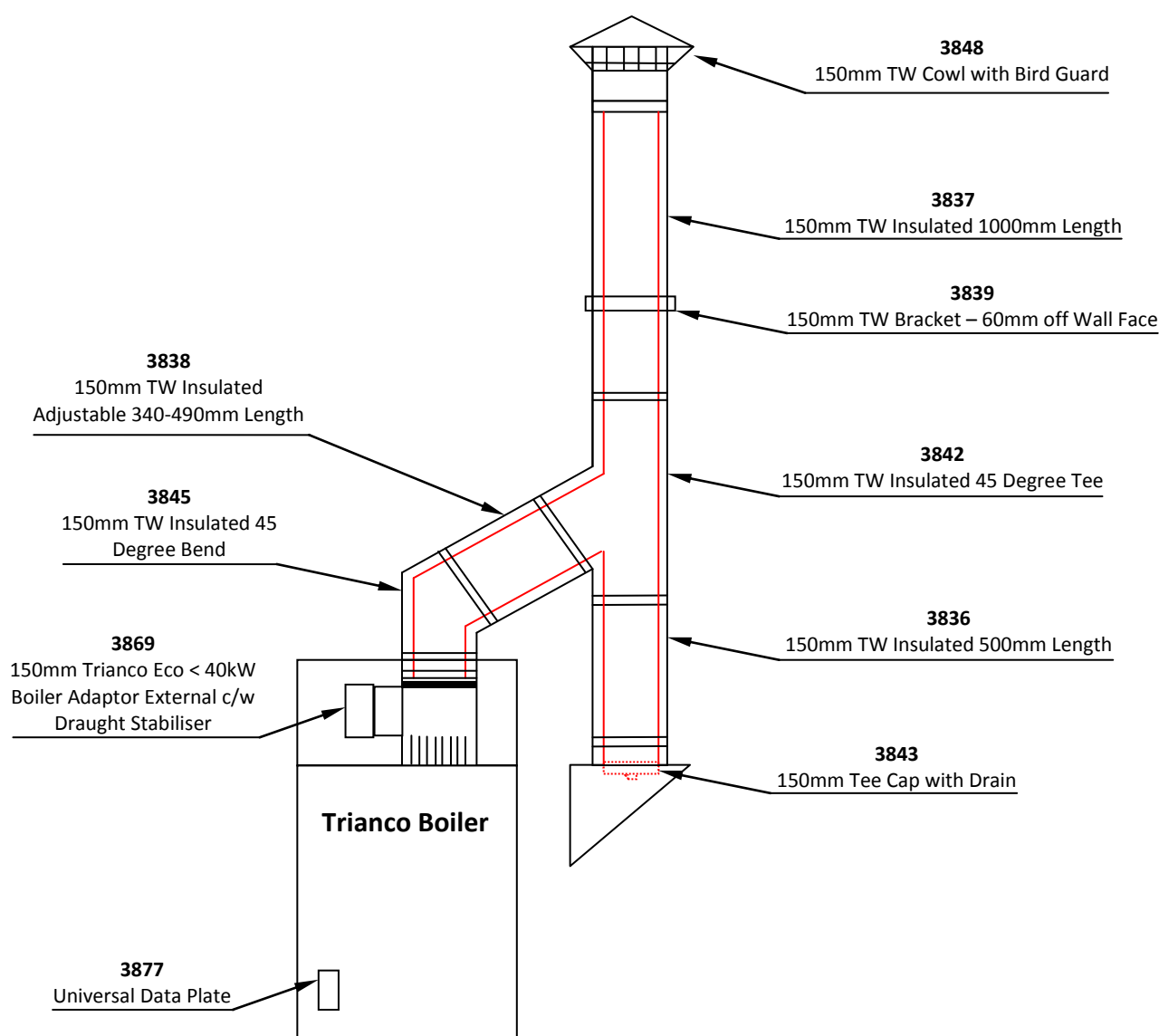
5.2.1 15-40Kw Internal Boiler Flue Kit (Code 3810)



Flue Spares

3835	E2-150-250	150mm Twin Wall Insulated 250mm Length
3836	E2-150-500	150mm Twin Wall Insulated 500mm Length
3837	E2-150-1000	150mm Twin Wall Insulated 1000mm Length
3839	E2-150-BK	150mm Twin Wall Bracket – 60mm off wall face
3845	E2-150-45	150mm Twin Wall Insulated 45 Degree Bend
3846	E2-150-PL	150mm Twin Wall Insulated Probe Length
3848	E2-150-CLCBG-SF	150mm Twin Wall Cowl with Bird Guard
3877	ECP-1	Chimney Plates x 1
3870	E2-150-BK-EXT	150 Twin Wall Bracket Extension – 60-130mm off wall face
3871	E2-150-SLCK	150mm Twin Wall Structural Locking Band
3878	TEXPD-SS	Explosion Relief Door (Stainless Steel)

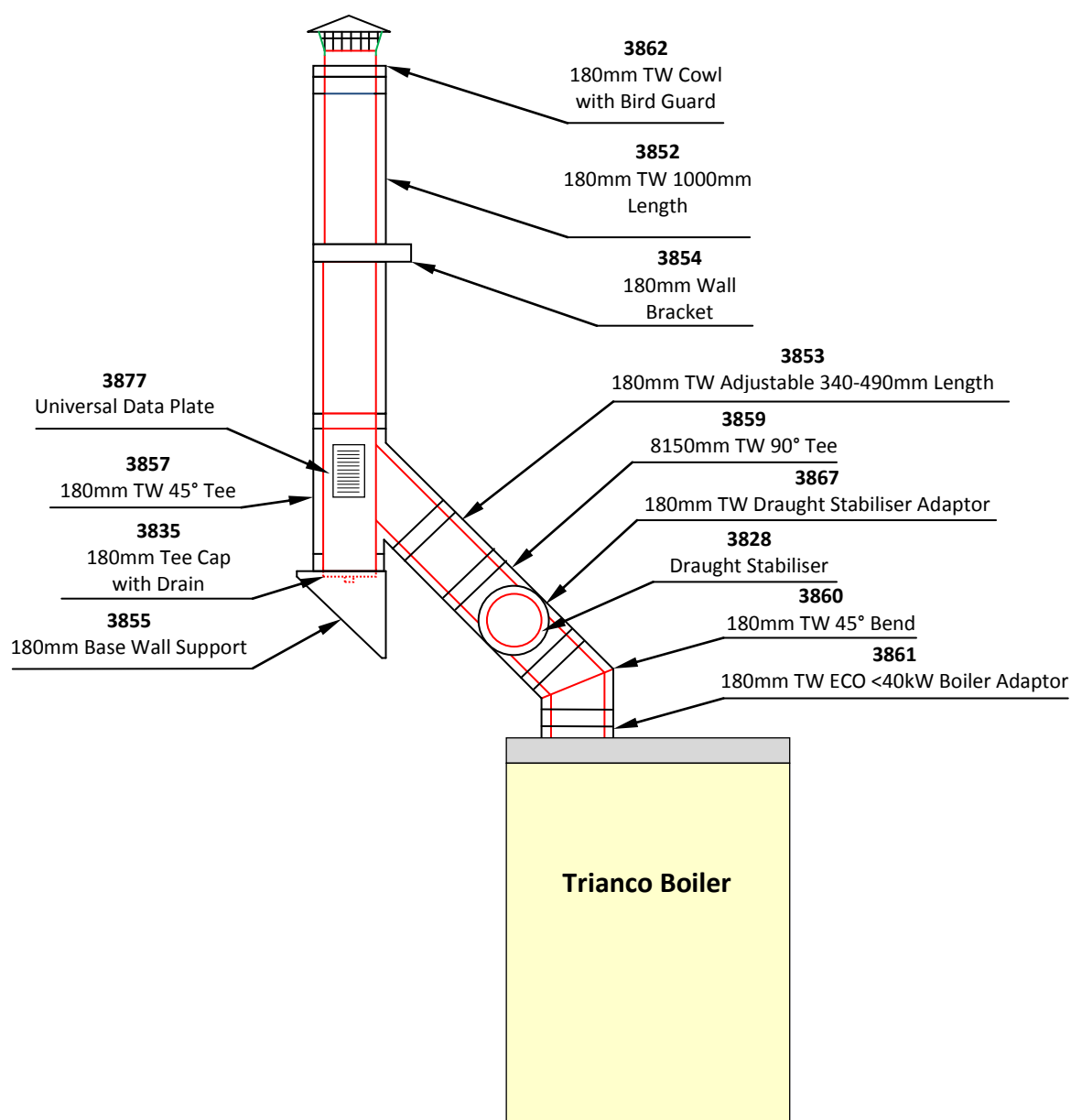
5.2.2 15-40kW External Boiler Flue Kit (Code 3810/E)



Flue Spares

3835	E2-150-250	150mm Twin Wall Insulated 250mm Length
3836	E2-150-500	150mm Twin Wall Insulated 500mm Length
3837	E2-150-1000	150mm Twin Wall Insulated 1000mm Length
3839	E2-150-BK	150mm Twin Wall Bracket – 60mm off wall face
3845	E2-150-45	150mm Twin Wall Insulated 45 Degree Bend
3846	E2-150-PL	150mm Twin Wall Insulated Probe Length
3848	E2-150-CLCBG-SF	150mm Twin Wall Cowl with Bird Guard
3877	ECP-1	Chimney Plates x 1
3870	E2-150-BK-EXT	150 Twin Wall Bracket Extension – 60-130mm off wall face
3871	E2-150-SLCK	150mm Twin Wall Structural Locking Band
3878	TEXPD-SS	Explosion Relief Door (Stainless Steel)

5.2.3 60kW Internal & External Boiler Flue Kit (Code 3811)



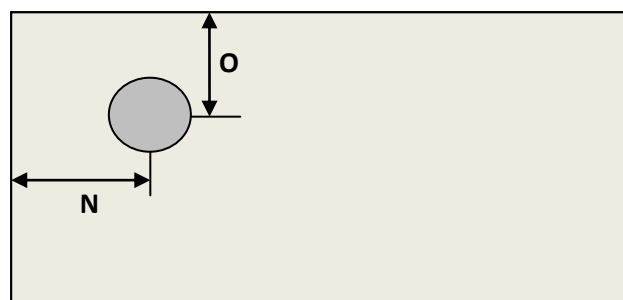
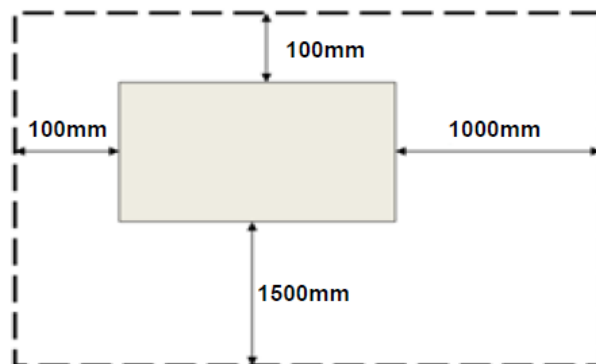
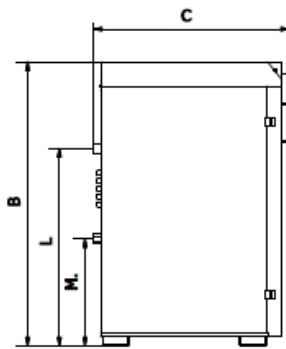
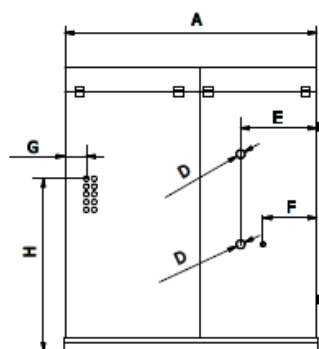
Flue Spares

3850	E2-180-250	180mm x 250mm Twin Wall Insulated Flue
3851	E2-180-500	180mm x 500mm Twin Wall Insulated Flue
3852	E2-180-1000	180mm x 1000mm Twin Wall Insulated Flue
3854	E2-180-BK	180mm Twin Wall Bracket - 60mm off Wall Face
3860	E2-180-45	180mm x 45 Twin Wall Insulated 45 Degree Bend
3863	E2180-BK-EXT	180mm Twin Wall Insulated Bracket Extension – 60-130mm off Wall Face
3864	E2-180-SLCK	180mm Twin Wall Insulated Structural Locking Band
3865	E2-180-PL	180mm Twin Wall Insulated Probe Length
3877	ECP-1	Chimney Plates
3876	T2-180-IS45	180mm Twin Wall Insulated Mesh Sleeve 45 Degree
3878	TEXPD-SS	Explosion Relief Door (Stainless Steel)
3879	T2-180-IWS	180mm Twin Wall Intermediate Wall Support

5.3 Boiler Parameters

Model	10kW	10kW*	15kW	15kW*	25kW	25kW*	40kW	40kW*	60kW	60kW*
Power (kW)	1-10	1-10	1.5-15	1.5-15	2.5-25	2.5-25	3-40	3-40	4-60	4-60
Weight (kg)	320	335	320	335	320	340	375	400	420	460
Water Volume (m ³)	72	72	64	64	64	64	74	74	91	91
Flue Gas Outlet (kz-mm)	153	153	153	153	153	153	153	153	180	180
Width (A-mm)	1155	1460	1155	1460	1155	1460	1155	1460	1155	1460
Height (B-mm)	1275	1360	1275	1360	1275	1360	1375	1485	1375	1485
Depth (C-mm)	865	865	865	865	865	865	865	865	865	865
Flue Spigot Diameter (mm)	146	146	146	146	146	146	146	146	170	170
Minimum Height of the Boiler Room (mm)	1831	1916	1831	1916	1831	1916	1931	2041	1931	2041
Flue Gas Temp. at Minimum Operation (°C)	90	90	90	90	90	90	90	90	90	90
Flue Gas Temp. at Nominal Operation (°C)	120	120	120	120	120	120	120	120	120	120
Maximum Flue Gas Temp (°C)	130	130	130	130	130	130	160	160	180	180
Min/Max O ₂ (%)	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11	8-11
Hopper (kg)	100	214	100	214	100	214	127	221	145	292
Working Pressure (bar)	2	2	2	2	2	2	2	2	2	2
Min/Max Flue Draught (Pa)	8/20	8/20	8/20	8/20	8/20	8/20	8/20	8/20	8/20	8/20
Avg Fuel Consumption (kg/hr)	2.2	2.2	3.2	3.2	5.4	5.4	8.6	8.6	13	13
Efficiency (%)	95	91	95	91	95	91	95	91	95	91
Seasonal Efficiency (%)	82.9	82.9	82.6	82.6	82.7	82.7	83.1	83.1	79.6	79.6
Dimension (D-inch)	M 1 ¼	M 1 ¼	M 1 ¼	M 1 ¼	M 1 ¼	M 1 ¼	M 1 ¼	M 1 ¼	M 1 ¼	M 1 ¼
Dimension (E-mm)	340	340	340	340	340	340	340	340	340	340
Dimension (F-mm)	235	235	235	235	235	235	235	235	235	235
Dimension (G-mm)	95	155	95	155	95	155	95	155	95	155
Dimension (H-mm)	565	570	565	570	565	570	570	570	570	570
Dimension (I-mm)	330	330	330	330	330	330	330	330	330	330
Dimension (J-mm)	200	200	200	200	200	200	200	200	200	200
Dimension (L-mm)	885	885	885	885	885	885	985	985	1095	1095
Dimension (M-mm)	485	485	485	485	485	485	485	485	485	485
Dimension (N-mm)	340	340	340	340	340	340	340	340	340	340
Dimension (O-mm)	210	210	210	210	210	210	210	210	210	210

*= large hopper store capacity

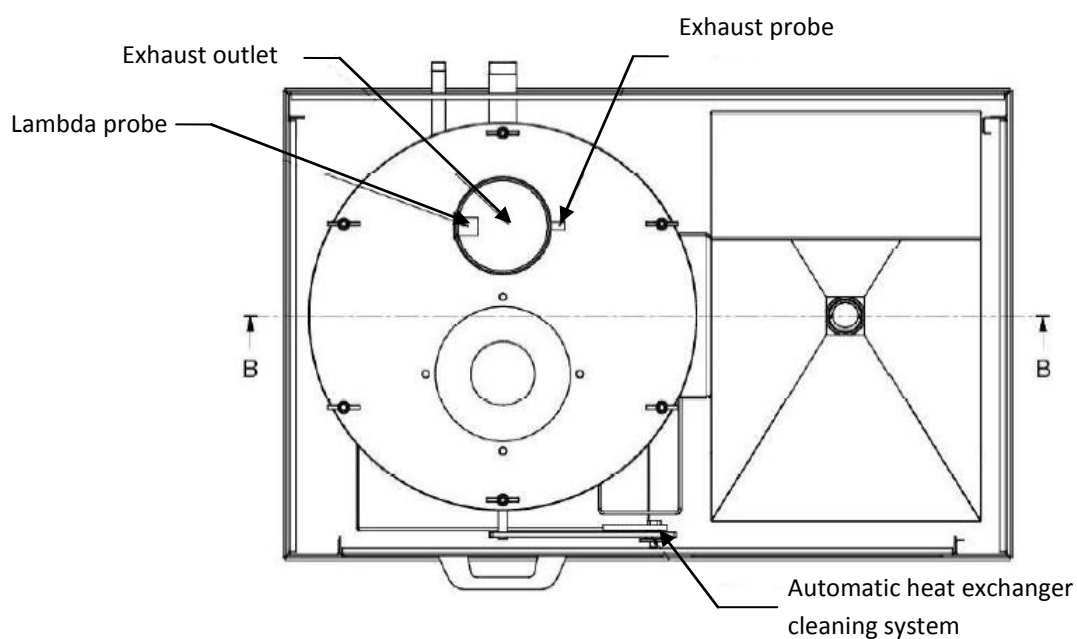
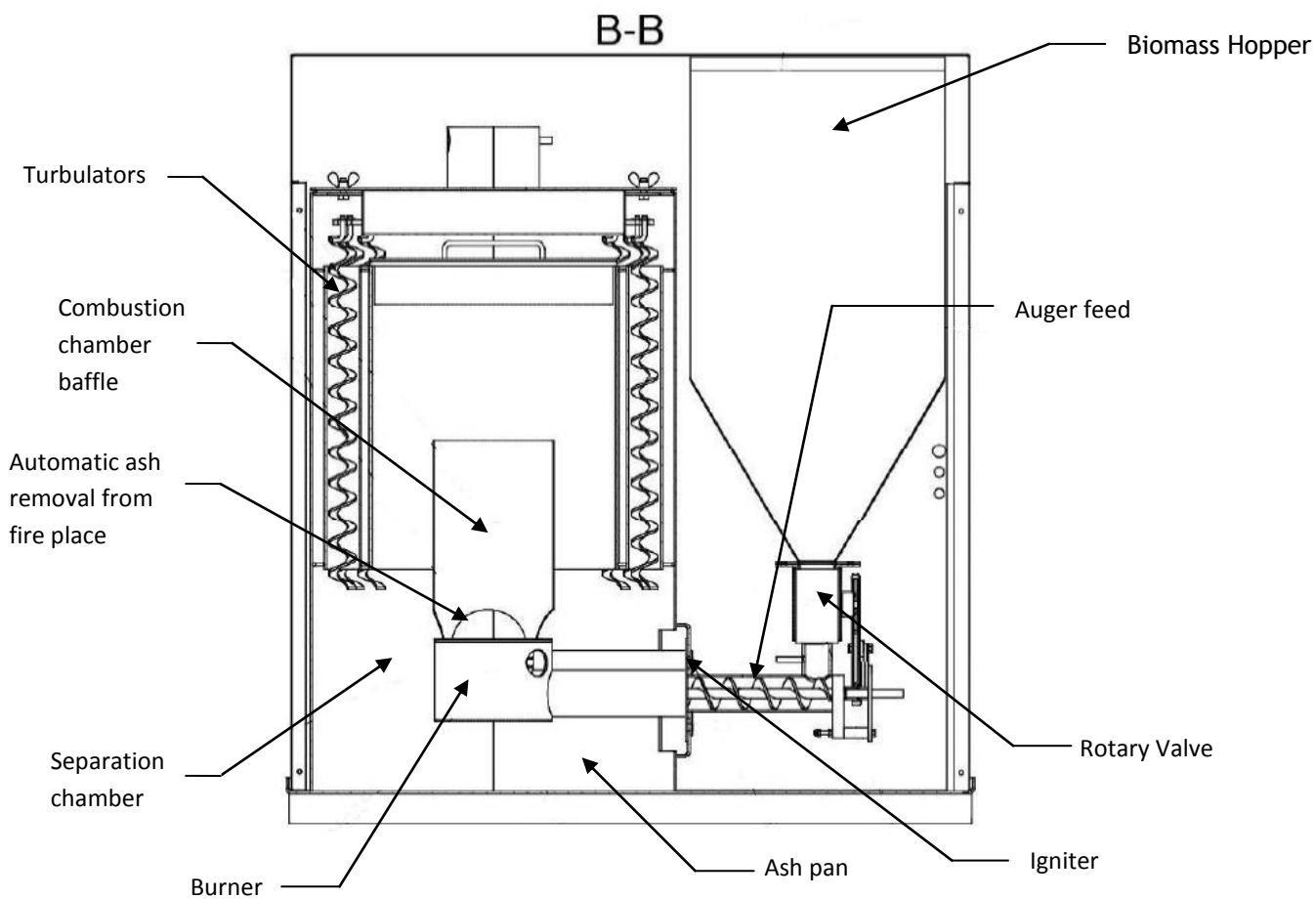


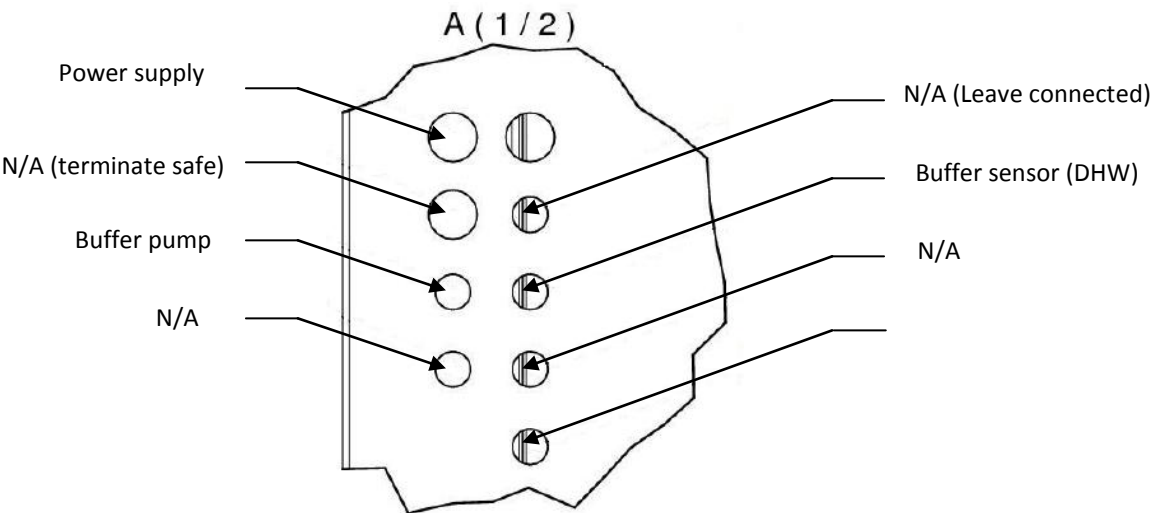
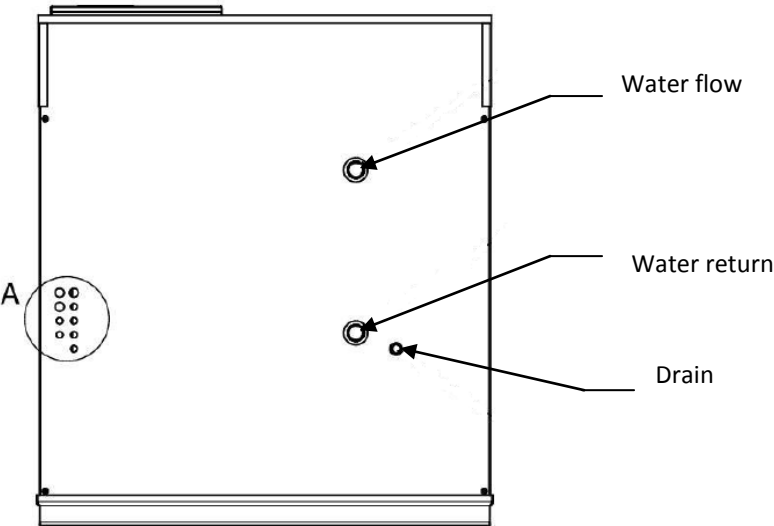
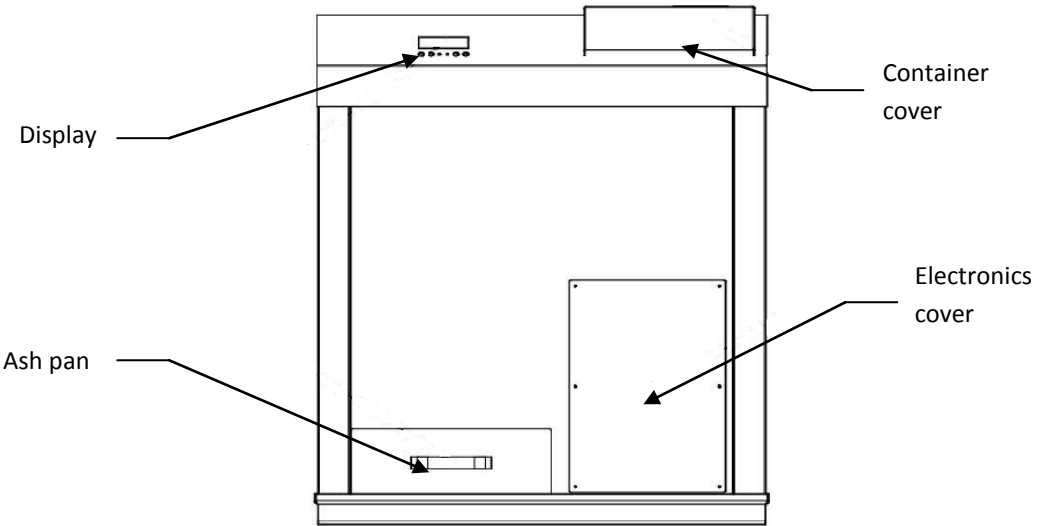
If the boiler has the large hopper then the clearance at the right hand side can be reduced to 400mm.

The lids and front doors may need to be removed for access through a standard doorway.

The above parameter comparison for Greenflame Eco pellet boilers is tentative. The manufacturer reserves the right to small variations to some values in the above table.

5.4 Construction of the Boiler





The above drawings show the main boiler elements. They have the following specifications:

- **Burner** – made out of steel. Its geometry is a result of numerous tests and measures. Equipped with air intakes on various levels which contribute to increased combustion efficiency. Biomass is transported from the hopper to the burner by means of the auger feed. On contact with embers and in connection with air supplied by many ducts the process of pyrolysis of biomass occurs. Exhaust fumes created in the process are directed through the heat exchanger to the chimney outlet through the chimney duct which is enhanced by a fan, which also serves a role for providing a sufficient amount of fresh air for proper combustion. The amount of fuel and fresh air supplied for combustion is automatically matched by the controller based on exhaust fume measurements (oxygen content in exhaust fumes) provided by the Lambda probe.
- **Combustion Chamber** – made out of steel. From the moment of starting the ignition process it quickly gains high temperature, which in turn improves the combustion process and reduces the amount of un-burnt gas. It is also isolated between the flame and boiler wall.
- **Rotary Valve** – it is a factory assembled element. Ensures perfect tightness between the hopper and auger feed. Guarantees very precise dosage of pellets.
- **Ignitor** – allows for completely automatic ignition of the pellets.
- **Turbulator (Turbulators)** – designed to increase the effectiveness of heat exchange by momentarily slowing down the speed of the exhaust flow. Additionally, they are periodically, automatically put in motion. Clearing the heat exchanger of ash.
- **Automatic Heat Exchanger Cleaning System (Turbulators Drive)** – a reduction unit controlled by automatics of the boiler, which propels the turbulators.
- **Exhaust Outlet** – contains a box that can be removed to gain access to the boiler. On top of the box there is an exhaust outlet and a turbine, responsible for the extraction of exhaust towards the chimney. The electric motor that is driving the motor is controlled by a microchip via a voltage regulator, which provides voltage based on the measurements provided by the Lambda probe. This solution has been used for many years. Bottom combustion has a lot of benefits and also prevents the fire getting to the pellet hopper.
- **Auger Feed** – Worm-gear that works in a sequential pattern depending on the demand of the burner. The auger provides a small amount of fuel that is released by the hatch. This allows operation under minimal load.
- **The Decantation Chamber** – expanding area located underneath the heat exchanger allows the deposition of unburned particles and dust hovering due to lower exhaust fume speed.
- **Ash Pan** – located under the burner. Collects ash that is removed from the burner, ash that drops by force of gravity and also ashes that origin from automatic heat exchanger cleaning.
- **Automatic Removal of Ash from the Fireplace** – occurs by the supplied pellet and also by fresh flowing through the burner.
- **Lambda Probe** – located in the exhaust outlet. The purpose of the lambda probe is to control the content of oxygen in the exhaust. Using the measurements it allows the optimisation of the combustion process used for fuel. In combination with the temperature probe it guarantees correct boiler operation and doubles as a safety device.
- **Exhaust Probe** – pilots the ignition and also manages the power of the boiler. Another role is to protect the boiler from unforeseen temperature rise.

- **Display** – located on the front of the boiler. Allows browsing through and editing of the available control parameters.
- **Electronics Cover** – covers the electric box that houses the heart of the control circuit.
- **Pellet Hopper** – its capacity depends on the power of the boiler. There's also possibility to connect it to an external feeder, which supplies fuel from a repository or large silo.

5.5 Boiler Equipment

A standard Greenflame Eco pellet boiler consists of:

- Burner
- Leister BM4 Igniter
- Lambda Probe
- Igneo Slim Controller
- Flue Temperature Sensor
- Rotary Valve
- Pellet Hopper
- Exhaust Fan
- Exhaust Fan Motor
- Cleaner Motor Reduction
- Auger Motor Reduction Unit

Additional options:

- Pellet Silo
- Vacuum System & Pneumatic Supply

The 'Vacuum System' is an optional fuel transportation drive, available on all Greenflame models. The system ensures smooth transportation of pellet from fuel store to boiler. With sensor indication controlling and monitoring the fuel supply. Should the hopper empty, the vacuum will automatically refill in defined periods of time. Auger systems are also available upon request.



6. Setting Up and Installation of the Boiler

6.1 Engineer's Responsibilities

The installation of the boiler can only be performed by qualified biomass engineers, complying with and in line with all rules and regulations. The installer must also comply with all recommendations and directions provided by the boiler manufacturer. Specifically this applies to the instruction manual, boiler fitting method and its components and also all plumbing systems.

For any discrepancies, inconvenience, damage and injuries that result from non-complying with regulations and recommendations found in this manual the installer takes the full responsibility.

6.2 Boiler Room

Internal pellet boilers should be fitted in a specifically allocated room (boiler room). The fuel deposit should also be located in an allocated room near the boiler, however, not closer than 400mm from the boiler. To ease access to the boiler and to enable maintenance, there should be at least 400mm of free space around the boiler. The boiler should be positioned on a non-combustible thermally isolated base, which should exceed the dimensions of the boiler by at least 200mm on all sides. If the device should be mounted in a basement it is advisable to put it on at least a 50mm height foundation.

It is mandatory to check if the boiler is perfectly horizontal and level to prevent air pockets from creating.

During the installation of the boiler it is available to provide sufficient distance from inflammable materials, according to the level of flammability.

If the level of flammability of material near the boiler is unknown, the safe distance should be doubled (safe distance is 200mm).

It is mandatory to fully follow all instructions and recommendations regarding boiler rooms contained in this instruction manual as well as in Current Building Regulations.

6.3 Ventilation and Exhaust – Flue System

To ensure proper combustion it is necessary to prepare sufficient air supply (non closing opening) with a surface area of no less than 200cm² not higher than 1m above floor level. A permanent air entry opening or openings with a total free area of at least 500mm² per kW of appliance rated output above 5kW. Proper combustion also requires a proper exhaust flue system. The role of the flue is to pipe away exhaust fumes. The flue required to complete this depends on:

- Temperature difference between exhaust and surrounding air.
- Usable flue height.
- Diameter of flue (no less than flue spigot diameter).
- Flue workmanship – as smooth as possible inner surfaces and air tightness.

Usable flue height is the difference between the highest point of the fireplace and flue outlet. In case of sloping roofs, flues should end around the crest, in the area of smooth wind flow – this way there's no interruption of air draught. It is always necessary to take into account the location and orientation of the building in relation to

surrounding buildings. In most cases, to determine flue parameters should be calculated according to Current Buildings Regulations. Improper cross-sectional area selection causes slowdown of exhaust fumes and in turn, deposition of ash inside the flue. If exhaust temperatures would drop below the dew point, the water vapours and sulphuric acid might cause damage to the wall.

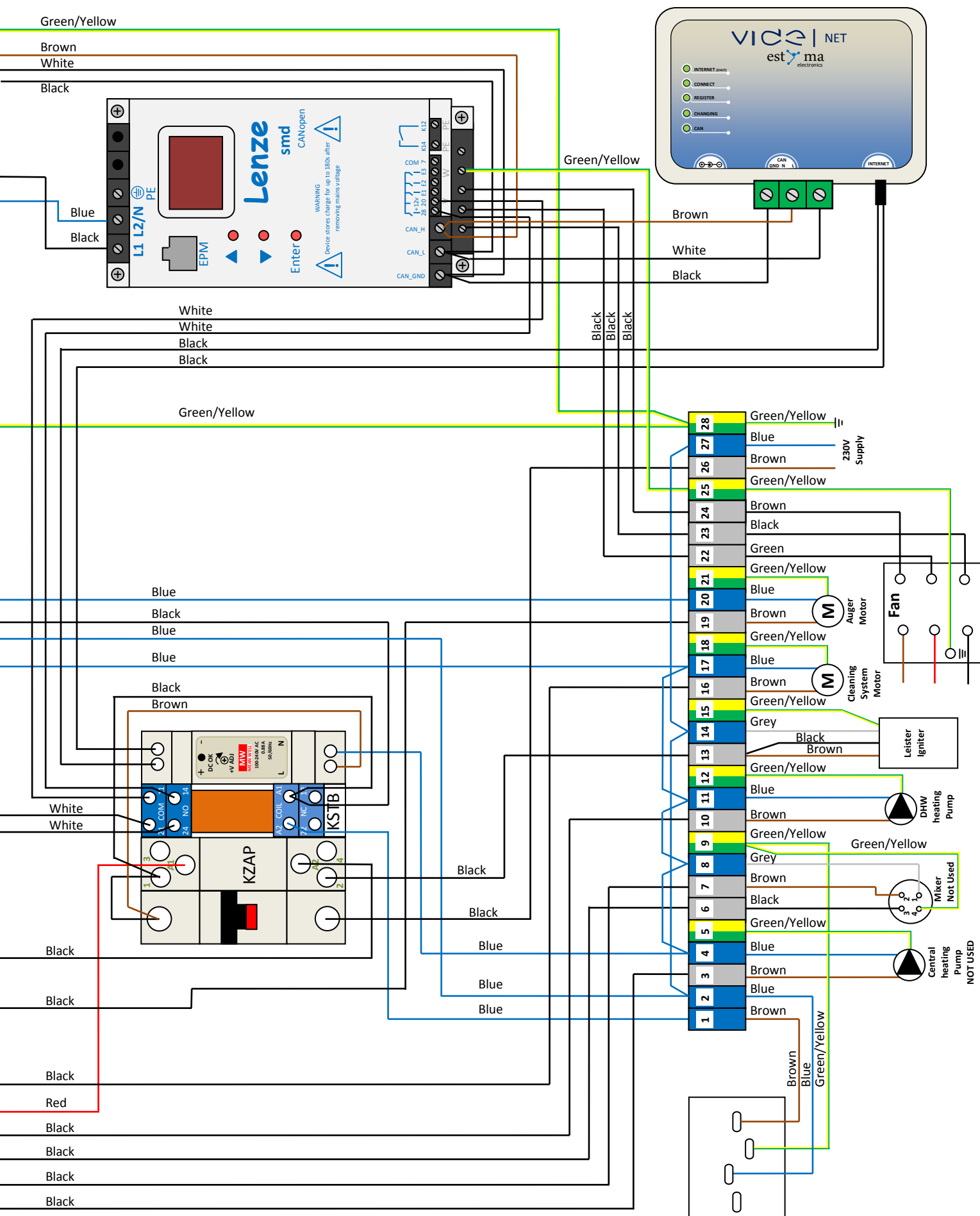
6.4 Plumbing and Electrical Schematics

Pellet boilers must be installed according to valid rules and regulations by the authorised installation company. First start-up must be performed by a service trained engineer and authorised by T R Engineering Ltd that can show legitimate validation documents. The responsibility for proper boiler installation and repairs is held by the installation/servicing company, trained by the manufacturer and that has validation/authorisation. Any manipulation or changes made in electrical parts of the boiler, or connecting additional controller devices, might result in warranty loss.

Finalisation and test heating must be denoted on the boilers commissioning report. Lack of such information about start-up in the commissioning report might result in warranty loss.

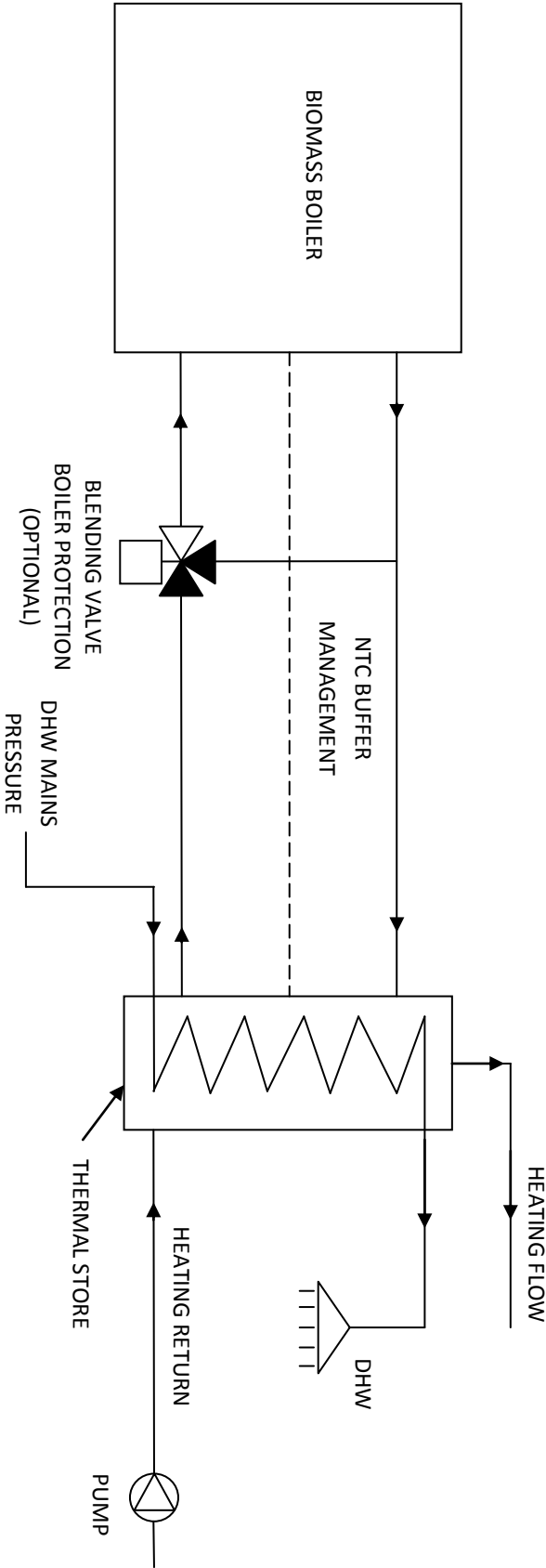
Plumbing systems should comply with BS 7593 and BS 5449 and be executed according to Current Building Regulations.

The boiler is dedicated to following the electrical parameters 230V/50Hz. Electrical systems should be executed by a qualified person that will create a 230V/10A double pole isolator, in an easily accessible place. Electrical supply of the boiler and lighting should be connected to separate circuits.



6.4.2 Plumbing Schematics

Buffer tank (a minimum of 10l
per kW of boiler output

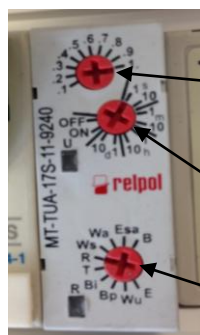


6.4.3 Auger Set-Up (Optional)

Mains In



To pellet sensor To auger



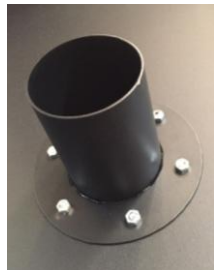
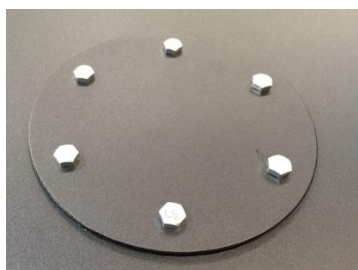
Fine timer

Course timer
(seconds, min, hrs)

This must always be set to R

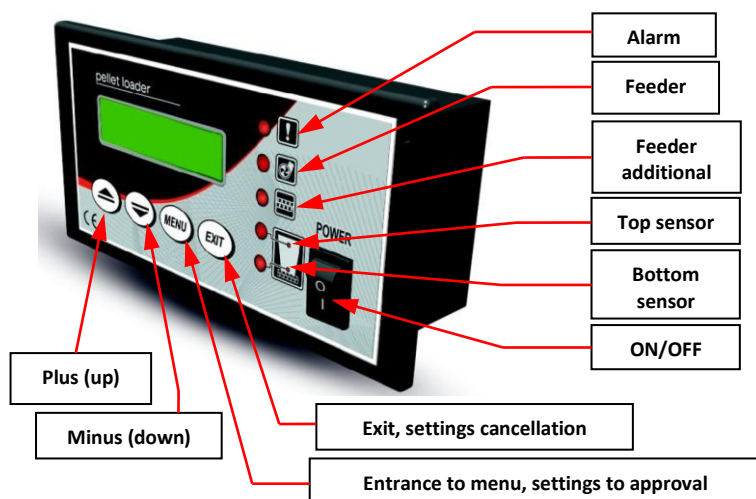
The auger should be set up so the fine timer is at .2 and the course timer is at 10h. This will set the auger to come on after the sensor has been uncovered for 2 hours.

The pellet sensor should be placed inside the boiler hopper about a 1/3 of the way down from the top.



Please ensure that the auger spigot is sealed upon installation of the boiler.

6.4.4 Vacuum System Set-Up (Optional)



Installation of the Vacuum System

1. Remove the lid and leave the hinges on the hopper.



2. Remove gas strut from the hopper lid.



3. Locate vacuum unit to hopper.

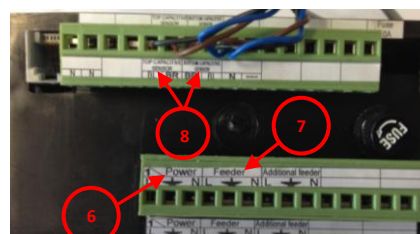
4. Locate vacuum lid unit on to existing hinges of the hopper.



5. Locate pellet loader controller to lid using existing cut-out.



6. Remove 2 pin plug from power lead and connect to the power connections of the controller. Supply must come from a 13A switched fused spur.



7. Connect vacuum motor cable to feeder connections.
8. Using the long adjustable sensor bracket and back nuts for the low sensor 250mm from the bottom of the hopper and the high sensor should be approximately half way up the hopper (high and low sensors can be identified from the controller connections).



9. Fit vacuum pipe supplied with the unit to the motor connection on the back of the unit.

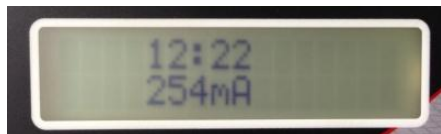


Controller Functions

Main Page

The main page is shown in the LCD display during normal operation with the following data displayed on it.

- Current time
- Feeder current
- Icon “(“ (if the night mode is active)

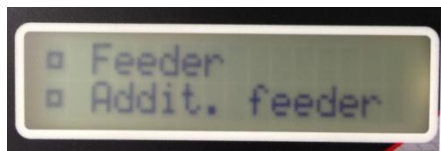


By pressing the **MENU** button the sub-menu is entered or the selected option is activated. Press the **EXIT** button to exit the menu or cancel the setting.

Manual Operation

The controller is equipped with the manual operation mode for user's convenience. When using that function, each is turned on/off independently from the others.

By pressing the **MENU** button a motor of the selected unit (feeder/additional feeder or alarm) is activated and stays on until the **MENU** button is pressed again.



Clock

The user may define the current time by setting the clock. Clock setting is necessary for proper operation.

Day from...

This function is used to define the time when the controller will switch to the day mode.

Night from...

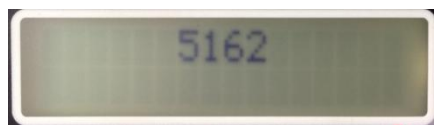
This function is used to define when the controller will switch to the night mode. The controller will start the main hopper filling process half an hour before switching to the night mode.

Language

This function is used to select the language version of the controller menu.

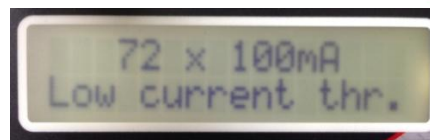
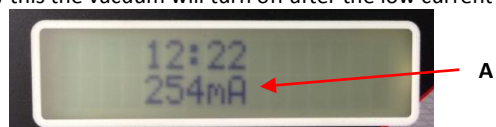
System Menu

To access the system menu enter the password 5162.



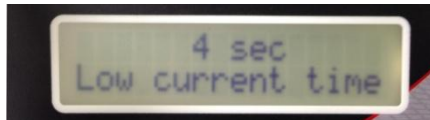
Low Current Threshold

To set this, monitor manual operation and when the vacuum store is full, take note of the mA value on the main screen i.e. 7078mA (A). This then needs to be set at 72 x 100mA so that when the value drops below this the vacuum will turn off after the low current time.



Low Current Time

This should be set at 4s so when the mA value drops below the threshold for 4 seconds the vacuum stops.

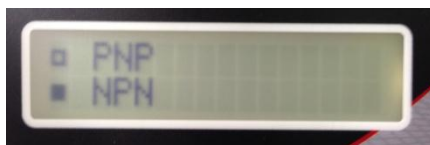


Pause Time

This should be set at 5 mins so if the vacuum does not turn off after this time an alarm will show (this is usually due to lack of pellet, **Feeder Protection**).

Lower and Upper Sensors

Both of these values should be set to NPN.



Protections

To ensure safe and failure free operation, the controller is equipped with a number of protections. When an alarm occurs the buzzer goes off and a corresponding message appears on the display.

Feeder Protection

Where the auxiliary hopper is not filled for a long period (e.g. due to lack of pellet) the controller will turn the feeder off and an alarm will be activated.

Fuse

The controller is equipped with a 10A fuse to protect the controller.

CAUTION: This must be protected by a 13A fuse from a switched fused spur.

Maintenance

The pellet loader controller must be checked for any damage to its wires before and during the heating season. You should also check the mounting of the controller; clean it of dust and other contamination.

Technical Data

Specification	Unit	
Power Supply	V	230V 50Hz ±10%
Max Power Consumption	W	2000
Ambient Temperature	°C	5-50
Feeder Output Load	A	7
Feeder Additional Output Load	A	1
Fuse Insert	A	10
Height	mm	600
Width	mm	400
Depth	mm	400
Weight	kg	25

Assembly

NOTE: Installation should be performed by a fully qualified engineer. **DO NOT** install the unit with the power on (make sure the plug is disconnected from the mains supply).

NOTE: Incorrect wiring may damage the controller.

The controller cannot be operated in a closed central heating system. The installation must include safety valves, pressure valves and a buffer tank to protect the boiler from water boiling in a central heating system.

7. Overview of the Basic Functions

The Igneo Slim controller is a modern microprocessor system, which controls the boiler and also the buffer tank.

The device controls the burning process by providing the appropriate amount of air and fuel. By using solid state relays the modulation is regulated smoothly.

Graphic Display – thanks to a large graphic display FSTN handling device is intuitive.

Large Fonts and Icon – to improve ease of handling equipment for elderly people.

Two types of menus – simple and sophisticated menus. During daily operation of the boiler the can support is easily accessible from the simple menu.

The modular construction of the CAN – using industrial CAN bus data exchange; it is possible to expand the system.

Buffer – control the heating system in combination with a heat storage reservoir.

Powerful modern 32-bit ARM processor – enables advanced controlling algorithm device Fuzzy Logic II generation.

The history of alarms and errors – the controller keeps a history of the last 20 errors and alarms with a description, date of creation and the date of confirmation.

Clock with Calendar – the clock allows to program a weekly cycle for the required temperatures in rooms and hot water which contributes to a reduction in expenditure on fuel.

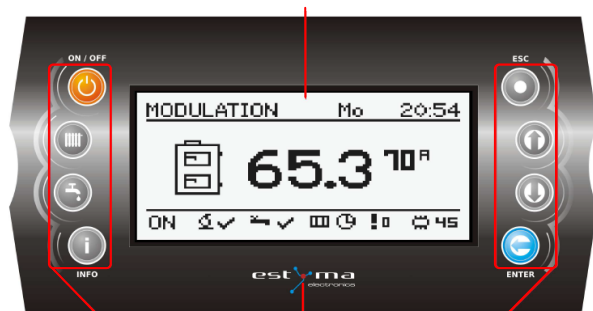
Statistics – the controller stores statistical data of the system, so it is possible to observe the work and reduce fuel consumption. For example, monitor temperatures and the boiler burner power as well as the auger operating time of the fuel.

Beep Sound Alarm – built-in piezoelectric loudspeaker signals the occurrence of an alarm in the boiler, which increases operational safety of the device.

Resetting – this function allows you to restore factory settings of the controller.

7.1 Control Panel

Graphic Display (7.1.4)










Status LED (7.1.2)

Buttons (7.1.3)

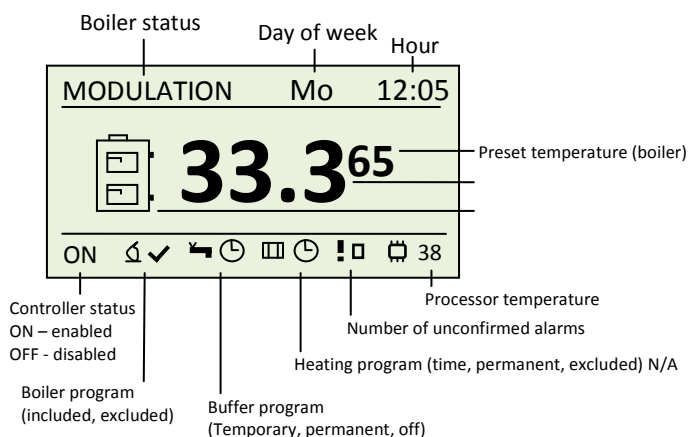
7.1.1 The Status LED

Status	Description
Green light continuously	Controller OFF
Green blinks	Controller enabled, burner OFF
Orange light continuously	Controller enabled, burner enabled
Orange blinks	Burner works
Red light continuously	There is an alarm to be confirmed
Red blinks	Alarm active

7.1.2 Buttons

Button	Function
 ON/OFF	Long press on the main screen (>3 seconds) changes the state of the ON/OFF.
 CH	Not Used - Disabled
 HW	Quick access to the full configuration settings for hot water/Buffer.
 ESC	Back one level up in the menu, the resignation of the parameter change.
 Up arrow	Navigating through the menus, increasing the value of the parameter being edited. On main screen, enter the simple menu.
 Down arrow	Navigating through menus, reducing the value of the parameter being edited. On main screen, enter the simple menu.
 ENTER	Access to the menu. Acceptance of changes in the value of the parameter being edited. Confirmation of the alarm.

7.1.3 Graphic Display



7.2 Statuses of the Burner

Status	Description
TURNED OFF	The burner is not working.
CLEANING	Cleaning the burner with a strong stream of air
FIRING UP	Firing up fuel. Providing the initial dose of fuel to run igniter and blower.
INCANDESCING	When the flame is in the firing up phase it starts providing additional portions of fuel and increases the power of the igniter.
POWER 1	The burner works with the first power.
POWER 2	The burner works with the second power.
MODULATION	The burner works with a modulated power.
BURNING OFF	Extinguishing of the burner.
STOP	Burner does not work. The required boiler temperature has been reached.

7.3 Navigation in the Menu

The controller has two types of menu:

Simple menu – allows for quick access to basic controller functions. To enter the simple menu press the **UP** or **DOWN** arrow on the main screen.

Main Menu – allows you to access all the functionality of the controller (monitoring, adjustment and service settings). Access to

the main menu is done by pressing the **ENTER** button on the main screen.

You can return back to the main screen by pressing the **ESC** button several times.

The boiler can be turned ON/OFF by pressing the **ON/OFF** button for 3 seconds.

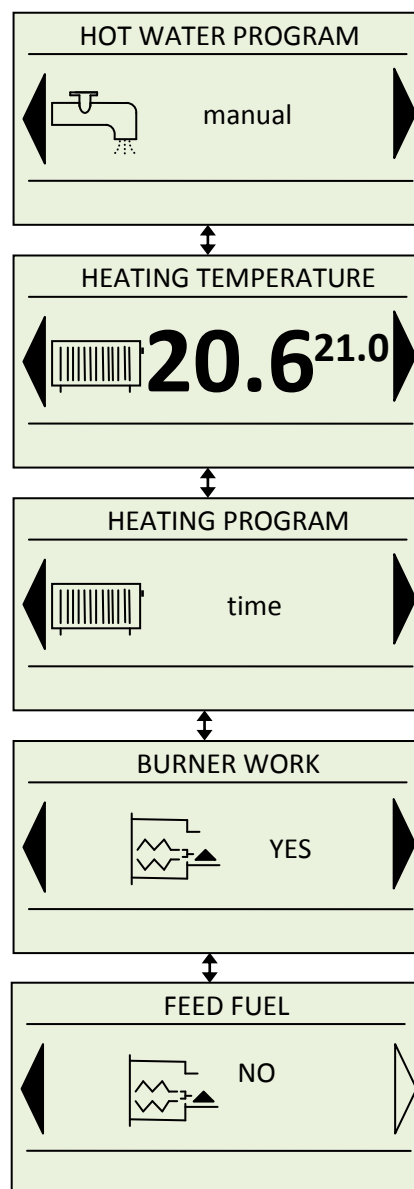
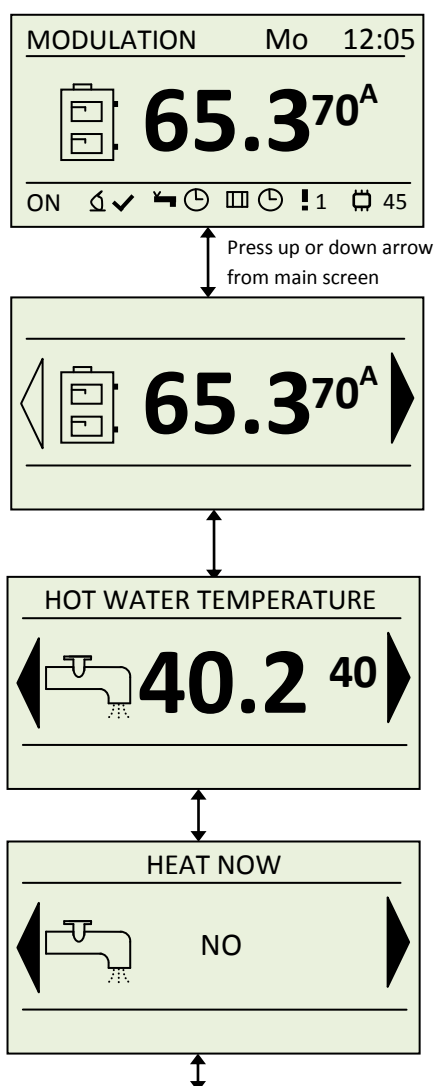
7.4 Time Scheduling

The controller is equipped with a clock and calendar. This makes it possible to program the operation of individual circuit elements for heating depending on the time and day of the week. The date and time settings are not reset during a power failure as the controller is equipped with a battery (CR2032 3V) that should be replaced every two years.

Selecting the day of week – Upon entry the day of the week flashes. Use the up and down arrows to select the day.

Programming – After selecting the day of the week and pressing enter the programmed hours indicator flashes. At the same time it also displays the time icon next to it which represents the current selected setting time (the sun symbol means comfort temperature; the moon symbol is the economic temperature). To move to the next hour, press the down arrow (economy temperature) or the up arrow (comfort temperature).

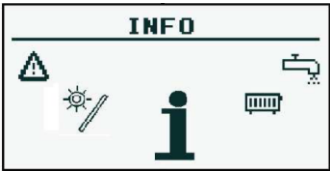
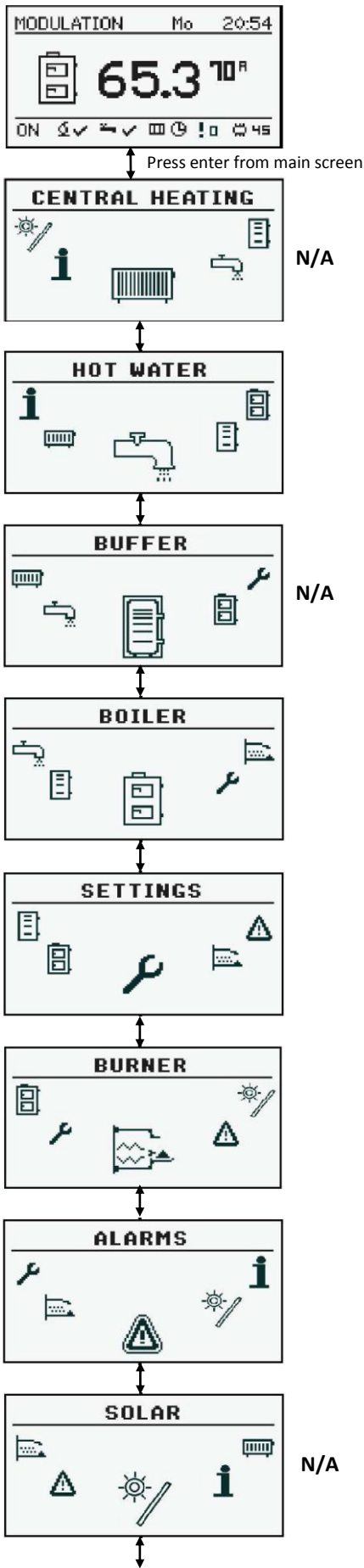
8. Simple Menu



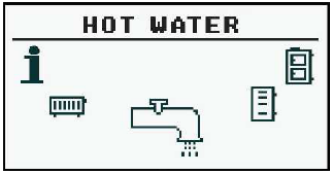
8.1 Simple Menu Screens

Screen	Description
Boiler Temperature	Shows the current temperature of the boiler (large font) and the desired temperature (small font). After pressing ENTER set the desired temperature of the boiler.
Hot Water Temperature	Shows the current temperature of hot water (large font) and the desired temperature (small font). After pressing ENTER set the desired temperature of hot water.
Heat Now	Disposable heating hot water to a comfortable temperature regardless of the program.
Hot Water Program	Set the mode of hot water: a) Time – according to the programmed timescales. b) Constant – regardless of the time intervals comfortable temperature is maintained. c) Disabled – off the heat.
Heating Temperature	Shows the current temperature in the room (large font) and the value of the desired (small font). After pressing the ENTER , set the desired temperature in the room.
Heating Program	Set the mode of heating circuit: a) Time – according to preset ranges. b) Constant – regardless of the time intervals comfortable temperature is maintained. c) Disabled – off the heat
Burner Work	Allow for operation of the burner. When not consent to the burner operation, regulator controls the heating system.
Feed Fuel	Manually feed pellets into the burner.

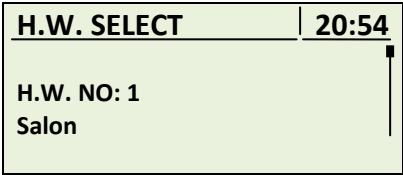
9. Main Menu



9.1 Hot Water

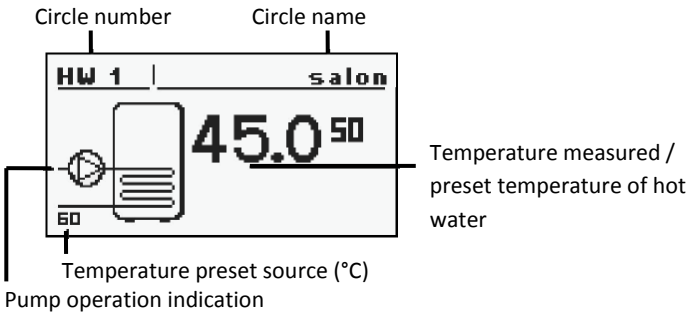


9.1.1 Selection of Circuit



9.1.2 State

This allows you to monitor the status of hot water.



9.1.3 Settings

Function	Description
Comfortable temp.	Desired temperature of hot water during heating. (Set at 70°C)
Programme	Set this to MANUAL
Heat now	Heats hot water once to a comfortable temperature regardless of the program. (Set to NO)
Hysteresis	This value can reduce the temperature of hot water. (Set at 10°C)
Economical temp.	Desired temperature of hot water outside the period of heating. (Set at 50°C)

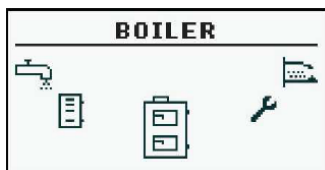
9.1.4 Time Program

This is used to configure the timed programmes for hot water.

9.1.5 Service

Function	Description
Source delta	Increasing the temperature of the source of the desired temperature of hot water during heating. (set at 10°C)
Source	Specifies the source of energy for hot water. (Boiler)
Temperature MAX	Maximum temperature of hot water. (Set at 80°C)
Delta MIN temp.	The minimum temperature difference between the source and the hot water at which the pump can work. (Set at 5°C)
Pump test	Starts the pump regardless of other conditions.
Circ. name	Gives the name for the hot water circuit.

9.2 Boiler



9.2.1 State

This shows the statistics of the boiler in the past 24 hours. The graph shows the temperature of the boiler and power of the burner. Hours refer to how many hours ago the boiler carried out these operating parameters. Statistics of 2 hours are displayed across the screen and can be switched using the up and down buttons.

9.2.2 Settings

Function	Description
Boiler temp. set	Heating water temperature in the boiler which will be maintained by the controller. Menu is active only in continuous work mode.

9.2.3 Service

Function	Description
Min pump temp.	The temperature above which the controller can attach pumps. (Set at 50°C)
Mode	Operating mode of boiler: (Set to AUTO) a) Auto – temperature calculated automatically. b) Continuous – the temperature is kept constant.
Hysteresis	The temperature of the boiler must be reduced by this value to start the burner. (Set to 5°C)
MIN return temp	Minimal return to boiler temperature maintained by the mixer. (Set at 45°C)
Return mixer time	Specifies the time of full opening of the return mixer.
Boiler pump test	Starts the boiler pump regardless of other conditions.
Return mixer test	Starts the actuator of the return mixer regardless of other conditions.
Cleaning begin time	Allows you to set the beginning of the heat exchanger cleaning.
Cleaning end time	Allows you to set the end of the heat exchanger cleaning.
Cleaning interval	Allows to you to set how often the heat exchanger will be cleaned.
Heat ex. Clean out test	Allows you to test the heat exchanger cleaning output.

9.3 Settings



9.3.1 Date and Time

This menu allows you to set the date and time of the controller.

9.3.2 Language

This menu allows you to select the language of the menu.

9.3.3 General Settings

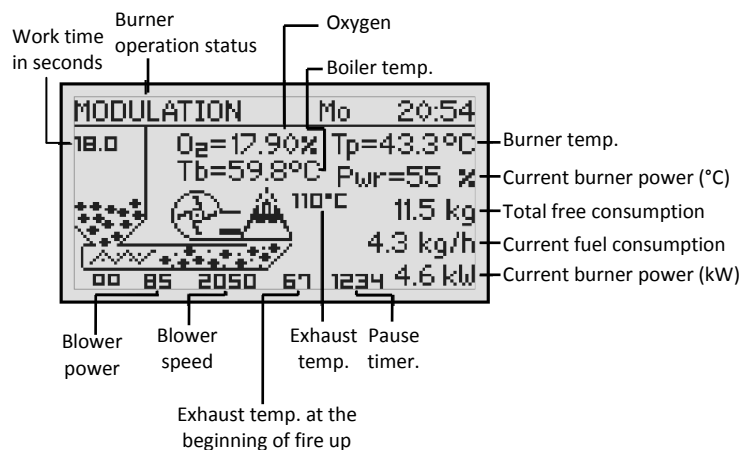
Alarm Buzzer

This allows you to set whether an alarm sounds if there is an alarm.

9.4 Burner



9.4.1 State



9.4.2 Settings

Function	Description
Feed fuel now	Starts fuel feeding screw regardless of other features.
Burner on	Turn the burner on.
Fuel type	Specifies the type of fuel.
Blower on Wood	Number of cleaning sequences during each cleaning cycle.

9.4.3 Service

Function	Description
Air MIN (30%)	Minimum amount of air during modulation where the power of the burner is 20% or power number is 1.
Air MAX (100%)	Maximum amount of air during modulation where the power of the burner is 100% or power number is 2.
Feeding MAX (100%)	Maximum time during fuel feeding when power of modulation is 100% or power number is 2 on every 20 seconds.
Power MIN (FL2)	Minimal burner power during modulation.
Power MAX (FL2)	Maximal burner power during modulation.
Modulation type	Burner mode, power modulation or two power levels.
Igniter test*	Turn on igniter for testing.
Heater feeder test*	Turn on burner feeder for testing.
Storage feeder test*	Turn on storage feeder for testing.
Blower test*	Turn on blower for testing.
Test fuel mass	Fuel mass obtained during continuous fuel feeder work through 1 hour (in kg).
Fuel calorific value	Fuel calorific value (in kWh/kg)
Lambda Control	Determine whether regulator considers oxygen concentration or not.
Oxygen MIN (20%)	Oxygen target minimal power.
Oxygen (100%)	Oxygen target for maximal power.

Fuel pre-dose	Fuel pre-dose (in seconds of feeder work).
Fire up blower power	Blower power during fire up phase.
Standby (min)	Holding-up phase duration after boiler has reached the set temperature.
Feeder interval	Feeder interval time.
Delta EGT fire up	EGT delta during fire up.
Incandescing power	Power during incandescing phase.
Blower in cleaning	Blower power during cleaning.
Cleaning time	Burner cleaning (blower on time) in sec.
Max fire up time (min)	Maximal fire up time in minutes.

*testing equipment in the burner menu is only possible when the controller is in the OFF mode.

9.5 Alarms



This menu contains a history up to 20 alarms that have occurred. The importance of the alarm codes is outlined in the following table.

9.5.1 Alarm Codes

Code	Short description	Explanation
1	Processor overheating	Processor overheating. The reason may be improper installation location of the controller.
2	No fire/fuel	The controller detected a lack of flame in the burner. The reason could be lack of pellet or the flame has gone out.
3	Burner overheating	The temperature of the burner has reached its maximum value.
4	Boiler sensor shorted	The controller has detected the boiler temperature sensor has shorted. This may be due to a damaged sensor or connection cable.
5	Boiler sensor open	The controller has detected the boiler temperature sensor is open circuit. This may be due to a damaged sensor or connection cable.
6	Burner sensor shorted	The controller has detected the burner temperature sensor has shorted. This may be due to a damaged sensor or connection cable.
7	Burner sensor open	The controller has detected the burner temperature sensor is open circuit. This may be due to a damaged sensor or connection cable.
8	Boiler overheating	The boiler temperature has exceeded the maximum value.
9	Processor reset	Controller has lost power or is damaged.
10	STB	
11	Communication with module 0	
12	Communication with module 1	
13	Communication with module 2	
14	Communication with module 3	
15	Communication with module 4	
16	Communication with module 5	
17	Communication with module 6	

18	Communication with module 7	
19	HW sensor shorted	
20	HW sensor open	
21	Room temp. sensor shorted	
22	Room temp. sensor open	
23	Quenching error	
24	Lambda communication	
25	Solar overheating	
26	Solar freezing	
247	Weather sensor shorted	The controller has detected the weather sensor has shorted. This may be due to a damaged sensor or connection cable.
249	Boiler overheating	The temperature of the boiler has reached its maximum value.

9.6 Controller Technical Data

Parameter	Value
Supply Voltage	~230V/50Hz ±10%
Power Input	<6VA
Temperature Measurement Accuracy	±4°C
Sensors	NTC 10kΩ B _{25/85} =3877K± 0.75% VISHAY BC components
Ambient Temperature	0-60°C
Moisture	5-95% non-condensing
Software Class	A
CH Pump	100W
HW Pump	100W
Igniter	400W
Blower	150W
Burner Feeder	150W
Feeder Tank	150W

10. Restarting of the Boiler after Interruption caused by Lack of Fuel

In case the boiler extinguishes due to lack of fuel please follow the instruction below:

- Fill the hopper with fuel.
- Using the manual feed, transfer fuel until it reaches the burner.
- Remove ash raised from complete burnout of fuel from the burner.
- Start automatic mode.

11. Final Information Regarding Installation and Boiler Start-Up

To ensure prolonged, failure free operation of the boiler please follow the rules below:

- Supply sufficient flue draught to allow optimal combustion.
- Secure the boiler from dampness and lack of flue draught by means of an acid-resistant or ceramic chimney insert along with drainage of condensate to sewer.
- Position the boiler on thermally isolated flooring to prevent it from developing water droplets on its walls.
- Make sure that the central heating system is equipped with a valve positioned on the lowest pipe and as close to the boiler as possible.
- Remember that the start-up of the boiler should be performed only by personnel trained by T R Engineering Ltd with a current authorised service certificate.

- Remember that a test heating must be performed after boiler installation and must be noted in the warranty card.
- Remember that the boiler can only be operated by adults, after reading and understanding this instruction manual. **It is forbidden for children to get close to the boiler without adult supervision.**
- Shut down the boiler if any maintenance/repair work is performed in the room that would involve gluing, painting, etc. that might increase the risk of fire or explosion.
- Shut down the boiler during periodical service or boiler maintenance.
- Ignite the boiler using only the automatic ignition function. It is forbidden to use any solid or fluid inflammable substances (such as gasoline, kerosene, etc.).
- Avoid overheating the boiler.
- Remember not to store any flammable material or substances in the vicinity of the boiler.
- Remember to keep the boiler temperature at 60°C and to utilise at least 45°C thermal protection at the water return duct.
- Remember that any intervention with electrical parts or the construction of the boiler is forbidden and might result in complete loss of warranty.

12. Cleaning and Maintenance

In order to prolong the lifespan of the boiler after every 1-2 weeks:

- Empty the ash pan of any unburnt pellet using provided apparatus.

Every 8 weeks:

- Clean the burner with a stiff brush ensuring all air holes are clear.



A full service is required at the below specified periods.

Greenflame Eco 10kW	5 tonnes of fuel or 1 year
Greenflame Eco 15kW	5 tonnes of fuel or 1 year
Greenflame Eco 25kW	5 tonnes of fuel or 1 year
Greenflame Eco 40kW	6 tonnes of fuel or 6 months
Greenflame Eco 60kW	7.5 tonnes of fuel or 6 months

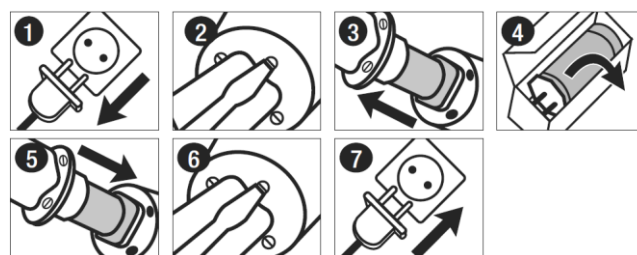
Service

- Isolate the appliance from the mains supply and test safe.
- Remove the first section of flue to allow for removal of the top of the boiler.

- Unscrew high limit stat cap lock nut, withdraw limit stat from case and move to one side.
- Remove limit lockout light from case.
- Unplug ribbon cable from boiler programmer and lift lid to gain access to top of boiler.
- Unplug the lambda probe. Remove the flue gas temperature probe and clean.
- Carefully using a knife cut the insulation on the top of the heat exchanger around the outside, taking care around cables. Cut the insulation from the 12 o'clock position at the back of the flue spigot to the 6 o'clock position.
- Using a 22mm spanner remove the lambda probe from the flue spigot. Clean with a soft brush.
- Remove the previously cut insulation to a safe place for refitting when finished.
- Using a 17mm spanner remove the four nuts holding the fan plate in position. Withdraw the fan and impeller from the top of the heat exchanger and clean using a stiff brush.
- Vacuum the fan impeller recess.
- Remove the nuts around the outside of the heat exchanger and lift off the top of the boiler.
- Vacuum the top of the heat exchanger.
- Using a 17mm spanner remove the nut on the turbulator ring at the 6 o'clock position and lift out the ring and turbulators. Clean turbulators.
- Using a 17mm spanner remove the nuts holding the securing tabs for the centre heat exchanger lid. Lift lid and clean the underside.
- Remove the boiler baffle and clean. Clean all heat exchanger surfaces.
- Using a flue brush clean out all the flue ways around the outside edge of the heat exchanger.
- On 10, 15 and 25kW models remove the plate on the underside of the burner and clean out the burner pot. On 40 and 60kW boilers access the burner pot from above. Make sure all combustion air holes are clear.
- Clean out remaining debris from the burner area.

Re-assemble components in reverse order. Use heat resistant mastic on any disturbed joints and re-attach insulation using foil tape.

13. Replacement Leister Igniter Cartridge



Part No.	Description	Quantity
401034	Igneo PCB	1
401035	Igneo Display	1
400821	Lambda Sensor Module	1
401033	Inverter Control	1
400823	Auger Motor	1
400824	Fan Motor	1
400825	Lambda Probe	1
400826	Boiler Sensor (DHW/CH)	1
400827	Exhaust Sensor	1
401030	Ignitor	1
400829	Ribbon Cable	1
400838	Rotary Valve	1
400839	Auger	1

14. Combustion Report

Installation Details	Engineer Details
Name: _____	Name: _____
Address: _____	Address: _____
_____	_____
_____	_____
Tel: _____	Tel: _____
Mobile No: _____	Mobile No: _____
Email: _____	Email: _____
_____	Reg No: TR

Inspection Details

Date of Completion: Date of Inspection:

Serial Number: Model:

Pellet Brand:

Auger Calibration Data

Weight of Pellet (Grammes):

(NON ECO BOILERS)

Power Level 1 Power Level 4 Power Level 7

Combustion Data

Firing rate at full power: CO²% CO ppm O²

A copy of the flue gas analysis print out must be attached to the combustion report.

Chimney/Flue

Existing/New: _____ Diameter (cm): _____ Height (m) (above roof/eaves): _____

Distance from adjacent buildings (m): _____

Construction: Manufacturers flue used? YES NO

Flue draught: _____ pa Flue gas temperature:

Installation Details

Pre-existing heating system?: YES NO

Size of accumulator tank (if applicable): _____ litres Size of expansion vessel: _____ litres

Draught Stabiliser: YES NO Condensate Drain: YES NO

Notes:

Fully completed reports **MUST BE SUBMITTED** to the manufacturer within 30 days of inspection for validation. The manufacturer reserves the right to withhold the warranty until any installation or inspection report non-conformances have been addressed. The inspection is for combustion setup only T R Engineering Ltd takes no responsibility for the installation including flue, wet system and electrical connections. The warranty period begins from the date of first ignition of the appliance. Failure to sign this document by customer and engineer will invalidate the warranty.

Installation points to be checked

1. Installation	Complete	N/A
a) Appliance air supply complies with Local Building Regulations. (Indoor Boilers Only)		
b) Constructional Hearth complies with Manufacturers recommendations?		
c) Adequate clearances provided around the appliance as per Manufacturers guidelines?		
d) Access panels un-obstructed?		
2. Flue		
a) Adequate clearances of the flue termination from windows, doors, air vents, etc?		
b) Manufacturers recommended flue pipe being used?		
c) Flue support bracket fixed to appliance and secure?		
d) All flue joints secured with clamping bands forming a tight seal?		
e) Rain cap / Anti-down drought cowl / bird guard fitted and secured to flue?		
e) Chimney visually checked?		
f) Is a data plate present?		
3. Controller and Electrical Work Complete		
a) Electrical wiring correctly installed and tested, i.e. permanent supply and control supply?		
b) Class 1 electrical equipment is earthed?		
c) All wiring is supported and routed correctly?		
d) 6A fused isolator (non-switch or plug type) in place?		
4. Boiler and system pipes/vessels		
a) System is sealed?		
b) System is open vent?		
c) System pressure has been correctly set (1.5 bar cold)?		
d) Overflow from safety valve sent to the drainage?		
e) Pressure relief valve and circulating pump operating correctly?		
f) All flow / return pipes insulated properly?		
5. System heat dissipation		
a) System has buffer storage?		
b) System heat dissipation capacity adequate to prevent overheat on extinguishing?		
6. Handover		
a) Maintenance instructions and schedules provided to customer/end user and training/instructions provided on how to handle hot ash?		
b) Customer/end user has been instructed in correct operation of system?		
c) System documentation and operating manual supplied to end user?		
d) End user has been fully informed of correct fuel for system, relevant storage information and where fuel can be sourced.		
e) Customer has viewed Homeowner introductory video (if applicable)?		

Customer Acceptance

I confirm that I have received training and instruction on how to operate and maintain this appliance and I am aware of the Health and Safety implications when handling hot ash. I understand the warranty/guarantee on this product and I have been provided with a User Manual and Operating Instructions.

Customer Signature: _____

Date: _____

Engineer Signature: _____

Date: _____

Please return Inspection reports by post, fax or email with completed guarantee card to:

T R Engineering Ltd
Unit 7, Newton Chambers Way
Thornccliffe Industrial Estate
Chapelton
Sheffield
S35 2PH
Tel. 0114 257 2300
Fax. 0114 257 1419
E-mail. technical@trianco.co.uk
Web. www.trianco.co.uk

15. Service Schedule

12 month -10/15/25kW – 5 tonnes of fuel
 6months - 40kW – 6 tonnes of fuel
 6 months - 60kw – 7.5 tonnes of fuel

Amount of pellet used: kg

Pellet brand:

CO²%; COppm: O₂:

Flue draught: Pa

Flue Gas Temperature: °C

Service Engineer Details

Name:

Address:

Post Code:

Tel:

Mobile No:

Email:

Date:

36 month-3600hrs-10/15/25kW – 15 tonnes of fuel
 18 months - 40kW – 18 tonnes of fuel
 18 months - 60kw – 22.5 tonnes of fuel

Amount of pellet used: kg

Pellet brand:

CO²%; COppm: O₂:

Flue draught: Pa

Flue Gas Temperature: °C

Service Engineer Details

Name:

Address:

Post Code:

Tel:

Mobile No:

Email:

Date:

24 months-2400 running hours-10/15/25kW – 10 tonnes of fuel
 12 months - 40kW – 12 tonnes of fuel
 12 months - 60kw – 15 tonnes of fuel

Amount of pellet used kg

Pellet brand

CO²% COppm O₂

Flue draught Pa

Flue Gas Temperature: °C

Service Engineer Details

Name:

Address:

Post Code:

Tel:

Mobile No:

Email:

Date:

48 months-4800 running hours-10/15/25kW – 20 tonnes of fuel
 24 months - 40kW – 24 tonnes of fuel
 24 months - 60kw – 30 tonnes of fuel

Amount of pellet used kg

Pellet brand

CO²% COppm O₂

Flue draught Pa

Flue Gas Temperature: °C

Service Engineer Details

Name:

Address:

Post Code:

Tel:

Mobile No:

Email:

Date:

60 month-6000hrs-10/15/25kW – 25 tonnes of fuel
 30 month - 40kW – 30 tonnes of fuel
 30 month - 60kW – 37.5 tonnes of fuel

Amount of pellet used: kg

Pellet brand:

CO²%, COppm: O₂:

Flue draught: Pa

Flue Gas Temperature: °C

Service Engineer Details

Name:

Address:

Post Code:

Tel:

Mobile No:

Email:

Date:

84 month-8400hrs-10/15/25kW – 35 tonnes of fuel
 42 month - 40kW – 42 tonnes of fuel
 42 month - 60kW – 52.5 tonnes of fuel

Amount of pellet used: kg

Pellet brand:

CO²%, COppm: O₂:

Flue draught: Pa

Flue Gas Temperature: °C

Service Engineer Details

Name:

Address:

Post Code:

Tel:

Mobile No:

Email:

Date:

72 months-7200 running hours-10/15/25kW – 30 tonnes of fuel
 36 month - 40kW – 36 tonnes of fuel
 36 month - 60kW – 45 tonnes of fuel

Amount of pellet used kg

Pellet brand

CO²% COppm O₂

Flue draught Pa

Flue Gas Temperature: °C

Service Engineer Details

Name:

Address:

Post Code:

Tel:

Mobile No:

Email:

Date:

96 months-9600 running hours-10/15/25kW – 40 tonnes of fuel
 48 month - 40kW – 48 tonnes of fuel
 48 month - 60kW – 60 tonnes of fuel

Amount of pellet used kg

Pellet brand

CO²% COppm O₂

Flue draught Pa

Flue Gas Temperature: °C

Service Engineer Details

Name:

Address:

Post Code:

Tel:

Mobile No:

Email:

Date:

T R Engineering Ltd
Unit 7, Newton Chambers Way
Chapelton, Sheffield, S35 2PH
Telephone: +44 (0)114 257 2300
Fax: +44 (0)114 257 1419
Email: info@trianco.co.uk
Web: www.trianco.co.uk

T R Engineering Ltd is a company registered in England and Wales Registration no. 7321802



Copyright of all contents of this leaflet is vested in T R Engineering Limited. Any part may not be reproduced without permission.

The contents of this leaflet are accurate at the date of printing but, because T R Engineering Ltd has a policy of continual development, it may be superseded and should be disregarded if specifications or appearances are changed.

The statutory rights of the customer are not affected. E&OE's.



