

# WOODCO

Heat and Power

## E-COMPACT TWIST<sup>®</sup> 25 – 100kW HE Condensing Pellet Boiler



### INSTALLATION, OPERATION AND MAINTENANCE MANUAL

Please read these instructions carefully before installing and/or lighting the appliance for the first time.  
Keep this document near the appliance, in a place which can easily be reached.

UIN-UK201505.06

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## 0. INTRODUCTION

Dear customer,

The product you have chosen is a biomass boiler with condensation technology, that is, one of the most efficient boilers - with least emissions - in the market.

This boiler can work at seasonal performances surpassing 103% efficiency, while high class biomass boilers work up to 95%, and mid class appliances barely reach 91% efficiency.

### Condensation technology

During the combustion process, steam is released from the moisture contained in pellet.

Condensing boilers exploit the latent heat of vaporization (change of state heat) condensing the steam from the flue gas and transferring this heat to the water circuit of the boiler. That is, they take advantage of a heat that would otherwise be lost along with the flue gases through the chimney.

As a result, flue gas temperature is below 50°C under condensation conditions, and below 70°C under non-condensing. In the case of conventional boilers, flue gas temperature is usually between 120°C and 200°C.

Condensation happens when flue gas reach a temperature below the so-called “dew point”.

The pellet dew point is around 45°C, and the boiler’s efficiency is above 100% then this event takes place.

The return temperature of a heating circuit depends on the chosen system:




Heating systems	Usual return temperatures
Radiators	60°C
Low temperature radiators	40°C - 50°C
Floor heating	30°C - 35°C

This return temperature must be between 30°C and 40°C for the flue gas to reach the dew point.

To do this, condensing boilers have a stainless steel heat exchanger, with a larger heat exchange surface, for enabling it to transfer as much heat as possible from the boiler's combustion chamber into usable heat. For this reason, even when working in a non-condensing temperature range, **the boiler performance will always be higher than a conventional**, that is, a non-condensing boiler, because of its larger heat-transfer surface.




This boiler complies with current regulations and has been tested in external laboratories accredited for certifying this type of product.

Installation of the boiler, checking and maintenance should be carried out by authorised personnel.











 	
Wood pellet condensing boiler	
Class 5 (EN-303-5:2012)	
 Fuel type:	Wood pellets Ø 6 mm EN-Plus A1 (EN-14961-2)








## 1. GENERAL AND SAFETY INFORMATION

### 1.1. SYMBOLS USED IN THIS MANUAL

 <b>WARNING</b>	<b>Indications identified with this warning sign are essential for a proper running of the boiler.</b>
 <b>DANGER</b>	<b>Indications identified with this danger sign warn of potential hazards identified for the integrity of people and things.</b>
 <b>SUGGESTED USE</b>	<b>Indications identified with this sign show suggestions at installation and running.</b>

### 1.2. SAFETY INSTRUCTIONS.

 Keep this manual near the appliance throughout its useful life.
 Before any operation, read the indications contained in this document. This manual holds important information regarding use and maintenance of the boiler.
 In case of any doubt, contact with your installer, dealer or Service Agent authorised by WES.
 Installation and maintenance must be carried out in accordance with the current local regulations and the instructions contained in this booklet, and should be performed by accredited and qualified personnel, as required by current regulations.
 Improper installation or faulty maintenance can cause harm to people, animals or property. In such cases, the manufacturer is absolved from any civil or criminal responsibility.
 This appliance is only intended for being used in heating systems and indirect production of domestic hot water. Any other use may cause harm to people, animals or property.
 The running of the boiler should be done in accordance with the local and national regulations as well as European standards.
 The appliance should be installed inside technical rooms. It is not designed to work outdoors.
 Boiler room must meet the regulations in force.
 During installation and running of the appliance, keep children at a safe distance from it.

-  After a long period of shutdown, check the absence of blocking prior to the ignition.
-  This appliance should not be used as an incinerator. Use only the fuel specified in this booklet.
-  The Commissioning of this appliance must be carried out by an Authorised Service Agent. This is an essential condition for the keeping the warranty of this appliance.
-  In order to improve the product, specifications are subject to change without notice.
-  This boiler is an electrical appliance. Before carrying out any work inside the boiler, make sure that it is isolated from the mains electricity supply.
-  The combustion chamber must always remain closed when the appliance is running. Under no circumstances should be the door opened when there is a flame inside. Risk of burns and fire.
-  WES refuses to accept any responsibility in the event that the appliance or any accessory has been improperly used or modified without authorisation.  
For all replacement of parts, only original WES spare parts must be used.

## 2. TECHNICAL FEATURES OF THE E-COMPACT TWIST BOILERS

### 2.1. GENERAL DESCRIPTION OF THE BCH BOILERS

E-COMPACT TWIST 25/30/35/45/50/70/100 are condensing biomass boilers which use as fuel ENplus-A1 pellets only.

This appliance consists of a boiler body and an underfed pellet burner. The burner can be fitted to the right of the boiler or left, upon request.

The boiler body is constructed of sheet steel, stainless steel and corrosion resistant materials throughout the flue gas circuit as well as all parts that may be in contact with condensate. Combustion chamber is cylindrical and the flue pipes are arranged concentrically around this chamber.

At the rear of the boiler there are placed hydraulic connections (flow, return, drain and water cleaning jets), as well as flue gas pipe and condensate drain. The condensate discharges through a drain at the bottom of the boiler, where a water trap is installed (*see section 5.-Hydraulic Installation*)

The boiler includes an automatic cleaning system of the burner plate, which wipes ashes onto a manually removable ash drawer. It also includes an automatic water jet system for cleaning the heat exchanger flue gas pipes.

Pellet is fed from an external hopper/silo through an auger.

The boiler is commanded by a pre-programmed electronic board that allows a fully automated performance. The following safety and control devices are also supplied:

- Combustion chamber temperature probe. When it reaches 890°C the boiler enters in blocking mode.
- Mechanical safety thermostat. When it reaches 105°C the boiler disconnects auger feeding.
- Water temperature probe. When it reaches 100°C, the boiler enters in blocking mode.
- Water pressure probe. When preset low/high pressure is reached, the boiler enters in blocking mode.
- Combustion chamber differential pressure sensor. When preset low/high depression is reached, the boiler enters in blocking mode.

- Fire/smoke damper actuator. Spring-return actuator which tightly closes pellet feeding.
- Snap disc thermostat in pellet feed pipe. Close the damper actuator if the temperature of the feed tube pellet reaches 80°C.
- Temperature sensor in the smoke box. Blocks if it reaches 100°C.
- For safety, provided that the boiler temperature is greater than 72 ° C, the output of the boiler which controls the circulating pump is activated.

## 2.2. DESCRIPTION OF BOILER OPERATION.



During normal operation, most of the surfaces of the appliance are hot.  
Take the appropriate precautions.

Fuel (pellet) enters onto the burn plate from below through an auger driven by a gear motor. Pellet is fired by a hot air ignition resistance. The whole operation is fully automated.

The flame is born in the burn plate, controlled by a combustion air fan (blower). This fan provides first combustion air (primary air) as well as afterburning air (secondary air), which is injected through a liner placed in the combustion chamber. Thus, a thorough combustion is achieved.

Combustion gases ascend in the combustion chamber and descend through the coil-wound heat exchanger. Flue gases are finally evacuated at the lower rear of the boiler.

For easing the evacuation of combustion gases, as well as ensuring a minimal depression in the combustion chamber, an exhaust fan is installed at the flue gas outlet box.

Condensate is drained by gravity, at the bottom of the boiler.

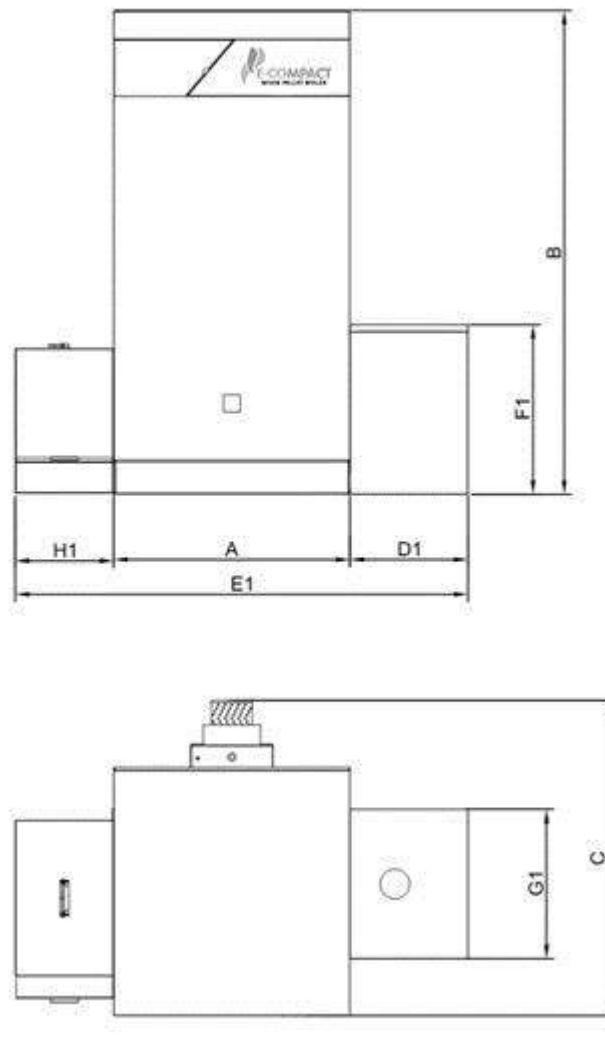
Ash removal, from the burn plate to the ash drawer, is performed automatically. The ash drawer must be emptied manually with a cadence that depends on the boiler working hours.

The coil-wound heat exchanger is cleaned by water jets, controlled by a water solenoid valve placed at the rear of the boiler. This cleaning is performed automatically whenever the boiler enters in **EXTINCTION** or **STANDBY** mode and the combustion chamber temperature is low enough.

The E-COMPACT boilers operate with a low temperature set point (heating) and a high temperature set point (DHW). When there is demand for DHW, the boiler temperature rises to meet the demand. Once satisfied, he returns to work in the heating set point.

**The operation of the boiler and equipment incorporated appears further explained in section 9.- Boiler operation.**

### 2.3. TECHNICAL DATA



Dimensions

Type		BCH-25	BCH-30	BCH-40	BCH-50	BCH-60	BCH-70	BCH-100
A	mm	695	695	695	695	695	695	840
B	mm	1.465	1.465	1.665	1.665	1.665	1.665	1.710
C	mm	850	850	850	850	850	850	1.115
D1	mm	420	420	420	420	420	420	420
E1	mm	1.365	1.365	1.365	1.365	1.365	1.365	1.610
F1	mm	645	645	645	645	645	645	600
G1	mm	500	500	500	500	500	500	525
H1	mm	250	250	250	250	250	250	350
Water flow/return connection	" GAS/M	1-1/4"	1-1/4"	1-1/2"	1-1/2"	1-1/2"	1-1/2"	2 "
Cleaning connection	" GAS/M	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Water drain connection	" GAS/M	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	3/4"
Flue gas pipe diameter	mm	150	150	200	200	200	200	250
Ash drawer capacity	lit.	30	30	30	30	30	30	77
Dry weight	kg	385	385	415	415	415	415	675




### Technical data

Type		BCH-25	BCH-30	BCH-40	BCH-50	BCH-60	BCH-70	BCH-100
Nominal heat output	kW	24,9	30,0	40,0	50,0	60,0	65,7	100
Condensing heat output	kW	25,8	31,2	41,8	52,4	63,5	69,9	106
Range of power output	kW	7,5/10/15/ 20/24,9	9/12/18/ 24/30	12/16/24/ 32/40	15/20/30/ 40/50	18/24/36/ 48/60	19/26/39/ 52/66	30/40/54/ 68/100
Efficiency $P_{NOM} / P_{MIN}$ (70°C/50°C)	%	94,5 / 93,1	94,5 / 93,0	94,6 / 91,9	95,3 / 93,1	95,3 / 94,1	95,0 / 93,8	99,1 / 98,0
Efficiency $P_{NOM} / P_{MIN}$ (50°C/30°C)	%	101,5 / 100,5	101,5 / 100,5	100,6 / 98,5	102,0 / 97,7	102,0 / 97,7	101,7 / 97,7	105,3 / 101,8
Min. required draft $P_{NOM}$ / $P_{MIN}$	Pa	8 / 5	8 / 5	8 / 5	8 / 5	8 / 5	8 / 5	8 / 5
Flue gas temp. $P_{NOM} / P_{MIN}$ (70°C/50°C)	°C	70 / 61	71 / 60	73 / 59	74 / 58	75 / 59	76 / 59	57 / 47
Flue gas temp. $P_{NOM} / P_{MIN}$ (50°C/30°C)	°C	50 / 38	48 / 38	46 / 39	44 / 40	44 / 40	45 / 41	39 / 37
Exhaust gas mass flow $P_{NOM}/P_{MIN}$ (70°C/50°C)	g/s	13 / 6	18 / 6	24 / 7	27 / 12	36 / 11	42 / 12	51 / 18
CO (10%O <sub>2</sub> )	mg/m <sup>3</sup>	39	34	25	16	13	11	25
OGC (10%O <sub>2</sub> )	mg/m <sup>3</sup>	3	2	1	< 1	< 1	< 1	3
Dust (10%O <sub>2</sub> )	mg/m <sup>3</sup>	39	36	31	26	21	18	18
NO <sub>x</sub> (10%O <sub>2</sub> )	mg/m <sup>3</sup>	147	154	166	179	143	123	150
Water capacity	l	78	78	112	112	112	112	213
Water side resistance 10K	mbar	331	477	38	59	86	104	238
Water side resistance 20K	mbar	83	119	10	15	21	26	59
Water operating temperature range	°C	27 - 80	27 - 80	27 - 80	27 - 80	27 - 80	27 - 80	27-80
Min. water temperature boiler	°C	27	27	27	27	27	27	27
Max. operating pressure	bar	3	3	3	3	3	3	5
Test pressure	bar	6	6	6	6	6	6	10
Electrical consumption ( $P_{NOM} / P_{MIN} / Standby$ )	W	104 / 56 / 13	104 / 56 / 13	150 / 73 / 13	150 / 73 / 13	160 / 75 / 13	160 / 75 / 13	400 / 230 / 15
Class (EN 303-5:2012)		5	5	5	5	5	5	5




### 3. FUEL

#### 3.1. FUEL CONSIDERATIONS

 This appliance has been designed for running exclusively on 6 mm diameter wood pellet, quality ENplus class A1 according to EN 14961-2 standards. *“Solid biofuels - Fuel specifications and classes - Part 2: Wood pellets for non-industrial use.”*

ENplus-A1 pellet can be made of stem wood and/or chemically untreated residues from the wood processing industry. Its main properties are the following:

Property		Threshold values ENplus-A1
Diameter	mm	6 or 8
Length	mm	$3,15 \leq L \leq 40$
Moisture content	%	$\leq 10$
Ash content	%	$\leq 0,7$
Net Calorific Value	MJ/kg	$16,5 \leq Q \leq 19$
	kWh /kg	$4,58 \leq Q \leq 5,28$



The fuel supplier must provide certified documentary evidence of its pellet quality.

#### 3.2. FUEL CONSUMPTION






The burner is modulating, with five modulation steps for each output. The boiler chooses automatically the optimal step for each need. The following charts show outputs and subsequent fuel consumption for each boiler model at each modulation step:

Modulation step		1	2	3	4	5
<b>BCH-25</b>						
Heat output	kW	7,5	10	15	20	25
Pellet consumption (70°C/50°C)	kg/h	1,7	2,3	3,4	4,5	5,6
Pellet consumption (50°C/30°C)	kg/h	1,6	2,1	3,2	4,2	5,3
<b>BCH-30</b>						
Heat output	kW	9	12	18	24	30
Pellet consumption (70°C/50°C)	kg/h	2,1	2,7	4,1	5,4	6,7
Pellet consumption (50°C/30°C)	kg/h	1,9	2,5	3,8	5,0	6,3
<b>BCH-40</b>						
Heat output	kW	12	16	24	32	40
Pellet consumption (70°C/50°C)	kg/h	2,7	3,6	5,4	7,1	8,8
Pellet consumption (50°C/30°C)	kg/h	2,5	3,4	5,0	6,7	8,3
<b>BCH-50</b>						
Heat output	kW	15	20	30	40	50
Pellet consumption (70°C/50°C)	kg/h	3,4	4,5	6,6	8,8	10,9
Pellet consumption (50°C/30°C)	kg/h	3,2	4,2	6,3	8,3	10,2
<b>BCH-60</b>						
Heat output	kW	18	24	36	48	60
Pellet consumption (70°C/50°C)	kg/h	4,0	5,3	7,9	10,5	13,1
Pellet consumption (50°C/30°C)	kg/h	3,8	5,1	7,5	9,9	12,3
<b>BCH-70</b>						
Heat output	kW	19	26	39	52	66
Pellet consumption (70°C/50°C)	kg/h	4,4	5,8	8,7	11,6	14,4
Pellet consumption (50°C/30°C)	kg/h	4,2	5,6	8,3	10,9	13,5
<b>BCH-100</b>						
Heat output	kW	30	40	54	68	100
Pellet consumption (70°C/50°C)	kg/h	6,2	8,2	11,1	14,0	20,6
Pellet consumption (50°C/30°C)	kg/h	5,7	7,6	10,3	12,9	19,0




Note: regarding fuel with Net CV = 4.8 kWh / kg

## 4. BOILER INSTALLATION

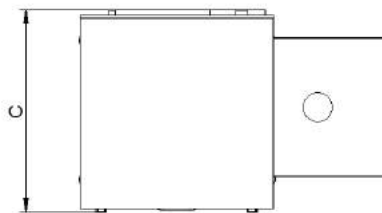
### 4.1. GENERAL WARNINGS

-  This appliance is only intended for being used in heating systems and indirect production of domestic hot water. Any other use may cause harm to people, animals or property.
-  The appliance should be installed inside technical rooms. It is not designed to work outdoors.
-  Installation and maintenance must be carried out in accordance with the current local regulations and the instructions contained in this booklet, and should be performed by accredited and qualified personnel, as required by current regulations.
-  During installation and running of the appliance, keep children at a safe distance from it.
-  Boiler room must meet the regulations in force.

### 4.2. UNPACKING

-  Take into account the actual size of the boiler to plan walkways and its connection in the boiler room.
-  Observe local regulations on waste and recycling.
-  Transportation of the boiler should always be done using hand trucks/pallet jacks. Pay attention to possible imbalances due to uncentered loads on the pallet.


The BCH boiler will come packaged on a single 800 x 1200 pallet. The smoke box and the extraction fan is supplied disassembled to facilitate passage through doors. The minimum width for the boiler to be carried without disassembling is 750 mm.



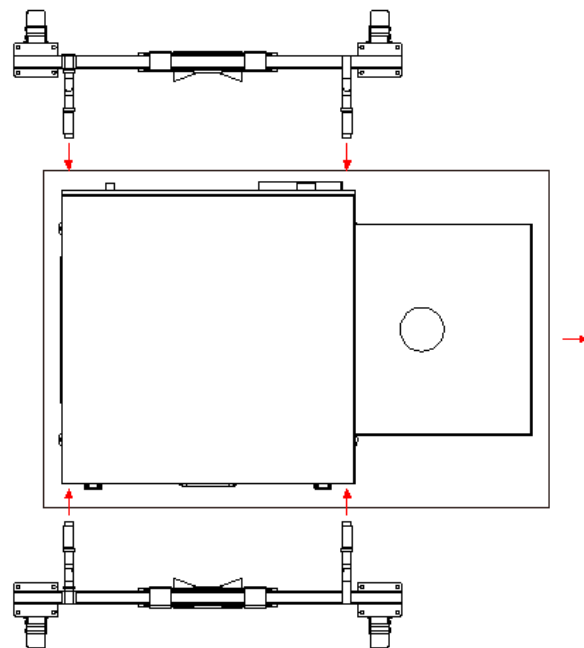
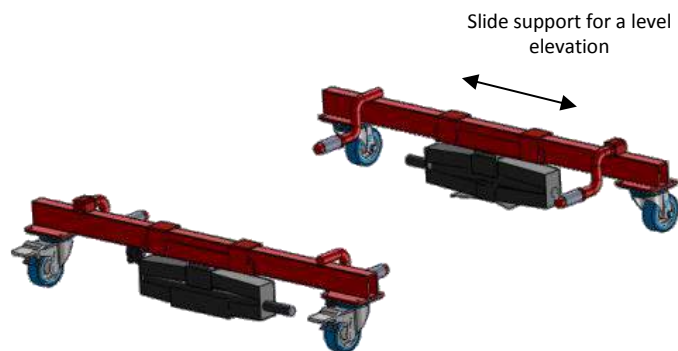
Type	A [mm]	B [mm]	H [mm]	Pallet [mm]	C Minimum passage width [mm]
BCH-25	1.160	760	1.470	1.200 x 800	800
BCH-30					
BCH-40			1.670		
BCH-50					
BCH-60					
BCH-70	1.300	900	1.710	1.350 x 900	900
BCH-100					


To facilitate the operation of lowering the boiler from the pallet, some useful designed for this purpose can be supplied on request.

Insert the useful in the holes in the base of the boiler. Actuate both lifting mechanisms gradually and alternately until the boiler stop supporting the pallet.







 Move the lifting mechanisms along the frame to lift the boiler levelled. Hold the boiler manually to avoid imbalances. Risk of falling boiler in case of unbalanced elevation.

Remove the pallet. Move the boiler to its final location and pose the boiler on the floor. Remove the mechanisms from the boiler holes.



 The mechanisms for lowering the boiler from the pallet must not be used for large displacements. These displacements should be performed by hand trucks/pallet jacks

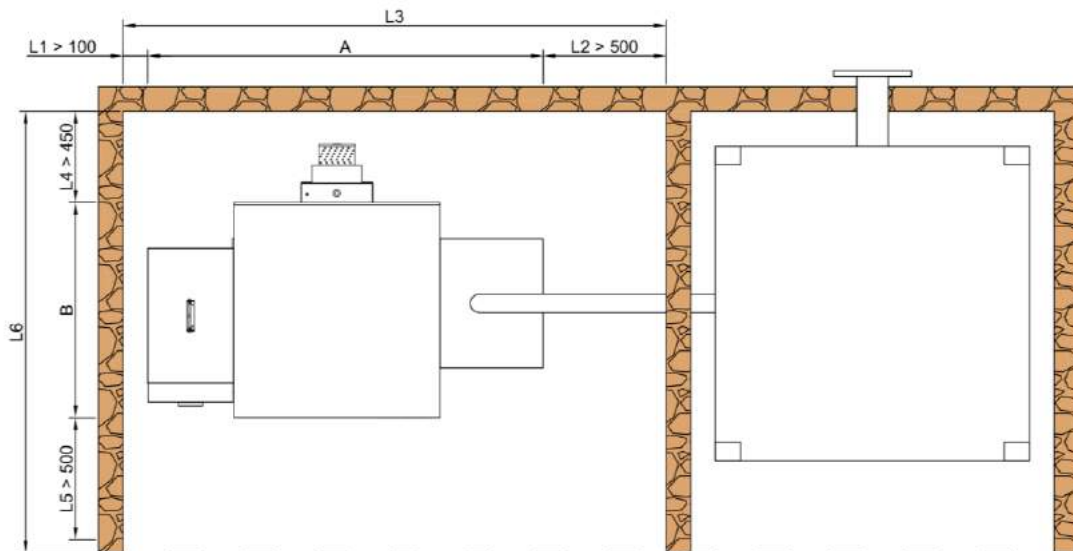
#### 4.3. LOCATION OF THE BOILER

-  The boiler room must comply with air venting requirements and regulations applicable in terms of fire protection, safety in use, etc.
-  The boiler should be installed in a boiler room frost-protected.
-  An adequate supply of combustion air and ventilation openings should be ensured by minimum net free area of 10 cm<sup>2</sup> for each kW of nominal heat output, never less than 200 cm<sup>2</sup>.
-  The boiler must have an adequate smoke discharge.
-  All necessary safety distances to combustible materials must be respected.
-  Locating the appliance in a room with an explosive/flammable atmosphere is prohibited

The boiler must have around it clearance enough to let servicing be carried out easily. Be aware of complying minimum distances imposed by local regulations


The minimum distances shown in the diagrams are:


L1	mm	Separation to the wall
L2	mm	Necessary to remove the burner
L3	mts	Required minimum width of the boiler room
L4	mm	Necessary for flue gas evacuation and drainage installation
L5	mm	Necessary to remove the ash pan and door opening.
L6	mts	Required minimum depth of boiler room




	BCH-25	BCH-30	BCH-40	BCH-50	BCH-60	BCH-70	BCH-100
A			1.365				1.610
B			700				875
			1.965				2.210
			1.600				

#### 4.4. COMBUSTION FUME DISCHARGE.

 This boiler shall not be connected to a venting system that serves a second appliance fired by other fuel.


 The smoke duct for the discharge of fumes must be installed by carried out complying local regulations by qualified personnel.

 The installation of horizontal sections must have a minimum slope of 3% for letting condensates to drain down to the smoke box of the boiler, where are discharged to the sewerage.

Smoke duct is composed of a flue pipe and a chimney pipe. Never use a flue pipe smaller in diameter than the flue connection of the boiler it is being connected to.

Type		BCH-25	BCH-30	BCH-40	BCH-50	BCH-60	BCH-70	BCH-100
Flue gas connection diameter	mm	150		200			250	

WES recommends stainless steel insulated chimneys resistant to the aggressive action of temperature and combustion products.

 The calculation of the chimney should be according to EN 13384-1.

The data required for the calculation can be obtained from the technical data in **section 2.3**. A 'T' element must be installed to overcome any solid or liquid obstruction.


The recommended draft is 5-8 Pa. A flue draft regulator may be required if the draft installation is higher.

#### 4.5. FUEL STORAGE AND FEEDING.


The boiler is fed from a textile silo to the burner through an auger. WES supplies textile silos of different storage capacities and the correspondent feeding auger kits.




Silo Reference	Dimension [mm]	Approx. capacity [Ton]
BCSP 201	200 x 200 x 250	3,0
BCSP 251	250 x 250 x 250	4,9
BCSP 301	300 x 300 x 250	6,9

 The storage of solid biofuels must comply with current legislation on safety and fire.

The filling of the silo is made through a Storz connector supplied with the silo, by a fuel supplier tanker truck.

 The silo Storz must be ground connected for avoiding electrostatic discharges.

 Read carefully the instructions supplied with the silo and follow the instructions described therein before filling it.


Auger connection to the burner is done through a flexible pipe, which must be coupled to the burner inlet, inside the burner enclosure, securing it with the supplied metal bracket. The diameter of the feed connection is 60 mm.

Auger electrical supply must be wired on the correspondent connector at the boiler rear.

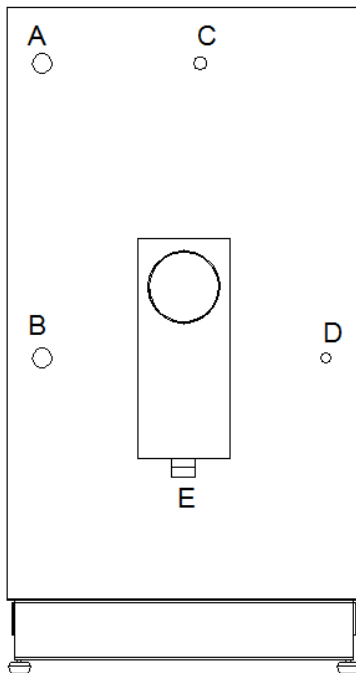


## 5. HYDRAULIC INSTALLATION

### 5.1. HYDRAULIC CONNECTIONS

 This is a condensing boiler. Condensate discharge to the sewage is done through a 40mm water trap with a height no lesser than 25 cm. The siphon must be filled manually in the first commissioning of the boiler.

Rear of the boiler



			BCH-25	BCH-30	BCH-40	BCH-50	BCH-60	BCH-70	BCH-100
A	Water Flow	"GAS/M	1-1/4"	1-1/4"	1-1/2"	1-1/2"	1-1/2"	1-1/2"	2"
B	Water Return	"GAS/M	1-1/4"	1-1/4"	1-1/2"	1-1/2"	1-1/2"	1-1/2"	2"
C	*V2V - Heat exchanger cleaning	"GAS/M	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
D	Water drain	"GAS/M	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	3/4"
E	* Condensate drain trap	"GAS/M	1-1/2"	1-1/2"	1-1/2"	1-1/2"	1-1/2"	1-1/2"	1-1/2"

*\* These products are supplied with the boiler*

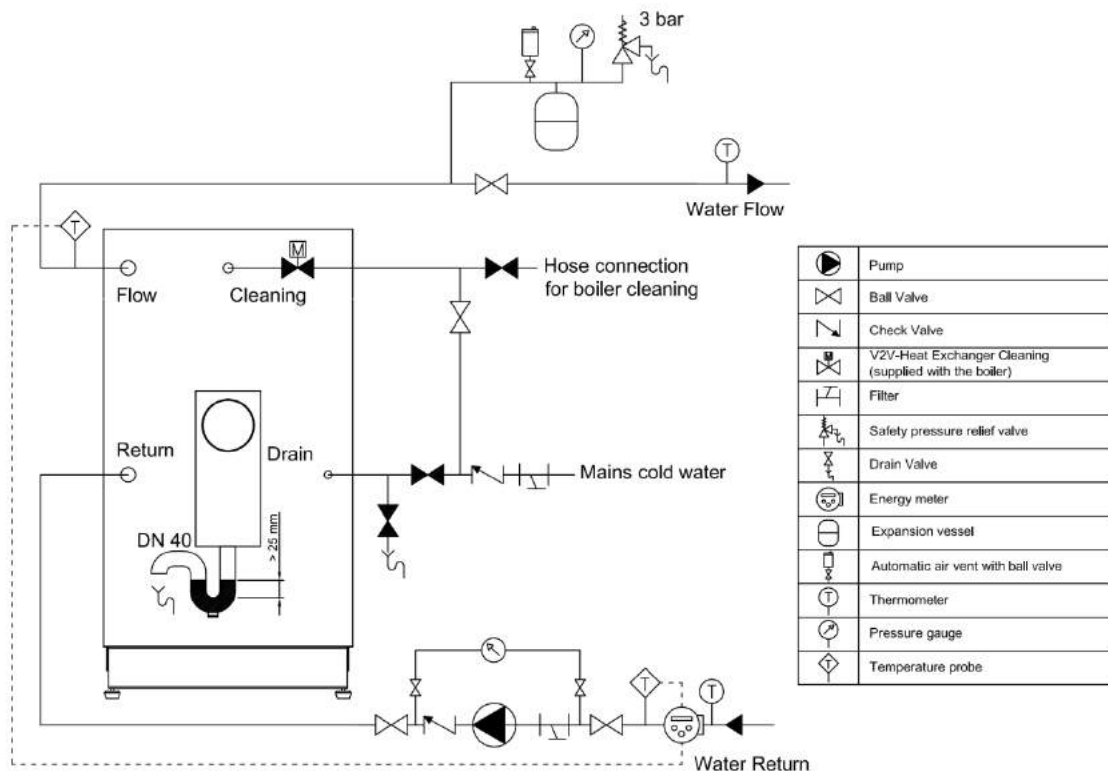
The following products must be installed along with the boiler

- **Circulation pump.** Its volume flow must be adjusted according to the boiler's nominal heat output and the temperature rise planned for the installation

	$\Delta T$ [°C]	Q [l/h]		$\Delta T$ [°C]	Q [l/h]		$\Delta T$ [°C]	Q [l/h]		$\Delta T$ [°C]	Q [l/h]
BCH-25	20	1.082	BCH-40	20	1.722	BCH-60	20	2.584	BCH-70	20	3.014
	15	1.442		15	2.297		15	3.445		15	4.019
	10	2.163		10	3.445		10	5.167		10	8.612
BCH-30	20	1.298	BCH-50	20	2.153	BCH-100	20	4.306		15	5.742
	15	1.731		15	2.871		15	8.612			

	10	2.596		10	4.306		10	6.029	
--	----	-------	--	----	-------	--	----	-------	--

- **Safety pressure relief valve**, rated at 3 bars and taken to sewage (5 bar to BCH-100).
- **Expansion vessel**. The vessel volume will be calculated based on the volume of the entire heating system.
- **Automatic air vent**.
- **Pressure gauges and thermometers**.
- **Mesh Filters**.
- **Check Valves**.
- **Ball Valves**.
- **Energy Meter**.
- **Condensate water trap**.



The condensate drain pipe should have a steady incline, with a minimum angle of 3%.

If due to the position of the boiler, the condensate cannot be discharged by gravity, a condensate pump should be used.

## 5.2. DOUBLE TEMPERATURE SETPOINT

The boiler can work with two temperature set points.

- Low temperature (heating)
- High temperature (usually DHW).

When there is no demand for high temperature, the boiler operates at low temperature set point.

When there is demand for high temperature, the boiler automatically switches its set point value of 70°C (modifiable value Th21-lh21), so it will increase the temperature of the boiler to this value or until demand (e.g. DHW) is satisfied. The sensor in charge of this control is the buffer probe temperature.

This feature is only available with if the parameter P35=2 or 3 (*see section 5.3.-Hydraulic schemes*). To enable this function, set the parameter A60=1 (*SYSTEM MENU → ENABLES*).



This functionality allows the maximum efficiency because the boiler only will work temporarily at high temperature, working most of the time at low temperature.

For further information on this feature, see section **9.8.- DHW Production**.

### 5.3. HYDRAULIC SCHEMES

The boiler is able to control the following outputs:

Description	Parameter P35
The boiler controls a pump (heating only, without DHW)	0
The boiler controls a pump and a 3-way valve.	2
The boiler controls two pumps. One for the low-temperature circuit and another one for high temperature (usually DHW).	3
The boiler controls a pump (buffer tank)	4

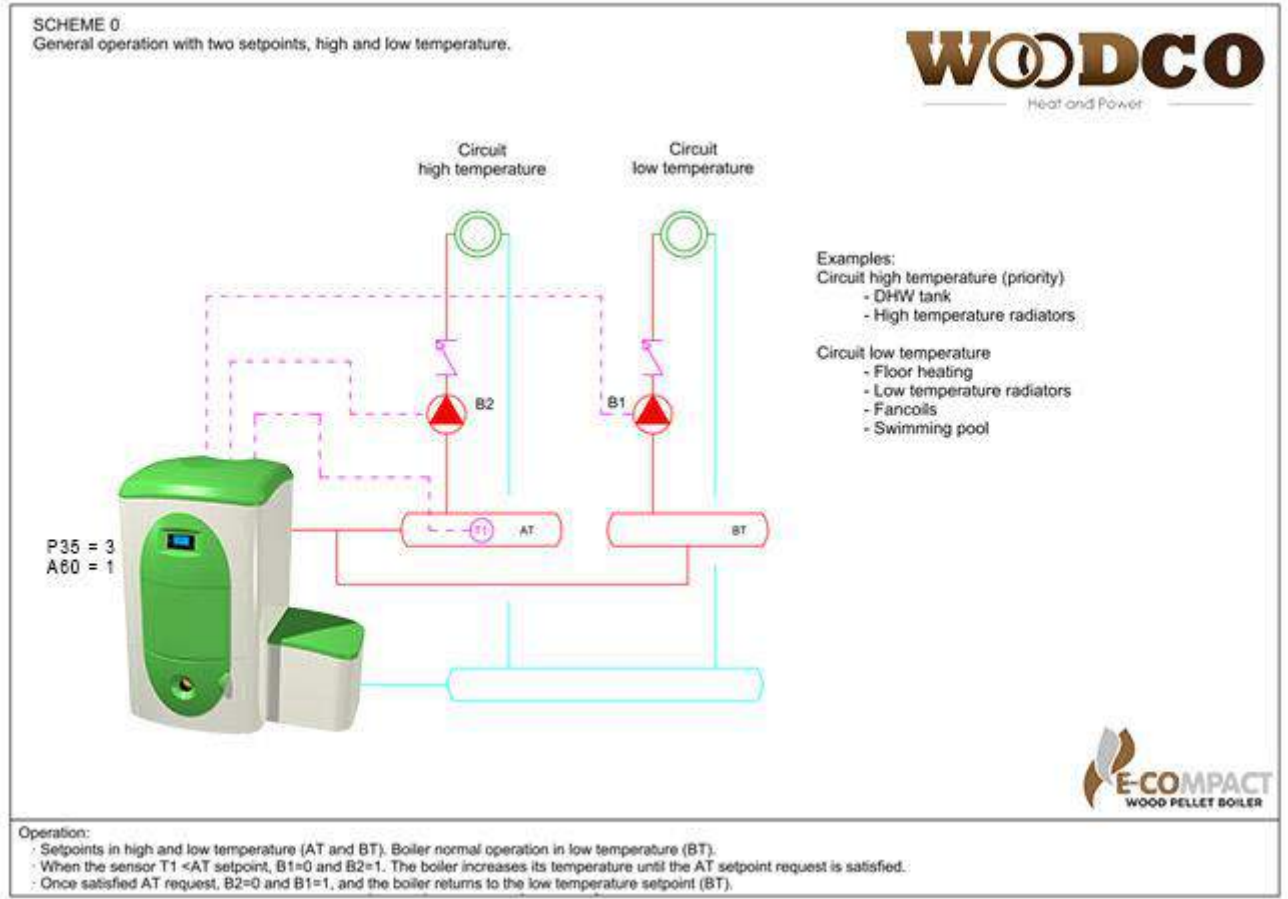
The control of these outputs is made by the following sensors:

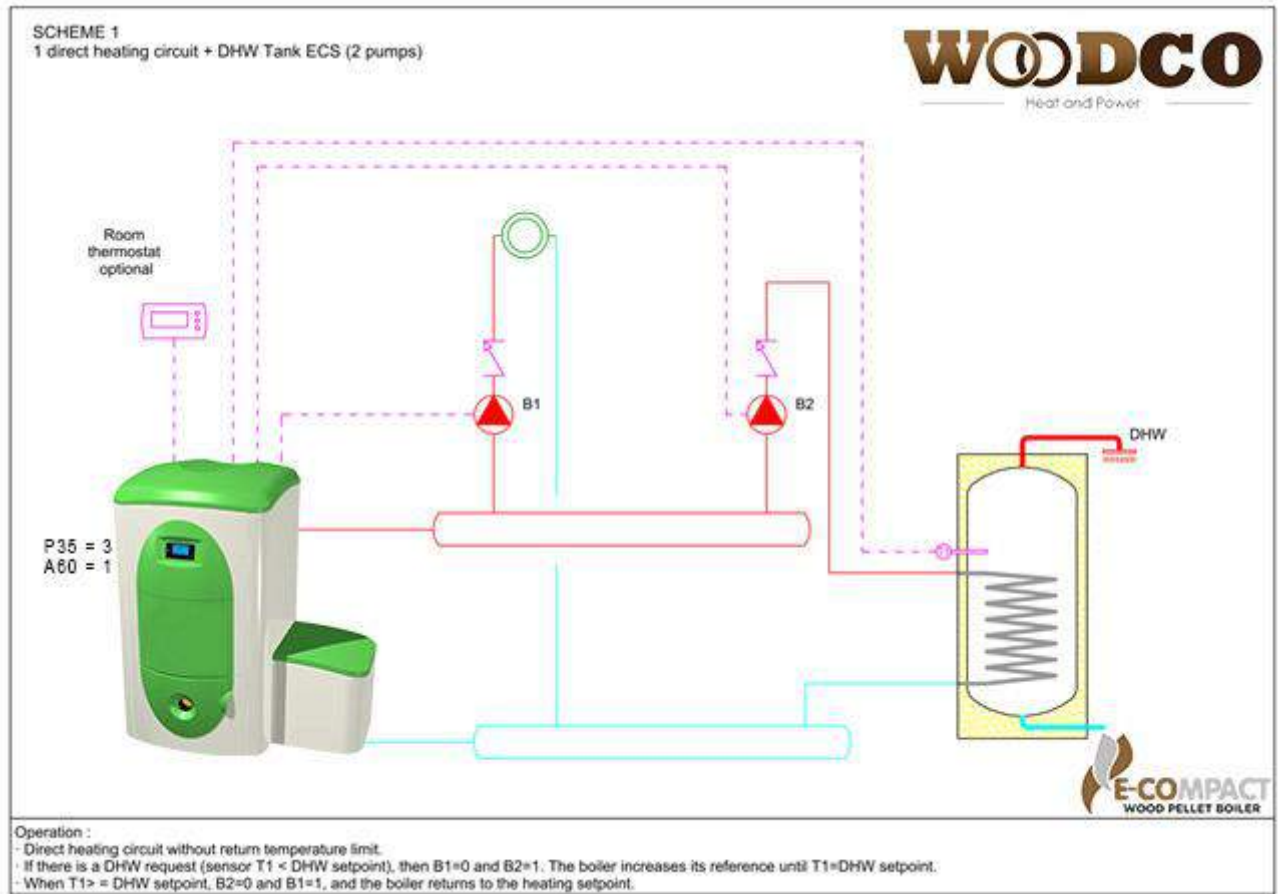
Boiler temperature probe
DHW/Buffer temperature probe
Room thermostat <i>(See section 6.4.- Room thermostat)</i>

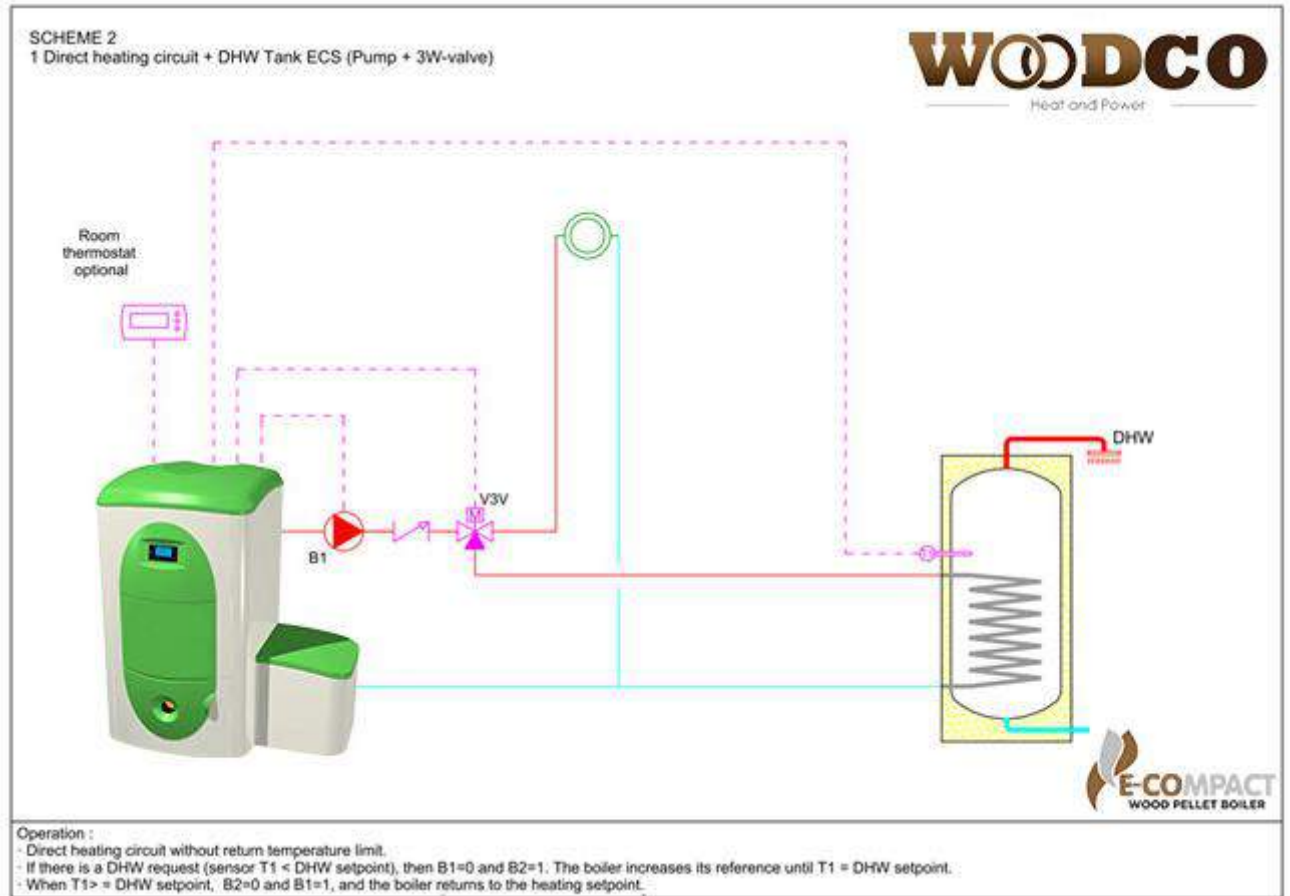
The choice of the hydraulic schemes is made by assigning the value of parameter P35 according to the desired scheme (**SYSTEM MENU → DEFAULT SETTINGS → PARAMETER P35**)

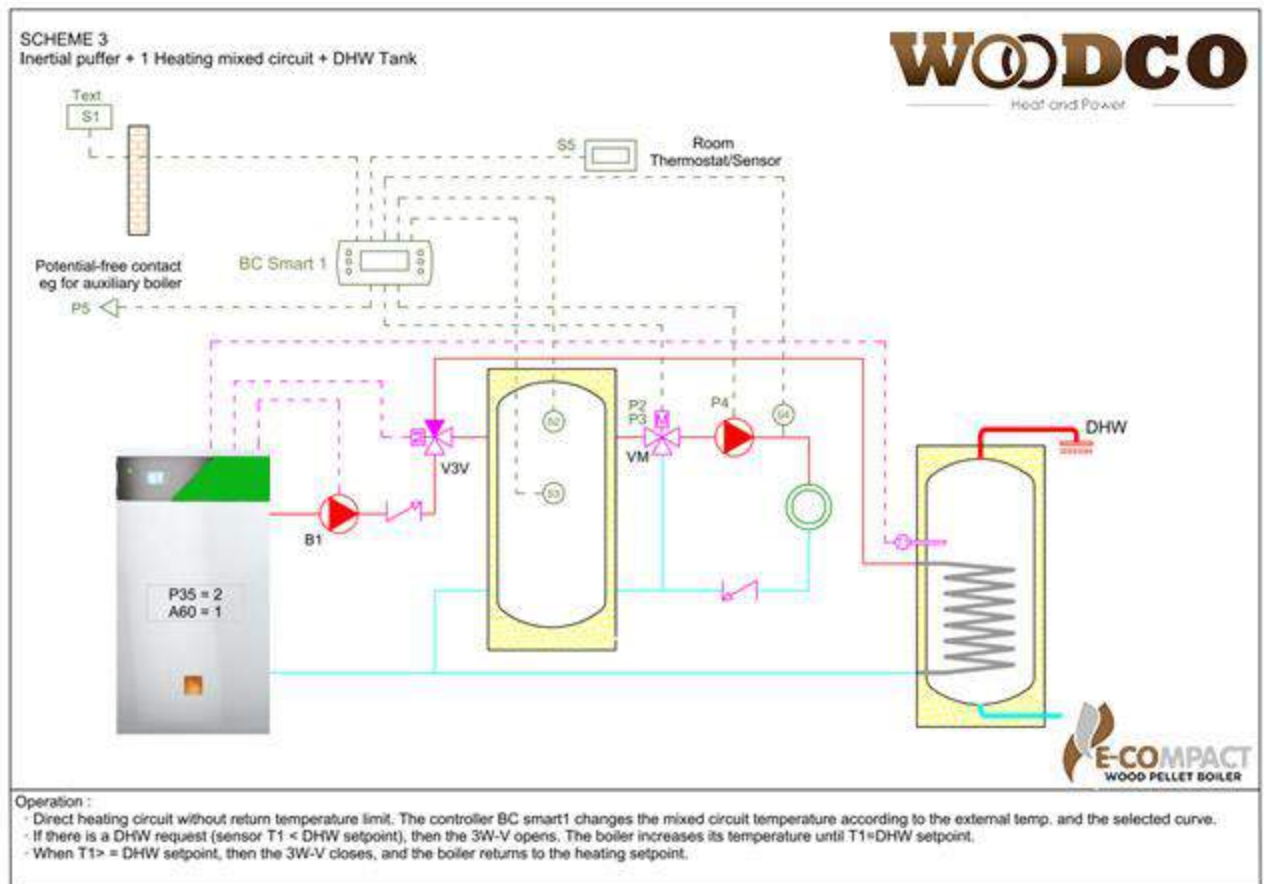
To control more circuits (incl. Thermal Solar) or variation of the flow temperature by mixing, WOODCO have an external unit (BC Smart 1) able to perform such controls and functions.

**For further information see the manual of the controller BC SMART-1.**

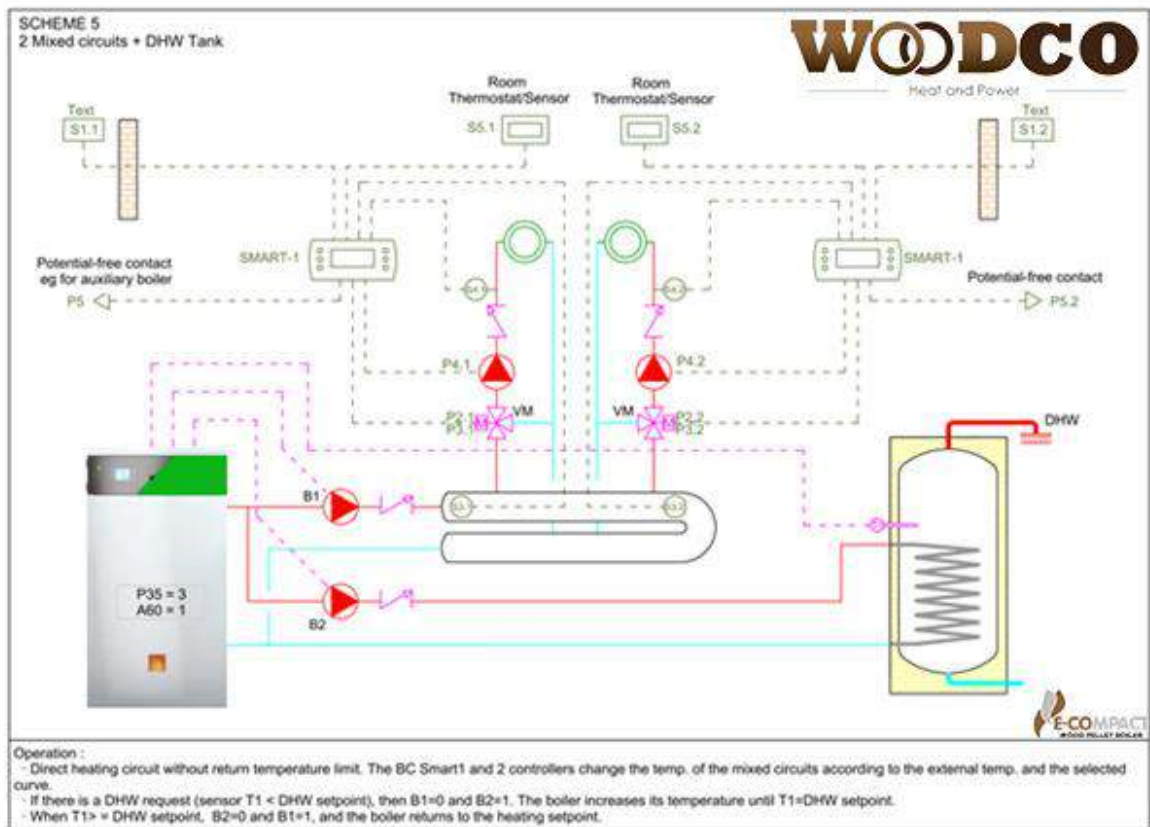
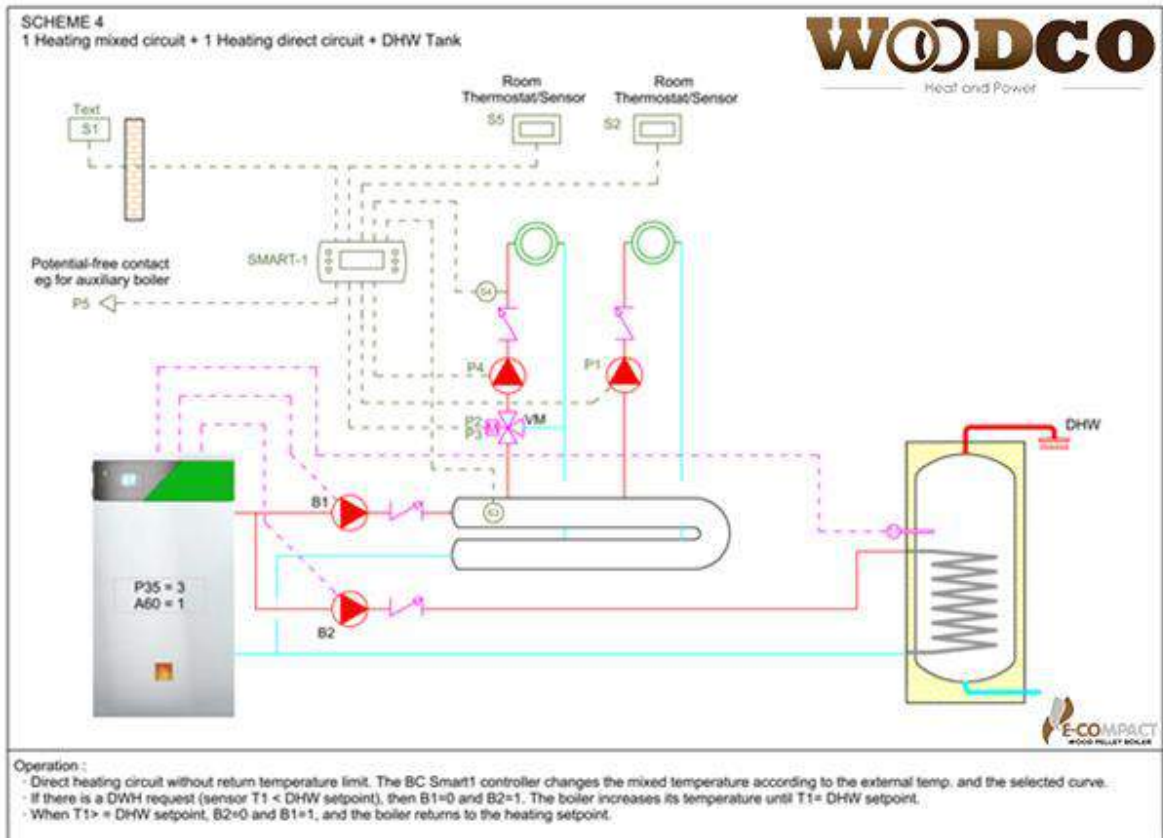


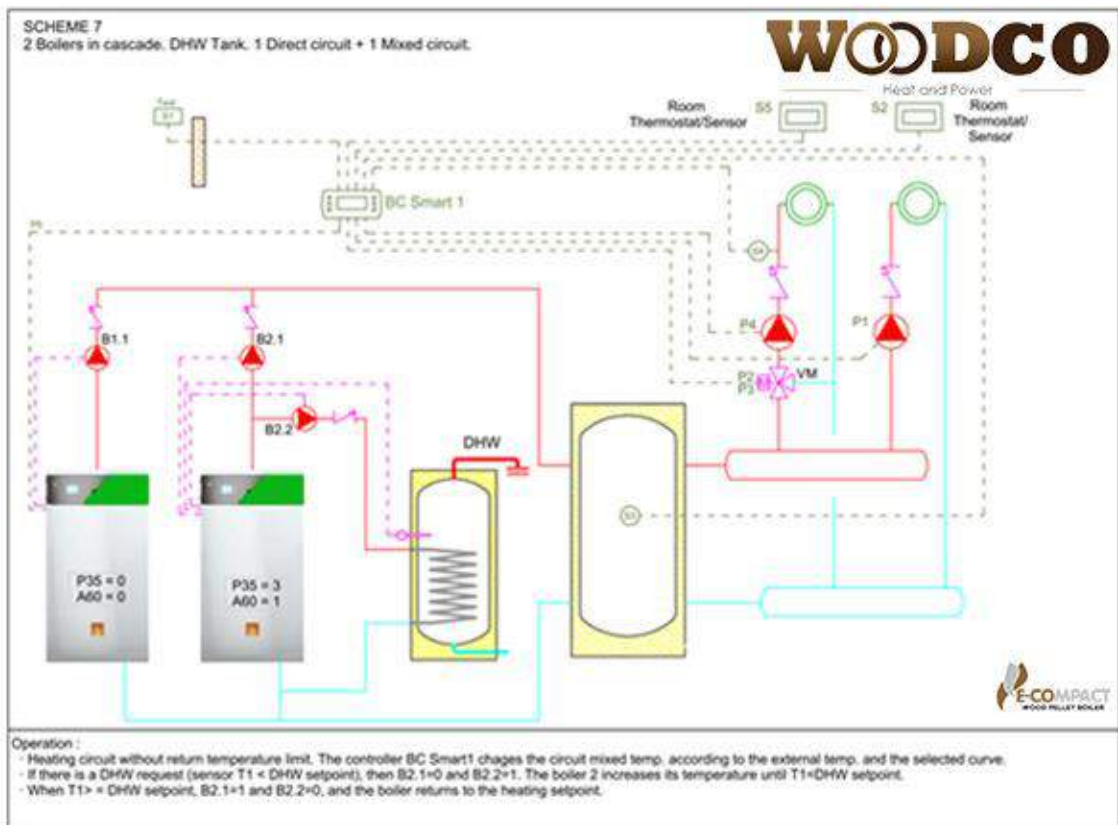
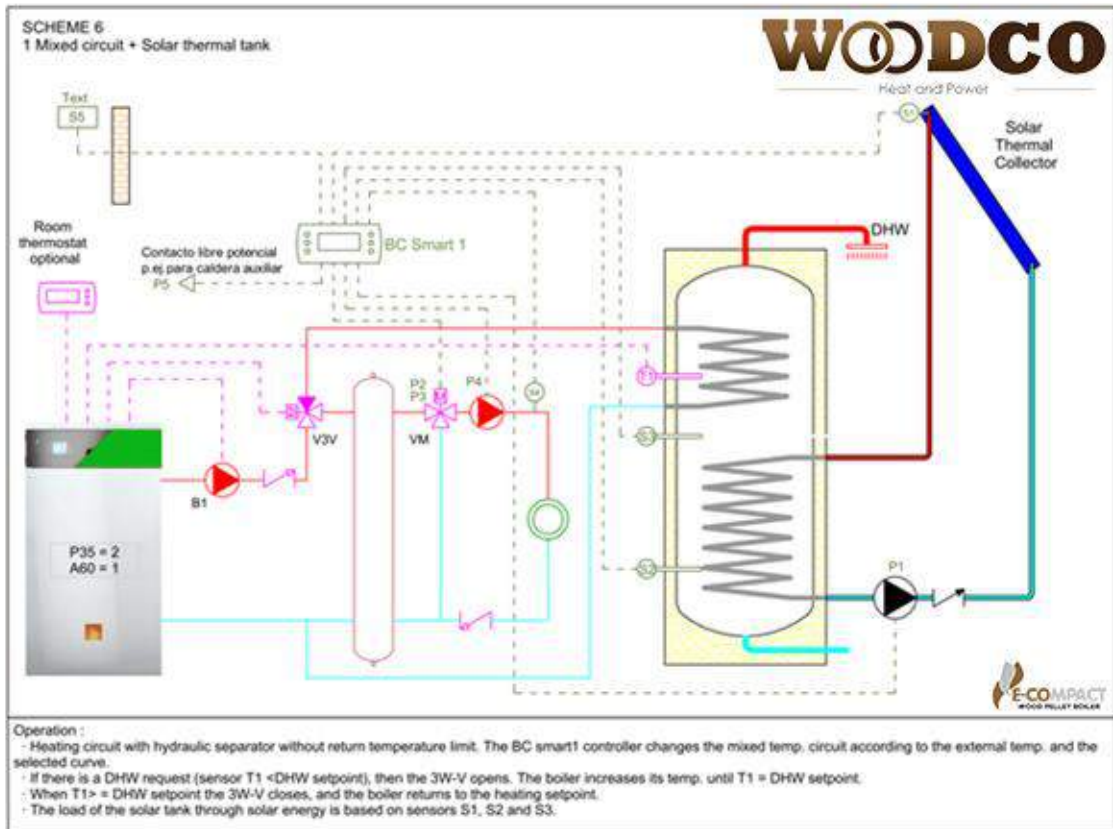




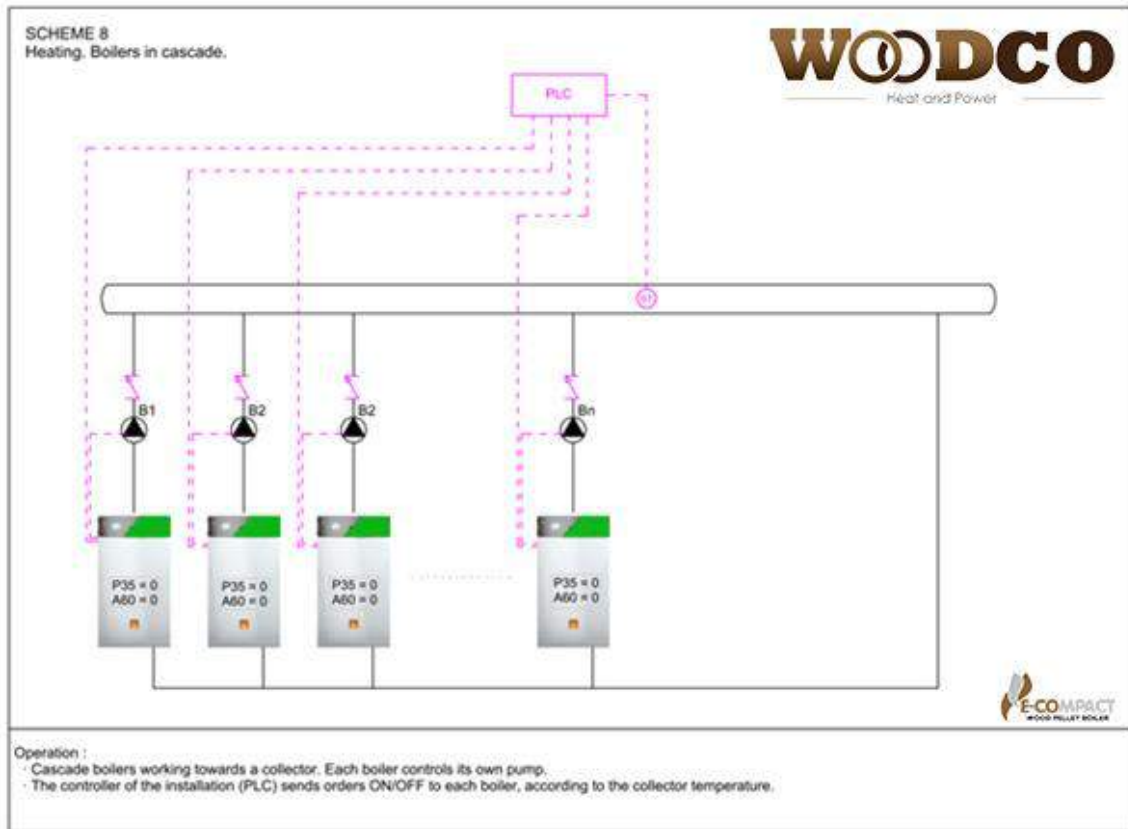












## 6. ELECTRICAL CONNECTIONS

### 6.1. WARNINGS



It is mandatory to install an all pole disconnection switch with contact aperture of at least 3 mm.



The boiler must be fully grounded.



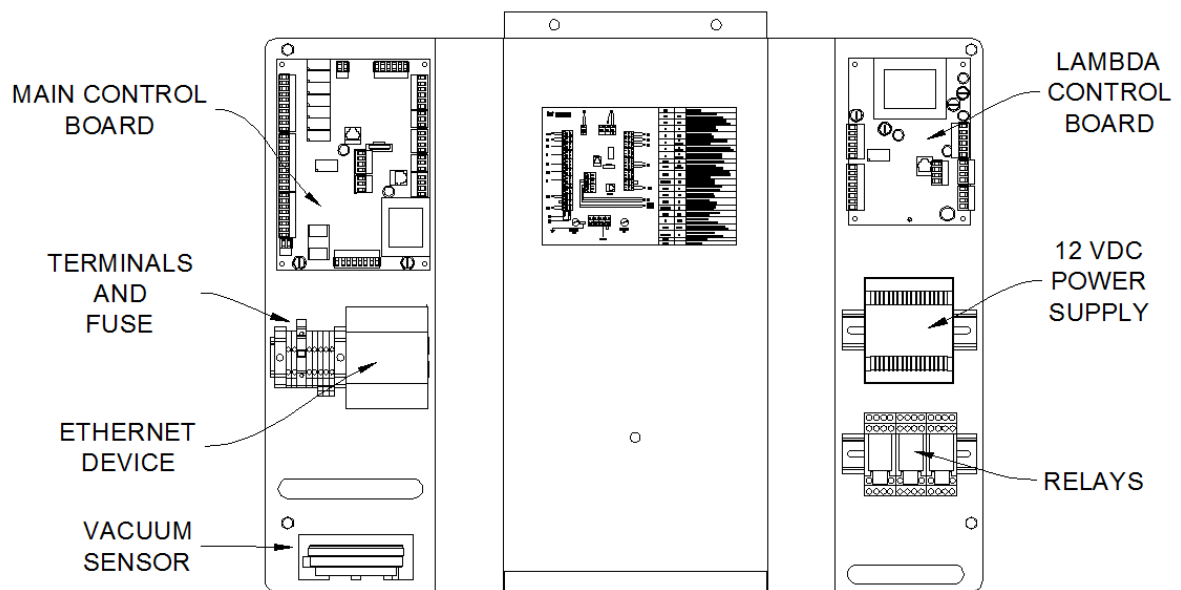
The electrical installation must be performed by qualified personnel.

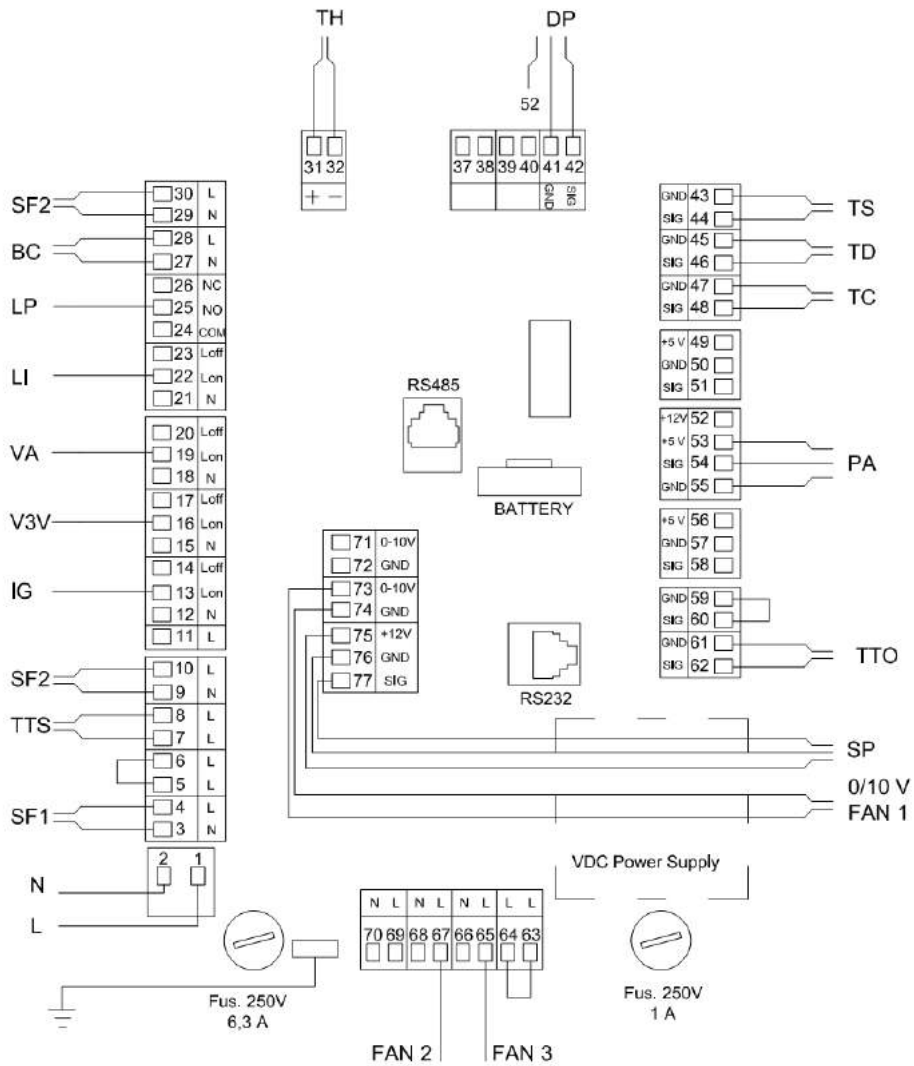


This boiler must be supplied with a 230V 50Hz electrical supply.  
Before carrying out any work inside the appliance, disconnect it from the mains.

### 6.2. BOILER CONTROL BOARD DIAGRAM.

Access to the electrical wiring is done by removing the front cover of the boiler, and the metal wiring protection cover.












INPUTS				OUTPUTS			
Nº		FUNCTION	TYPE	Nº		FUNCTION	TYPE
1-2		Line 230V - 50 Hz	230 V	3-4	SF1	Burner auger	TRIAC (max 3 A*)
7-8	TTS	Safety thermostat	ON/OFF	9-10	SF2	Ash drawer auger	ON/OFF (max 3 A*)
31-32	TH	Combustion chamber temperature	Thermocouple K	13	IG	Ignition element	ON/OFF (max 3 A*)
41-42-52	DP	Combustion chamber differential pressure sensor	12 V	16	V3V	3-way valve	ON/OFF (max 3 A*)
43-44	TS	Safety temperature (flue gas box)	NTC 100k	19	VA (Out 1)	Fire/smoke damper actuator	ON/OFF (max 3 A*)
45-46	TD	DHW/Buffer tank probe	NTC 10k	22	LI (Out 2)	Cleaning exchanger solenoid valve	ON/OFF (max 3 A*)
47-48	TC	Boiler probe temperature	NTC 10k	25	LP (Out 3)	Burning plate cleaning linear actuator	ON/OFF (max 3 A*)
53-54-55	PA	Water pressure sensor	5 V	27-28	B1	Circulation pump	ON/OFF (max 3 A*)
61-62	TTO	Room thermostat	ON/OFF	29-30	SFE (Out 4)	Silo/hopper loading pellet motor	ON/OFF (max 3 A*)
75-76-77	SP	Pellet sensor	12 V	65	FAN3	Exhaust Fan	TRIAC (max 1,8 A*)
				67	FAN2	Combustion Fan 2	TRIAC (max 1,8 A*)
				73-74	FAN1	Combustion Fan 1	TRIAC (max 1,8 A*)





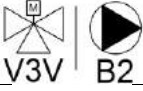


\* All fed outputs are under fuse and the total current must not exceed 6.3 A

### 6.3.- WIRING.

All sensors and electrical devices included in the boiler are supplied installed and wired.


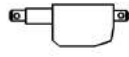

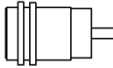

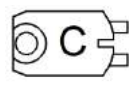



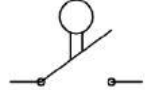
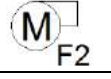
Only the following devices (depending on the system configuration), might be wired on the connectors placed at the rear of the boiler:

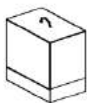
1	A	B	2	3	4	5	6
230 V 50 Hz							
L N $\perp$			L N $\perp$	L N $\perp$	L N $\perp$	L N $\perp$	L N $\perp$

		Description	Cables	TYPE
1	230 V 50 Hz	Line	3 x 1,5 mm <sup>2</sup>	230 V
A		Room thermostat	2 x 1 mm <sup>2</sup>	ON / OFF
B		DHW/Buffer temperature	2 x 1 mm <sup>2</sup>	NTC – 10 k
2		Silo/hopper auger	3 x 1,5 mm <sup>2</sup>	230 V
3		Pump	3 x 1,5 mm <sup>2</sup>	230 V
4		3-way valve/ Pump 2	3 x 1,5 mm <sup>2</sup>	230 V
5		Cleaning exchanger solenoid valve	Supplied with the boiler	230 V
6		Exhaust fan	Supplied with the boiler	230 V

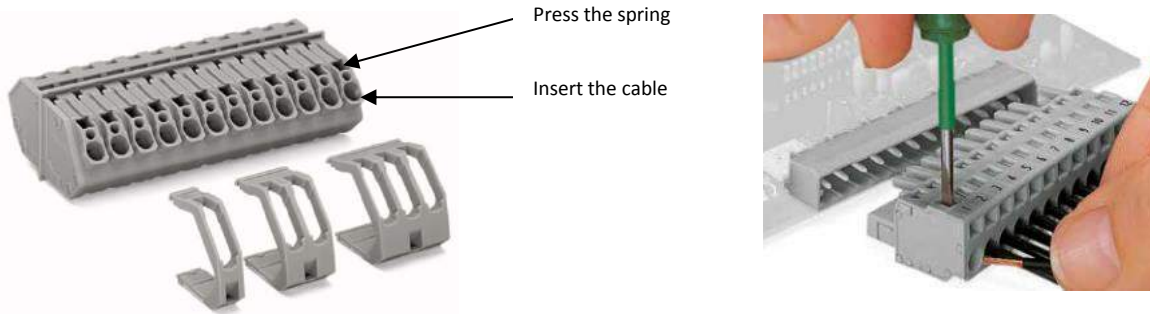
The buffer probe (NTC 10k) is supplied with the boiler. The length can be extended by a 2x1 mm<sup>2</sup> cable.

The electrical connections of the burner are situated on the side of the boiler burner on the drawer.

Nº	Symbol	Designation	Nº	Symbol	Designation
1		Ignitor element	6		Burning plate cleaning linear actuator
2		Combustion plate rotation motor	7		Pellet sensor
3		Combustion FAN 1	8		Signal (control) fire/smoke dumper actuator
4		Burner auger	9		Signal (control) combustion fan (FAN 1)
5		Fire/smoke damper actuator	10		Limit switches linear actuator
11		Combustion FAN 2 (Only BCH-100)			


12		Ash drawer auger	
----	---	------------------	--

The connections in the rear of the boiler and in the burner are plug-in screwless type. The cable fixing is done by pressing the hole with a screwdriver until you feel that the spring is open. Then insert the cable and remove the screwdriver. Check correct cable fixing.



#### 6.4. ROOM THERMOSTAT.

The boiler is supplied with default control heating set point temperature. However has the ability to connect a room thermostat.




The signal from the room thermostat should be free of potential.  
Risk of breakage of the control board.

The operation is set with parameter A07 (*System Menu* → *Enables* → *Parameter A07*)

<b>A07</b>	Assign the behaviour of the room thermostat	0	Room thermostat disabled. The boiler regulates with the set point temperature. <b>Default parameter.</b>
		1	The thermostat is used to switch the boiler from <b>RUN</b> mode to <b>STANDBY</b> mode.
		2	The thermostat is used to switch off the circulating pump. <b>Note: For security reasons, if the boiler temperature exceeds 72°C, the boiler keeps the pump on.</b>
		3	If the thermostat opens the circuit, the boiler enters mode <b>EXTINCTION</b> . If the thermostat closes the circuit and the boiler is in <b>EXTINCTION</b> mode you need to wait until the end of this phase and the boiler will automatically start the <b>IGNITION</b> cycle.
		4	The thermostat is used to switch the boiler from <b>RUN</b> mode to <b>MODULATION</b> mode. In <b>MODULATION</b> mode the boiler works constantly to its minimum power ( <b>P1</b> ).

#### 6.5. BOILERS IN CASCADE.

The range of E-COMPACT boilers is prepared for multi-boiler systems in parallel (in a cascade). Commissioning of each boiler is via release ON/OFF (thermostat terminals at the rear of the boiler). The start-up sequence must be performed by any controller chosen from those available on the market, for an output on / off potential free.

A		Room Thermostat	Wire 2 x 1 mm <sup>2</sup> <b><u>WITHOUT</u></b> <b><u>VOLTAGE</u></b>	ON / OFF
---	---	-----------------	--	----------

#### 6.6. LAMBDA PROBE KIT.

As an option, a lambda probe can be installed on any BCH boiler. Its electronic board continuously measures the quantity of oxygen in the flue gas, thus modifying motors and fans setpoint to achieve the finest combustion.

The lambda probe kit includes the following products:

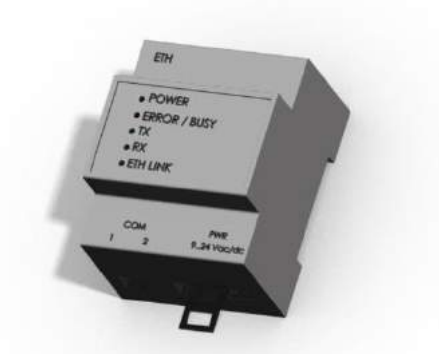
- Lambda probe with connector
- Extension cable with connector
- Lambda Module Electronic card
- Communication cable to boiler main circuit board
- Electrical cable



For further information see the manual supplied with the kit Lambda.

#### 6.7. ETHERNET DEVICE KIT.

As an option, the monitoring and remote control device EasyCheck can be installed on any boiler. This device (thanks to its web server embedded) allows control and monitoring control of the boiler from the Internet, either in local or remote network.

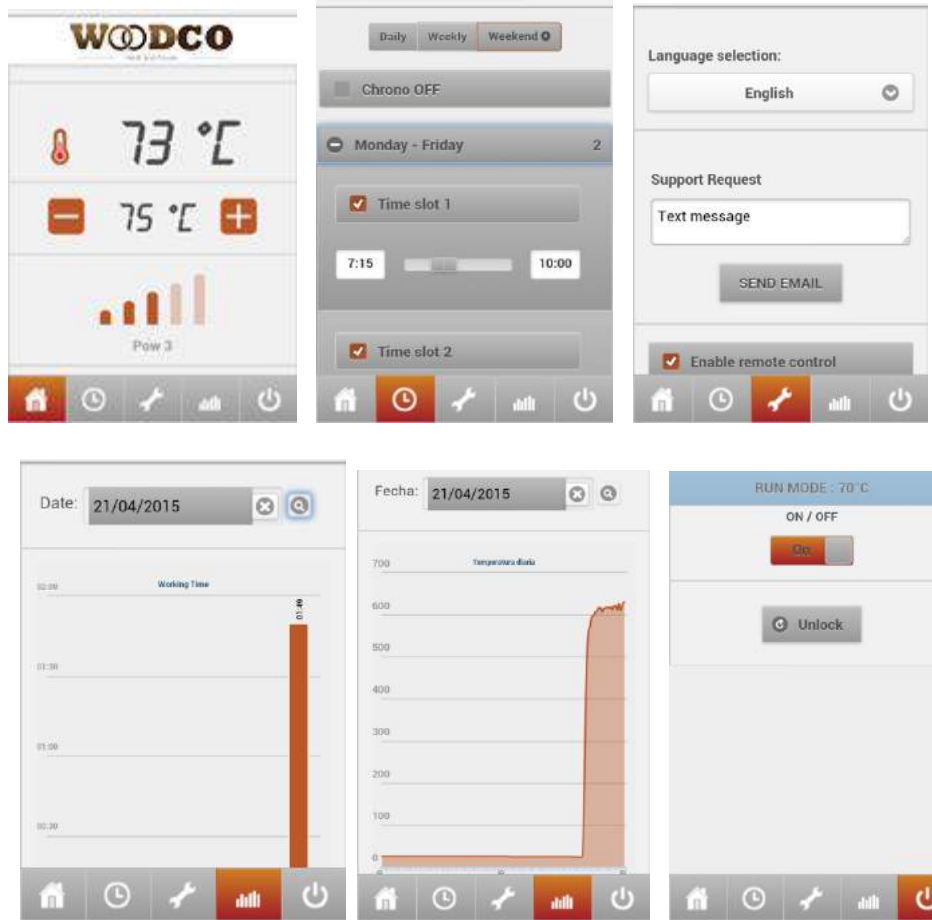


The remote monitoring kit includes the following products:

- DIN rail EasyCheck web control unit
- Power cables
- Communication cable to boiler main circuit board

With this equipment you can connect remotely to turn on/off/unlock the boiler, display their status, make time schedules, attendance messaging and recording operating hours and boiler temperatures.

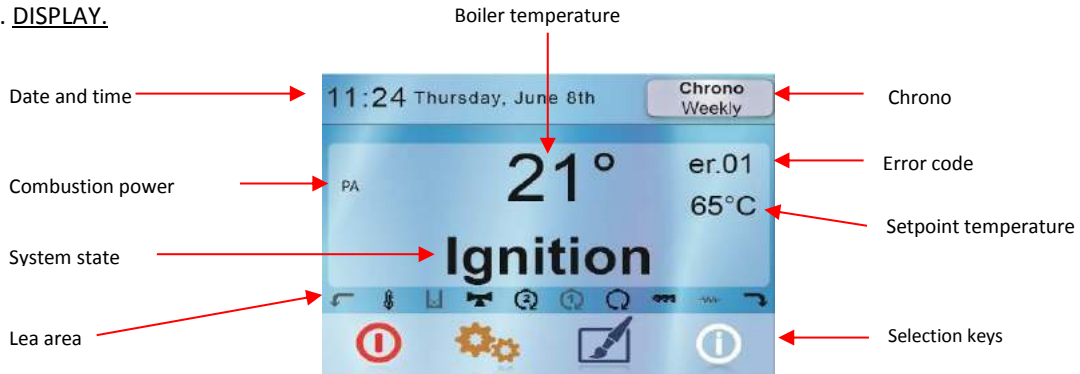




For further information, see lambda probe kit and remote monitoring kit manuals.

## 7. CONTROL PANEL

### 7.1. DISPLAY.



SELECTION KEYS	
	System ignition if pressed for 3 seconds. Unlock.
	Alarms Reset if pressed for 3 seconds
	SETTINGS menu
	CUSTOMIZATION menu
	INFORMATION menu

BROWSING KEYS	
	Back to Main frame
	Back to the upper level
	Up/down scroll
	Increase/decrease value
	Left/right scroll
	Exit from menu saving data
	Exit from menu without saving data

LED	DESCRIPTION (To view, click on the display. In dark, those that are active)
	Ignition resistance ON
	Auger ON
	Pump ON
	3-way valve/Pump 2 ON
<b>L5</b>	Fire/smoke damper actuator ON
<b>L6</b>	V2V Exchanger cleaning solenoid valve ON
<b>L7</b>	Burning plate cleaning linear actuator ON
<b>L8</b>	Silo/hopper loading pellet motor ON
	Lack of pellet
	Room thermostat contact opened
	DHW request
	Winter Mode
	Summer Mode

Press for accessing to the information menu.



Information	
Exhaust T. [°C]:	550
Boiler T. [°C]:	50
Buffer T. [°C]:	50
Safety T. [°C]:	42
Water Press. [mbar]:	2500

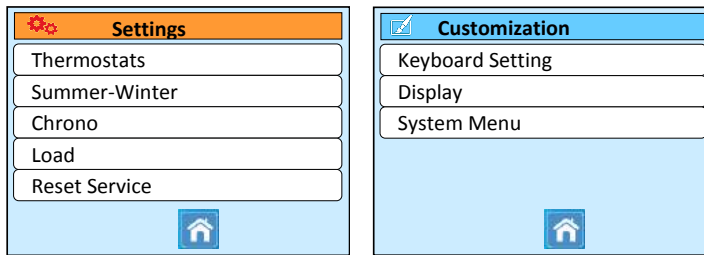
Information	
Exhaust Press. [Pa]:	15
Oxygen [%]:	8
FreqAC [Hz]:	50

Values shown in the Main frame:

- CHECK UP** → System checking
- IGNITION** → Ignition (includes different phases). *See section 9.5 Ignition mode*
- STABILIZATION** → Flame stabilization
- RUN** → Run mode
- MODULATION** → Previous phase to Standby
- STANDBY** → Standby mode
- EXTINGUISHING** → Extinguishing mode
- OFF** → Boiler off
- BLOCK** → Boiler locked

### 7.2 STRUCTURE AND MANAGEMENT OF THE MENU

There are two main submenus, **SETTINGS** menu and **CUSTOMIZATION** menu. They are accessed by pressing the icons  and  respectively.

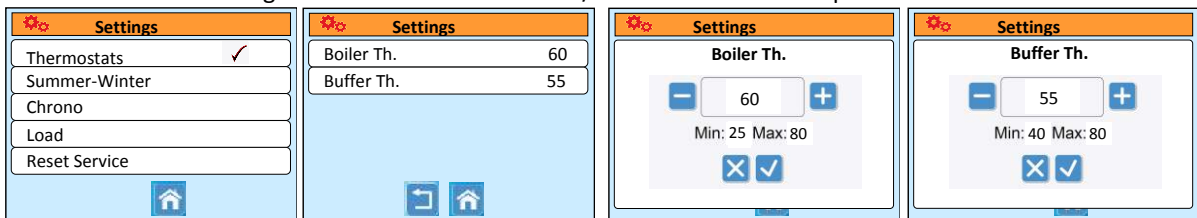


### 7.3. SETTINGS MENU (USER)

	USER MENU		DESCRIPTION
1	THERMOSTATS	Boiler thermostat	For setting Boiler Thermostat set point
		Buffer thermostat	For setting DHW/Buffer Thermostat set point
2	SUMMER-WINTER		For choosing season
3	CHRONO	Program:	Allows scheduling three ON/OFF time lapses for each program.
		- Daily - Weekly - Weekend	
4	LOAD		Burner auger load
5	RESET SERVICE		Reset counters for the next ash removal

#### 7.3.1. THERMOSTATS

This menu allows setting boiler thermostat and DHW/buffer thermostat set points.



#### 7.3.2. SUMMER-WINTER

This menu allows choosing Summer / Winter operating mode.

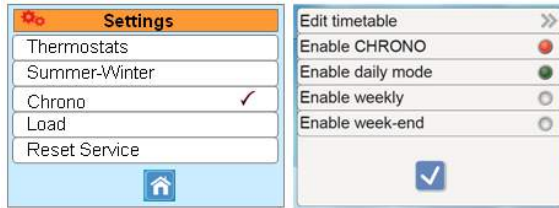
In Winter mode, there is priority for Domestic Hot Water (DHW). When the DHW set point is reached, the boiler returns to its previous state (**RUN** or **STANDBY**).

In Summer mode, when the DHW set point is reached, the boiler will be in **STANDBY** mode.



### 7.3.3 CHRONO

This menu allows scheduling boiler running hours.

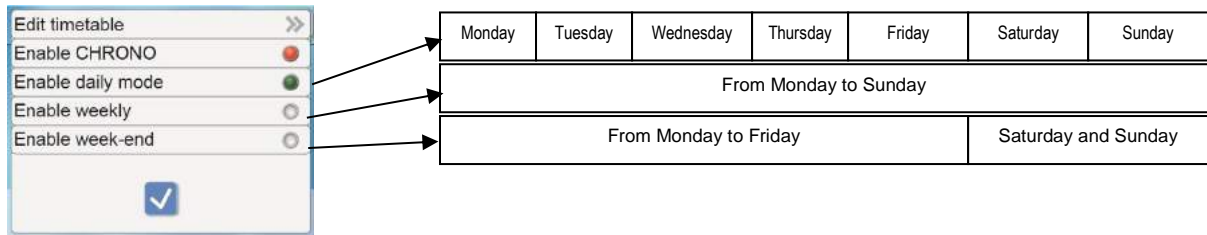


Press **“Enable CHRONO”** for enabling/disabling chrono function.

Enabled function	<input checked="" type="radio"/>
Disabled function	<input type="radio"/>

To select the desired CHRONO program, press on one of these options:

- **“Enable daily mode”**: Individual schedule for each day of the week
- **“Enable weekly”**: The same schedule from Monday to Sunday
- **“Enable week-end”**: Two schedules: from Monday to Friday and from Saturday to Sunday



In each option up to three ON/OFF time lapses can be set. Examples:



Press on the left **«** right **»** arrows of the first line to scroll between the three programming options available: “daily mode”, “weekly”, “week-end”

Press on the left **«** right **»** arrows of the second line to scroll days or group of days of the week, according to the Programming modality selected before.

### 7.3.4. LOAD

This menu allows loading manually the burner plate from the auger

To enable the auger select ON. To stop the auger, select OFF.

Manual load is allowed only if the system is OFF



7.4. CUSTOMIZATION MENU (INSTALLER).

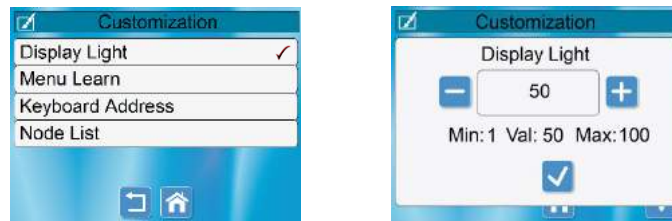
7.4.1. KEYBOARD SETTING.

This menu allows setting time and date, as well as language.



7.4.2.- DISPLAY/KEYBOARD MENU.

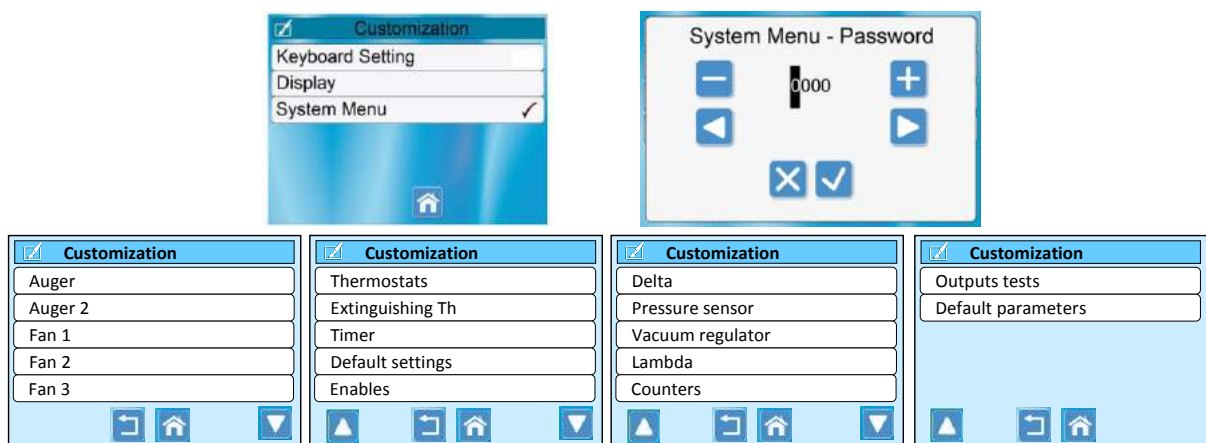
This option allows setting the display brightness.



7.4.3. SYSTEM MENU.

This menu allows entering into the Technical Menu. The access is protected by password (default password: 0000). The user must not modify the content of this menu.

Only the installer or a Service Agent are allowed to modify the content of this menu. WES refuses to accept any responsibility in the event that unauthorized personnel enter in this menu.



	System menu	Description
1	Auger	Allows setting <b>Auger ON</b> seconds from the total <b>Auger Period</b>
2	Auger 2	Allows setting <b>Auger2 ON</b> seconds from the total <b>Auger2 Period</b>
3	Fan 1	Allows setting <b>Combustion Fan 1</b> working values
4	Fan 2	Allows setting <b>Combustion Fan 2</b> working values
5	Fan 3	Allows setting <b>Exhaust Fan</b> working values
6	Thermostats	Allows setting several thermostats working values
7	Extinguishing Th	Allows setting Extinguishing thermostat working values
8	Timer	Allows setting working time associated to the different system stages
9	Default Settings	Allows setting default parameters
10	Enables	Enables/Disables different functions
11	Delta	Allows adjusting delta temperature and several thermostats hysteresis
12	Pressure sensor	Allows setting Pressure sensor threshold
13	Vacuum Regulator	Allows setting the parameters needed for adjusting the speed of the exhaust fan in the presence of a vacuum sensor
14	Lambda	Allows setting the parameters for running the boiler under Lambda Regulator
15	Counters	Allows setting the counters for the system diagnose
16	Outputs Test	Allows a manual test of the different outputs from the touch screen
17	Default parameters	Resets factory settings

The explanation for each parameter and its default value can be found of **section 13.- “CONTROL PARAMETERS”**.

These parameters are factory preset, and can be modified only under manufacturer surveillance.

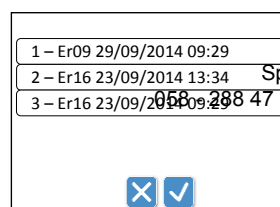
There are other parameters subject to be modified by the installer, depending on the type of installation. These are described in the **section 8.- “COMMISSIONING”**.

**MENÚ 15 – COUNTERS.** Allows setting the counters for the system diagnose.



This menu shows the following counters:

Submenu	Description
Total time	Boiler feeding total time
Functioning time	Boiler running total time: time into which at least one fan is working
Run Mode time	Boiler actual heating time: time into which heating is effectively produced (Run/Modulation)
Ignitions N°	Total number of ignition attempts
Failed Ign. N°	Failed number of ignition attempts
Errors N°	Total number of errors
Cleaning N°	Total number of burning plate cleanings
Cleaning 2 N°	Total number of heat exchanger cleanings
Counters reset	Reset all counters







Error list: shows a list with the most recent errors.

The outputs test menu is detailed in the following chapter **8. COMMISSIONING**

## 8. COMMISSIONING.

 The Commissioning of this appliance must be carried out by an Authorised Service Agent. This is an essential condition for the keeping the warranty of this appliance.


 Check that all instructions given in the **5.-Hydraulic installation** and **6.-Electrical connections** chapters have been followed.

### 8.1. WATER FILLING.

In locations with hard water (>25°fH, >250 ppm mg/l, >17.54°e), the heating water must be softened. It avoids the formation of limescales which can endanger the correct performance not only of the boiler, but also of the rest of components (pumps, valves...)

Fill the circuit slowly with cold water, having the air vent opened, until a 1.5 bar pressure is reached.

### 8.2. BOILER PARAMETERS SETTING.

 → System Menu → Password

9	DEFAULT SETTINGS	(Shaded FACTORY DEFAULTS)	
Parameter	Value	Description	
<b>P35</b>	Plumbing configuration <i>(Default settings)</i>	0	Heating
		2	Heating (Pump) + DHW Tank (3W-valve)
		3	Heating (Pump) + DHW Tank (Pump)
		4	Inertial puffer
<b>P66</b>	RS485 configuration <i>(Default settings)</i>	0	Disabled
		1	Enabled. Only if lambda probe is installed.
<b>A07</b>	Sets room thermostat <i>(Enables)</i> <b>(See section 6.4)</b>	0	Room thermostat disabled. The boiler regulates with the flow temperature.
		1	Ambient thermostat is used to switch the boiler from <b>RUN</b> mode to <b>STANDBY</b> mode then the setpoint is reached.
		2	Ambient thermostat is used to switch off the circulation pump when the setpoint is reached.
		3	Ambient thermostat is used to switch off the boiler when the setpoint is reached.
		4	Ambient thermostat is used to switch the boiler from <b>RUN</b> mode to <b>MODULATION</b> mode then the setpoint is reached.
<b>A60</b>	Set function double temperature setpoint <i>(Enables)</i>	0	Disabled
		1	Enabled for plumbing configuration P35=2, P35=3
<b>6</b>	<b>THERMOSTATS</b>	<b>Allows the setting of several thermostats</b>	



The boiler is supplied with the most usual temperature parameters for the correct operation of the boiler. However, you can change various parameters such as the maximum and minimum temperatures of the boiler, the maximum and minimum temperatures of the DHW tank, activation temperature of the anti-ice temperature, etc.

See full listing in section **13. LIST OF CONTROL PARAMETERS → THERMOSTATS.**

<b>16</b>	<b>OUTPUTS TEST</b>	<b>Allows a manual test of the different outputs <i>when the boiler is OFF</i></b>
-----------	---------------------	--

FAN 1 (%)	Pump (ON/OFF)
FAN 2 (%)	3 way-valve (ON/OFF)
FAN 3 (%)	Output 1. Fire/smoke damper actuator (ON/OFF)
AUGER 1 (burner, ON/OFF)	Output 2. Exchanger cleaning solenoid valve (ON/OFF)
AUGER 2 (ashes, ON/OFF)	Output 3. Burner plate cleaning actuator (ON/OFF)
Igniter (ON/OFF)	Output 4. Hopper/silo auger motor (ON/OFF)

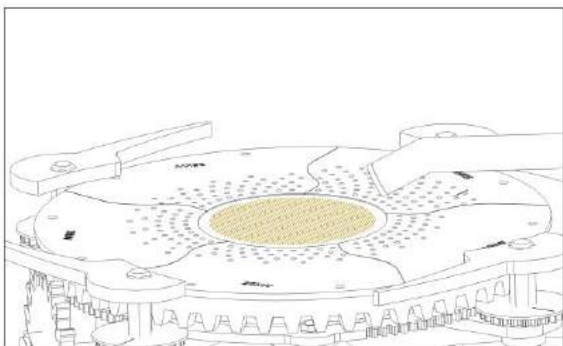
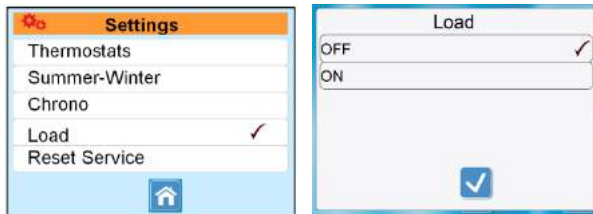
Output test lasts 60 seconds max. After that, the boiler returns to its previous mode.

### 8.3. FIRST PELLETS LOAD.

First, it is necessary that the auger external silo is filled with pellets so that it is ready to supply the boiler. To do this, perform the OUTPUTS TEST (**SYSTEM MENU → OUTPUTS TEST → OUTPUT 4**) as many times as necessary for the auger begins to supply pellets towards the boiler.

After this step, it will be necessary to do the first pellet load, choosing “Load” option from the Settings menu. This option activates the feeding auger of the boiler. For stopping the pellet load, press OFF or wait 60 seconds.

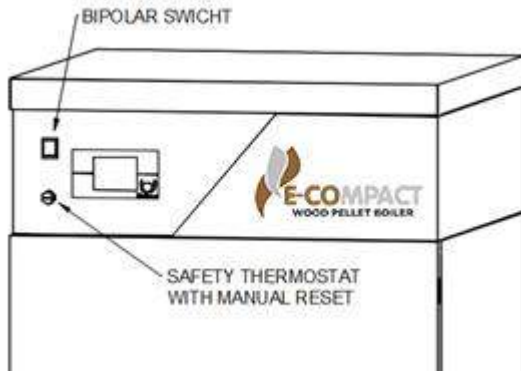
Manual load is allowed only if the system is OFF. Repeat manual load until the burner plate has fuel enough.




Keep the manual load until there is enough pellets in the combustion plate.

**Repeat operation if necessary.**


#### 8.4. TURNING THE BOILER ON/OFF. UNLOCK.




The boiler is electrically supplied via a two pole isolation switch with voltage indicating light

Hold the  icon for 3 seconds until an acoustic signal is heard. The display will show “**IGNITION IN PROGRESS**”.

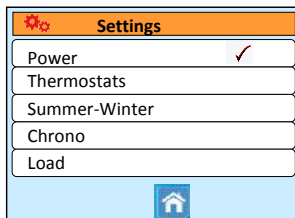
The boiler will command automatically the performance of all its components, following the current settings.

For turning off the boiler (even in case of emergency stop), hold the  for 3 seconds until an acoustic signal is heard. The display will show “**EXTINGUISHING IN PROGRESS**”.

In running mode, if the boiler detects an error, it will enter in **EXTINGUISHING** mode, and once this process ends, it remains in **BLOCK** mode.

To unlock, hold the  icon for 3 seconds until an acoustic signal is heard. The display will show **OFF**.

#### 8.5. MANUAL SELECTION POWER.



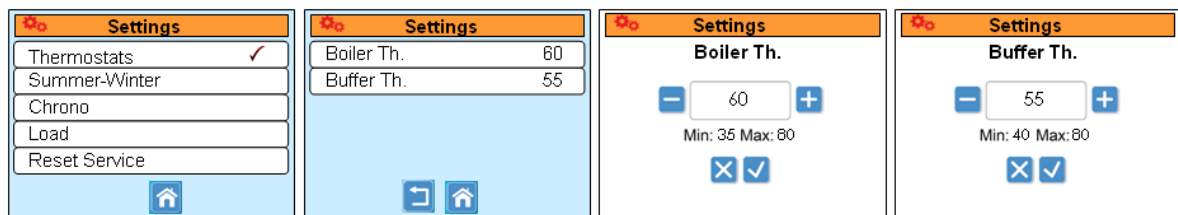
The boiler is supplied with automatic power modulation operation, but in the commissioning may be interesting to select the manually operating power. This is controlled with the parameter **A05 (System Menu → Enables)**.

- A05 = 0: Manual selection of power.
- A05 = 1: Caldera automatically modulates.

After changing the parameter A05, in the Settings Menu will appear the option Power, where you can select the chosen power.

#### 8.6. BOILER AND BUFFER TEMPERATURE SETPOINT.

The heating water set point is set as described in 7.3.1. That menu shows how to set both boiler and buffer thermostats set points.



#### 8.7. WINTER-SUMMER

This menu allows choosing WINTER/SUMMER operating mode.

In Winter mode, there is priority for Domestic Hot Water (DHW). When the DHW set point is reached, the boiler returns to its previous state (**RUN** or **STANDBY**)

In Summer mode, when the DHW set point is reached, the boiler will go to **STANDBY** mode.



### 8.8. RESET SERVICE

Pressing **RESET SERVICE**, the ash drawer cleaning interval is reset. This time is defined in the parameter **T70**. Once this time is done, the display will show a message to remind the user the need for cleaning the ash drawer. By default, this parameter is set at 240 hours. The hours counter increases only when the boiler is in **RUN** mode and **MODULATION** mode.

## 9. BOILER OPERATION

### 9.1. CIRCULATION PUMP CONTROL

The boiler controls the circulation pump of the following ways:

- **First start:** To increase the speed of heating water in the boiler, the pump starts when the water temperature of the boiler exceeds 35°C.
- **Operation safety:** Regardless of the setting parameter A07, when the boiler temperature exceeds 72°C, the boiler keeps the pump on.

### 9.2. FANS CONTROL

The boiler incorporates a fan to provide combustion air (FAN 1) and an exhaust fan in charge of generating the necessary depression in the combustion chamber (FAN 3).

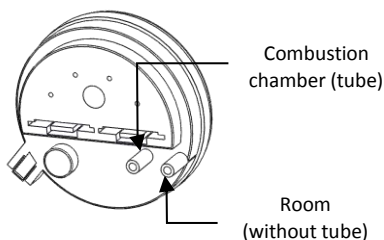
Regulation FAN 1 is carried out by the programming introduced in the boiler, in which the mode of functioning of the fan is determined in the following phases:

**Ignition - Stabilization - Power 1 to 5 - Second Ignition - Standby - Extinguishing - Cleaning**

The FAN 3 operates automatically to keep the depression set points in the combustion chamber, in the following phases:

**Ignition - Stabilization - Power 1 to 5**

This depression set point, is measured by a sensor located in the front of the boiler, behind the metal plate which protect the electrical circuits.



When the boiler incorporates the accessory module LAMBDA, is the lambda probe which determines the rate of operation of the FAN 1 to obtain the desired percentage of oxygen in the flue gas.

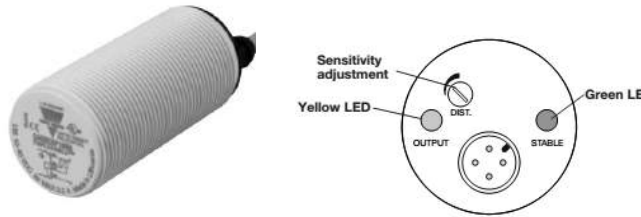
### 9.3. AUGERS.

The boiler incorporates an auger driven by a gear motor, to introduce the pellet into the burner. The auger regulation is managed by the program introduced in the boiler, which determining its time of actuation in the following phases:

**Ignition - Stabilization - Power 1to 5 - Second Ignition - Standby**

At the rear of the boiler, the electrical connection of the hopper auger (not supplied with the boiler) it is provided.

The operation of the external auger is carried out via the pellet detection sensor.



When it detects lack of pellet, the LED swicht off and sends a signal to the external auger for transporting pellet to the boiler.

When the sensor detects the existence of pellet, the yellow LED lights and the external auger stops.

WES supplies different models of external augers adapted to the boiler. In the case of installing an auger not supplied by WES, the parameter T23 should be regulated to prevent error in the boiler due to lack of pellets ( → **System Menu** → **Password** → **Times** → **T23**).



- T23: Delay in stopping the external auger once detected pellet (by default 2 sec.). If the external auger provides less of pellet than burner auger, T23 has to be increased.

The maximum lack of pellet time until the boiler goes into alarm is 60 sec. (**parameter T24**).

### 9.4. FIRE/SMOKE DUMPER ACTUATOR.

The boiler incorporates a dumper actuator with return spring that works as smoke and flame security device. The boiler governs the opening or closing of the dumper actuator according to the state of the boiler.



- **Ignition-Stabilization-Power 1 to 5 - Second Ignition** → **OPEN**
- **Standby - Extinguishing** → **CLOSED**
- **Error - Block** → **CLOSED**

Any alarm detected by the boiler, or in case of power failure, the dumper actuator automatically closes in tight manner the pellet supply duct, thereby preventing back of fire and flue gas.

### 9.5. IGNITION MODE

In the **IGNITION** mode there are the following phases:

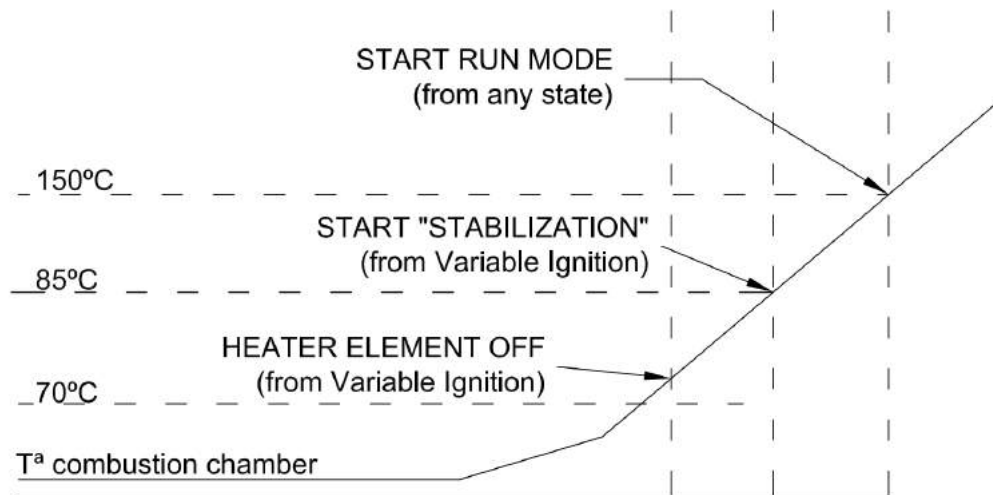
Display	Phase	Description	Time
CHECK UP	Open dumper actuator	Open the pellet feed valve.	60 sec.
	Check Up	Check the system	10 sec.
IGNITION	Preheating	Preheating of the ignition element.	90 sec.
	Loading	Pellet preload in combustion plate. (Variable depending on the model)	T03
	Fix Ignition	First phase of the electric ignition.	600 sec.
	Variable Ignition	Second phase of the electric ignition (5 attempts maximum)	300 sec.
STABILIZATION	Stabilization	Flame stabilization phase	300 sec.
RUN	Run	Normal operation. Power modulation.	

The Ignition element switch off once it enters in the **VARIABLE IGNITION** phase and the temperature in the combustion chamber is above **70°C**.

The **STABILIZATION** phase begins being under **VARIABLE IGNITION** and the temperature of the combustion chamber exceeds **85°C**.

**RUN** phase begins when the temperature of the combustion chamber exceeds 150°C, regardless of the stage where you are at that moment.

Display	CHECK UP		IGNITION				STABILIZATION	RUN
MODE	OPEN DUMPER ACTUATOR	CHECK UP	PREHEATING	LOADING	FIX IGNITION	VARIABLE IGNITION	STABILIZATION	RUN
	60 sec.	10 sec.	90 sec.	T03	600 sec.	300 sec. X 5	300 sec.	
FAN 1	OFF	MAX.		ON		ON	ON	ON
FAN 3	OFF	MAX.		ON		ON	ON	ON
AUGER		OFF		ON	OFF	ON	ON	ON
HEATER ELEMENT	OFF			ON		ON	OFF	



### 9.6. RUN and STANDBY MODE.

In **RUN** mode, the boiler automatically modulates the working power to reach the temperature setpoint. The modulation range is 5 steps power (P1 to P5), and its operation is determined by the configurable parameter D08 (**System Menu** → **DELTAS** → **D08**), the default is 12.

When the boiler temperature is lower than (temperature setpoint - D08), the boiler operates at full power (P5). From then it modulates its power, changing every 3°C (D08/4).

Examples:

Tª setpoint = 50°C	
D08 = 12°C	
Boiler Temp.	Power
< 38°C	P5
38°C - 40°C	P4
41°C - 43°C	P3
44°C - 46°C	P2
47°C - 50°C	P1

Tª setpoint = 75°C	
D08 = 12°C	
Boiler Temp.	Power
< 63°C	P5
63°C - 65°C	P4
66°C - 68°C	P3
69°C - 71°C	P2
72°C - 75°C	P1

D8 parameter values must be multiples of 4 (D08 = 4, 8, 12, 16, ...).

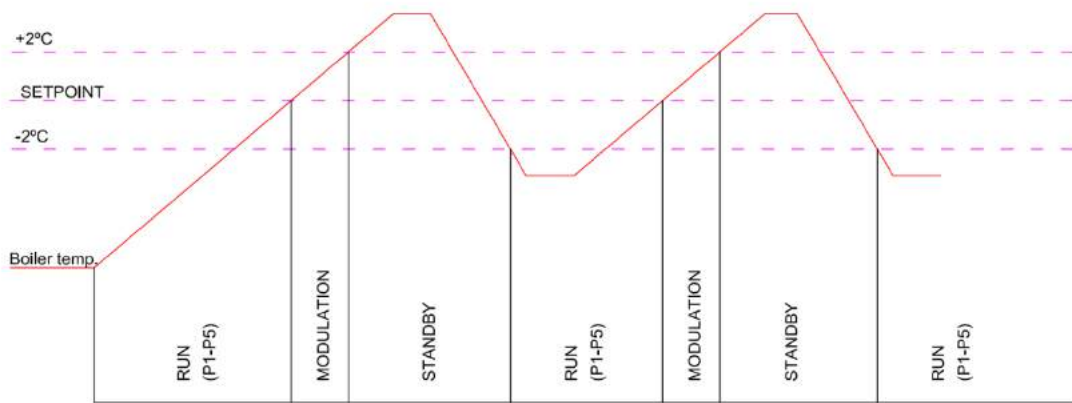
The higher the value, the boiler takes longer to reach the setpoint, but instead it will work more regular and lower consumption because it will work most of the time at different powers of its maximum power.

The lower the value, the faster boiler reaches the set temperature, but if the heating system has low inertia, the boiler can reach excessive temperatures.

When the boiler reaches the setpoint temperature, the boiler goes to **MODULATION** mode. When the boiler exceeds 2°C (D10) the temperature setpoint, the boiler is switched to **STANDBY** mode. In **STANDBY** mode the pellet feed valve is closed, so in this mode the boiler does not consume any fuel and the temperature of the combustion chamber starts to drop.

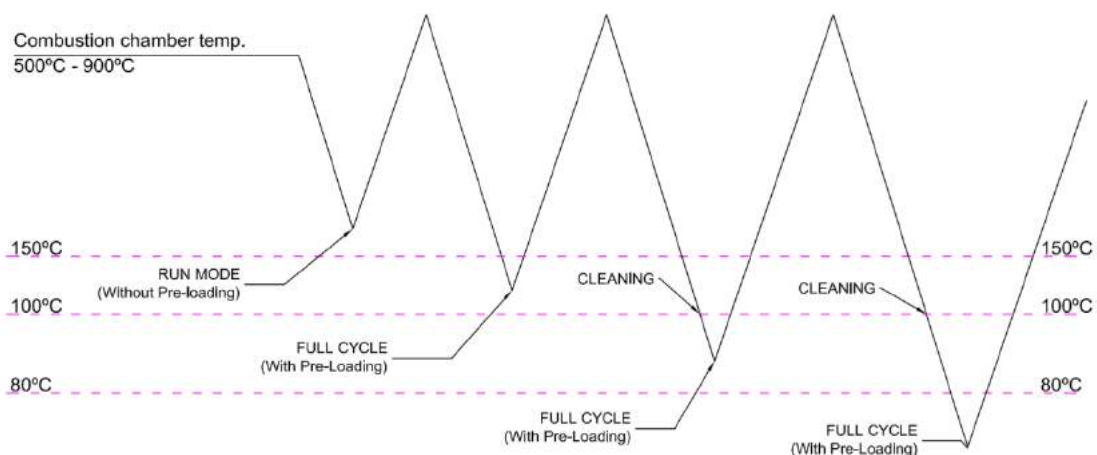
In **STANDBY** mode, if the boiler temperature drops below (setpoint-2°C (D10)) (i.e. there is request for heating or DHW), the boiler out of **STANDBY** mode and enters in **NORMAL** mode, modulating their power from the minimum power (P1).

Run	Power modulation
Modulation	The boiler setpoint has been reached
Standby	The boiler temperature is 2°C over the setpoint



In **STANDBY** mode, if the temperature of the combustion chamber down below **100°C**, the boiler will make the **final cleaning** and remain in **STANDBY** mode. If the heat demand returns, the boiler will start automatically the full cycle, including the **PRELOADING** phase.

If the heat demand returns when the temperature of the combustion chamber is above 150°C, the start is performed omitting the ignition process, so it will enter directly in **RUN** mode, without performing the precharge phase.



### 9.7. EXTINGUISHING and BLOCK MODE.

**EXTINGUISHING** mode is activated when the boiler is turned off manually or by scheduling. In these cases, the boiler ends in **OFF** mode.



**EXTINGUISHING** mode is also activated when the boiler detects an alarm. In these cases, the boiler ends in **BLOCK** mode and unlock necessary (*see section 8.4*).

After starting the **EXTINGUISHING** mode, the boiler can be automatically out of this state in the following cases:

- After a power failure between 1 and 60 minutes, if the boiler was ON.
- Manually by pressing the ON/OFF button on the boiler. It starts the **IGNITION** cycle.

#### 9.8. DHW PRODUCTION

The E-COMPACT TWIST boilers are planned for production of DHW through a DWH Tank (see section 8. - Default Settings), parameters P35=2 or 3, and A60 = 1 (System Menu → Enables).

With these parameters, the behaviour of the boiler is as follows:

- If there is no demand for DHW, the boiler works with the set point manually entered (e.g. 50°C).
- If there is demand for DHW, the boiler automatically changes its set point to 70°C, to satisfy as quickly as possible the DHW set point manually entered (30-60°C) (*See section 8.6.- Boiler and Buffer temperature set point*)
- Once satisfied the demand for DHW:
  - WINTER MODE: the boiler returns to its previous state (**RUN** or **STANDBY**)
  - SUMMER MODE: the boiler is switched to **STANDBY**.

#### 9.9. AUTOMATIC CLEANINGS

The boiler carries out various cleaning automatically:

- **PERIODIC CLEANING**. Combustion plate cleaning by air.
- **CLEANING 1**. Mechanical cleaning of combustion plate.
- **CLEANING 2**. Final cleaning (mechanical for the combustion plate and by water in the exchanger tubes).

**PERIODIC CLEANING** consists in putting to the maximum speed the combustion fan for a short period of time (parameters T07 and T08).

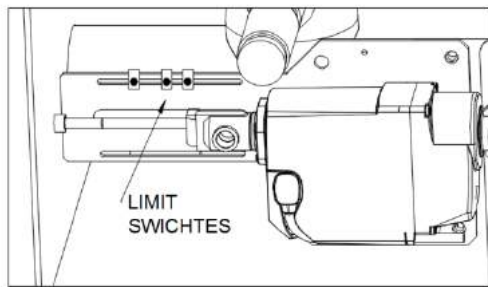
**CLEANING 1** consists in putting the cleaning nails into the plate to an intermediate position and simultaneously the plate begins to rotate. Thus the ashes are swept to the ash drawer. The frequency and duration of the cleaning is done differently depending on the model of the boiler (T27 and T28 parameters).

**CLEANING 2** is performed in these circumstances:

- Boiler in **EXTINGUISHING** mode and temperature of the combustion chamber below 80°C (TH01). After the cleaning, the boiler is in **OFF** mode.
- Boiler in **STANDBY** mode and temperature of the combustion chamber below 100°C (TH28). After the cleaning, the boiler remains in **STANDBY** mode.

The final cleaning comprises a mechanical cleaning of the combustion plate, similar to the **CLEANING 1** described above, but in this case the nails rotate to the end position, so that, they also clean the exit holes of the primary combustion air.











The positioning of the nails is controlled by the limit switches of the linear actuator located on the burner.

During CLEANING 2, cleaning exchanger tubes solenoid opens and allows the water flow for a time T54 in seconds (configurable parameter System Menu → Time → T54). Water flows inside the tubes and it is evacuated to the drain.

In the case of BCH-100 model, the activation of the solenoid valve is associated to the CLEANING 1.

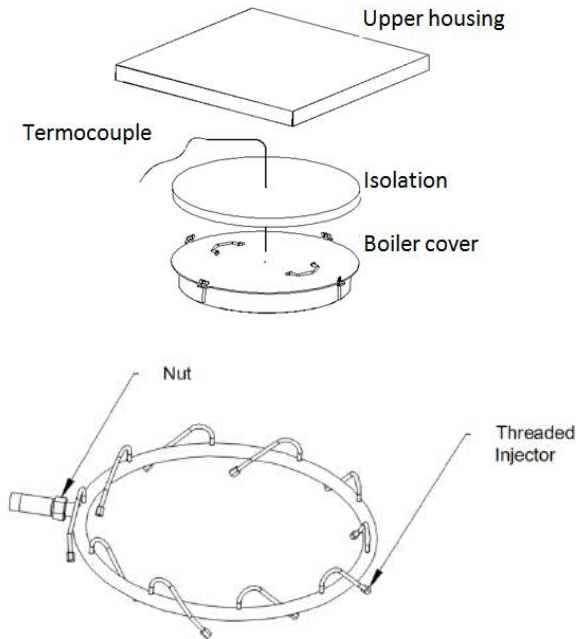
## 10. CLEANING AND MAINTENANCE

-  Read carefully the following instructions in order to avoid unnecessary risks.
-  The internal cleaning of the boiler must be performed at least once a year by qualified personnel.
-  The metallic parts must be mechanically cleaned with a **NON METALLIC** brush.
-  Risk of burns. The servicing must be done with the boiler OFF and cold. Warning: even in these conditions ashes may still be hot.
-  Risk of electric shock. The servicing must be done with the boiler OFF.
-  According to the legislation, it is mandatory to keep a servicing logbook.

E-COMPACT boilers are automatic boilers, but for safety, smooth performance and for extending its useful life, the following maintenance operations, as legislation specifies, are necessary:

TASK	PERIODICITY
Check the status of pellet storage	weekly
Visual inspection of the boiler	weekly
Ash cleaning and removal	monthly
Review the security elements	monthly
Cleaning the burner	yearly
Checking and cleaning, if necessary, smoke circuit, boiler flue circuit, flue gas pipe and chimney	yearly
Checking tightness seal between burner and boiler	yearly
Review the status of thermal insulation	yearly
Review automatic control system	yearly
Review the expansion vessel	yearly
Review of water treatment systems	yearly
Review DHW preparation system	yearly
Checking for pipes tightness	yearly

### 10.1. COMBUSTION CHAMBER AND HEAT EXCHANGER TUBES CLEANING.



Access to the top of the boiler removing the upper housing and insulation.

Remove the thermocouple and the boiler cover by releasing the four nuts.

Before cleaning with water, aspirate the ash accumulated on top of the boiler and inside the combustion chamber.

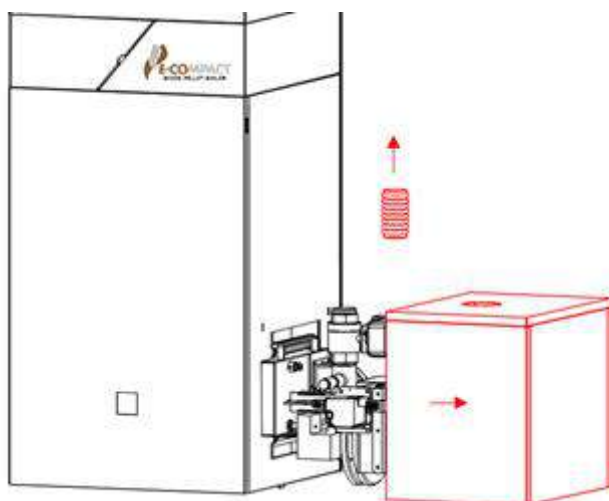
Check the effectiveness of water cleaning system by performing an **OUTPUT TEST** (Output2) as described in section 8.2. In case some Injector were blocked or flow water is diverted, replace the threaded injector by a new one.

Remove the cleaning system through the loose nut. **Remember to shut off the water supply before removing the toroid.**

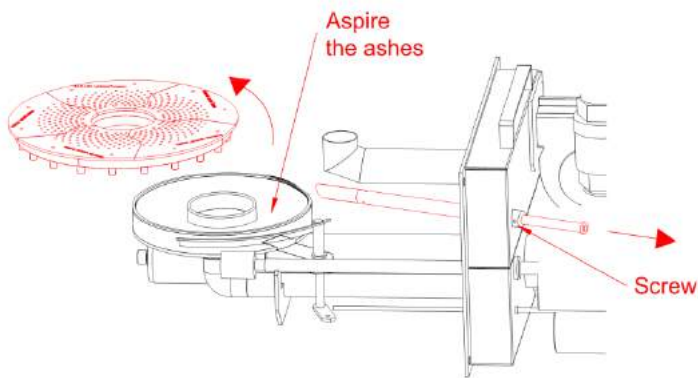
The flue tubes are cleaned individually introducing inside each tube a 25 mm diameter water hose connected to the water network. Let the water run for a few seconds inside each tube to flush any solid waste.

Cleaning water with waste are discharged through the condensate drain trap.

### 10.2. BURNER CLEANING.

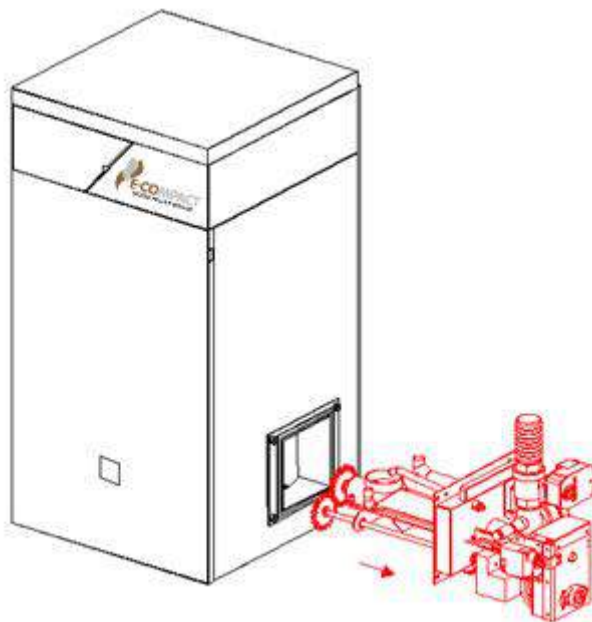
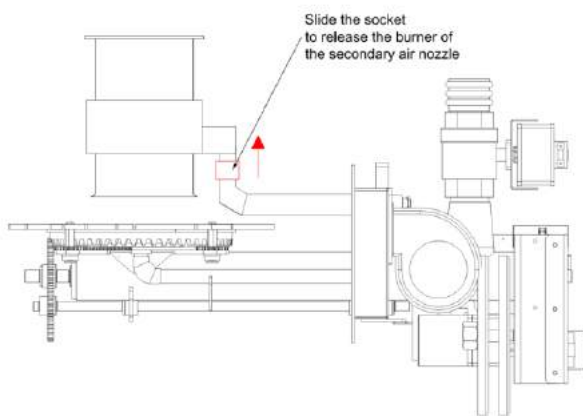


Remove the supply hose pellet and the burner cover to access the screw of the ignition resistance.



- Remove the heater element to release the burner grate.
- Remove the grate by the front door.
- Aspire the ash.
- Clean the burner grate.

To remove the burner inside the boiler proceeds as follows:



Remove the fixing screws and remove the burner by the lateral door.



Please assemble in reverse order.



The heater element must be correctly positioned and fixed with the screw.

Check the correct closure of the connecting piece to the burner of the secondary air nozzle.

## 11. ASH REMOVAL



The ash volume depends on the number of boiler running hours, as well as the quality of the used pellet.



Ash removal must be carried out complying local legislation in force.




Pay attention during emptying the ashes, as they may still be hot. In this case you must wait for them to cool, since there is risk of fire.



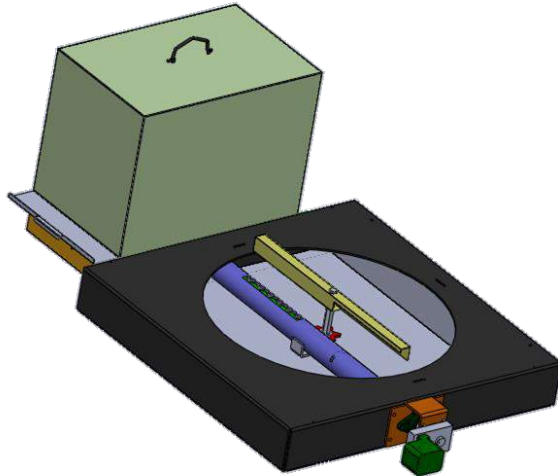
Protective equipment: gloves, goggles, mask.



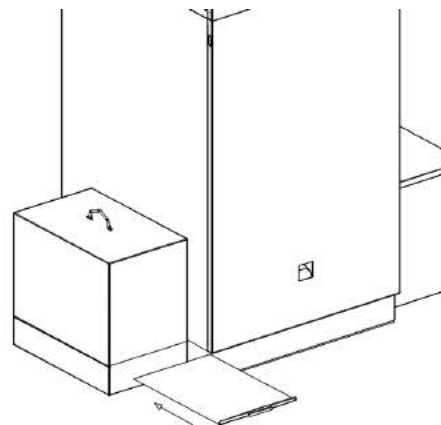
Ashes are a good thermal insulator. It is advisable not completely empty the drawer

The boiler will show the message "**CLEANING**" in the display to indicate empty signal of the ash box. This message is displayed after a time T70 programmable according to the boiler output. After emptying the drawer, enter  User Menu → Reset Service. Thus the counter (see section 8.8) restarts.

The boiler has enough space to store the ash produced for more than a month of normal operation, so that cleaning and removal of ashes are to be carried out once a month.



The BCH-25 /... / 100 models have an automatic system that extracts the ashes from the burner bottom and place them in an ash box, which can be emptied without stopping the boiler.



Insert to empty the ash box

To remove the ash box from its support base, first enter the bottom lock sheet.

**THIS SHEET MUST BE OUT IF THE BOILER IS RUNNING**



During operation of the boiler, the base of the ash box should be filled with ashes to prevent the exhaust fan can absorb air through the auger. In the commissioning of the boiler, when

there are no ashes produced, it is necessary to fill the base of the case with the bag of vermiculite supplied with the boiler.

## 12. LIST OF ERRORS. CAUSES AND ACTIONS TO BE TAKEN.

Code	Causes and actions to be taken
Er01	<p><b>Error activation Safety thermostat</b> The water temperature in the boiler has reached 100 ° C. The boiler enters into <b>EXTINCTION</b> mode. Let the boiler to cool and make a visual inspection. A manual reset is needed, by pressing until you hear a "click" the switch located under the cap next to the touch screen. This reset will occur when the boiler temperature has dropped below 90°C.</p> <p>Possible causes and actions to be taken:</p> <ul style="list-style-type: none"> <li>- No water flowing through the boiler circuit. Check manual valves and filters in the circuit. Check the connection and operation of the pump. Contact your installer.</li> <li>- Boiler temperature probe not connected, badly placed or defective. Check the placement and connection of the probe. Contact Service Agent.</li> <li>- Existence of air in the boiler circuit. Check the automatic air vent.</li> <li>- Heating circuit without pressure. Contact your installer.</li> </ul>
Er03	<p><b>Extinguishing not foreseen for low temperature at the combustion chamber</b> The boiler moves to <b>EXTINCTION</b> mode because of low temperature at the combustion chamber.</p> <p>Possible causes and actions to be taken:</p> <ul style="list-style-type: none"> <li>- Lack of pellets in the auger. Check for fuel. Make a manual auger load (LOAD command in user menu). Contact your installer.</li> <li>- Pellet feed auger motor stopped. Check the power supply. In case of motor failure, contact your installer or Service Agent.</li> <li>- Igniter failure. Check resistance (211 Ω / 230 V). In case of failure contact your installer or Service Agent</li> <li>- Reading Error at combustion chamber temperature probe. Verify that flame is placed in the combustion chamber. If so, combustion chamber temperature probe is not measuring correctly. Stop the boiler and contact your installer or Service Agent.</li> <li>- Combustion chamber temperature probe no connected, badly placed, or defective. Check the placement and connection of the probe. Stop de boiler and contact your installer or Service Agent</li> </ul>
Er04	<p><b>Water over-temperature</b> The water temperature in the boiler has reached 95°C. The boiler enters into EXTINCTION mode. Let the boiler to cool and make a visual inspection.</p> <p>Possible causes and actions to be taken:</p> <ul style="list-style-type: none"> <li>- No water flowing through the boiler circuit. Check manual valves and filters in the circuit. Check the connection and operation of the pump. Contact your installer.</li> <li>- Boiler temperature probe not connected, badly placed or defective. Check the placement and connection of the probe. Contact Service Agent.</li> <li>- Existence of air in the boiler circuit. Check the automatic air vent.</li> <li>- Heating circuit without pressure. Contact your installer.</li> </ul>
Er05	<p><b>Combustion chamber over-temperature</b> The combustion chamber has reached 890°C. The boiler enters into EXTINCTION mode.</p> <p>Possible causes and actions to be taken:</p> <ul style="list-style-type: none"> <li>- Faulty performance of auger / incorrect settings. Stop the boiler and contact your installer or Service Agent.</li> </ul> <p><b>Flue gas over-temperature in chimney</b> SECURITY message appears on the display. The flue gas sensor exceeds 100°C.</p> <p>Possible causes and actions to be taken:</p> <ul style="list-style-type: none"> <li>- The exchanger tubes cleaning system by water is not being effective. Check the valves located upstream of the solenoid cleaning valve. Stop de boiler and contact your installer or Service Agent</li> </ul>
Er09	<p><b>Low water pressure</b> Water pressure is below 0.5 bar (500 mbar).</p> <p>Possible causes and actions to be taken:</p> <ul style="list-style-type: none"> <li>- Water leakage in the heating circuit. When the circuit is cold, re-pressure and purge the circuit. If the pressure drops again contact your installer.</li> </ul>
Er10	<p><b>High water pressure</b> Water pressure is over 3 bar (3000 mbar).</p> <p>Possible causes and actions to be taken:</p> <ul style="list-style-type: none"> <li>- Safety 3 bar pressure relief valve not installed or defective. Contact your installer.</li> <li>- Expansion vessel defective or improperly sized. Contact your installer.</li> </ul>
Er11	<p><b>Real time clock error</b> Possible causes and actions to be taken:</p> <ul style="list-style-type: none"> <li>- Battery failure of the control board. Contact your installer or Service Agent.</li> </ul>

<b>Er12</b>	<p><b>Ignition failed</b> The boiler has not been able to ignite a flame after several programmed attempts.</p> <p>Possible causes and actions to be taken:</p> <ul style="list-style-type: none"> <li>- Igniter failure. Check resistance (211 Ω / 230 V). In case of failure contact your installer or Service Agent</li> <li>- Absence of pellets in the combustion plate. Make a manual load by selecting LOAD at User menu.</li> </ul> <p>Air obstruction at primary / afterburning air conducts. Clean conducts.</p>
<b>Er15</b>	<p><b>Lack of voltage</b> The boiler has stopped working because of power failure.</p> <p>Possible causes and actions to be taken:</p> <ul style="list-style-type: none"> <li>- Unlock the boiler and return to normal operation.</li> </ul>
<b>Er16</b>	<p><b>RS485 lambda probe communication error</b> The main control board does not communicate with the board of the lambda probe.</p> <p>Possible causes and actions to be taken:</p> <ul style="list-style-type: none"> <li>- Check both boards voltage (LEDs ON). Faulty fuses. Contact your installer or Service Agent.</li> <li>- Check RS485 communication cable. For replacement contact your installer or Service Agent.</li> </ul>
<b>Er18</b>	<p><b>Extinguishing for lack of pellet</b> The sensor pellet detects unavailability of pellet for feeding the boiler.</p> <p>Possible causes and actions to be taken:</p> <ul style="list-style-type: none"> <li>- Fault in auger/vacuum feeding system. Contact your installer or Service Agent.</li> <li>- Sensor pellet faulty. Contact your installer or Service Agent.</li> </ul>
<b>Er22</b>	<p><b>Lambda regulator error</b> Lambda probe regulator has detected an error and blocks the boiler.</p> <p>Possible causes and actions to be taken:</p> <p>For disabling lambda regulator error warning modify the parameter P60 = 0 (System Menu → Lambda → Control → P60). Contact your installer or Service Agent.</p>
<b>Er34</b>	<p><b>Depression below the minimum threshold</b> Combustion chamber depression has dropped below preset minimum threshold (15 Pa).</p> <p>Possible causes and actions to be taken:</p> <ul style="list-style-type: none"> <li>- Fault in smoke exhaust fan. Contact the Service Agent.</li> <li>- Pressure sensor defective. Contact the Service Agent.</li> <li>- Chamber inspection door opened. Close the door.</li> <li>- Pressure sensor or its tubule incorrectly installed. Connect the tubule / place the sensor in the proper position.</li> </ul>
<b>Er35</b>	<p><b>Depression above the maximum threshold</b> Combustion chamber depression has risen over preset maximum threshold (200 Pa).</p> <p>Possible causes and actions to be taken:</p> <ul style="list-style-type: none"> <li>- Pressure sensor defective. Contact the Service Agent.</li> <li>- Excessive draft in the chimney. Place a flue draft regulator. Contact the Service Agent.</li> </ul>

**NOTE: Errors EL00 to EL08 correspond to boilers equipped with lambda probe. Refer to the manual provided with the lambda probe.**

#### Other error messages

<b>End Pellet</b>	<p><b>Lack of pellet error</b> The sensor pellet detects unavailability of pellet for feeding the boiler.</p> <p>Possible causes and actions to be taken:</p> <ul style="list-style-type: none"> <li>- The boiler runs out of fuel. Ask for more fuel to your supplier</li> <li>- Fault in feeding pellet to the burner. Check the feeding system (auger or vacuum)</li> </ul>
<b>Prob</b>	<p><b>Temperature probe error</b> When CHECK-UP phase, if one or more probes show 0 °C value, open or short circuit. It does not cause an error; it is only a display message.</p> <p>Possible causes and actions to be taken:</p> <ul style="list-style-type: none"> <li>- Check probes connection. In case of faulty probe, request replacement by contacting the Service Agent</li> </ul>
<b>Service</b>	<p><b>Servicing message</b></p> <p>The interval (240 hours in RUN mode) since last emptying of the ash box is fulfilled.</p> <p>Possible causes and actions to be taken:</p> <ul style="list-style-type: none"> <li>- Empty the ash box. Restart the counter doing the RESET SERVICE in the user menu.</li> </ul>



### 13. LIST OF CONTROL PARAMETERS.

Code	Value	Description	Default value
<b>ENABLE</b>			
A05	0	Manual management of the combustion system	1
	1	Automatic management of the combustion system	
A07	0	External room thermostat input is disabled	0
	1	External room thermostat is used to switch boiler to <b>STANDBY</b> mode when the set point is reached.	
	2	External room thermostat is used to switch off the circulation pump when the set point is reached.	
	3	External room thermostat is used to switch off the boiler when the set point is reached	
	4	External room thermostat is used to switch the boiler to <b>MODULATION</b> mode when the set point is reached.	
A10	1	From Extinguishing state it's possible to go directly to <b>CHECK UP</b>	1
A13	1	If boiler temperature is higher than (setpoint+2°C) after time T55, the boiler enters into <b>STANDBY</b> mode.	1
A14	1	Enable Pressure Sensor Error management	1
A16	1	Enable Power Changing delay	1
A20	0	Water pressure Sensor Configuration Type A	0
A26	0	Exit from <b>STANDBY</b> if there aren't the conditions	0
A27	1	Extinguishing in <b>STANDBY</b> enable. TH28 and T13 parameters are used.	1
A29	1	Exit from <b>STANDBY</b> if a sanitary water demand occurs enabled.	1
A30	1	Vacuum Regulator on Exhaust Fan Speed Enabled.	1
A60	1	Double temperature set point function enabled for schemes with P35=2, 3.	1
<b>DEFAULT SETTINGS</b>			
P02	Maximum number of ignition attempts		5
P03	Number of power steps		5
P04	Number of combustion recipes		1
P05	Auger 1 period		s/model
P09	Pellet level sensor configuration		0
P14	Fan 1 min speed		20
P27	Fan 3 min speed		20
P35	Hydraulic configuration (see section 5.3)		2
P61	OUT1 configuration. Fire/smoke dumper actuator.		1
P62	OUT2 configuration. Cleaning 2 (final cleaning)		13
P63	OUT3 configuration. Cleaning 1 (burner)		4
P64	OUT4 configuration (external auger)		2
P66	0	RS485 communication with lambda module disabled	0
	1	RS485 communication with lambda module enabled	
P78	1	Safety function with smoke probe enabled.	1
<b>THERMOSTATS (Thermostat hysteresis are shown as IHxx in menu)</b>			
TH01	Boiler off		80 (-2)
TH02	Ignition resistance off		70 (+2)
TH03	Pre-Extinguishing for low chamber combustion temperature		100 (-2)
TH06	Move to STABILIZATION Mode		85 (+2)

TH07	Move to MODULATION Mode	850 (+20)
TH08	Flue gas Safety	890 (+20)
TH09	Bypass Ignition (move to RUN)	150 (+5)
TH18	Anti-freeze	5 (-0)
TH19	Circulation pump ON	35 (+2)
TH20	DHW min temperature	40 (+2)
TH21	DHW max temperature. Automatic set point for high temperature operation.	72 (-2)
TH24	Boiler water temperature	60
TH25	Boiler safety thermostat	95 (+2)
TH26	Boiler min range thermostat	25
TH27	Boiler max range thermostat	80
TH28	Extinguishing exhaust temperature in STANDBY	100 (-5)
TH29	Buffer thermostat	45 (±2)
TH30	Differential thermostat	3 (±1)
TH35	Extinguishing exhaust temperature Power 1	200
TH36	Extinguishing exhaust temperature Power 2	300
TH37	Extinguishing exhaust temperature Power 3	400
TH38	Extinguishing exhaust temperature Power 4	450
TH39	Extinguishing exhaust temperature Power 5	500
TH55	Min. value for buffer thermostat	30
TH56	Max. value for buffer thermostat	60
TH78	Flue gas safety temperature	100 (+2)
<b>DELTA TEMPERATURE</b>		
D01	Delta temperature to exit from <b>STABILIZATION</b> phase (to add to TH06)	50
D08	Delta temperature for power modulation in proportional combustion management	8
D10	Delta temperature for moving from <b>MODULATION</b> to <b>STANDBY</b>	2
<b>TIME</b>		
T01	Check-up Cleaning time (air sweeping)	10 s.
T02	Preheating phase	90 s.
T03	Auger preload	s/model
T04	Fixed ignition	600 s.
T05	Variable ignition	300 s.
T06	Stabilization	300 s.
T07	Periodic cleaning repetition (air sweeping)	60 m.
T08	Periodic cleaning duration	15 s.
T09	Safety thermostat delay	60 s
T10	Safety pressure switch delay	60 s.
T11	Exit from STANDBY delay	10 s.
T13	Minimum Extinguishing time at Standby	60 s.
T14	Pre-Extinguishing	900 s.
T15	Safety Extinguishing	60 s.
T16	Final cleaning time	60 s.
T17	Power shifting delay	30 s.
T18	Power shifting delay at IGNITION	30 s.
T22	Entering time delay at STANDBY	10 s.
T23	Pellet tank loading time after minimum level signal	2 s.
T24	Pellet tank loading time for reaching the minimum level	60 s.

T25	Delay on closing from pellet sensor signal	0 s.
T26	Delay on opening from pellet sensor signal	0 s.
T27	Cleaning system delay on RUN mode	60 m.
T28	Cleaning system time	20 s.
T50	Fired/smoke dumper actuator open time	60 s.
T54	Cleaning engine 2 ON at the end of Extinguishing	20 s.
T55	Waiting time to go in Standby from Modulation	10 s.
T68	Exit delay from Security function	10 s.
T70	Cleaning Message Timer	240 h.
<b>WATER PRESSURE SENSOR THRESHOLD</b>		
S01	Pressure sensor minimum threshold	500 mbar
S08	Pressure sensor maximum threshold	3000 mbar
<b>COMBUSTION CHAMBER DEPRESSION SENSOR</b>		
PR 00	IGNITION mode set point	60 Pa
PR 01	STABILIZATION mode set point	30 Pa
PR 02	Power 1 set point	s/model
PR 03	Power 2 set point	s/model
PR 04	Power 3 set point	s/model
PR 05	Power 4 set point	s/model
PR 06	Power 5 set point	s/model
PR 20	IGNITION mode depression delta	3 Pa
PR 21	STABILIZATION mode depression delta	3 Pa
PR 22	Power 1 depression delta	3 Pa
PR 23	Power 2 depression delta	3 Pa
PR 24	Power 3 depression delta	3 Pa
PR 25	Power 4 depression delta	3 Pa
PR 26	Power 5 depression delta	3 Pa
PR 70	Min depression threshold alarm	5 Pa
PR 90	Max depression threshold alarm	200 Pa
T69	Depression sensor. Regulation time	5 s.
T70	Depression sensor. First regulation waiting time	60 s.
T80	Delay after Depression Alarm	60 s.

PARAMETER LIST OF LAMBDA REGULATOR		
Parameter	Description	Value
TH50	Lambda ON thermostat set	200°C (± 4)
TH51	Lambda ON thermostat min.	200°C (± 4)
TH52	Lambda ON thermostat max.	850°C (± 20)
P66	Communication RS485 with Lambda module disabled	0
	Communication RS485 with Lambda module enabled	1
T62	O <sub>2</sub> monitoring interval	10 sec.
T63	Maximum time regulator out of range	10 sec.
T64	Delay for the first regulation	20 sec.
P58	Outputs order management	13
P60	Lambda regulator error management	0 / 1 / 2
P67	FAN 1 regulation direction	0

P68	FAN 2 regulation direction	0
P69	Auger regulation direction	1
P70	Outputs regulation management	1
UC81	FAN 1 regulation step	1%
US81	FAN 2 regulation step	--
C81	Auger regulation step	0,1 sec.

The parameters that define the behaviour of the auger and fans are:

	Burner Auger	Ashes Auger	FAN 1	FAN 2	FAN 3
Ignition	C01	C21	UC01	US01	UA01
Stabilization	C02	C22	UC02	US02	UA02
Power 1	C03	C23	UC03	US03	UA03
Power 2	C04	C24	UC04	US04	UA04
Power 3	C05	C25	UC05	US05	UA05
Power 4	C06	C26	UC06	US06	UA06
Power 5	C07	C27	UC07	US07	UA07
Second Ignition	C08	C28	UC08	US08	UA08
Standby	C09	C29	UC09	US09	UA09
Extinguishing	--	C30	UC10	US10	UA10
Periodic Cleaning	--	--	UC11	US11	UA11
Ignition. Min. speed vacuum regulator	--	--	--	--	UA41
Ignition. Max. speed vacuum regulator	--	--	--	--	UA42

Power	Speed min. / max			% O <sub>2</sub>	
	Burner Auger	FAN 1	FAN 2	Value	TOLERANCE
P1	C43 / C63	UC43 / UC63	US43 / US63	o03	o23
P2	C44 / C64	UC44 / UC64	US44 / US64	o04	o24
P3	C45 / C65	UC45 / UC65	US45 / US65	o05	o25
P4	C46 / C66	UC46 / UC66	US46 / US66	o06	o26
P5	C47 / C67	UC47 / UC67	US47 / US67	o07	o27

If the lambda probe kit is installed, please see the manual provided with lambda probe kit.





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