



# E-Compact 28S

## Installation and Operation Manual

featuring the  
iGEN Control Module

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## FOREWARD

Dear Customer,

We would like to congratulate you on choosing this high-quality product from WoodCo Energy SA. The E-COMPACT 28 S wood pellet boiler for residential and small commercial applications is manufactured to the highest standards and features the latest in biomass combustion technology and functionality and is designed with aim of maximising efficiency, reducing CO2 emissions, compact design for installation in the smallest of plant rooms, next generation system management features and most importantly ease of use by the Customer.

In order for the product to operate to its full potential it must be installed, commissioned and serviced according to the guidelines contained in this manual. This manual is intended for both installation engineers, who have received basic product training by WoodCo or its affiliated partners, and the Customer. It contains information on best practice and product specific information for the E-Compact 28 S, and it should be retained as a valuable resource when it comes to fault diagnostics and trouble shooting. It also contains important health and safety information and instructions on how to operate and maintain the boiler. All information contained in this manual is correct at time of going to press.

WoodCo operate a policy of continuous development and improvement of our products and welcome any feedback from our Customers. We also reserve the right to make improvement changes to the product without notice. Please forward your comments to :

WoodCo Energy SA,  
Rte de Courgenay 28,  
Porrentruy 2900,  
SUISSE  
+41 324668008  
info@woodco-energy.com

WoodCo Energy Ireland,  
Unit D Cahir Business Park,  
Cahir,  
Co. Tipperary,  
Ireland  
+353 52 7445330



For the latest edition of manuals and technical updates for this product scan this QR code.



## SAFETY NOTICE

**PLEASE READ THIS ENTIRE MANUAL BEFORE YOU INSTALL AND USE YOU NEW BOILER. THIS APPLIANCE MUST BE INSTALLED BY COMPETENT PERSONNEL ONLY. FAILURE TO INSTALL THE APPLIANCE IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS AND LOCAL BUILDING REGULATIONS AND BYE-LAWS WILL INVALIDATE THE WARRANTY. IT IS THE RESPONSIBILITY OF THE CUSTOMER TO ENSURE THAT ALL BUILDING CODE REQUIREMENTS HAVE BEEN MET.**



# 1. TECHNICAL DATA

## 1.1 TYPE PLATE AND CE CONFORMITY



**HEAD OFFICE:**  
WOODCO Energy SA, Route de Courgenay 38,  
2900 Porrentruy, Switzerland  
info@woodco-energy.com www.woodco-energy.com

**MANUFACTURING:**  
WOODCO Energy Ireland  
Unit D, Cahir Business Park, Cahir, Co. Tipperary

Model	E-Compact 28 S
Nominal Output	5 - 25 kW
Operating Temperature	90°C
Maximum Operating Pressure	3 Bar
Maximum Draft	10 pa
Boiler Dry Weight	375 kgs
Water Capacity	73 litres
Nominal Efficiency	95%
Boiler Class	Class 5
Electrical Supply	230V 50Hz 10A
Fuel	EN Plus A1 Wood Pellets



This appliance must be commissioned by  
**AUTHORISED PERSONNEL ONLY.**



### EC DECLARATION OF CONFORMITY. (In accordance with BS EN ISO/IEC 17050-1:2004)

We: WoodCo Energy SA  
 Of: Rte de Courgenay 28, Porrentruy 2900, SUISSE  
 Tel.: +41 324668008  
 Email: info@woodco-energy.com  
 Website: www.woodco-energy.com

Declare that:

Equipment: Floor standing wood pellet boiler

Model name/number: E-Compact 28S

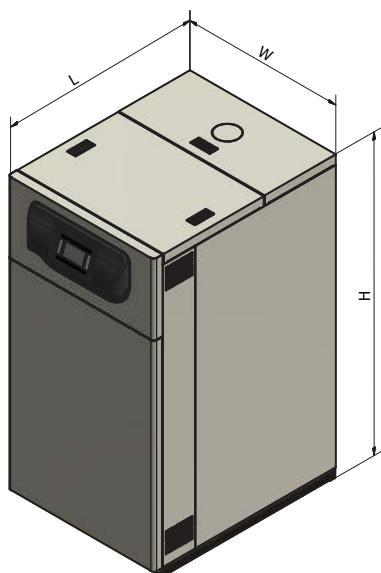
Complies with the following Directives:

- **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: 2002 + A1:2004 + A11:2004 + A2:2006 + A12:2006 + A13:2008 + A14:2010 (Clause 19.11.4 requirements), EN 55014 -1: 2006 + A1:2009.
- **EN 303-5:1999**



June, 2016

## 1.2 DIMENSIONS



Term	Description	Value	Unit
W	Overall Table Width	675	mm
L	Overall Length (Excl. Touch Screen Panel)	842	mm
H	Overall Height	1293	mm
	Dry Weight	375	kgs

## 1.3 INTENDED USE

The E-Compact 28S heating boiler is designed for the standard use of burning wood fuel products made from untreated wood in the form of wood pellets for the purpose of hot water heating. Any other application is considered improper use.

The manufacturer will accept no liability for any damage resulting from improper use. The operator bears sole responsibility in such cases. Proper use includes adherence to the installation, operation and maintenance requirements specified by the manufacturer. Modification of the controller parameters could affect the boilers control program and could lead to malfunctions. Only trained maintenance and operation personnel may undertake modifications to the controller parameters. Only the fuel specified in this document may be used and failure to do so will invalidate the product warranty.

## 1.4 CONSTRUCTION OF THE BOILER ROOM

- Boiler room must be executed according to legislation in your country.
- Keep air openings of the boiler free.
- Do not store any flammable materials in the boiler room.
- Execute the boiler room in frost-proof condition. Fireproof, plane and solid floor- and ceiling construction
- Correctly install heating main switch according to authorised electrician (depending on building regulations).
- Fire extinguisher





## ...TECHNICAL DATA

### 1.5 CONSTRUCTION OF THE FUEL STORAGE ROOM

Boiler room must be executed according to legislation in your country.

- No electrical installation or devices inside the storage room; all lines to be installed concealed.
- Watch for sound insulation at the wall opening for the extraction auger (transmission of structure-borne sound)
- Protection against moisture, water and dust.

<b>Danger</b>	
  	<p><b><u>Dust explosion in fuel storage room</u></b> Burning through explosive and flammable dust (Pellet dust).</p> <ul style="list-style-type: none"> <li>• No motors in the fuel storage room (acc. to country-specific regulations)               <ul style="list-style-type: none"> <li>» except agricultural buildings</li> </ul> </li> <li>• No other source of ignition (e.g. light) in the storage room</li> <li>• No electrical equipment (e.g. light switch) in the storage room</li> <li>• No welding works in dusty environment</li> </ul>

### 1.5 FUEL QUALITY

With regard to the quality standards for wood pellets, DIN EN14961-2 "Solid biofuels - fuel specifications and classes - wood pellets for non-industrial use" applies.

Wood pellets are pressed into a cylindrical shape. They consist of untreated shavings and sawdust from the wood processing industry as well as unprocessed forestry waste. They have a standardised diameter and length. They are pressed at a very high pressure and have a very low water content. The energy contained in 2 kg of pellets corresponds approximately to the energy contained in a litre of heating oil. In accordance with DIN EN 14961-2, the fuel specifications for wood pellets are separated into categories A1 and A2. The diameter of the employed pellets must be in accordance with D06.

- A1/D06

The diameter of the pellets must be 6 mm +/- 1 mm. The length of the pellets must measure between 31.5 mm and 40 mm. A maximum of 1% by weight of the pellets may be longer than 45 mm. The water content must be less than 10% (M10), the ash content must be less than 0.7% by weight (A0.7).

- A2/D06

The diameter of the pellets must be 6 mm +/- 1 mm. The length of the pellets must measure between 31.5 mm and 40 mm. A maximum of 1% by weight of the pellets may be longer than 45 mm. The water content must be less than 10% (M10), the ash content must be less than 1.5% by weight (A1.5).

Standard	A1 wood pellets	A2 wood pellets
Length	3.15 - 40 mm	3.15 - 40 mm
Diameter Ø	D06: 6 mm +/-1 mm	D06: 6 mm +/-1 mm
Thermal value	16.5 - 19 MJ/kg 4.6 - 5.3 kWh/kg	16.3 - 19 MJ/kg or 4.5 - 5.3 kWh/kg
Density	1.0 - 1.4 kg/dm <sup>3</sup>	min. 1.12 kg/dm <sup>3</sup>
Bulk weight	600 kg/m <sup>3</sup>	600 kg/m <sup>3</sup>
Water content	max. 10%	max. 10%
Ash content	max. 0.7%	max. 0.7%
Fine material	max. 1.0%	max. 1.0%
Sulphur content	max. 0.03%	max. 0.03%
Nitrogen content	max. 0.3%	max. 0.3%
Chlorine content	max. 0.02%	max. 0.02%
Additive	max. 2.0%	max. 2.0%

### 1.6 INSTALLATION OF HEATING CIRCUITS

A proper execution of the heating circuits is essential for optimum operation of the boiler.

- ▶ See enclosed hydraulic schemes

The design of accumulators, pumps and mixing valves has to be carried out according to legislation and through a heating professional.

### 1.7 BACK END PROTECTION

It is recommended that back-end protection is used to prevent low temperature water from entering the boiler. This will prevent thermal shock in extreme cases and also prevent the build-up of fine dust / ash particles on the internal surfaces of the heat exchanger which will involve more frequent cleaning and a loss of efficiency

### 1.8 FLUE PIPE CHIMNEY DIMENSIONS

Please refer to Technical Data Table in section 1.10 for recommended chimney dimensions.

### 1.9 ELECTRICAL CONNECTIONS

Please refer to Technical Data Table in section 1.10 for details of power supply requirements.

The electrical connection has to be executed according to the enclosed electrical wiring diagram through a licensed and authorised electrician. Main power switch should be located outside of the boiler room (acc. to building regulations) max. back-up fuse 10 A.

It is absolutely imperative that the intrinsically safe cables are permanently installed.

## ....TECHNICAL DATA

### 1.10 TECHNICAL DATA

Boiler Type	E-Compact 28S
<b>Performance data (measured according to EN 303-5)</b>	
Nominal thermal power	25.61 kW
Minimum thermal power	5.19 kW
Boiler efficiency at nominal thermal power	95.51
<b>Electrical connection</b>	
Voltage	230 V
Frequency	50 Hz
Back-up fuse	10A
Current load during ignition (igniter on)	7.0A
Current load in Standby	0.4A
<b>General Boiler Data</b>	
Boiler Class	5
Max. permissible operating pressure	3.0 Bar
Maximum supply temperature	90°C
Recommended return temperature	50°C
Water content	73 litres
Weight	375 kgs
<b>Planning data for flue calculation (EN 13384-1)</b>	
Flue gas temperature (Tw) at	
Nominal thermal power	140°C
Minimum thermal power	115°C
Flue gas requirement (Pa)	10 Pa
Diameter of flue gas exit from boiler	100mm
Height to centre of flue gas exit from boiler	840mm
Recommended minimum chimney diameter	125mm
<b>Water side connections</b>	
Supply connection	1" outside thread
Return connection at pump valve	1" inside thread
Pressure relief valve connection	1/2" inside thread
Air vent connection	1/2" inside thread
Water-side resistance at nominal thermal power	0.7 Bar



## 2. SAFETY INSTRUCTIONS



### 2.1 GENERAL SAFETY ADVISE


The heating system was built using state-of-the-art technology and conforms to recognised safety regulations. Nevertheless, there is still a risk of injury or death to users or bystanders, and of adverse effects upon the heating system or upon other material goods.

Have your specialist heating company provide you with detailed instructions on the operation of the heating system. Only use the heating system when it is in perfect condition. Use it properly, as intended, be aware of safety and hazards, and observe the Operating manual. Have any faults which could impair safety fixed immediately.

For more information on fuel, see chapter 1, section 1.4 'Fuel Quality.'



### 2.2 OBLIGATION TO INSTRUCT EXTERNAL PERSONNEL



  	<b>Danger</b>
	<p><b><u>Non-observance of the safety regulations!</u></b> Death, injury, damage through inappropriate installation.</p> <ul style="list-style-type: none"> <li>Observe safety instructions of the boiler and in the operation manual!</li> <li>Exactly read the user manual PRIOR commissioning</li> </ul> <p><b><u>Unauthorised people.</u></b> Death, injury and/or damage can occur through inappropriate installation.</p> <ul style="list-style-type: none"> <li>Work on the boiler through qualified and experienced personnel only.</li> <li>Keep out external, unauthorised and untrained people from the boiler room and the storage room.</li> <li>No transfer of control entry codes.</li> <li>Observe legal minimum age of personnel.</li> <li>Place prohibition sign in front of boiler room door and fuel storage door.</li> </ul>



	<b>Danger</b>
	<p><b><u>Unauthorised Commissioning</u></b> Commissioning shall only be undertaken by WoodCo authorised and trained personnel only</p>

### 2.3 REMAINING RISKS

despite all precautions the following residual risks remain ;



  	<b>Danger</b>
	<p><b><u>Hot surfaces, hot ash!</u></b> <b><i>Burns through hot boiler components</i></b> Prior any maintenance works shut down and cool down boiler.</p> <ul style="list-style-type: none"> <li>Do not grasp into the boiler during operation.</li> <li>Wear heat resistant gloves.</li> </ul> <p>The ash in the ash box does save heat.</p> <ul style="list-style-type: none"> <li>Do not empty hot ash into dustbin.</li> </ul> <p><b><u>Put ash in closed, not-flammable vessels only.</u></b></p> <p><b><u>Hot water</u></b> Scalds through sprinkling, hot water.</p> <ul style="list-style-type: none"> <li>Check hoses, lines and connections periodically for leakages, wear and tear or any other damage!</li> <li>Rectify damages immediately.</li> <li>Prior any maintenance works on the circulation water system, de-pressurise the unit</li> <li>Check, if all valves are in correct position.</li> </ul>


  	<b>Danger</b>
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  	<b>Danger</b>
	<p><b><u>Dust explosion in fuel storage room</u></b> Burning through explosive and flammable dust (Pellet dust).</p> <ul style="list-style-type: none"> <li>No motors in the fuel storage room (acc. to country-specific regulations)             <ul style="list-style-type: none"> <li>» except agricultural buildings</li> </ul> </li> <li>No other source of ignition (e.g. light) in the storage room</li> <li>No electrical equipment (e.g. light switch) in the storage room</li> <li>No welding works in dusty environment</li> </ul>





....SAFETY INSTRUCTIONS

 	<b>Danger</b>
	<p><b><u>Risk of deflagration, explosion and burning</u></b>                  Burns through explosively combustion of residual gases (CO) in the combustion chamber.</p> <ul style="list-style-type: none"> <li>• Open combustion door carefully</li> <li>• Slightly in the beginning.</li> <li>• Hold back body and face from the combustion door                     <ul style="list-style-type: none"> <li>▶ To avoid any burning risks</li> </ul> </li> <li>• The risk of deflagration increases significantly after uncontrolled conditions. (e.g. power loss)</li> <li>• At / after a power loss, do NOT open the combustion door</li> <li>• Do not open combustion door during heating operation</li> </ul>

	<b>Danger</b>
	<p><b><u>Flue gases in the boiler room / building</u></b></p> <ul style="list-style-type: none"> <li>• Flue gases can lead to serious poisoning</li> <li>• Check boiler doors and seals                     <ul style="list-style-type: none"> <li>▶ see "Cleaning intervals" on page 32.</li> </ul> </li> <li>• Burning creosote-treated wood (Paint, varnish, impregnation) results in toxic ash.</li> <li>• Avoid skin and eye contact.</li> </ul>

  	<b>Danger</b>
	<p><b><u>Rotating augers and moving parts in the area of the ash extraction, stoker auger and the fuel extraction!</u></b></p> <ul style="list-style-type: none"> <li>• Amputation, crushing of hands through touching moving parts or augers.</li> <li>• Omit access to augers or motors at operating boiler.</li> <li>• Do not perform any works on the plant, if any other person is in the danger zone.                     <ul style="list-style-type: none"> <li>▶ Secure / lock fuel storage room</li> </ul> </li> <li>• Remove blockages and perform cleaning only with tools and at switched-off boiler status. Also lock &lt;main power switch&gt;.</li> </ul>
	<p><b><u>Unpredictable operation conditions</u></b></p> <ul style="list-style-type: none"> <li>• The spring blades of the agitator system are retracted under the cover disc if the storage room is filled completely.                     <ul style="list-style-type: none"> <li>▶ These springs may shoot up suddenly.</li> </ul> </li> <li>• Watch out for the spring position when entering the fuel storage room.</li> <li>• Remove fuel bridges with rods or shovels only</li> <li>• Wear safety shoes</li> <li>• Observe fuel storage room sticker!</li> </ul>

	<b>Danger</b>
	<p><b><u>Manual mode</u></b></p> <ul style="list-style-type: none"> <li>• Unpredictable operation conditions</li> <li>• During manual mode no monitoring of limit switches or motors is performed.</li> <li>• Manual mode is only allowed to be executed by trained staff.</li> </ul>

	<b>Danger</b>
	<p><b><u>Electrical works on the boiler.</u></b></p> <ul style="list-style-type: none"> <li>• Touching open or free terminals, cables and equipment components can lead to severe injury or death!</li> <li>• Observe information signs.</li> </ul> <p>Prior any works:</p> <ul style="list-style-type: none"> <li>▶ Check that there is NO VOLTAGE with voltmeter.</li> </ul>





### 3. BOILER CONSTRUCTION

#### 3.1 OVERVIEW OF COMPONENTS

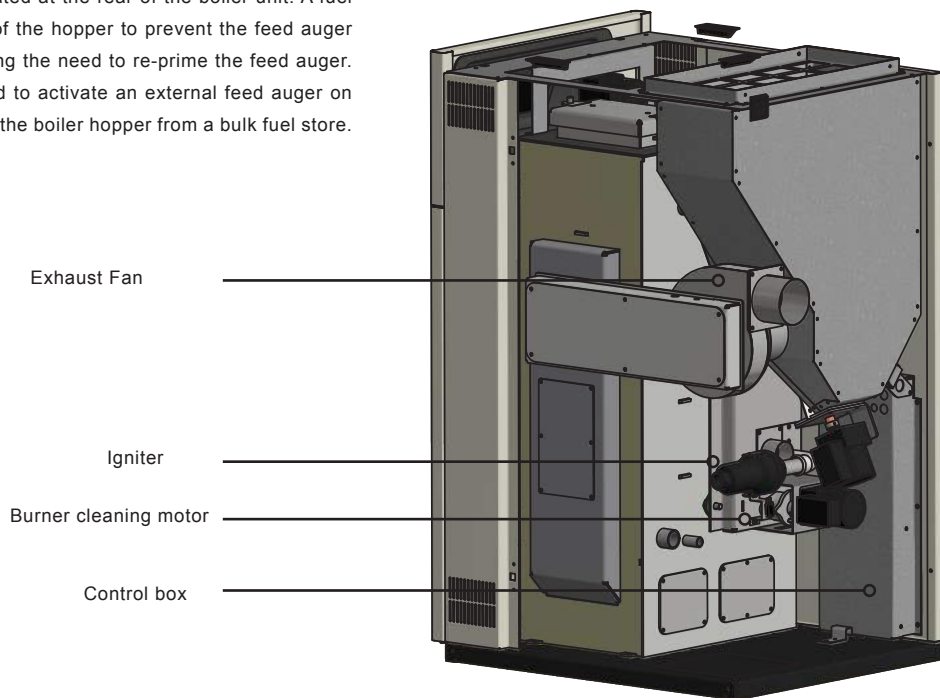
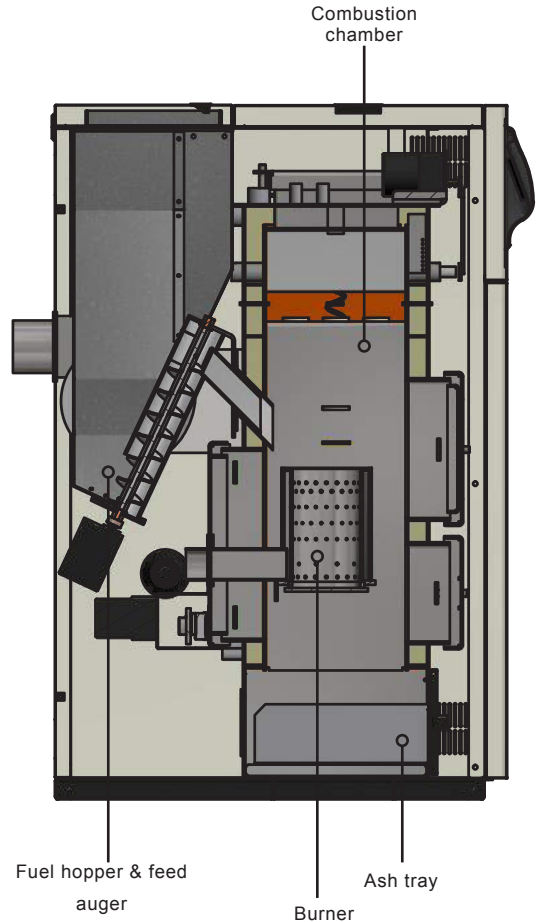
The E-Compact 28S is a floor standing hot water heating boiler fuelled with wood pellets. The boiler unit consists of a water backed combustion chamber and the heat exchanger with a burner mounted in the combustion chamber. Pellets are stored in an integrated 50kg day hopper and fed into the burner via an auger screw which drops the fuel from the top of the auger into the burner. Here the pellets are ignited with an igniter and the products of combustion are drawn through the heat exchanger and discharged through the exhaust outlet at the rear of the appliance.

The main combustion chamber has a viewing window so one can view the operation of the burner and for easy simple fault diagnostics. The secondary heat exchanger is automatically cleaned by reciprocating springs that move vertically within the heat exchanger tubes. This cleans the heat exchanger surfaces and maintains efficiency.

The burner consists of vertical direction inner and outer tube providing an air cavity. The inner tube has a series of air holes located throughout its surface which provide the correct ratio of air for combustion. Air enters the burner through an air intake duct at the rear of the boiler unit. Combustion air is drawn through the air holes in the burner by the exhaust fan which maintains a constant under-pressure in the combustion chamber. The burner is cleaning automatically at the end of each run cycle or at a pre-determined cleaning shut down by dropping the base flap so that ash or any debris in the burner falls into the ash container underneath. The burner flap will drop six times during the cleaning cycle to ensure all debris has been removed.

Ash is deposited into two ash collection trays, one in the main combustion chamber and a second underneath the heat exchanger tubes in the boiler secondary pass. The ash trays are removed together. WoodCo offer an option for automatic ash removal to a large capacity ash container.

The 50kg integral fuel hopper is located at the rear of the boiler unit. A fuel sensor is positioned near the base of the hopper to prevent the feed auger from running empty therefore avoiding the need to re-prime the feed auger. The sensor can also be programmed to activate an external feed auger on suction system to automatically refill the boiler hopper from a bulk fuel store.



## 4. CONTROL

### 4.1 OVERVIEW OF CONTROLLER

The E-Compact 28S is equipped with the very latest sophistication in boiler combustion technology and control. The iGEN Touch Screen control system is now standard across the full range of WoodCo biomass boiler products. Central to the control system is an easy to operate touch screen interface which has 'smart phone like' features, such as bright intuitive graphics, easy navigate menus and various boiler control options.

The menus are clearly laid out as follows :

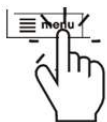
- **Home Screen** - displays all basic system function information and where boiler temperature and fuel refill levels can be set.
- **User Menu** - boiler settings, general settings, boiler on/off, alarms, manual mode, etc., are all contained in the User Menu. Set-up screens for the connecting the boiler modem to WiFi are located here also.
- **Service Menu** - (password protected) parameters for the set-up and commissioning of the boiler are located here.
- **Manufacturers Menu** - (password protected) all editable controller parameters are located in the Manufacturers Menu. These include all the parameters that control ignition, run mode and standby as well as draft and oxygen level set-up.



Boiler Off Screen

### 4.2 NAVIGATING AROUND THE CONTROLLER INTERFACE


The iGEN control interface uses a touch screen panel for easy navigation to the required icon or parameter. Menu and icon selection or editing of parameters is easy by touching the necessary graphic on screen. Ensure fingers are free from water, oil or grease as this may effect the accuracy of selection.

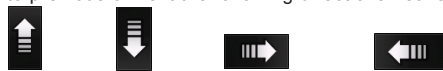


In the User Menu the following options are available at the bottom of the screen to



1. return to the previous menu / lack of acceptance of the parameter setting.
2. return to the main screen from any menu.
3. Favourites menu (speed dial). Icons can be added to Favourites by holding the icons for a moment until accepted. The removal of the selected items in the favourites menu, hold an icon and then confirm removal.
4. Information the selected parameter.
5. Service menu.

Pressing the  icon will revert back to the User Menu. To scroll up or down or go to previous or next the following directional icons are used.





















### 4.3 USER MENU

The User Menu provides the Customer with simple navigation icons for setting basic boiler parameters, adjusting temperature and turning the boiler ON or OFF. Access to the Service Menu and Manufacturers Menu are also accessed though the User Menu by pressing the Setting Icon. Access to these higher level menus requires a PIN number which is available from the manufacturer but only to authorised and trained technicians.



The User Menu and icons are laid out as follows:



User Menu	
	System Information - all boiler sensor information, functional I/O's, counters, etc are displayed here.
	Boiler Settings
	Boiler Temperature Settings - set the desired target temperature
	Night Time Decrease Settings - set the required night time temperature
	Fuel Refill - when manually filling the boiler hopper reset the fuel level to 100%
	Summer / Winter Mode - prioritises hot water production during summer months.
	General Settings
	Time Settings
	Date Settings
	Screen Brightness
	Sound Settings
	Language
	WiFi Settings - connect the boiler to the internet by connecting to the router.
	Alarm - lists the alarms in sequential order
	Turn Controller ON/OFF
	Service Settings - access to the Service Menu and Manufacturers Menu. (Password protected)
	*Manual Mode. - used to carry out a functional check on each component on the boiler, e.g. fan, pump, etc.
	<b>*Danger</b>
	<p><b>Manual mode</b></p> <ul style="list-style-type: none"> <li>• Unpredictable operation conditions</li> <li>• During manual mode no monitoring of limit switches or motors is performed.</li> <li>• Manual mode is only allowed to be executed by trained staff.</li> </ul>

### 4.3 SERVICE MENU

The Service Menu is password protected as it contains parameters which are adjusted during the commissioning process to trim fan speeds and auger settings to ensure good combustion. It also contains parameters on how the boiler is to be controlled, options for external fuel hopper filling, buffer tank management, etc. Below is a table of the various menus and sub-menus in the Service Menu.

Service settings
<b>Boiler settings</b>
Auger:
Auger efficiency test
Efficiency test time
Fuel weight
Auger efficiency
Energy density
Output modulation:
(Max) boiler power
(Max) combustion fan
(Max) exhaust fan
(Max) oxygen
(Med) boiler power
(Med) combustion fan
(Med) exhaust fan
(Med) oxygen
(Min) boiler power
(Min) combustion fan
(Min) exhaust fan
(Min) oxygen
Boiler power range HIGH
Boiler power range MIN
Weather control the boiler
Boiler heating curve
Curve shift
Room temp. factor
Return protection
Return protection 4D
Hysteresis return
Min. return temperature
Closing the valve
Min. boiler temperature
Max. boiler temperature
Boiler off source:
Connectors
OFF
ecoSTER T1/T2/T3
Loading pellet from silo
Lambda calibration*

..... CONTROL

Service settings	
<b>CH and DHW settings *</b>	
CH pump activation temperature	
CH pump standstill when loading DHW*	
Minimum DHW temperature	
Maximum DHW temperature	
DHW cont. hysteresis*	
DHW disinfection*	
Boiler inc. by DHW, Mixer	
Extending DHW pump operation time*	
Circulating pump standstill time*	
Circulating pump operation time*	
Circulating pump start temperature*	
Exchanger*	
<b>Buffer settings*</b>	
Buffer suport	
Loading start temperature	
Loading end temperature	
Loading start delta	
Start heat installation	
Heat recovery H1 (start)	
Heat recovery H2 (stop)	
<b>Mixer 1-5 settings*</b>	
Mixer support:	
Off	
CH on	
Floor on	
Pump only	
Preset mixer temperature	
Mixer weather control	
Heating curve mixer	
Curve translation	
Room temp. factor	
Thermostat select:	
Off	
Universal	
ecoSTER T1, ecoSTER T2	
Min. mixer temperature	
Max. mixer temperature	
Valve full opening time	
Off by thermostat	
Mixer input dead zone*	
Proportional range*	
Integration time constant*	
<b>AUX 1/2</b>	
AUX function:	
Off	
Reserve boiler	
Alarms	
Circulation pump	
Reserve boiler – start temperature*	

\* unavailable if no adequate sensor or additional module is connected then the parameter is hidden.

4.4 MANUFACTURERS MENU

The Manufacturers Menu is a restricted area with access only by the Manufacturer. It contains important configuration and safety parameters.

Manufacturers Menu	
<b>Burner Settings</b>	
Ignition:	
Auger pre-load	
Flame detection	
Pre-heating combustion fan	
Variable ignition combustion fan	
Ignition exhaust fan	
Ignition vacuum	
Fixed ignition time	
Variable ignition time	
Variable ignition auger on	
Igniter pre-heating time	
Stabilization:	
Stabilization time	
Stabilization boiler power	
Stabilization combustion fan	
Stabilization exhaust fan	
Stabilization vacuum	
Min. power operation time	
Run mode:	
Auger cycle time	
Boiler hysteresis	
(Min) H1 hysteresis	
(Med) H2 hysteresis	
Burning off:	
Maximal time of burning off	
Minimal time of burning off	
Burning off airflow	
Burning off exhaust fan	
Burning off vacuum	
Flame detection	
Supervision:	
Supervision time	
Blowing during supervision	
Supervision vacuum	
Supervision exhaust fan	
Auger work time	
Auger interval time	
Cleaning:	
Blowing during cleaning	
Cleaning exhaust fan	
Cleaning vacuum	
Cleaning time before ignition	
De-Ash work	
De-Ash pause	
Boiler cleaning motor work	
Boiler cleaning motor pause	



..... **CONTROL**

**Manufacturers Menu**

- Compressor charging
- Solenoid release
- Lambda sensor:
- Lambda mode
- Dynamics
- Response time
- Airflow correction max
- Airflow correction min
- Auger correction increase
- Auger correction decrease
- Lambda correction delay
- Minimum airflow output
- No flame detection time
- No flame temperature level
- No flame auger pause
- Time for rising exhaust temperature
- Maximum burner temperature
- Burner auger extension

**Boiler Settings**

- Regulation mode:
- Standard
- Fuzzy-logic
- Max/Med/Min KW
- Tank capacity
- Fuel alarm level
- Pellet sensor fuel level
- Boiler cooling temperature
- Ash monit-fuel
- Antifreeze delay
- Vacuum sensor
- Vacuum correction
- Minimum vacuum
- Maximum vacuum
- Minimum water pressure
- Maximum water pressure
- Parameter A,B,C FuzzyLogic

**Clear Counters**

**Clear Alarms**

**4.4 HOME SCREEN IN OPERATION MODE.**

During operation or Run Mode the screen below is displayed.



**Legend:**

1. Mode of regulator operation: IGNITION, RUN MODE, SUPERVISION, STABILIZATION, BURNING OFF, CLEANING.
2. preset boiler temperature,
3. measured boiler temperature,
4. key to enter "Menu" list
5. Information fields:  
fan, feeder 1, feeder 2, pump, pump CH, DHW, lighter,
6. fuel level
7. clock time and weekday
8. outside temperature (weather) - if connected
9. field of functions, which modify preset boiler temperature -meaning of the symbols:

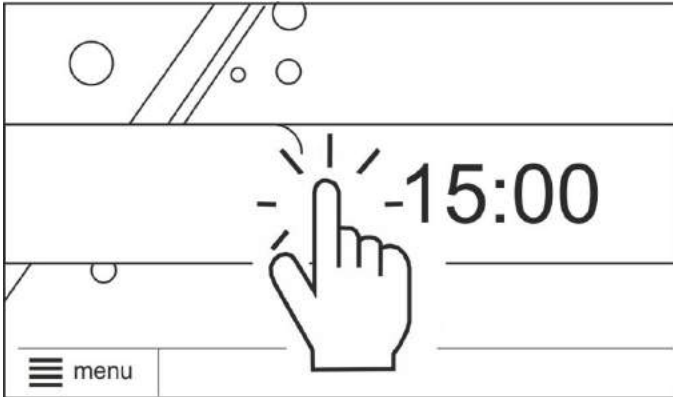
- increase of preset temperature for buffer loading
- opening of room thermostat or other control contacts
- increase of preset boiler temperature loading DHW tank
- increase of preset boiler temperature by mixer circuit
- of preset boiler temperature for active time intervals


Both, left and right windows may display different information. By touching the screen, you may navigate between displayed information: mixer circuits information window, DHW window, fuel level window, oxygen levels (when using a Lambda module).


..... CONTROL

4.5 SWITCHING ON AND OFF THE BOILER

Make sure fuel is present in the tank and tank hatch is closed. Now boiler may be switched on. To start the boiler - press BURNER OFF? at any place on the home screen. The message: ACTIVE REGULATOR? appears. Confirm the



message and the boiler enters firing-up stage. There is also another method of boiler start-up. Press MENU button and find and press  button in the User Menu. If the Installer has configured the 'Boiler Off Source' to OFF then the boiler will immediately initiate the ignition sequence. If 'Boiler Off Source' is set to 'Connectors' then the Operation Mode screen displays and Off will appear in the Operation Mode area of the display (top left corner) and the external control device (thermostat or timer) will need to close contacts before the boiler will start.

To stop the boiler - press MENU button, and find and press  button in the User Menu. Note: regulator enters burning off phase. Upon completion of burning off stage, the message BURNER OFF appears on the Home Screen or OFF appears in the Operation Mode screen

4.6 SETTING PRESET BOILER TEMPERATURE

Preset boiler temperature, just like the preset mixer circuit temperature, can be set in the menu (possible settings of these temperatures are limited by the scope of their corresponding regulator service parameters).

Menu → Boiler settings → Preset boiler temperature

The value set as Preset boiler temp. is ignored by the regulator if the preset boiler temperature is controlled by weather sensor. Regardless of this, the preset boiler temperature is automatically increased in order to fill the hot utility water tank and feed heating mixer cycles. The Preset boiler temperature can also be set by holding the Preset temperature figure on the temperature graphic and this will shortcut to the temperature selection screen.



4.7 DOMESTIC HOW WATER SETTINGS - DHW

The device controls temperature of the domestic how water - DHW – tank, provided that a DHW temperature sensor is connected. If the sensor is disconnected, an information about lack thereof is displayed in the main window. The parameter: **DHW settings** → **DHW pump mode** allows the user to:

- disable filling of the tank, parameter off,
- set DHW priority, using the priority parameter - in this case, the CH pump is deactivated to speed up filling of the DHW tank.
- set simultaneous operation of the CH and DHW pump, using parameter no priority,

The controller has a function of automatic, periodic heating of DHW container to 70 °C to eliminate bacterial flora from the DHW tank.



Keep the users informed of activating the disinfection function as there is risk of scalding with hot usable water.

The controller increases the DHW container temperature once a week, at 2:00 a.m. Monday. After 10 minutes of maintaining the temperature at 70 °C, the DHW pump is switched off and the boiler returns to normal operation. Do not activate the disinfection function when the DHW support is off.

Setting DHW preset temperature

Preset DHW temperature is defined by parameter:

**DHW settings** → **DHW preset temp.**

DHW tank hysteresis

Below temperature DHW preset temp. reduced by DHW tank hysteresis, the DHW pump is activated in order to fill the DHW tank.



When value of hysteresis is set too low, the DHW pump will start faster after decrease in DHW temperature.

4.8 ENABLING THE SUMMER FUNCTION

In order to activate the SUMMER function, which enables to load the DHW tank in the summer, without the need for activating the CH system and mixer cycles, set the parameter DHW pump mode to Summer.



Do not enable the summer function if the DHW pump is disconnected or damaged.





## ..... CONTROL

The SUMMER function can be enabled automatically, on the basis of readouts from the weather sensor.

### 4.9 MIXER CIRCUITS SETTINGS

Settings for the first mixer circuit can be found in the menu:

#### Menu → Mixer 1 settings

Settings for other mixers can be accessed in next menu items and they are identical for each circuit.

#### Settings for mixer without weather sensor.

It is necessary to manually set the required water temperature in the heating mixer circuit using parameter Preset mixer temp., e.g. at a value of 50°C. The value should allow to obtain the required room temperature.

After connecting room thermostat, it is necessary to set a value of decrease in preset mixer temperature by thermostat (parameters Mixer room therm.) e.g. at 5°C. This value should be selected by trial and error. The room thermostat can be a traditional thermostat (no/nc), or room panel ecoSTER TOUCH. Upon activation of the thermostat, the preset mixer circuit temperature will be decreased, which, if proper decrease value is selected, will stop growth of temperature in the heated room.

#### Settings for mixer with weather sensor without room thermostat ecoSTER TOUCH.

Set parameter Weather contr.mixer to on.

Select weather curve as per point 0

Using parameter Curve translation, set preset room temperature following the formula:

Preset room temperature = 20°C + heating curve translation.

#### Example.

In this setup, it is possible to connect a room thermostat which will equalize the inaccuracy of selecting heating curve, if the selected heating curve value is too high. In such case, it is necessary to set the value of preset mixer temperature decrease by thermostat, e.g. at 2°C. After opening of the thermostat contacts, the preset mixer circuit temperature will be decreased, which, if proper decrease value is selected, will stop growth of temperature in the heated room.

#### Settings for mixer with weather sensor and with room thermostat ecoSTER TOUCH.

Set parameter Weather contr.mixer to on.

Select weather curve as per point. 0

The ecoSTER TOUCH regulator automatically translates the heating curve, depending on the preset room temperature. The regulator relates the setting to 20 °C, e.g. for preset room temperature = 22 °C, the regulator will translate the heating curve by 2°C, for preset room temperature = 18 °C, the regulator will translate the heating curve by -2 °C. In some cases described in point. 0 it may be necessary to fine-tune the heating curve translation.

In this setup, the ecoSTER TOUCH room thermostat can:

- decrease the heating cycle temperature by a constant value when the preset room temperature is reached. Analogously, as specified in the previous point (not recommended), or
- automatically, continuously correct the heating cycle temperature.

**It is not recommended to use both options at the same time.**

Automatic correction of room temperature is carried out in accordance with the following formula: Correction = (Preset room temperature - measured

room temperature) x room temperature coefficient /10

#### Example.

Preset temperature in the heated room (set at ecoSTER200) = 22 °C. Temperature measured in the room (by ecoSTER200) = 20 °C. Room temp. coeff. = 15.

Preset mixer temperature will be increased by  $(22\text{ °C} - 20\text{ °C}) \times 15/10 = 3\text{ °C}$ . It is necessary to find appropriate value of the Room temp. coeff. Range: 0...50. The higher the coefficient, the greater the correction of preset boiler temperature. If the setting is "0", the preset mixer temperature is not corrected. Note: setting a value of the room temperature coefficient too high may cause cyclical fluctuations of the room temperature!

### 4.10 WEATHER CONTROLLED OPERATION

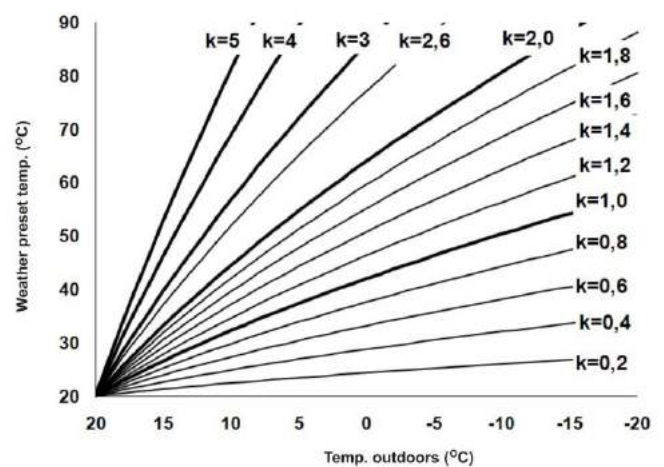
Depending on the temperature measured outside the building, both preset boiler temperature and temperatures of mixer circuits can be controlled automatically. If the proper heating curve is selected, the temperature of the circuits is calculated automatically, depending on the outdoor temperature. Thus, if the selected heating curve is appropriate for the given building, the room temperature stays more or less the same, regardless of the temperature outside.

**Note:** during trial and error selection of the appropriate heating curve, it is necessary to exclude influence of the room thermostat on regulator operation (regardless of whether the room thermostat is connected or not), by setting the parameter:

**Mixer 1 settings → Mixer room therm. to "0".**

If a room panel ecoSTER200 is connected, it is also necessary to set the parameter Room temp. coeff. to "0". Guidelines for proper setting of the heating curve:

- floor heating 0,2 -0,6
- radiator heating 1,0 - 1,6
- boiler 1,8 - 4



Guidelines for selection of appropriate heating curve:

- if the outdoor temperature drops, and the room temperature increases, the selected heating curve value is too high,
- if the outdoor temperature drops, and the room temperature drops as well, the selected heating curve value is too low,
- if during frosty weather the room temperature is proper, but when it gets



## ..... CONTROL

warmer - it is too low, it is recommended to increase the Curve translation and to select a lower heating curve,

- if during frosty weather the room temperature is too low, and when it gets warmer - it is too high, it is recommended to decrease the Curve translation and to select a higher heating curve.

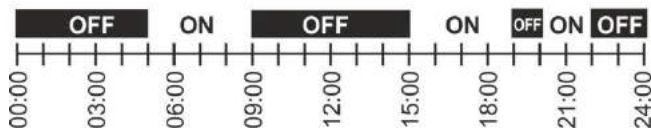
Buildings with poor thermal insulation require higher heating curves, whereas for buildings which have good thermal insulation, the heating curve can have lower value.

The regulator can increase or decrease the preset temperature, calculated in accordance with the heating curve, if it exceeds the temperature range for the given circuit.

### 4.11 DESCRIPTION OF NIGHT TIME DECREASE SETTINGS

#### Boiler night time decreases

The boiler operates in selected time intervals. Outside of the selected intervals, the boiler is burned off.



#### Night time decreases for heating circuits, DHW container and circulation pump operation.

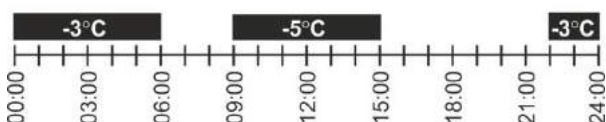
The intervals can be used to define time periods at which lower preset temperature may be set e.g. for a night time or when the user is not at home (e.g. he/she left for a work/school). This feature enables automatic reduction of preset temperature without compromising the heat comfort and reduces fuel consumption.

To activate time intervals, set the parameter: *Night time decrease* for the given heating circuit to ON.

Night time decrease may be set for working days, Saturdays and Sundays.

The example of night time decrease of preset temperature from 22:00 to 06:00 next day and from 09:00 to 15:00 is given below.

Note! Setting of time intervals for 24 hours (one day) should start from 00:00!



In the given example, the regulator will set the decrease of preset temperature by 3 °C from 00:00 to 06:00, and will keep the preset value (without the decrease) from 06:00 to 09:00. Then, it will set the decrease by 5 °C from 09:00 to 15:00, and will keep the preset value (without the decrease) again from 15:00 to 22:00; and again will set the decrease by 3 °C from 22:00 to 23:59.

Time interval is disregarded when its decrease is set to "0" even though "from... to ..." values have been entered.

Decrease of preset boiler temperature in selected time intervals is indicated by the symbol:



on the main screen

### 4.12 CIRCULATING PUMP CONTROL

The circulation pump operation is available only after choosing the functionality of AUX output in:

**Service settings** → **AUX 1/2** → Circulation pump.

Settings for the pump are located in:

**CH and DHW Settings**

Setting of circulating pump control is analogical to night decrease setting. Circulating pump switches on in selected time intervals. In the skipped intervals the circulation pump is being activated for Circulating pump standstill time.

### 4.13 FUEL LEVEL SETUP

#### Activating the fuel level gauge

In order to enable display of the fuel level, the Manufacturer has set the value of parameter:

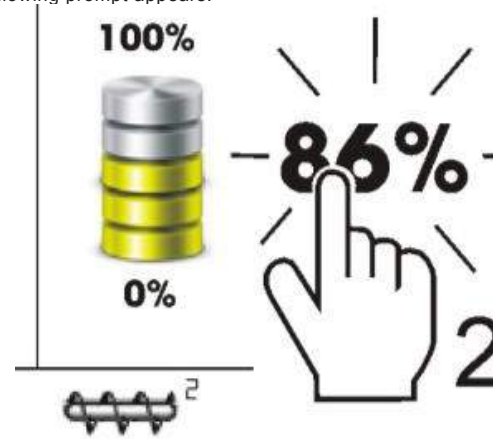
**Producer settings** → **Boiler settings** → **Fuel alarm level**

to match the fuel level sensor in the boiler hopper.

Pressing the left or right window in the main window, you can choose a fuel gauge.

#### Operation of fuel level indicator

Any time upon filling fuel tank, press and hold pressed current fuel level value. Following prompt appears:



"Set fuel level at 100%". Once selected and confirmed YES, fuel level is set to 100%.



## ..... CONTROL

The same operation can be performed in the User Menu:

Boiler settings → Pellet sensor fuel level



*Note:* Fuel may be replenished at any time without a need to wait for complete emptying of fuel tank. Replenish fuel always to the level corresponding to 100% level of the fuel tank and set 100% level as described above.

The controller calculates the fuel level according to actual fuel consumption also considering some parameters from Service menu: Tank capacity, Energy density. Auger efficiency can be obtained by calculating the parameter Auger efficiency test by Efficiency test time.

If the fuel level is set to 100% and only half the hopper is filled with fuel, i.e. 50%, when the fuel level reaches the fuel level sensor the fuel level will automatically drop to 10% (the amount of remaining fuel at the sensor level), when the fuel levels reaches 5% a 'Low Fuel Level' alarm will be signalled and the boiler will go to Burning Off mode.

### 4.14 INFORMATION



Information menu allows to preview temperatures being measured and to recognize which components are currently ON.



Upon connection of mixers', extension modules, information windows of additional mixers are displayed.

### 4.15 MANUAL CONTROL



When the boiler is in the Off state, there is a possibility for the controller to manually activate all components such as: pumps, auger motor, cleaning motors, AUX output or variable power control for the exhaust fan. This function enables to check out if given device is being correctly connected or is it ready for operation.



**Note:** Access to manual control menu is possible only in the STAND-BY mode, i.e. when the boiler is OFF.



**Note:** Long-term operation of the fan, the feeder or other working equipment may lead to occurrence of hazardous conditions.

### 4.16 FAVOURITE MENU

In Touch version in the menu bar at the bottom of the screen there is a



button:

Upon activation of this key, a quick selection menu appears. To add new item to this menu - hold respective icon pressed in pie menu for a while.

To remove selected item from favourite menu - hold corresponding icon pressed and confirm REMOVE.

### 4.17 ECOSTER TOUCH

The controller can work together with ecoSTER TOUCH remote control device, which has a built-in room thermostat. This room panel shows useful information such as: fuel level, alarm indication etc.. Visit [www.woodco-energy.com](http://www.woodco-energy.com) for further information.



### 4.18 IGENET

The controller can work together with iGENet 300 internet module. It enables online control and supervision over the controller. Visit [www.woodco-energy.com](http://www.woodco-energy.com) for further information.



## 5. MODE OF OPERATION

The e-Compact 28S is designed for the fully automatic combustion of wood pellets and with the highest safety considerations. During operation the iGEN control system manages the various stages of ignition and run mode in order to achieve the desired water temperatures and specified by the Customer with the highest efficiency and safety. The following sections details the Mode of Operation through a run cycle.

### 5.1 IGNITION

#### Cleaning

The boiler goes through an initial pre-purge stage of the exhaust fan to ensure that any lingering smoke from smouldering fuel in the ash tray of removed from the combustion chamber. The boiler cleaning system also activates to clean the combustion chamber tubes.

#### Pre-Heating

The igniter gun heats up the ignition air or a short period of time before the loading of fuel into the burner. This prevents the fuel smouldering as the ignition air heats up and leads to a cleaner and faster ignition.

#### Pre-Load

The fuel is loaded into the burner by the activation of the auger motor which pushes fuel to the head of the auger where it drop into the burner pot. The quantity of fuel is set by the manufacturer as too much fuel can cause excessive smoking during ignition and too little may result in a failed or delayed ignition.

#### Fixed Ignition

During Fixed Ignition the purpose is to initiate ignition of the fuel. A steady state of underpressure in the combustion chamber is maintained by the exhaust blower which receives speed control information via the vacuum sensor. Ignition should initiate within the first 180 seconds and the flame will be visible through the viewing window in the front of the boiler. Fixed Ignition is set for a 'fixed' time period and after this expires the ignition process transitions to Variable Ignition stage.

#### Variable Ignition

On entering Variable Ignition a flame should be established and during this stage the flame is developed so that an exhaust temperature rise is detected. Variable Ignition has a set time period but if there is an exhaust temperature increase of  $>3^{\circ}\text{C}$  the ignition process transitions immediately to the final ignition stage of Stabilization. If there is not the required temperature rise within the Variable Ignition time then it repeats this stage again and up to a maximum of 3 attempts. The number of ignition attempts can be viewed by the  $\frac{1}{4}$  symbol on the bottom of the screen. After 3 unsuccessful attempts, an alarm 'Failed Ignition Attempt! - Empty Unburned Fuel from the Burner' alarm is displayed. In such case, the boiler operation is stopped. Boiler operation cannot be continued automatically. After resolving the cause of the error to fire-up, the boiler can be restarted.

#### Stabilization

When entering the Stabilization stage it has been confirmed that a flame is established and there is a rise in exhaust temperature so Stabilization develops the flame into a more intense flame during the Stabilization time before entering Run Mode. On entering Stabilisation the igniter is turned off.

### 5.2 RUN MODE

At the beginning of Run mode, the burner works over programmed time with minimal power and after that starts to gradually to increase the power up to reaching the maximum power. The power of the burner will be reduced when the boiler water temperature will be near the level of set temperature.

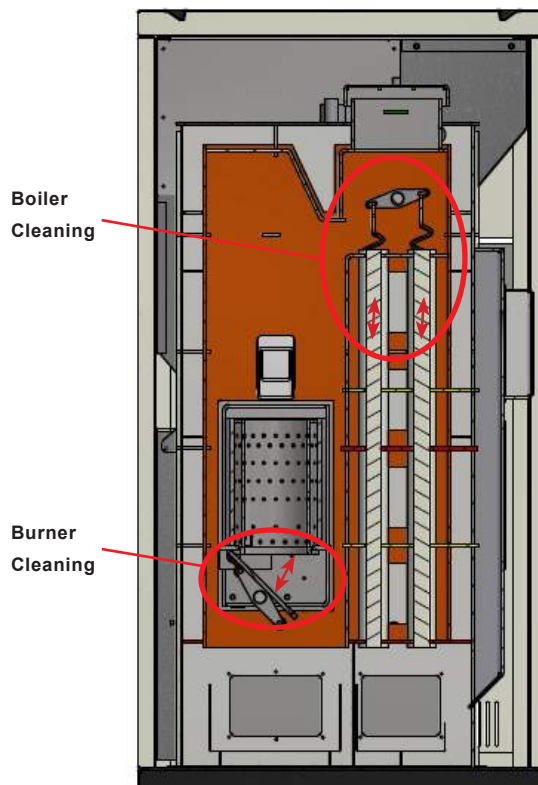
The combustion is regulated with PiD control which manages all fuel feeding, combustion air and modulation based on water temperature and exhaust temperature. On reaching the temperature set by the User the boiler will have modulated to its lowest power level and it will maintain this power up to a  $5^{\circ}\text{C}$  rise over the set point, e.g. if the set point is  $70^{\circ}\text{C}$  the temperature in the boiler can rise to  $75^{\circ}\text{C}$  before it goes to the extinguishing or Burning Off stage.

### 5.3 BURNING OFF

In the BURNING OFF stage the remaining fuel will be burned off and the boiler will be prepared for standby or switching off. The controller stops the fuel feeding and combustion air burns the remaining embers to ash. After the 'Minimum Burning Off' time has elapsed and the exhaust temperature has decreased below the 'Flame Detection Level' the process will enter the Final Cleaning stage.

### 5.4 FINAL CLEANING

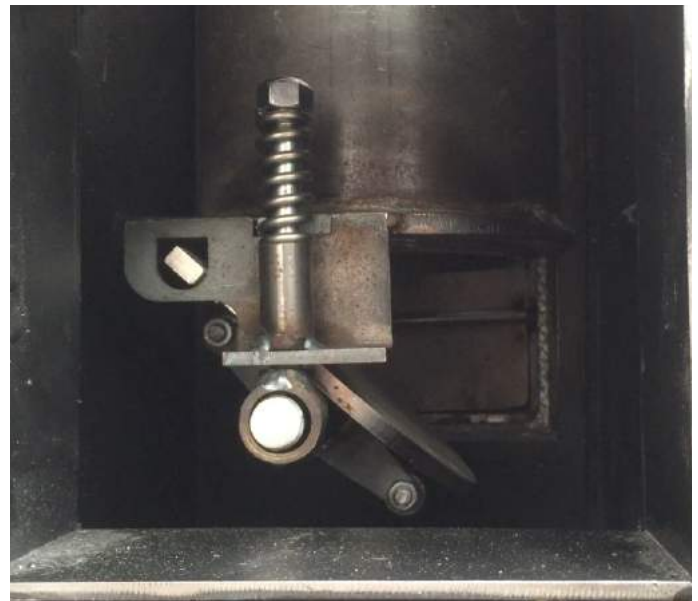
In the Final Cleaning stage the door at the base of the burner will be tilted to allow any ash in the burner to fall into the ash tray. This will repeat a number of times before the door closed fully. The boiler cleaning will also be activated. At the end of Final Cleaning the boiler will stay in a Standby state, if the boiler is in the On position but awaiting a reduction in water temperature before restarting, or it will go to OFF if it has been switched off.



..... MODE OF OPERATION

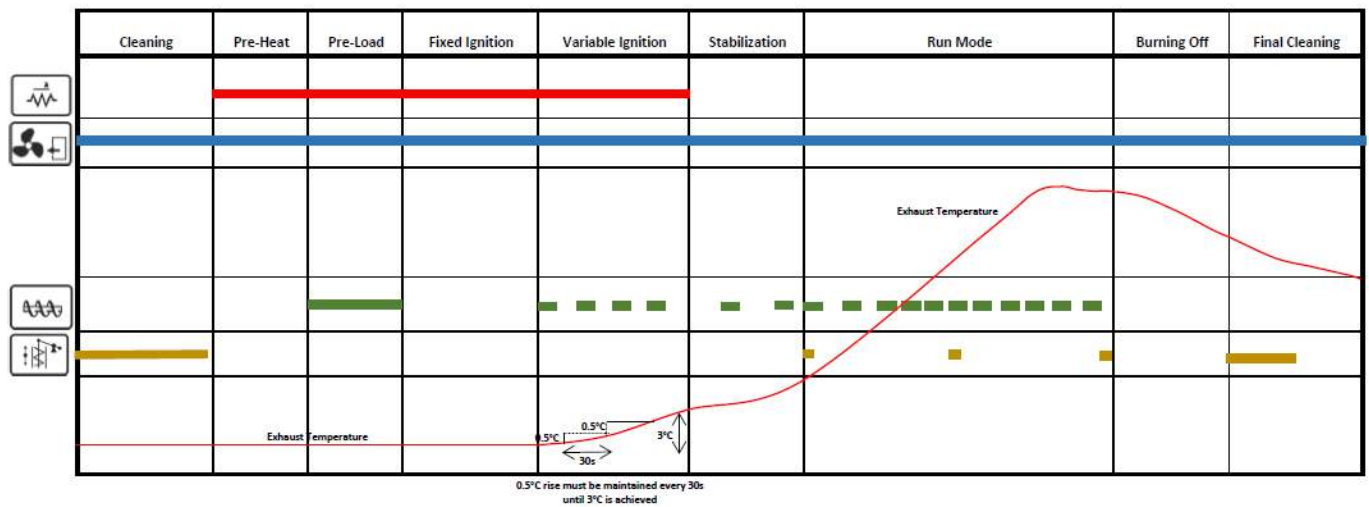


Boiler Heat Exchanger Cleaning

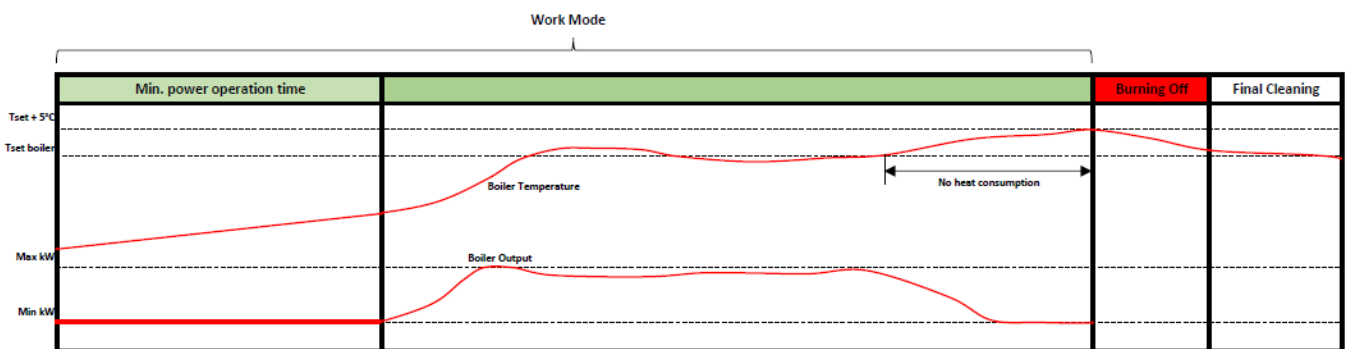


Burner Cleaning

5.5 OPERATION MODE




5.6 MODULATION CYCLE




## 6. INSTALLATION

### 6.1 GENERAL

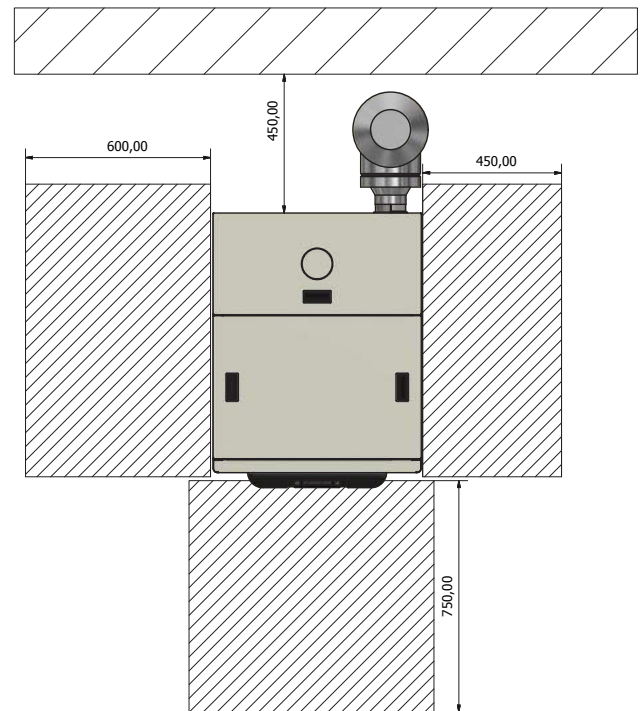
When installation the boiler careful planning should be carried out to ensure that all manufacturers recommendations and local building regulations and bye-laws are complied with. Failure to do so may invalidate the product warranty. Please read this manual carefully and if in doubt on any topic please contact Woodco Technical Support for Guidance.

	Danger
	<p><b>Observe safety and operational instructions!</b></p> <ul style="list-style-type: none"> <li>• Death, injury, damage due to "ignoring" of safety instructions</li> <li>• Strictly read and follow the safety instructions in this manual</li> <li>• Exactly read and follow the operation manual.</li> <li>• Only recommendations detailed in this manual are allow.</li> <li>• Any proposed variation from the recommendations in this manual must be confirmed in writing by WoodCo</li> </ul>

	Danger
	<p><b>Ensure proper planning of the boiler and the fuel storage room!</b></p> <ul style="list-style-type: none"> <li>• Death, injury, damage can result in poor planning and construction of the installation room or fuel storage room</li> <li>• <b>Boiler room:</b> <ul style="list-style-type: none"> <li>» carry out as defined in the given local fire safety regulations</li> <li>» fireproof floor</li> <li>» Ensure sufficient supply of combustion air, according to local regulations</li> <li>» Ensure protection against wet conditions and provide frost-proof</li> <li>» Ensure that the hearth can bear the weight of the boiler when full.</li> <li>» Install a CO alarm</li> </ul> </li> <li>• <b>Fuel storage room:</b> <ul style="list-style-type: none"> <li>» Ensure static weight spread</li> <li>» Protection against moisture, water and dust.</li> <li>» Ensure dust-proof measures</li> <li>» Ensure easy access and easy refill of the fuel storage room</li> <li>» Safety devices according to local</li> <li>» Install a CO alarm</li> </ul> </li> </ul>

### 6.2 BOILER ROOM CLEARANCES

To ensure unhindered operation and maintenance of the heating system, you must ensure that the heating system is installed to our specifications and that the minimum spacings are maintained. We recommend that objects which are not needed for the operation or maintenance of the heating system not be stored in the boiler room.



Installation / Service Clearances

Term	Value	Unit
Front	750	mm
Rear	450	mm
Left Side	600	mm
Right Side	450	kgs

### 6.3 CHIMNEY

According to EN 303-5, the entire flue system must be installed in such a way that contamination, condensation and insufficient flue draught are avoided. The benefits of the E-Compact 28S can only be reaped if all of the factors necessary for good combustion are carefully adjusted. The heating system and chimney form a single functional unit and must be adapted to one another in order to guarantee fault-free and economical operation.

Since the flue temperature may stabilize below 100°C when the system is partially loaded, a chimney/flue is required which meets the requirements of EN 13384-1: 2003-03 "Thermal and fluid dynamic calculation methods". If it does not meet this standard, contact your specialist heating company or chimney technician.



When planning the flue system, a flue calculation based on DIN EN 13384-1 must be performed by authorised specialists.

Another essential criterion is meeting the flue draught requirement. This depends on three major factors. The requirements for minimising the draught loss in the chimney are:

- Good thermal insulation to avoid the flue gases cooling down too quickly.
- Smooth interior surface to reduce the flow resistance.





## .... INSTALLATION

- Chimney well-sealed to avoid outside air leaking in. Air penetrating from the outside speeds up the cooling of the flue gases.

These requirements correspond to chimneys of the type according to DIN EN 13384-1: 2003-03 "Thermal and fluid dynamic calculation methods".

Free-standing chimneys require particularly good insulation.

The system may only be connected to a chimney which has been dimensioned in accordance with DIN EN 13384-1, taking into account the fuel planned and the expected load, and which meets local building regulations for the installation site.

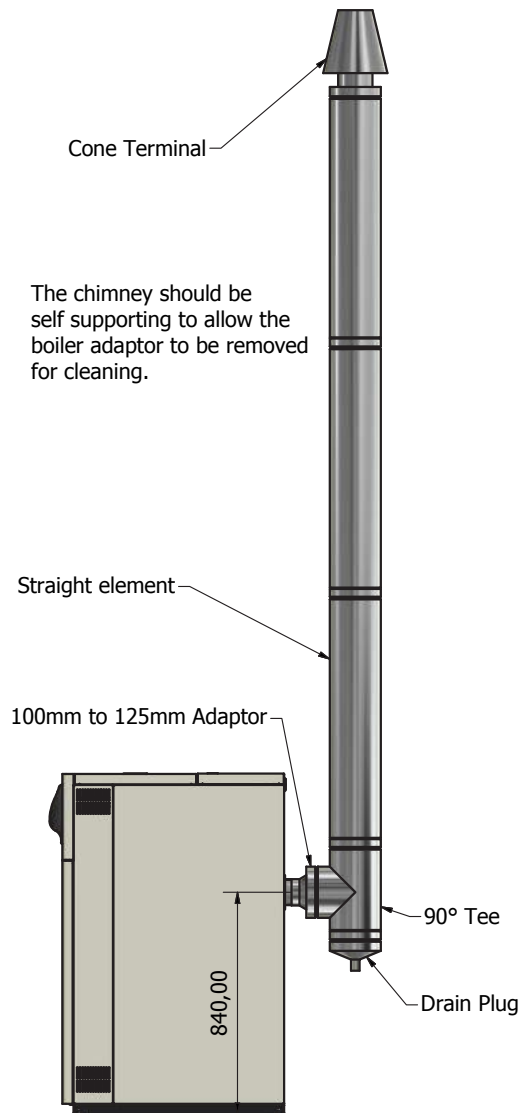
- A chimney can only be designed with full knowledge of the on-site conditions. This includes taking into account the following factors:
- Location of the house
  - Surrounding hills/slopes
  - Wind direction
- Location of the chimney in the roof
  - The opening of the chimney must be at least 0.5 m above the highest edge of roofs with a slope of more than 20° or at least 1.0 m higher than roof surfaces which slope at 20° or less.
- The effective height of a chimney is measured from the entrance into the flue to the end of the chimney.

The boiler must be connected to the flue with a connecting piece which is as short as possible, at an angle which is less than 30-45° to the chimney. If a 90 degree tee must be used then the horizontal section must be < 250mm from the boiler adaptor to the tee. In other cases you should aim for a connecting piece with a maximum length of 1 m using just one fitting. Every additional fitting results in a greater pressure loss in the exhaust path and should thus be avoided. The same is true for over long connecting pieces. If, for constructional reasons, they have to be longer than 1 m, they should be adequately insulated (at least 5 cm of mineral wool or equivalent material) and, if possible, should be fitted with an upward inclination.

In extreme cases it may be necessary to install a draft stabilizer / explosion flap. On exposed site where there may be extreme wind gusts which can cause excessive under pressure in the combustion chamber a draft stabilizer will allow ambient air from the room into the chimney instead of drawing gases from the boiler. Fit a draft stabilizer is fitted it should be installed as per manufacturers instruction and set correctly to 10Pa.

An explosion flap can prevent boiler damage if volatile gases in the gases catch fire and cause an explosion. Any increase in pressure is released through the flap preventing excess pressure in the boiler chamber.

Data for correct sizing of chimney system		
Nominal Power	kW	25
Reduced Power	kW	5
Exhaust Temperature	°C	140
CO2	%	12.5
Exhaust mass flow	m/s	5
Minimum draft (cold)	Pa	5
Flue draft max.	Pa	10
Chimney internal diameter	mm	125



Typical Chimney Arrangement

## 6.4 HYDRAULIC INSTALLATION

There are hydraulic solutions for every application. The hydraulic systems illustrated in this section are only shown in schematic form. They serve as an overview and planning aid. For the actual installation of the hydraulic system, further components are needed that are not shown here.


The safe installation of the hydraulic system must be performed according to EN 12828 or the relevant local standards and directives.

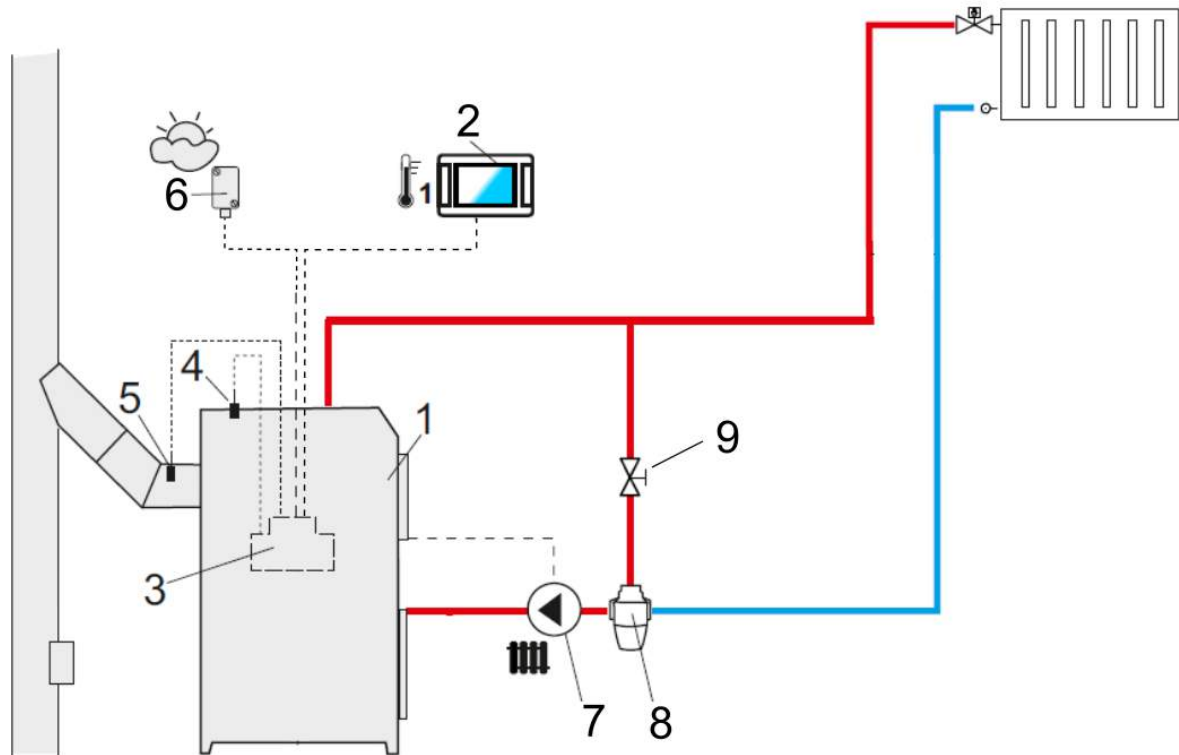
The heating system must be filled with water in accordance with VDI guideline 2035, "Avoiding damage in hot water heating systems".

The diaphragm expansion vessel must be constructed in accordance with EN 13831 "Closed expansion vessels with built-in diaphragm for integration in water installations".

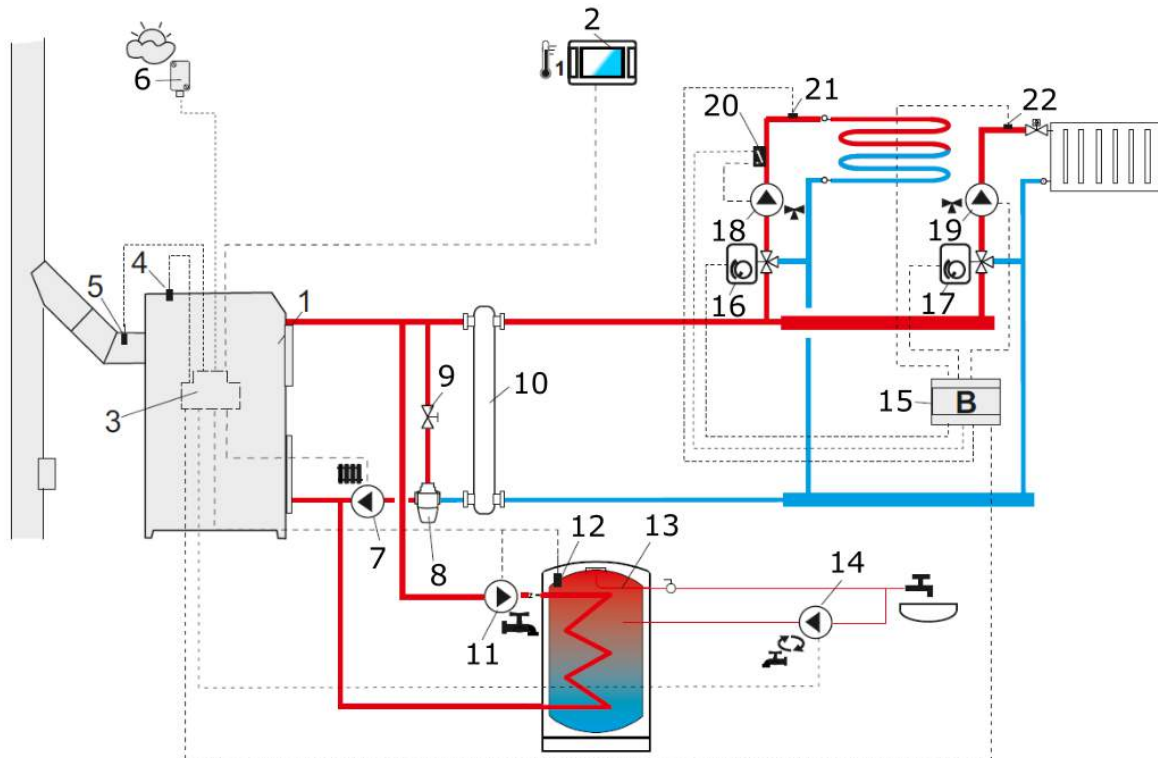
Before putting the system into operation, the pressure of the diaphragm expansion vessel must be adjusted for the conditions in the heating system and in the building.

..... INSTALLATION

 The presented hydraulic diagrams do not replace central heating engineering design and may be used for information purposes only!



**Scheme A - Single heating circuit installation :** 1 – boiler, 2 – ecoSTER TOUCH Room Control Panel, 3 – iGEN controller-module A, 4 – boiler temperature sensor , 5 – exhaust temperature sensor, 6 - out-door weather sensor, 7 – CH pump, 8 –thermostatic 3-way valve for return protection, 9 – valve.

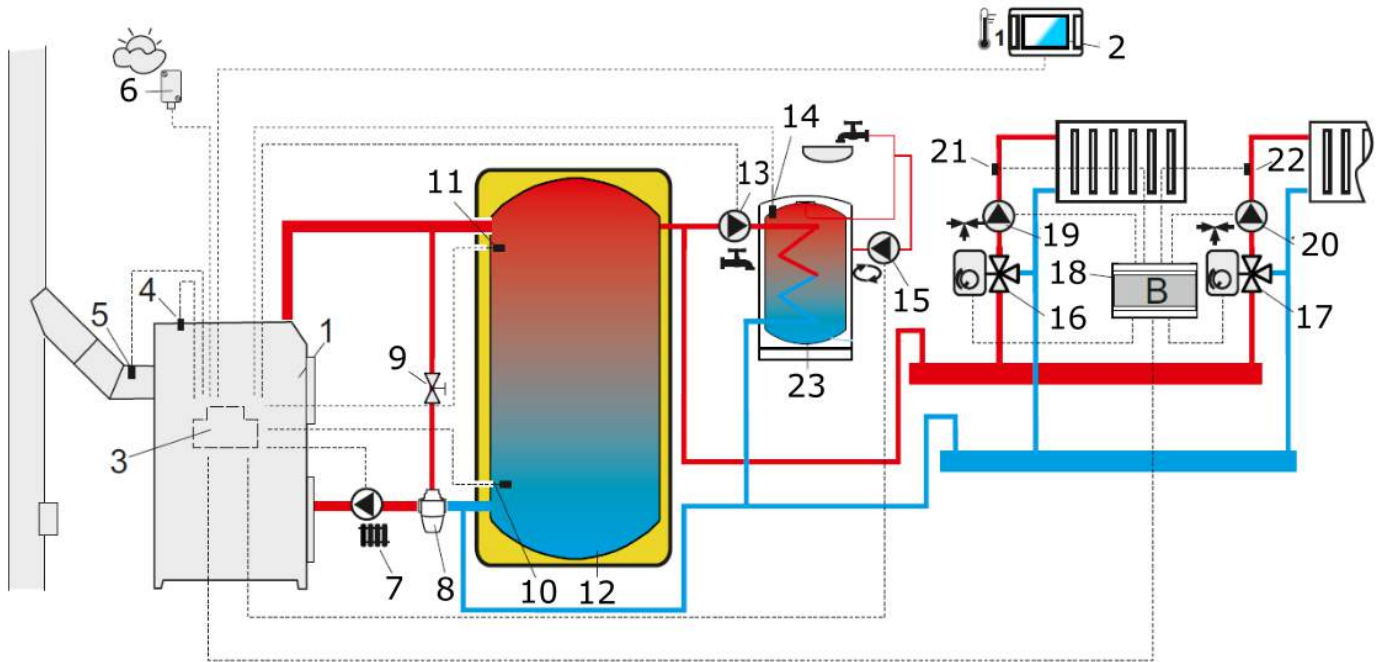


**Scheme B - System with DHW tank, hydraulic clutch and two adjustable heating circuits:** 1..9 – as in Scheme A, 10- hydraulic clutch, 11 – DHW pump, 12 – DHW temperature sensor, 13 – DHW tank, 14 – circulation pump, 15 – additional module B, 16,17 –a 3-way valve actuator, 18,19 – mixer pump, 20 – return sensor temp., 21,22 – mixer temp. sensor.





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**Scheme C with heat buffer, DHW tank and two adjustable heating circuits:** 1..9 – as in Scheme A, 10/11 – lower/upper sensor of buffer temperature, 12 – heat buffer, 13 – DHW pump, 14 – DHW temp. sensor, 15 – circulation pump, 16,17 – a 3-way mixing valve with actuator, 18 – additional module B, 19,20 – mixer pump, 21,22 – mixer temp. sensor, 23 – DHW tank.

After putting the system into operation, heat up the system to the maximum boiler temperature and bleed air from the system again to make sure that there are no air pockets.

The safety devices must be implemented in accordance with EN 12828 "Heating systems in buildings" and the correspondingly harmonised national standard DIN 4751, Part 2 "Closed, thermostatically safeguarded heat generating systems with supply temperatures of up to 120 °C; safety equipment".



It is the responsibility of the installer to ensure that adequate heat dissipation measures are employed to prevent overheating. Also the size of an expansion vessel must be sufficient to provide the necessary system expansion to prevent stress on the heat exchanger jacket. Failure to do so will invalidate your warranty.



Flow connection from boiler. 1"/DN25



Return connection to boiler via 1"/ DN25 pump valve.

	<b>CAUTION</b>
	<p><b><u>Corrosion in the boiler through condensation!</u></b>  <b>Damage of the system through aggressive condensate.</b>                  •Install back end protection properly and according to hydraulic scheme.</p>


If the boiler drops under the dew-point, condensation is produced within the boiler. This, in combination with particulates from the combustion process leads to the production of aggressive condensate in the boiler which can cause rusting and degrade the boiler integrity. For correct operation of the 3-way mixing valve, as long as the heating water return is under the minimum return temperature of the boiler, an mixture of the flow takes place to raise the return water temperature and prevent condensation. For further information on back end protection devices please contact WoodCo Energy for advice.

	<b>IMPORTANT</b>
	<p><b><u>The pressure relief valve (PRV) discharge pipe must be directed towards the floor to prevent scalding.</u></b></p>

..... INSTALLATION

6.5 ELECTRICAL INSTALLATION

The directives of 2006/95/EC (low voltage guidelines) must be followed for the electrical connections to the system. No electrical installations, such as power sockets, distribution boxes, lights or light switches may be located in the fuel bunker. Any lights must be suitable for use in areas at risk of explosion. The VDE regulations for rooms with a risk of dust explosion must be followed.

	<b>IMPORTANT</b>
	<p><b>To operate the heating system safely and properly we recommend protecting the electronic components with a lightning and surge protection according to EN 62305 or DIN VDE 0100-443. Please contact your specialist electrical service.</b></p>

If using an outside temperature sensor should be affixed about one third of the way up the building (at least 2 m from the ground) on the coldest side of the building (north or northeast). When installing the sensor, you should take into account sources of heat which might falsify the result of the measurement (chimneys, warm air from air shafts, direct sunlight, etc.). The cable outlet must always point down to avoid moisture penetration. For the electrical installation, a cable with the designation JYSTY 2 x 2 x 0.6 mm2 with a maximum length of 50 m should be used.

The heating circuit temperature sensor serves to measure the supply temperature for heating circuits controlled by mixers (if applicable). The sensor should be installed at a distance of approx. 30 cm after the circulation pump on a bright metal part of the supply line.

The temperature sensors for the buffer tank are immersion sensors with a moulded cable and serve to measure the temperature of the accumulator and the hot water tank.

If the ecoSTER indoor thermostat is being used, the preset room temperature can be altered by 2-3 °C. A touch screen selection allows the operating status for each heating circuit to be changed. Before installing the indoor thermostat unit, a suitable location must first be found. To ensure that only the actual room temperature is measured, this site may not be in an area where sunlight falls, where there's a draft, a radiator, a chimney etc. In addition, it should be attached to an interior wall. The most appropriate room is the room where the inhabitants spend the most time (e.g. living or dining room). This room should not have any other source of heat in operation (e.g. tiled stove). If there are thermostatic valves on the radiators, these must be set higher than the room temperature in the control system. Otherwise, the indoor thermostat unit will be affected. This would distort the supply to the heating circuit and all other rooms would become too warm. In all of the other rooms however, thermostatic radiator valves must be fitted.

Data for electrical connection	
Voltage	230v
Frequency	50 Hz
Backup Fuse	10A
Electrical Load during Ignition	7A
Electrical Load in Standby	0.4A

The electrical panel on the E-Compact 28S provides easy connection of the mains cable into the terminal shown below. Terminals are also provided if an external auger is being used to automatically fill the boiler hopper with fuel.

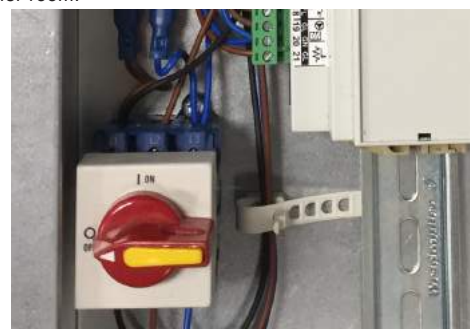


Electrical Terminals	
1	Permanent Live 230v
2	Controlling Live 230v
3	Neutral
4	Ground / Earth
5	External Auger Live 230v
6	External Auger Neutral
7	External Auger Ground/Earth

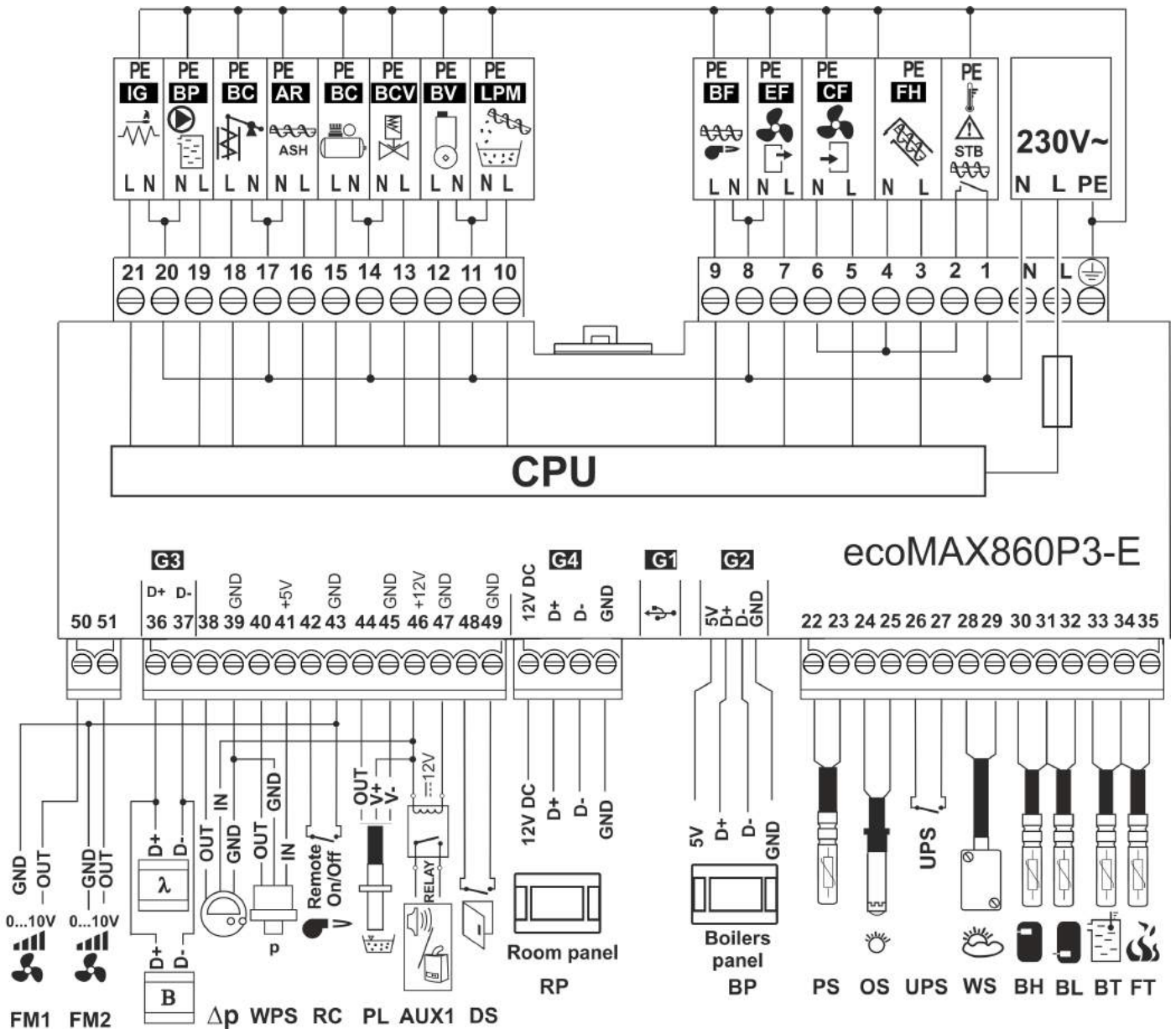
**i** Important : If the boiler is being controller by a non-voltage switching contact, the contacts can be directly connected to terminals 42-43 on the IGEN control module A. If the boiler operation is being managed by buffer tank sensors then you can leave the control terminal 2 unconnected.

**NEVER CONNECT MAINS VOLTAGE TO PINS 42-43 ON THE IGEN CONTROL MODULE**

A mains isolation switch is provided to isolate power during servicing / maintenance. A separate mains isolator should be provided outside of the boiler room.



..... INSTALLATION



iGEN Control Module Connections for E-Compact 28S

PE/L/N	Mains	28-29	Weather Sensor
1-2	High Limit Thermostat	30-31	Buffer High Level Sensor
3-4	Feed Auger	31-32	Buffer Low Level Sensor
7-8	Exhaust Fan	33-34	Boiler Temperature Sensor
10-11	External Filling Auger	34-35	Exhaust Temperature Sensor
13-14	Burner cleaning Motor	36-37	Lambda / Module B
17-18	Boiler Cleaning Motor	38-39-46	Vacuum Sensor
19-20	Boiler Pump	39-41-42	Water Pressure Sensor
20-21	Igniter (via relay)	42-43	Remote Control (via relay)
22-23	Fuel Pipe Temperature	44-45-46	Pellet Level Sensor
26-27	Burner Cleaning Reference Switch	G4	ecoSTER Room Panel



## ..... INSTALLATION

### 6.6 SCOPE OF SUPPLY

The E-Compact 28S is a fully integrated biomass boiler which contains the boiler module, burner, fuel hopper and feeder and electrical panel within a single unit. Your boiler should be delivered with the following items packed within the boiler enclosure :

#### Items packed within the boiler

CH Pump

Pump Valve

Chimney Adaptor c/w gasket

2 x Buffer probes


Manual pack.

If any of these items are missing upon delivery please notify WoodCo Energy immediately. Likewise if there is any damage WoodCo Energy must be notified within 7 days or we retain the right to refuse replacement.

### 6.7 INSTALLATION STEPS

1. Remove crate and packaging from around boiler and dispose of in an environmentally sensitive manner.
2. Move the boiler into the boiler room and remove the securing brackets securing the boiler to the wooden pallet.
3. Move the boiler from the pallet, taking care not to damage the surrounding painted panels, and position in its final location.
4. Fit the chimney adaptor and gasket and place the flue spigot over the chimney adaptor. Construct the flue as detailed in this manual.
5. Fit the central heating pump to the pump valve fitted to the return connection on the boiler (ensure you use the rubber sealing rings provided).
6. Fit the loose pump valve supplied to the other side of the pump and complete the return connection onto the valve. It is recommended that a filling point is added to the return pipework.
7. Connect the flow connection to the male threaded adaptor.
8. Pipe the blow off from the PRV (pressure relief valve) towards the floor.
9. Check that all connections on the boiler are sealed and secure.
10. The boiler and heating system should be flushed to ensure the removal of any debris from the heating circuit.
11. If the boiler is installed on a sealed system check the charge pressure of the expansion tank and adjust accordingly. It should not be less than the static head at the boiler.
12. Fill the heating system and boiler and observe for leaks around the connections on the boiler.
13. Make sure the system is fully vented.
14. Connect mains power to the electrical panel. Connect the control live 230v (if applicable). If a room thermostat with volt free contacts

is being used these contacts can be connected directly to pins, 42-43.

15. Leave the mains power isolated until all necessary checks have been completed to ensure that cables are tied away from any potential heating surfaces.
16. Fill the hopper with fuel to the height of the guard mesh.
17. Once the chimney, hydraulic connections and electrical connection have been made the power may be turned on by rotating the isolation switch on the boiler.
18. The touch screen display will illuminate and message 'Boiler Locked - Enter Unlock Password'. WoodCo Energy will only issue password to trained engineers on WoodCo products. Contact WoodCo Energy Technical Support for assistance.
19. Once the boiler is unlocked, enter manual mode  and activate each of the components individually to ensure **t h e i r** correct operation.
20. In Manual mode the auger can be primed to fill the auger with fuel. Keep the auger running until you can see fuel dropping into the burner pot through the viewing window of the combustion chamber. Leave running for 30 seconds after the first pellets start falling then stop.
21. Activate the burner cleaning door to allow the fuel to fall into the ash container.
22. Remove the pellets from the ash container.
23. Run the central heating pump in manual mode to assist in venting the heating system and getting rid of any air.
24. Your boiler is now ready for commissioning.







## 7. COMMISSIONING.

The heating system will initially be commissioned by specialists from WoodCo Energy or an authorised WIN (Woodco Installer Network) partner.


The commissioning includes an introduction to the operation and maintenance of the heating system as well as performing measurements on the system to determine exhaust emissions and firing performance. Commissioning is covered in a separate document reserved for trained engineers and is beyond the scope of this manual.

	<b>Danger</b>
	<p><b>Material damage and injury due to incorrect commissioning</b></p> <p>Commissioning the system requires comprehensive expertise. If this commissioning is done by an untrained person, the heating system could be damaged.</p> <p>Only allow authorised specialists to perform the commissioning.</p>
	<b>IMPORTANT</b>
	<p><b>The Commissioning must be carried out by a technician with a WoodCo Energy training certificate. The completed commissioning report must be sent back within 10 days after commissioning, otherwise the warranty is voided . A copy remains in the commissioning book on-site.</b></p>

## 8. MAINTENANCE

To ensure fault-free and safe operation, certain cleaning and maintenance work is necessary. This effort will also help you avoid expensive repairs, provided you observe the recommended intervals.

The cleaning and maintenance work can also be performed by an authorised specialist heating company through a servicing contract.


 Only use genuine WoodCo spare parts. You can obtain WoodCo replacement parts from your specialist heating company.

There are several areas where cleaning of the boiler and maintenance can be carried out. The viewing window of the combustion chamber can be removed and through here the combustion chamber surfaces can be cleaned with a brush. The inner tube of the burner can also be easily withdrawn through this opening for cleaning. The ash pan is the most used part of the boiler for cleaning. Frequent removal of ash maintains the combustion chamber in an ash free state without the risk of high ash level obstructing the burner cleaning door. Between the ash tray area and the viewing window is located a third cleaning door. Through this area the burner flap door can be cleaned of any hard carbon deposits which may have lodged onto the door.

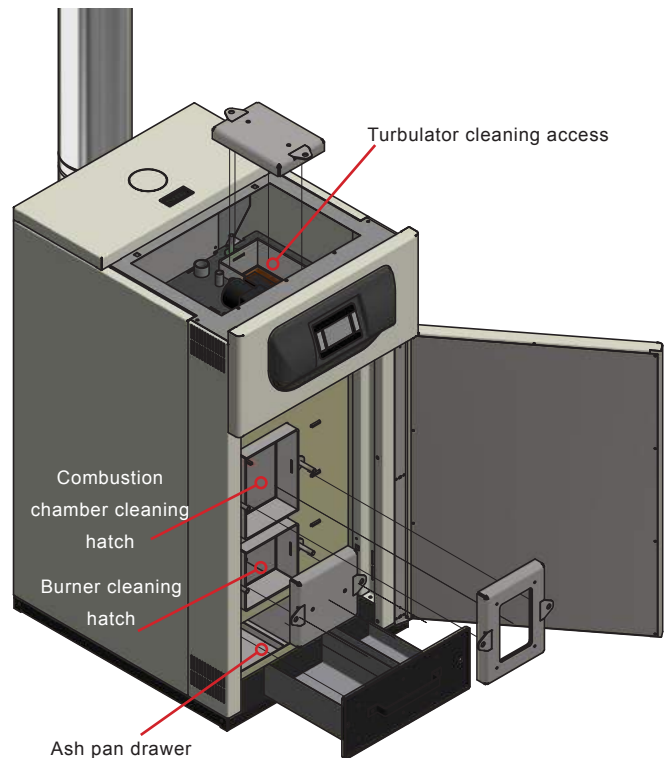
The secondary pass area which contains the turbulators in the heat exchanger pipes is accessible on the top of the boiler. The turbulator assembly can be removed during the less frequency service checks by removing the clamping bolts and withdrawing the assembly. The heat exchanger tubes should be then cleaned with a coarse pipe brush.

All components should be run in manual mode to check that they haven't

become loose during operation and requires adjustment. Once all cleaning and component checks have been carried out and the inspection covers replaced then the boiler may be re-used.

 The Information Menu on the controller will also provide information on when a service is due and will give frequent alerts on the display when ash needs to be removed.

Check in to the [www.woodco-energy.com](http://www.woodco-energy.com) website for the latest information and video series on routine maintenance and cleaning.



Service Intervals	
Weekly	<ul style="list-style-type: none"> <li>• Empty ash drawer</li> <li>• Check burner cleaning door</li> <li>• Clean glass on viewing window</li> </ul>
Monthly	<ul style="list-style-type: none"> <li>• Removal of burner pot and ensure all air holes are clear.</li> <li>• Clean down all heat exchanger surfaces.</li> <li>• Clean vertical and horizontal flue transition on the side of the boiler.</li> <li>• Clean exhaust temperature probe.</li> <li>• Clean dust from inside boiler casing panels and under fuel hopper.</li> </ul>
Half yearly	<ul style="list-style-type: none"> <li>• Removal of turbulator cleaning system</li> <li>• Clean exhaust fan</li> <li>• Clean flue transition to chimney.</li> <li>• Drain any condensate from chimney.</li> <li>• Clean chimney</li> <li>• Clear vacuum sensor hose</li> </ul>
Yearly	<ul style="list-style-type: none"> <li>• Removal of exhaust fan</li> <li>• Empty of boiler hopper and removal of all dust.</li> <li>• Removal of Igniter and replacement of electrical resistance.</li> <li>• Cleaning of air intake duct of dust / debris.</li> <li>• Return service report to WoodCo Energy to maintain warranty. WoodCo will provide the service engineer with a reset code to reset the service counter.</li> </ul>
Every second fill	<ul style="list-style-type: none"> <li>• Removal of dust from base of fuel bunker.</li> </ul>

## 9 TROUBLESHOOTING

Alarms	
Maximum boiler temperature exceeded	Boiler temperature has exceeded 95C. The controller will try to lower the temperature by directing overheated water to the DHW tank and also by opening mixer actuators (only when Mixer Support = CH On). When the temperature, measured by DHW sensor, will exceed the value of Maximum DHW temperature then the DHW pump will be shut down in order to protect the users against scalding. If the boiler temperature decreases the controller will return to its normal operation. However if the temperature will continue to increase (and it will reach 95 °C) a constant alarm of boiler overheating and corresponding signalling sound will be activated. <b>Possible cause</b> Poor circulation from the boiler. Check that water is circulating through the pump and that all valves and mixer valves are open.
Maximum burner temperature exceeded	This alarm occurs when the maximum temperature at the fuel feed drop pipe is exceeded. This alarm occurrence will result in shutting down the burner operation until the reason for causing this alarm is found. <b>Possible cause</b> Insufficient draft. Check chimney for blockage. Check vacuum sensor tube for blockage. May occur in down-draft conditions and it may be necessary to modify the chimney.
Boiler temperature sensor damage	The alarm occurs when damage to the boiler temperature sensor, and after exceeding its measuring range. Check the sensor, and possibly replace.
Burner temperature sensor damage	The alarm occurs when damage to the burner temperature sensor, and after exceeding its measuring range.
Exhaust temperature sensor damage	The alarm occurs when damage to the exhaust temperature sensor, and after exceeding its measuring range.
Exhaust temperature not achieved. Check the fuel quality	This alarm will occur, when during the rising of exhaust temperature, there will be a failure of heating up the exhaust above the temperature of lack of fuel alarm level. This alarm feature prevents from covering the burner with unburned fuel. It will be necessary to check the quality and moisture of the fuel.
Failed Ignition Attempt	This alarm will occur after third unsuccessful of automatic ignition inside the burner. This alarm can be caused by malfunction of the igniter or fan, failure of fuel feeding system, incorrect parameter setting, low quality of the fuel or insufficient fuel level. Always check the burner for unburned fuel before resetting the error.
Water Safety Thermostat Activated or Drop Feed Safety Thermostat Activated	This alarm will occur after activation of independent safety thermostatic device (STB), which protects the boiler against overheating. In this case the burner will shut down.
Lack of communication	The control panel is being linked with the rest of the electronics with RS485 digital communication link. In case a cable for this link is damaged, an alarm will occur on the screen with the information "Attention! No communication". The controller doesn't stop to operate and works normally with before preset parameters. It is necessary to check the connection cable between control panel and the module and replaced it with a new one or repair it.
Unsuccessful attempt of hopper loading	This alarm informs about unsuccessful attempt of adding fuel from additional fuel silo to boiler hopper. In case, when during preset time of hopper loading, a sensor in this hopper will not detect the increase of fuel level, this alarm will occur. This signal does not shut down boiler automatic operation.
Vacuum sensor damage	This alarm will occur during malfunction of the underpressure sensor. Through the setting of min/max range of the underpressure on the 0 value, there is a possibility to continuous operation without this sensor until arrival of the maintenance team.
Low/High draft level	This alarm will occur with exceeding the set value of min/max underpressure.
Low water pressure	Ensure the heating system and boiler are full before switching on power to the controller. Attention, do not to exceed maximum permitted pressure level in case the sensor becomes damaged.
High water pressure	Release pressure from the heating system. Attention, do not to exceed maximum permitted pressure level in case the sensor becomes damaged.
Water pressure sensor damage	This alarm will occur when the water pressure sensor will be damaged. Through setting min/max range of the pressure on the 0 value there is a possibility for continuous operation without this sensor till arrival of the maintenance team.
Burner cleaning mechanism blocked	This error will occur if the burner door does not close to engage the proximity switch. Check that the door is closed or that there is not an obstructions. Check the adjustment of the proximity switch.



## 10 WARRANTY / GUARANTEE

### 10.1 WARRANTY PERIOD

The manufacturer offers the following warranties on this appliance :

- Leaks in the heat exchanger –5 years
- Faulty electrical components (motors, fan, controller) –2 years
- Pump, Ignition Element –1 year

from the date of first ignition of the appliance as proved by a valid Commissioning Report which gives 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 installer according to the detailed instructions 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.

### 10.2 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 parts will be guaranteed for the remainder of the guarantee period starting from the date of commissioning of the product.

### 10.3 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 inappropriately sized expansion vessel) or electrical system failure. 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 requirements for the flue installation, particularly in relation to draft, 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.

**Any consequential loss or damage caused by the failure of a component on this product is not covered.**

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

Damage caused by 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.

To maintain the warranty the boiler must be serviced in accordance with manufacturer's instructions and a copy of the service report returned to the manufacturer every year. Failure to do so will mean the warranty on parts

will default to 1 year.

The manufacturer reserves the right to change the specification of the product without notice.

#### CLAIMS UNDER THE GUARANTEE

The request for action under the guarantee must be addressed to the Dealer/Retailer, who will forward the claim to manufacturer's technical assistance service. On receipt of a claim under the guarantee our service team will check that the required records, i.e. commissioning report, service reports are in order before processing the claim, The guarantee is deemed to be invalid if the manufacturer has not received the necessary documentation.

THE MANUFACTURER DECLARES THAT THE APPLIANCE WHICH YOU HAVE PURCHASED COMPLIES WITH EEC DIRECTIVE 2004/108/EC AND 2006/95/EC AND SUCCESSIVE AMENDMENTS





WoodCo Energy SA,  
Rte de Courgenay 38,  
Porrentruy 2900,  
SUISSE

WoodCo Energy Ireland,  
Unit D Cahir Business park,  
Cahir,  
Co. Tipperary,  
Ireland.

[www.woodco-energy.com](http://www.woodco-energy.com)

