



**SERADENS SUPER PLUS
SSP 20/24/28/36
PREMIX DOUBLE CONDENSING BOILER
SERVICE MANUAL**

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1. GENERAL INFORMATION

Thank you for choosing ALARKO brand.






This booklet covers ALARKO branded premix double condensing SSP 20/24/28/36 model combi boilers in SERADENS SUPER PLUS product range, suitable for natural gas or LPG use. Keep this booklet on hand to consult to whenever you may need.




You will be informed about combi boiler use by authorized dealers after they mount the boiler on its position and set the connections, and by authorized service people after they take the boiler into operation. You can ask any unclear points again. Our experts will be glad to answer your questions.

For long-term, safe and economical use of the boiler, please read this booklet carefully before using the boiler, obey the safety rules and warnings carefully.

Start-up of the boiler by authorized service is free of charge and it is required for the Product guarantee to be valid.

1.1 General Notifications

-  **Professionally qualified personnel in accordance with current laws and standards and in line with the manufacturer's instructions must install the appliance.**
-  **With 'Professionally qualified personnel' is intended a personnel with technical knowledge in the field of installation and maintenance of components for central heating and domestic hot water Product ion systems for domestic and industrial use.**
-  **The appliance must be used solely for the purpose for which it has been designed and manufactured: central heating and domestic hot water Product ion. Any other use is deemed as improper and as such dangerous. Under no circumstances will the manufacturer be held responsible for damage or injury to persons or animals caused by errors in the installation and/or use of the appliance, or through non-compliance with current local and national standards and/or the manufacturer's instructions.**
-  **The installation, operation and maintenance manual forms an integral and essential part of the Product and must be kept near the appliance always.**
-  **This manual must be kept in a safe place and made available for any future reference. If the appliance is sold or transferred to a different owner, this must follow the appliance to be read by the new owner and/or installer.**

-  **The warnings contained in this chapter have been written for the appliance user, the installer and the service engineer.**
 -  **The user manual must be read carefully as it provides information on the operation and the operating limits of the appliance.**
 -  **This appliance must be used exclusively in a pressurized central heating system.**
- After the removal of all the packaging, check that the appliance has not been damaged. In case of doubt, do not attempt to use the Product but refer to the supplier. Packing materials (cardboard box, wooden crate, nails, staples, plastic bags, polystyrene, etc.) must not be left within reach of children in that these items represent a potential hazard and must be disposed of in a responsible manner.
 - Before carrying out any cleaning or maintenance operations, disconnect the appliance from the mains electricity supply by switching off at the main switch and/or any other isolating device.
 - Do not obstruct the air intake or flue exhaust grills.
 - Do not obstruct the air intake or flue exhaust terminals.
 - In the case of a fault and/or malfunction in the appliance, shut down the system. Do not interfere with or attempt any repairs. Call for professionally qualified technical assistance only.
 - Any warranty repairs to the appliance must be carried out exclusively by the manufacturer's authorized service centre using original spare parts. Non-compliance with the above requirements may compromise the safety of the appliance and invalidate the warranty. In order to guarantee the efficiency of the appliance and its correct operation, it must be serviced regularly by professionally qualified personnel in line with the manufacturer's instructions.
 - When the appliance is no longer required for use, any parts that may constitute potential sources of danger must be rendered harmless.
 - Only original accessories or optional extras (including electrical parts) must be used with the appliance.
 - As dictated by current legislation, this appliance must be installed exclusively by qualified personnel. Before starting the boiler for the first time, make sure that it is connected to a water supply and central heating system compatible with its performance characteristics.
 - The room must be ventilated by means of an air intake protected with a grill. Make sure the grill does not reduce the passage section.

- The air intake from adjacent rooms is allowed providing that those rooms are in depression with respect to the atmosphere and that there are not fireplace or fan installed. When the appliance is installed outdoor, i.e. on balcony or terrace, make sure it is not directly exposed to atmospheric agents to prevent any damage to components which would lead to a warranty invalidation. It is recommended to provide the boiler with a protective casing/box against bad weather conditions.
- **Check the technical data reported on the packing and on the type label stuck inside boiler. Also check that the burner is appropriate for the type of gas to burn.**
- **Make sure that the pipes and fittings used for the gas service are perfectly tight and that there are no gas leaks.**
- Prior to start-up, the central heating pipes should be flushed to remove any residues that could compromise the operation of the appliance.
- The appliance can be regarded as being electrically safe when it has been connected to an efficient earth system installed in accordance with the requirements of current safety standards. This fundamental safety requirement must be checked and verified. In case of doubt, have the electrical system checked by a qualified electrician. The manufacturer will not be held liable for any damage or injury caused as a result of an ineffective or non-existent earth system.
- The domestic power supply must be checked by a qualified electrician to ensure that it can support the maximum power absorption of the appliance, as indicated on the type label (stuck inside boiler). In particular, make sure that the cable ratings are adequate for the power absorbed.
- Do not use adapters; multiple sockets or extension leads to connect the appliance to the mains power supply.
- The appliance must be connected to the mains power supply through an appropriate electrical isolator in accordance with the current wiring regulations.

When using an electrical appliance, a few fundamental rules must be observed:

- Do not touch the appliance with damp or wet parts of the body or when barefoot.
- Do not pull on the electric wires.
- Do not leave the appliance exposed to atmospheric elements (rain, sun, etc.).

- Do not allow the appliance to be used by children or anyone unfamiliar with its operation.
- The user must not replace the power supply cable.
- If the cable is damaged in any way, switch off the appliance and have the cable replaced by a suitably qualified electrician.

1.2 Product Conformity

ALARKO CARRIER declares that all its Product s are manufactured to a high specification and in compliance with the relevant standards.

ALARKO boilers are CE certified and possess technical and functional characteristics that comply with the following standards:

EN 15502-1:2012+A1:2015, GAS FIRED HEATING BOILERS – PART 1: GENERAL REQUIREMENTS AND TESTS.

EN 15502-2-1:2013, GAS-FIRED CENTRAL HEATING BOILERS - PART 2-1: SPECIFIC STANDARD FOR TYPE C APPLIANCES AND TYPE B2, B3 AND B5 APPLIANCES OF A NOMINAL HEAT INPUT NOT EXCEEDING 1 000 kW.

EN 60335-1, HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES - SAFETY - PART 1: GENERAL REQUIREMENTS.

EN 60335-2-102, HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES - SAFETY - PART 2-102: PARTICULAR REQUIREMENTS FOR GAS, OIL AND SOLID-FUEL BURNING APPLIANCES HAVING ELECTRICAL CONNECTIONS.

EN 13203-2, GAS-FIRED DOMESTIC APPLIANCES PRODUCING HOT WATER - PART 2: ASSESSMENT OF ENERGY CONSUMPTION

IPX4D – CLASSIFICATION FOR ELECTRICAL DEVICES

Gas fired boilers also comply with the following directives:

2009/142/EC, GAS APPLIANCES DIRECTIVE

92/42/CEE, BOILER EFFICIENCY DIRECTIVE

2014/35/EU, LOW VOLTAGE DIRECTIVE

Electromagnetic compatibility tests of combi boilers were performed according to the following standards:

EN 55014-1 (2006) + A1 (2009) + A2 (2011)

EN 55014-2 (1997) + A1 (2001) + A2 (2008)

EN 61000-3-2 (2014)

EN 61000-3-3 (2013)

The materials used such as copper, brass, stainless steel, etc. form a compact, homogeneous, highly functional unit that is easy to install and simple to operate. In its simplicity, the wall-mounted appliance is equipped with all the appropriate accessories required to make it a fully independent boiler capable of satisfying domestic hot water Production and central heating needs. All boilers are fully inspected and are accompanied by a quality certificate, signed by the inspector, and a guarantee certificate. This manual must be kept in a safe place and must accompany the boiler at all times.

ALARKO CARRIER will not be held responsible for the consequences in the case of nonobservance of the instructions contained in this manual or in the case where actions not specifically described herein are undertaken.

ALARKO CARRIER declare that no substances harmful to health are contained in the appliance or used during appliance manufacture and have not used or intend to use any of the following substances in the manufacture of ALARKO heating Products.

- Asbestos
- Mercury
- CFC's.

1.3 Gas Safety

Gas appliances must be installed only by informed and authorized people in accordance with rules of local gas distribution institutions. Gas conversion processes must also be performed by authorized people.

This appliance is produced and certified to operate with natural gas or mix LPG under gas inlet pressures specified in Section 3.1, Technical Specifications Table. Operation under any different gas conditions is not allowed.

Adjusted gas type of your boiler is written on type label stuck in the boiler, unless it is converted to another gas by an authorized person. Make sure that the boiler is not used with a different gas, other than which it is adjusted for or it is finally converted to.

1.4 Premix Condensing Technology

The temperature of flue gas generated by the combustion for conventional (non-condensing) combi boilers with copper or titanium exchanger is about 120-150°C regardless of the operating temperature of the boiler. With this high temperature, energy and fuel cost on the water vapor inside the flue gas just flies away, too. However, for premix, i.e. full condensing combi boiler with gas-air

pre-mixing feature, flue gas temperature are lowered under 55°C while generating flow water temperature at about 50°C and lower thanks to the exchangers with much wider heat transfer surface. For flue gas temperatures under 55°C, the water vapour inside the flue gas condenses, i.e. transforms to liquid from gas form. Thus, energy is captured before going out the flue, and transferred to the water inside the exchanger. This is called concealed heat energy. By regeneration of energy inside the water vapour, it is possible to save up to %30 from fuel costs.

Therefore, set the heating temperature to maximum 50°C in order to get maximum efficiency from your combi boiler with minimum cost.

As the condensate water is acidic, main exchangers to premix full condensing combi boilers shall be made of stainless steel or aluminum alloy resistant to acidic condensate water. Alarko Seradens Super Plus condensing combi boilers use main exchanger with very high resistance against condensate water.

Combustion is always performed ideally with the premix system, i.e. premixing of gas and air at the ideal ratio of 1:10 before combustion. This is ensured by the modulating fan which adjusts its speed as per the capacity requirement and the venturi which mixes the gas taken by the drawing of the fan from the modulating gas valve and air in the ideal ratio.

Premix condensing boilers do not perform condensing while generating domestic hot water. However in Seradens Super Plus double condensing boiler models, the domestic hot water entering the boiler is passed through the full condensing stainless steel exchanger coils integrated in addition to the main exchanger, and thus both pre-heating and condensing are achieved. Flue gas temperatures are reduced up to 18°C while generating domestic hot water for these models. This proves how efficiently the appliance operates.

2. USER INSTRUCTIONS

2.1 Introduction

Following the installation and commissioning, authorized service technician will inform you about the combi boiler use and maintenance. Our technician will be glad to answer any question coming from you. Commissioning of the appliance done by authorized service is free of charge.

Before starting to use your combi boiler, read this booklet carefully. While using the appliance, follow the safety instructions and warnings stated in this booklet. In this way, you have the chance to use your combi boiler with optimum lifetime, safety and economy. In this section, some additional technical information is also given to introduce the appliance.

2.2 Course of Action In Case Of Gas Leakage

- Be calm.
- EXTINGUISH any flame.
- OPEN all the doors and windows to vent the room.
- CLOSE gas valves of any appliance
- CLOSE gas valves at the building and apartment inlet.
- DO NOT LIGHT anything and do not SMOKE.
- DO NOT TOUCH electric buttons, DO NOT SWITCH from on to off or off to on position.
- DO NOT ATTACH OR PULL OUT electric plugs.
- DO NOT RING the bells.
- DO NOT USE the telephone where the gas smell exists.
- CONTACT YOUR GAS SUPPLIER AND FIRE BRIGADE and explain the situation.

2.3 Warnings!

- This appliance must only be used for the intended purpose of manufacture. Alarko Carrier Sanayi ve Ticaret A.Ş. does not take any responsibility for the damage or injury on persons, animals or objects caused by incorrect installation, service or maintenance, use except for the intended purpose or disobeying any of the warnings within this booklet.
- Spaces allowed for installing a gas-fired boiler are defined by international and/or local regulations and rules of gas distribution companies. You can supply detailed information about those limitations from your installer. For your own safety, do not ask the installer to install your boiler to prohibited spaces.
- Before gas installation, a suitable gas installation project has to be prepared and approved according to the requirements of local gas distribution organization. After approval of local gas distribution organization and precise application of installation, have your boiler commissioned by an Authorized Service. Commissioning is a free service.
- Do not let unauthorized people to interfere or service the boiler.
- Gas conversion process (from natural gas to LPG or from LPG to natural gas), if necessary, must be made by an authorized service only. Conversion is paid by the end-user.

- Keep flammable and combustible objects, either liquid or solid, away from the boiler.
- Do not use any spray, chemical solvent, chlorinated cleaner, paint or adhesive near the boiler.
- Do not place cooker near the appliance and protect the boiler from direct vapor. The boiler is to be connected to an earthed 230 V 50 Hz electric supply.
- To enable the frost protection function in winter when the weather temperature might fall below 0°C, do not turn the boiler off. This function is active only if the combi boiler and gas valve are in ON condition. Manufacturer does not take any responsibility for the damage caused by neglecting this rule.
- Filter must be installed at the water inlet of the boiler to protect the pump and the filter must be cleaned periodically. The pump shaft should be rotated manually before starting the boiler after a long time of inactivity. Apply the authorized service to take more information about this process.
- If you charge the central heating system with hard water, this may cause blockage of DHW heat exchanger. Domestic hot water should not exceed 17,5 French hardness value.
- Domestic hot water circuit does not need a pressure safety valve. On the other hand, pressure should not exceed 10 bar. In case of doubt, a pressure regulator should be fitted. Consult your installer on this issue.

2.4 Terms and Conditions of Guarantee and Service

Your boiler is 2 (two) years guaranteed by Alarko Carrier for material and production defects provided that the principles, warnings and standards mentioned in installation and operating instructions are obeyed.

Guarantee is not valid under below conditions:

Installation by unauthorized company and people.

Damages due to service by unauthorized people.

Damages due to any natural disaster, war or terror activity.

Damages due to bad weather conditions, especially frost, unless instructions in this booklet are obeyed.

Damaged or modified serial number of boiler.

Incorrect installation, use and maintenance with respect to the instructions and the regulations in force.

Boilers produced for display and exhibition purposes.

Absence of Guarantee Form.

The transportation risks belong to the customer if boiler is sent to service by customer and belongs to the service if boiler is taken by service.

2.5 Control Panel

1. Operating mode setting knob (Summer / Winter / Heating Only / Off). In case of error, this button functions as reset button.
2. Info menu entry button.
3. Domestic hot water (DHW) temperature increase button.
4. Domestic hot water (DHW) temperature decrease button.
5. Heating water temperature increase button
6. Heating water temperature decrease button
7. LCD display for temperature, error codes and operating mode.
8. Terminal board for external wiring of room thermostat and outside temperature sensor*.
9. Economy (ECO) mode on/off button.

* Room thermostat and outside temperature sensor is optional.

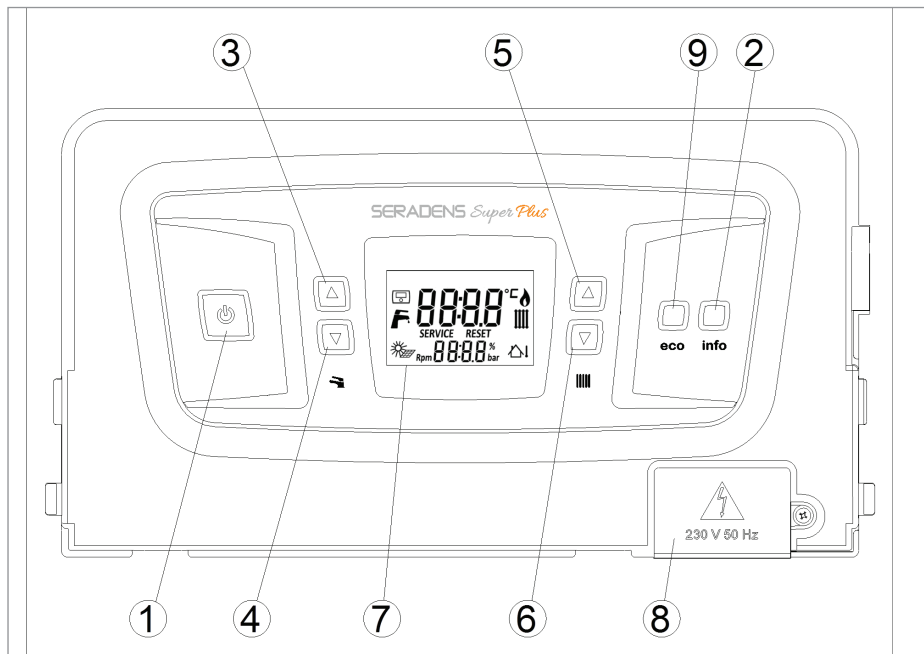


Figure 1. Control panel

2.6 Additional Digit Area on Display

There is a smaller digit area positioned under basic digit area on Seradens Super Plus display, which share some extra information continuously or alternately with user. As factory setting, central heating water pressure is shown in additional number area. If ECO mode is on or any pre-heating function(s) is on, related info is shared alternately with user.

Additional digit area can be changed to any of below items with a change on parameter settings.




1. Nothing shown
2. Central heating water pressure
3. Instant capacity of burner as percentage
4. External temperature (If there is outside temperature sensor)

2.7 User Info Menu

The info menu is used to display the value of some variables or parameters according to customer needs. This menu is usable even if the boiler is in OFF position.

You can activate the user info menu simply pressing the Info key (2) (Figure 1) for a time period of 2 seconds. You can see many information and values alternately in the user info menu. To display sequentially all the other variables supported, press the DHW temperature increase (3) and decrease (4) keys.

The following is a list of information you can display in the user info menu:

1. Heating water pressure (Basic digits display pressure value, additional digits display -0-. **bar** symbol continuously lights.)
2. Heating water sensor temperature (Basic digits display temperature value, additional digits display -1-. Radiator () symbol continuously lights.)
3. Domestic hot water (DHW) sensor temperature (Basic digits display temperature value, additional digits display -2-. Tap () symbol continuously lights.)
4. External temperature (It is shown only if the outside sensor is connected. (Basic digits display temperature value, additional digits display -3-. Outside temperature sensor () symbol continuously lights.)
5. DHW pre-heating condition. If pre-heating function is on, “**PhE**” symbol which stands for “Pre Heating Enabled” is shown. If this function is off, then “**Phd**” symbol which stands for “Pre Heating Disabled” is shown. (Basic digits display the pre-heating condition, additional digits display -4-.)

The system comes back to the default menu if no key is pressed within a time-out period corresponding to 30 sec. Alternatively, you can close user info menu by pressing Info key (2) for time period of 2 seconds.

2.8 Filling the System

ATTENTION!

Water pressure in heating circuit must be checked during operating period. System must be filled with 1.2 bar pressured water. (An external manometer must be used at start-up) Filling operation must be done while the boiler is cold and in OFF condition.

Pressure sensor is included in Seradens Super Plus combi boilers. After all connections (electric, fittings and flue) are completed, system could be filled by means of filling tap (F) which is positioned at left-bottom side of the boiler (Figure 2). Before filling the system, press user info key (2) for 2 seconds and see pressure value on basic digit area. Filling operation must last until "1.2 bar" value is displayed on the screen. If the user info menu is closed before the intended value is reached (it is closed after 30 seconds), enter the user info menu again by pressing key (2) for 2 seconds in order to be sure of that sufficient amount of water is filled to the system.

If the water pressure falls down under a certain value, E04 error is seen on the screen. In order to increase the pressure value, open the filling tap (F) in Figure 2. Check the pressure value from the screen to avoid filling the system excessively. Keep filling the system until the pressure reaches 1.2 bar, then close the filling tap.

Excessive filling of the heating system leads to E47 error, this is a precaution to avoid uncontrolled discharge of excess water from 3 bar safety valve. If you see E47 error on the screen due to excess pressure, discharge the proper amount of water by means of drainage tap (D) (Figure 2) or follow the instructions given in "Water Pressure Errors" in Section 2.9.

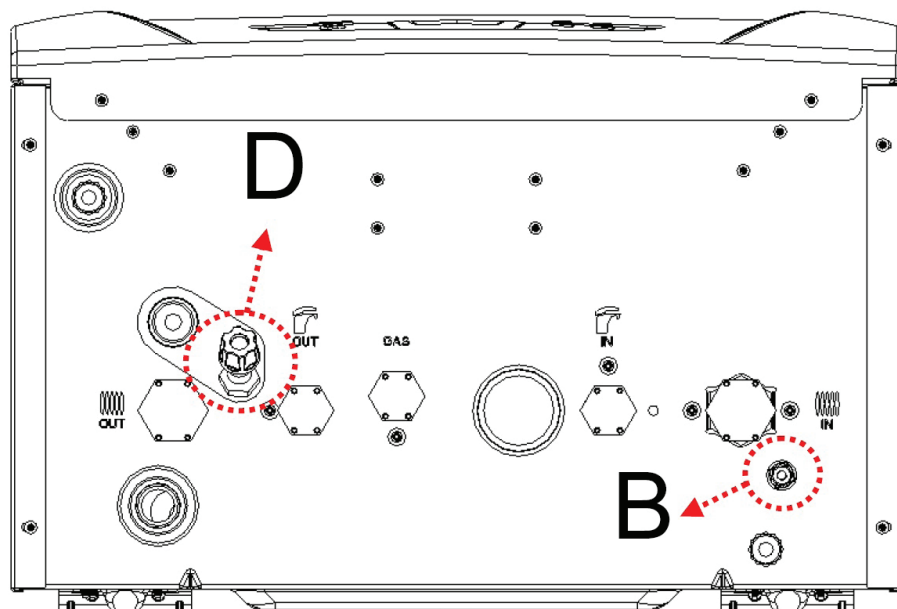


Figure 2. Bottom view of Seradens Super Plus combi boiler

ATTENTION!




Pressure of heating system increases due to heated water. Filling the system with cold water of 2.3-2.4 bar may lead to E47 error when the system is heated. In order to avoid such a condition, be sure that system pressure is 1.2 bar while the water is cold (at room temperature or lower).

2.9 Operating Modes and Start-Up






“OFF” Mode

In this mode, the boiler is OFF. The boiler doesn't operate in case of any domestic hot (DHW) or heating (CH) water need. However, pump locking protection and freeze protection functions are active in order to protect combi boiler from unsafe situations. The user info menu is usable even if in off mode for monitoring water pressure during filling operation.




“SUMMER” Mode

Press key **(1)** (Figure 1) to operate your boiler in “SUMMER” mode and see only the tap symbol () continuously shown on the display. At this mode combi boiler only operates for the domestic hot water (DHW) system. The automatic ignition system lights the burner every time if there is a demand for DHW. The existence of the flame is shown with a flame symbol () on the display. During DHW usage, the tap symbol () on the display blinks.

“WINTER” Mode

In order to operate the combi boiler in “WINTER” mode, press key **(1)** (Figure 1) and see tap symbol () and radiator symbol () continuously shown on the display. At this mode combi boiler operates for the domestic hot (DHW) and heating (CH) systems. The automatic ignition system lights the burner every time there is a demand for both. The existence of the flame is shown with flame symbol () on the display. In this case, the tap symbol () on the display blinks when system operates for DHW and radiator symbol () blinks when system operates for CH.

“ONLY HEATING” Mode

In order to operate the combi boiler in “ONLY HEATING” mode, press key **(1)** (Figure 1) and see only radiator symbol () continuously shown on the display. At this mode combi boiler only operates for heating (CH) system. The automatic ignition system lights the burner every time there is a demand for CH system. The existence of the flame is shown with flame symbol () on the display. In this case, radiator symbol () blinks when system operates for CH.

ATTENTION!

If there is no room thermostat in the system (bridged), pump runs without stopping in “WINTER” and “ONLY HEATING” modes, therefore radiator symbol consistently blinks.

Economy (ECO) Mode

The appliance can also be operated in economy mode, whose conditions are previously defined. When the user pushes ECO key (9) (Figure 1), system sets the heating water temperature to 50°C automatically, this is the optimum value between condensing and room temperature comfort. If the appliance's parameter settings were done in reference to low temperature range (underfloor heating), then heating water temperature in ECO mode is 38°C. Domestic hot water outlet temperature is set to 45°C for both low and normal temperature ranges.

When ECO mode is active, user observes "ECO ON" symbol on the display for 2 seconds. During operation in ECO mode, pressure value (if parameter setting is done to show pressure) and "ECO" word are shown successively on additional digit area. In order to switch off ECO mode, ECO key (9) must be pushed one time or a new heating or DHW temperature value setting must be done. If either activity is done, "ECO OFF" symbol is observed on the display for 2 seconds and the successive demonstration on additional digit area is finished.

Starting-up Boiler

- Open the gas isolation valve located in your house and make sure that gas is supplied to the appliance.
- When electricity is supplied to the appliance, "OFF" word can be seen on the display. Pushing mode button (Figure 1) leads to change the operating mode, every push changes mode sequentially between SUMMER-WINTER-ONLY HEATING-OFF.
- When operating mode is selected as Winter or Only Heating Mode, the combi boiler lights automatically if there is a heat demand (A room thermostat must be connected or connection must be bridged). If Summer Mode is selected, a hot water tap must be turned on in order to light the boiler.
- Check that there are no flashing numbers on the display **(7)** (Figure 1) (also see Section 2.9). If code E04 appears on the display **(7)** this denotes that there is no water in the boiler. Consequently, fill the system as described in Section 2.7.

Setting Heating (CH) Temperature

The heating temperature is regulated by using keys **(5)** and **(6)** (Figure 1).

- Pushing key **(5)** will increase the CH set point temperature.
- Pushing key **(6)** will decrease the CH set point temperature.

The range of set temperature for the CH varies from a minimum of 30°C to a maximum of 85°C, in case of reduced range operation, temperature range is from a minimum of 30°C to a maximum of 45°C.

When display backlight is off, pushing key number **(5)** or **(6)** once leads to set temperature value to be shown on the display. Pushing info key **(2)** leads to the instant temperature value to be shown on the display.

Setting Domestic Hot Water (DHW) Temperature

DHW temperature is regulated by using keys **(3)** and **(4)** (Figure 1).

- Pushing key **(3)** will increase the DHW set point temperature.
- Pushing key **(4)** will decrease the DHW set point temperature.

The range of set temperature for DHW varies from a minimum of 30°C to a maximum of 60°C.


When display backlight is off, pushing key number **(3)** or **(4)** once leads to set temperature value to be shown on the display.

ATTENTION!

If hot water taps are not used for a long time in “Winter” and “Only Heating” modes, temperature of the stationary DHW remaining in the main heat exchanger may reach up to the set temperature of CH water. If you set CH temperature above 50°C, let the hot water to drain off the tap for a time certainly.

2.10 Diagnostics – Error Codes

This paragraph contains a list of error codes that the boiler may generate on the display **(7)** (See Figure 1) together with the relative indications and the operations that the user can carry out to reset the boiler.

 If the problem re-occurs after the following actions have been taken or if you see another error code that is not listed below, please call an authorized Service Centre.

E01 No Flame or Spurious Flame

This error code appears if there is no flame (ionization current) sensed on the burner. In this case code **E01** lights on the display continuously.

- Check that the gas valve on the boiler and gas meter are open and make sure that there is gas in the mains supply (or in the tank).
- Turn off and then turn on the appliance using button **(1)** (Figure 1) on the control panel. Let the system ignite by itself, if **E01** error remains, retry to turn off and turn on the appliance once again. This action is taken in order to be sure if the gas in the pipes reached to the appliance.
- When the error code on the display disappears, the boiler will restart. If the problem persists, call the Service Centre.

This error may occur on the appliances in which gas supply is cut off for long time period. In general, when gas is supplied to the appliance and after some number of ignition trials, system starts by itself.

E02 Limit Thermostat Error

E02 code lights on the display continuously. Call the Service Centre.

E03 Flue Fuse or Safety Fuse Malfunction

E03 code lights on the display continuously. Call the Service Centre.

E04/E46/E47 Water Pressure Errors

These errors occur related to the low/high pressures on heating (CH) system or a fault in pressure sensor.

If **E04 Low Heating Water Pressure Error** code lights on the display continuously,

- Check the water pressure in the CH circuit by using info menu (See Section 2.7 for details).
- Fill the system with water until pressure value reaches to 1.2 bar.
- The boiler will restart automatically. If the problem persists, call the Service Centre.

If **E46 Pressure Sensor Error** code lights on the display continuously,

Reset the system by pressing key **(1)** for 2 seconds, if the error persists call the Service Centre.

If **E47 High Heating Water Pressure Error** code lights on the display continuously,

- Check the water pressure in the CH circuit by using info menu.
- Evacuate sufficient amount of water from the system until pressure value decreases to 1.2 bar.
- The boiler will restart automatically. If the problem persists, call the Service Centre.

In order to discharge water from CH system;

1. Close domestic hot water (DHW) inlet valve under the appliance.
2. Open a HOT water tap in the kitchen or WC (Prefer closest tap to the appliance)
3. Open filling tap located under the appliance. If filling tap opens in these conditions, water in the CH system evacuates from HOT water tap. Check pressure value via info menu and decrease CH pressure to 1.2 bar.
4. When you see desired pressure value on the screen; close the hot water tap, close filling tap on the appliance and open main DHW inlet tap under the appliance.

E05 Heating Water Flow Temperature Sensor Error

E05 code lights on the display continuously. Call the Service Centre.

E06 Domestic Hot Water (DHW) Temperature Sensor Error

E06 code lights on the display continuously. Call the Service Centre.

E15 Heating Water Return Temperature Sensor Error (Only active if modulating pump is used)

E15 code lights on the display continuously. Call the Service Centre.

E16 Fan Error

E16 code lights on the display continuously. Call the Service Centre.

E22 Electronic Card Microprocessor Error

E22 code lights on the display continuously. Call the Service Centre.

E31 Remote Control Error

E31 code lights on the display continuously. Check the battery condition and cable of the remote controller. If the error persists call the Service Centre.

E32**Main Board Communication Error**

E32 code lights on the display continuously. Call the Service Centre.

E35**Flame Detection Error**

E35 code lights on the display continuously. Call the Service Centre.

E62**LCD Card Communication Error**

E62 code lights on the display continuously. Call the Service Centre.

E98**Main Power Error**

E98 code lights on the display continuously. Call the Service Centre.

E99**Internal Safety Error**

E99 code lights on the display continuously. Call the Service Centre.

----**Main Power Supply Error**

--- lights on the display continuously. Call the Service Centre.

Note: If the boiler will not be used for a long time, user must do one of the following:

- If the combi boiler will not be used for a long time in summer (summer holiday etc.): Unplug the connection. Close the gas supply valve. Close the domestic hot water (DHW) mains inlet valve.
- If the combi boiler will not be used for a long time in winter: Leave your boiler in standby position, electrical and gas connections connected and thus freeze protection in active condition.

2.11 Automatic Control Devices (Optional)

Using one of the following automatic control devices is recommended on the purpose of comfort and fuel economy.

• Room Thermostat

You can use “room thermostat” with your boiler to maintain desired room temperature. Analog and digital models are available. These models are nonprogrammable.

• Weekly Programmable Room Thermostat

This device is used to set your boiler to run at desired time intervals and temperatures during the week.

• Wireless RF / Wired Remote Control

This device is used to set your boiler to run at desired time intervals and temperatures during the week. You can set and see all the operating modes, heating and domestic hot water temperatures and error codes of combi boiler on remote control display. If an outside sensor is connected, you can also see outside temperature on remote control display.

There are models having a cable and wireless models. In case of using with telephone interface card you can operate combi boiler from a distance by telephone.

- **Smart Combi Boiler Thermostat Set**

You can control your combi boiler inside your home by using your smart thermostat or you can control from anywhere in the world by using your smart phone or tablet. You can access and change instant temperature settings or time programs. For all these, it is enough to download the free application to your phone or tablet.

- **Phone Control Interface Devices**

These devices enable you to simply turn on/off your combi boiler by your phone. There are two models, one works with fixed lines and the other with GSM lines.

- **Outside Temperature Sensor**

This sensor activates boiler according to the weather conditions. It can be used either with above controller and thermostats or single.

All these automatic control devices are optional. For the safety of your boiler, contact the authorized installers or services to buy any of these options. Do not forget to ask for user manual of the device. You can get more detailed information from our web site (www.alarko-carrier.com.tr).

2.12 Automatic Operation of the Boiler In Accordance With Weather Temperature (Optional)

If you use outside sensor with your boiler, you can manage the appliance with one of below options:

- In case of “remote controller + outside sensor” use, weather compensation curve is set by the remote controller itself (see remote control installation and operating manual).
- In case of only outside sensor use, weather compensation curve is set from P21 parameter (see section 5.1 “Parameter Settings”) on electronic card only by authorized services. Parameter settings are only done by authorized services.
- For higher heating flow water temperatures the curves with higher KD values, for lower heating flow water temperatures the curves with lower KD values must be chosen.

While outside sensor is connected, central heating flow temperature is set between 30-85°C range in the systems including radiators. As for floor heating systems, this range is between 30-45°C. If ECO mode is active and outside sensor is used, working range is 30-50°C for the systems with radiators and 30-38°C for underfloor heating systems.

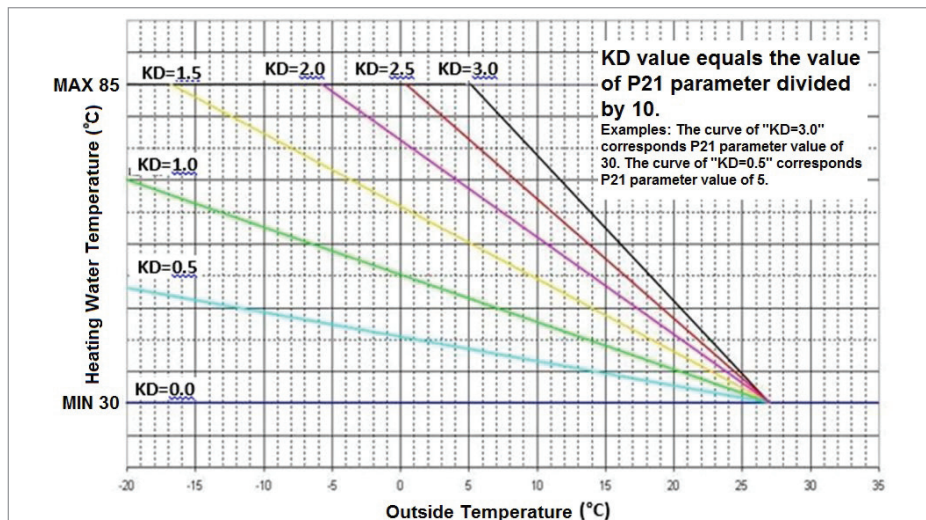


Figure 3. Outside temperature compensation curves

Outside temperature compensation curves are given in Figure 3.

The selection of the compensation curve is determined by the maximum heating flow temperature T_m and the minimum outside temperature T_e .

Note: The y-axis values of the delivery temperature T_m refer to standard 80-30°C appliances or 40-25°C underfloor heating appliances. The type of appliance can be programmed using P03 parameter (see section 5.1 "Parameter Settings").

2.13 Domestic Hot Water (DHW) Pre-heating Function

Quick hot water supply is possible in Seradens Super Plus combi boilers by means of pre-heating function in DHW. This function is set active on demand by authorized service.

When this function is active; if DHW temperature falls 15°C than set value, the appliance operate at minimum capacity for a while. It stops operating while DHW temperature reaches 5°C below set value. This is enough for DHW temperature to reach set value.

It is obligatory to use room thermostat for pre-heating function's turn to come in winter and only heating modes. Otherwise, pre-heating function is never active because software always thinks as though there is always demand for heating. In summer mode, water in DHW heat exchanger is pre-heated for the next DHW need.

This feature is set closed as default due to the additional consumption it causes. This feature can be set as active only on demand and only by an authorized service.

2.14 Solar Connection Set (Optional)

By taking advantage of solar energy, it is possible to get domestic hot water more economically with Seradens Super Plus combi boilers. Only thing needed to achieve this is to connect the solar collector and hot water tank to the Solar Connection Set which can be supplied as accessory with Seradens Super Plus. There is no need for any electronic control system. Schematics of a working system is shown in Figure 4, Solar Connection Set is shown in Figure 5.

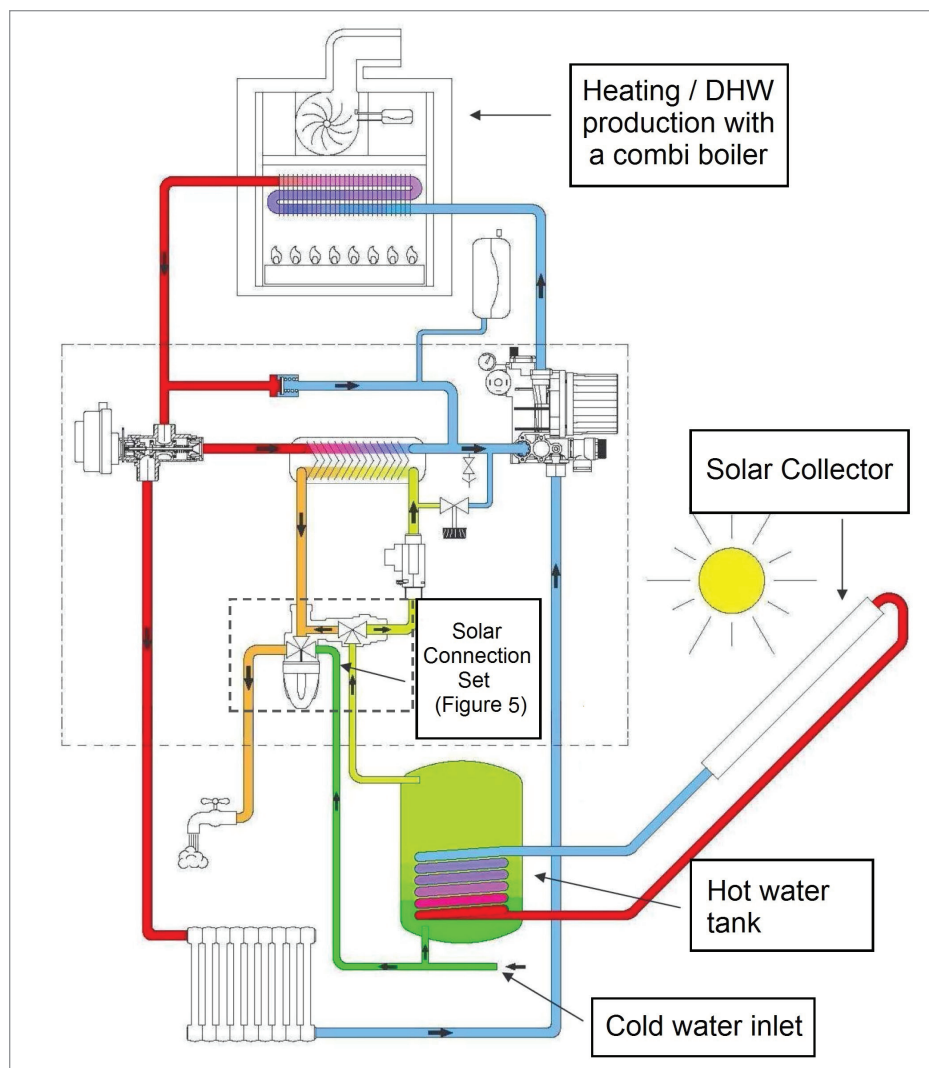


Figure 4. Solar connection set

If water temperature in the hot water tank is above 48°C, diverting valve positioned in Solar Connection Set (Figure 5) leads water directly to mixing valve. Thermostatic mixing valve mixes water with cold water and sends to the taps at fixed temperature of 40°C, this phenomenon prevents people from boiling. If water temperature in the hot water tank is below 48°C, diverting valve sends domestic hot water to the combi boiler to be heated to demanded temperature. Temperature of domestic hot water coming from combi boiler is also set before being sent to the taps. Setting temperature of thermostatic valve can be set between 25-60°C. Solar Connection Set is composed of a Solar Connection Set body and the pipes shown in Figure 5.

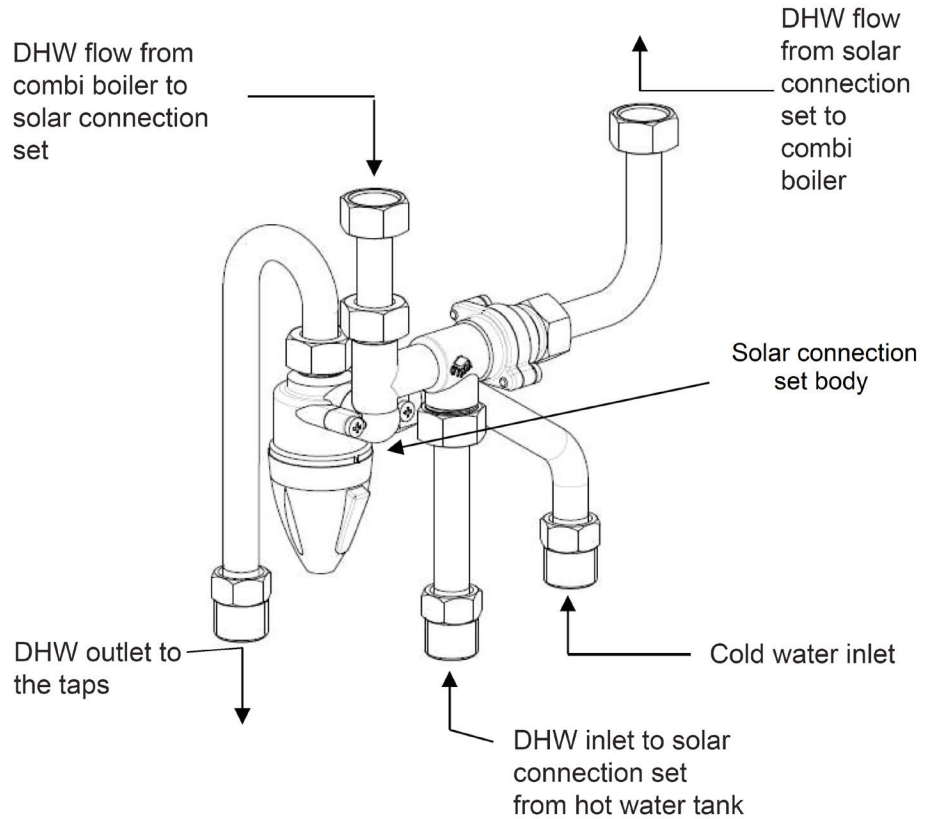


Figure 5. Solar connection set

2.15 Use with LPG

Your combi boiler can be used with LPG. The boiler must be adjusted to work with LPG by authorized service. The boiler is suitable to work with LPG bottles for only if they are connected to the boiler via a special “collector kit” manufactured by Alarko Carrier. In cold environments, the use of a heater kit is recommended for economic and safe use. In case thermostatic hot water buckets are used to heat up the LPG bottles, water temperature should not exceed 22°C.

Do not place the boiler and the LPG bottles in the same cabinet.

Use certified bottles only.

Do not shake or lay the bottles.

Only use a certified 30 mbar regulator at every bottle exits.

If you smell gas, turn the bottles off and follow the instructions in Gas Safety section.

WARNING! The boiler must be adjusted to work with LPG by the Authorized Service.

The boiler will be out of guarantee unless 30 mbar certified regulators and the collector kit made by Alarko Carrier are used with the boiler.

3. TECHNICAL CHARACTERISTICS

3.1 Technical Data

| Model | | SSP 20 | SSP 24 | SSP 28 | SSP 36 |
|--|-----------|--|-------------------------|-------------------------|-------------------------|
| CE Certification | no | 1312CR6123 | 1312CR6123 | 1312CR6123 | 1312CR6123 |
| Appliance Type | | B23-B33-C13-C13(x)-C33-C33(x)-C43-C43(x)-C53-C53(x)-C63-C63(x)-C83-C83(x)-C93-C93(x) | | | |
| Appliance Category | | II2H3B/P | II2H3B/P | II2H3B/P | II2H3B/P |
| Domestic Hot Water (DHW) Load Max. | kW | 20.6 | 25.55 | 27.6 | 34.9 |
| Heat Load Min. (50/30°C) | kW | 3.92 (G20) – 4.44 (G30) | 4.84 (G20) – 5.91 (G30) | 5.57 (G20) – 7.36 (G30) | 5.79 (G20) – 7.84 (G30) |
| Heat Power Min. (50/30°C) | kW | 4.01 (G20) - 3.04 (G30) | 5.06 (G20) – 4.38 (G30) | 5.97 (G20) - 5.59 (G30) | 6.17 (G20) – 5.92 (G30) |
| Heat Load Max. (50/30°C) | kW | 18.54 | 22.16 | 26.11 | 32.86 |
| Heat Power Max. (50/30°C) | kW | 20.18 | 24.15 | 27.90 | 35.72 |
| Efficiency at %100 load (50/30°C) | % | 108.8 | 109 | 108.7 | 108.7 |
| Efficiency at %30 load (50/30°C) | % | 108.7 | 108.6 | 107.2 | 107.7 |
| Heat Power Max. (80/60°C) | kW | 18.15 | 21.3 | 25.86 | 33 |
| Heat Power Min. (80/60°C) | kW | 3.52 (G20) – 2.67 (G30) | 4.47 (G20) – 4.19 (G30) | 5.33 (G20) – 5.05 (G30) | 6.47 (G20) – 5.48 (G30) |
| Efficiency at %100 load (80/60°C) | % | 97.82 | 98.59 | 98.82 | 99.23 |
| Heating (Central Heating) Circuit | | | | | |
| Central Heating Water Temperature Setting (Min-Max) | °C | 30-85 / 30-45 | 30-85 / 30-45 | 30-85 / 30-45 | 30-85 / 30-45 |
| Max. Heating Operating Temperature | °C | 95±4 | 95±4 | 95±4 | 95±4 |
| Expansion Vessel Capacity | liter | 8 | 8 | 8 | 10 |
| Max. Operating Pressure (Heating) | bar | 2.8 | 2.8 | 2.8 | 2.8 |
| Min. Operating Pressure (Heating) | bar | 0.5 | 0.5 | 0.5 | 0.5 |
| Domestic Hot Water (DHW) Circuit (Automatic Bypass Feature) | | | | | |
| DHW Temperature Setting (Min-Max) | °C | 30-60 | 30-60 | 30-60 | 30-60 |
| Max. Hot Water Operating Pressure | bar | 10 | 10 | 10 | 10 |
| Min. Hot Water Operating Pressure | bar | 0.5 | 0.5 | 0.5 | 0.5 |
| DHW Flow Rate at ΔT 30 K | liter/min | 12 | 15 | 17 | 21 |
| Dimensions | | | | | |
| Width | mm | 437 | 437 | 437 | 437 |
| Height | mm | 640 | 640 | 640 | 640 |
| Depth | mm | 302 | 366 | 366 | 366 |
| Weight (net) | kg | 33 | 35 | 35 | 36 |
| Hydraulic Connections | | | | | |
| Central Heating Flow Connection | Ø | 3/4" | 3/4" | 3/4" | 3/4" |
| Central Heating Return Connection | Ø | 3/4" | 3/4" | 3/4" | 3/4" |
| DHW Input (Cold Water) | Ø | 1/2" | 1/2" | 1/2" | 1/2" |
| DHW Output (Hot Water) | Ø | 1/2" | 1/2" | 1/2" | 1/2" |
| Gas Connection | Ø | 1/2" | 1/2" | 1/2" | 1/2" |
| Flue Systems | | | | | |
| Horizontal – Concentric Flue System | Ø mm | 60/100 | 60/100 | 60/100 | 80/125 |
| Max. Flue Length | m | 6 | 6 | 5 | 8 |
| Twin Pipe Flue System | Ø mm | 80+80 | 80+80 | 80+80 | 80+80 |
| Max. Flue Length (From Terminal to Terminal) | m | 50 | 50 | 50 | 50 |
| Vertical – Concentric Flue System | Ø mm | 60/100 | 60/100 | 60/100 | 80/125 |
| Max. Flue Length | m | 6 | 6 | 5 | 8 |
| Gas Supply | | | | | |
| Natural Gas G20 | | | | | |
| Inlet Pressure | mbar | 20 | 20 | 20 | 20 |
| Gas Consumption | m³/h | 2 | 2.39 | 2.82 | 3.55 |
| LPG G30 | | | | | |
| Inlet Pressure | mbar | 30 | 30 | 30 | 30 |
| Gas Consumption | kg/h | 1.19 | 1.51 | 1.83 | 2.27 |
| Electrical Specifications | | | | | |
| Power Supply | V/Hz | 230/50 | 230/50 | 230/50 | 230/50 |
| Electrical Power Consumption | W | 125 | 132 | 134 | 140 |
| Electrical Protection | IP | X4D | X4D | X4D | X4D |
| Sound Level | dB (A) | 39-42 | 39-42 | 39-42 | 39-42 |

3.2 Dimensions SSP 20

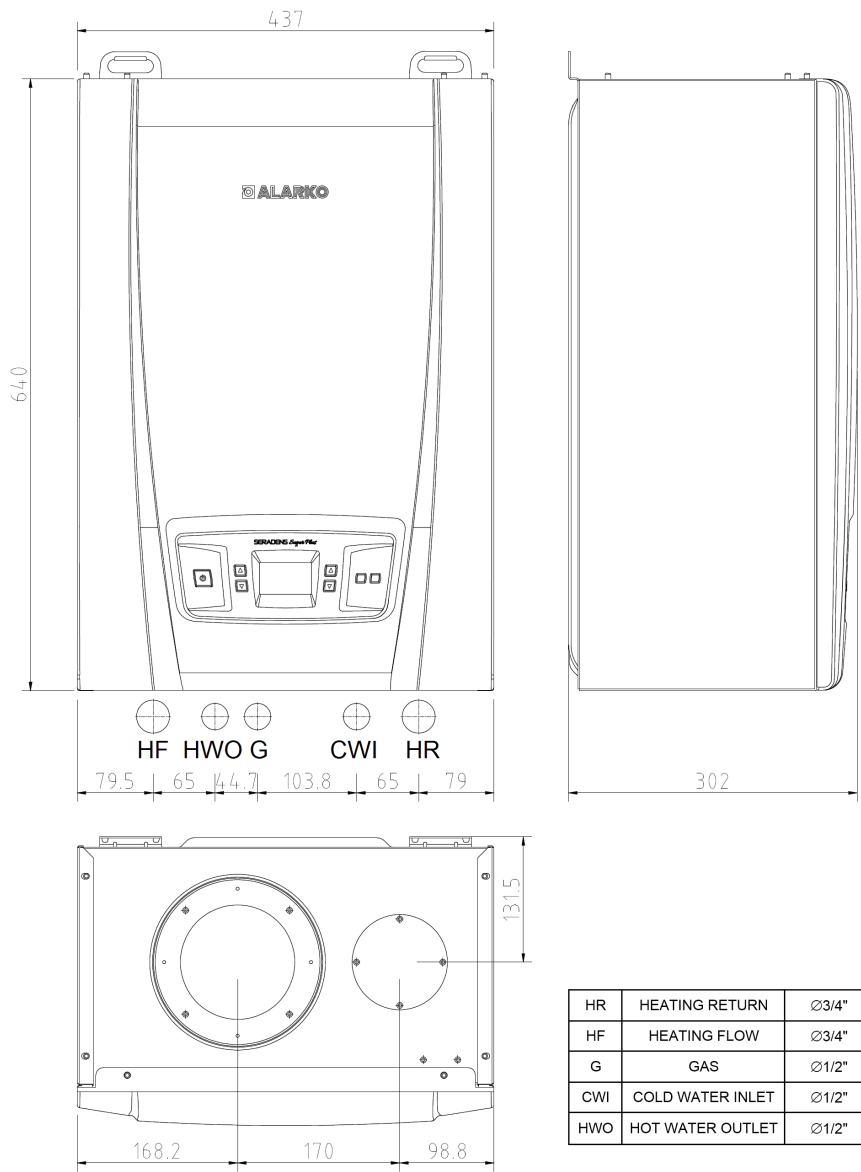


Figure 6. Dimensions

SSP 24/28/36

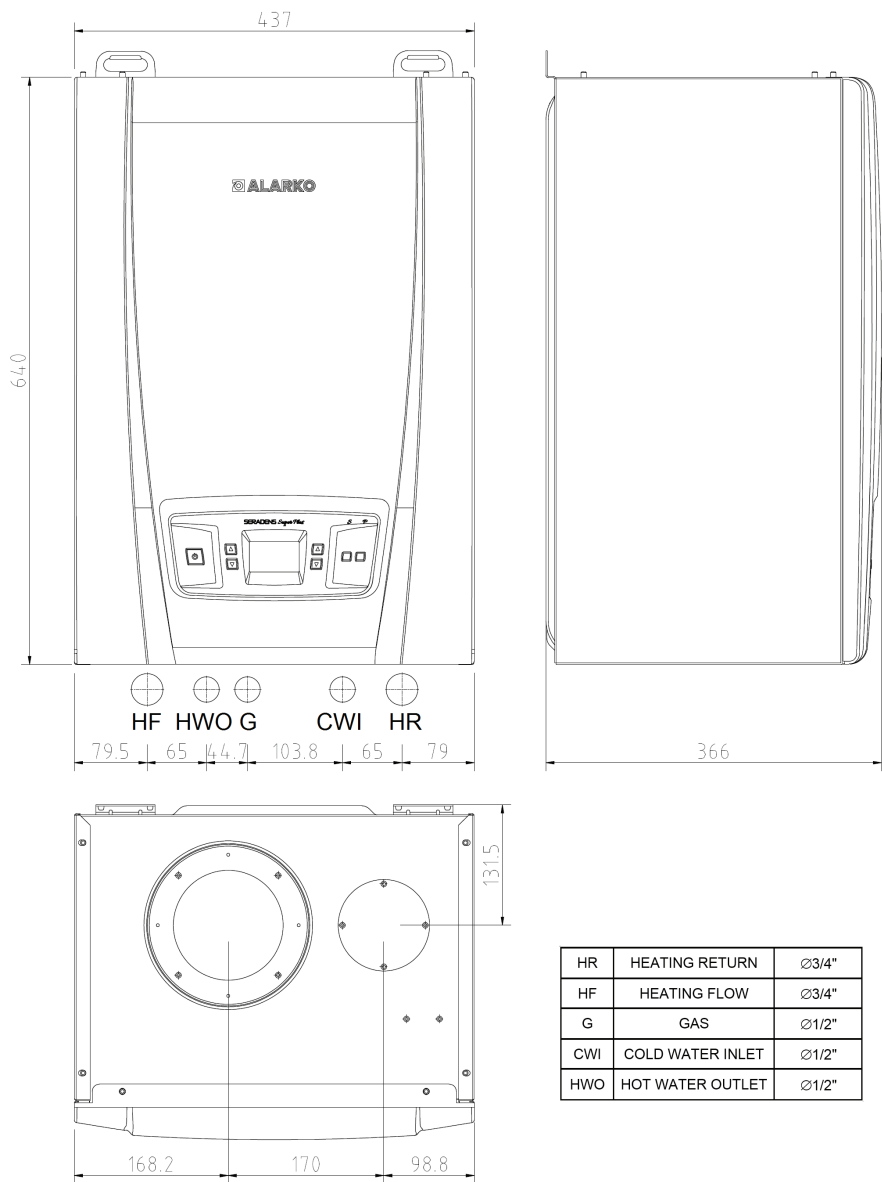


Figure 7. SSP 24/28/36 dimensions

3.3 Internal Parts of Boiler

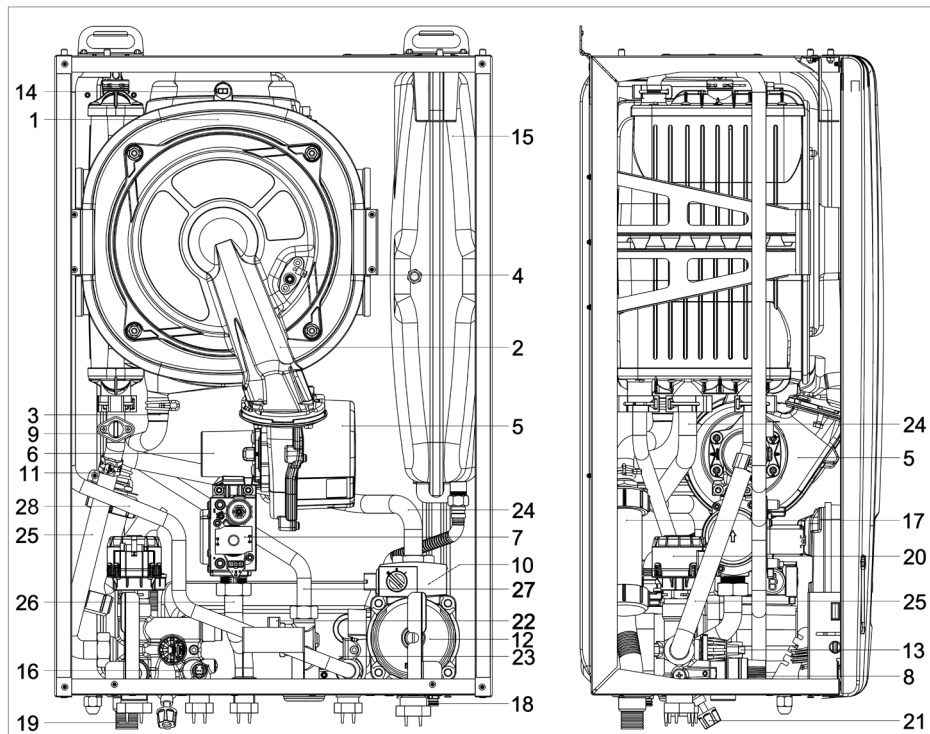


Figure 8. Main parts of the boiler

- | | |
|---|---|
| 1. MAIN CONDENSING HEAT EXCHANGER | 15. EXPANSION TANK |
| 2. PREMIX BURNER UNIT (GAS MANIFOLD + BURNER) | 16. DOMESTIC HOT WATER (DHW) TEMPERATURE SENSOR |
| 3. SIPHON INLET PIPE | 17. SIPHON |
| 4. IONISATION AND IGNITION ELECTRODE | 18. DRAINAGE TAP |
| 5. FAN | 19. CONDENSATE DRAIN PIPE |
| 6. VENTURI | 20. 3 WAY VALVE MOTOR |
| 7. ELECTRONIC GAS VALVE | 21. WATER FILLING TAP |
| 8. 3 BAR PRESSURE SAFETY VALVE | 22. ELECTRONIC FLOW SENSOR |
| 9. LIMIT THERMOSTAT | 23. DOMESTIC HOT WATER (DHW) PLATE EXCHANGER |
| 10. AUTOMATIC AIR VENT | 24. HEATING RETURN PIPE |
| 11. HEATING WATER FLOW TEMPERATURE SENSOR | 25. HEATING FLOW PIPE |
| 12. PUMP | 26. GAS INLET PIPE |
| 13. PRESSURE SENSOR | 27. DHW PRE-HEATING INLET PIPE |
| 14. FLUE FUSE | 28. DHW PRE-HEATING OUTLET PIPE |

3.4 Water Circuit

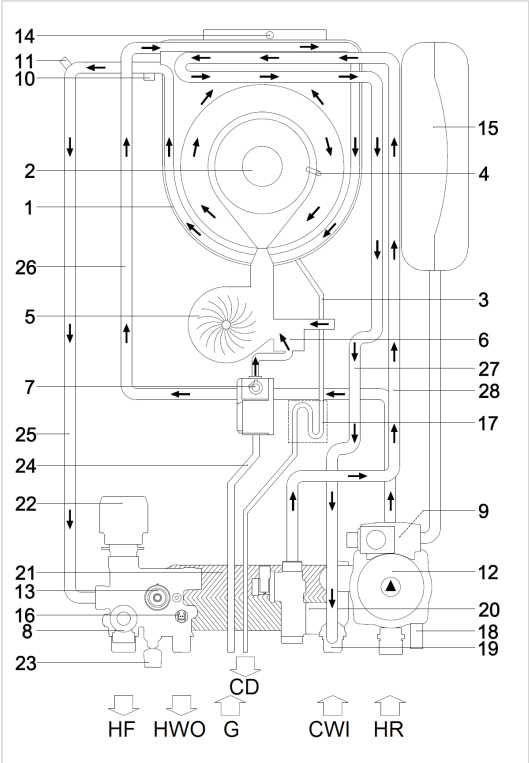


Figure 9. Water circuit schematic diagram

| | |
|-----|------------------|
| HR | HEATING RETURN |
| HF | HEATING FLOW |
| G | GAS |
| CWI | COLD WATER INLET |
| HWO | HOT WATER OUTLET |
| CD | CONDENSATE DRAIN |

- 1. MAIN CONDENSING HEAT EXCHANGER
- 2. PREMIX BURNER UNIT (GAS MANIFOLD + BURNER)
- 3. CONDENSATE DRAINAGE PIPE
- 4. IONISATION AND INGTION ELECTRODE
- 5. FAN
- 6. VENTURI
- 7. ELECTRONIC GAS VALVE
- 8. 3 BAR PRESSURE SAFETY VALVE
- 9. AUTOMATIC AIR VENT
- 10. LIMIT THERMOSTAT
- 11. HEATING WATER FLOW TEMPERATURE SENSOR
- 12. PUMP
- 13. PRESSURE SENSOR
- 14. FLUE FUSE
- 15. EXPANSION TANK
- 16. DOMESTIC HOT WATER (DHW) TEMPERATURE SENSOR
- 17. SIPHON
- 18. DRAINAGE TAP
- 19. FLOW LIMITER
- 20. ELECTRONIC FLOW SENSOR
- 21. DOMESTIC HOT WATER (DHW) PLATE EXCHANGER
- 22. 3 WAY VALVE MOTOR
- 23. WATER FILLING TAP
- 24. GAS INLET PIPE
- 25. HEATING FLOW PIPE
- 26. HEATING RETURN PIPE
- 27. DHW PRE-HEATING INLET PIPE
- 28. DHW PRE-HEATING OUTLET PIPE

3.5 Circulation Pump Performance Chart

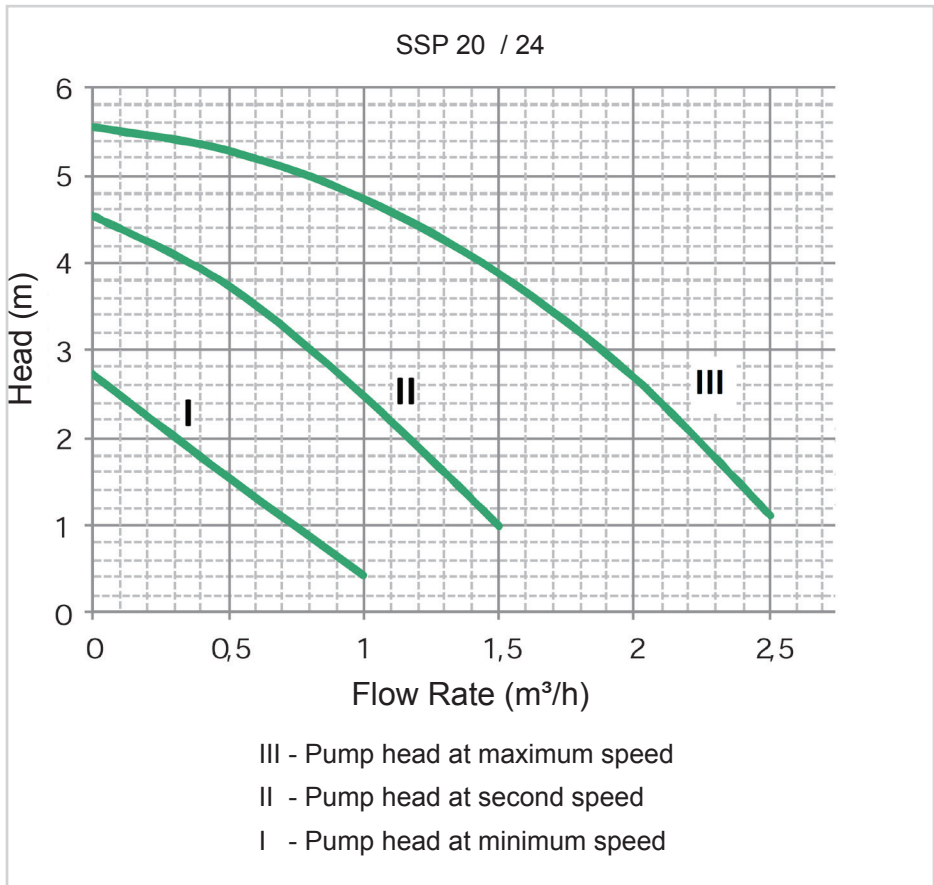


Figure 10. SSP 20 / 24 pump performance chart

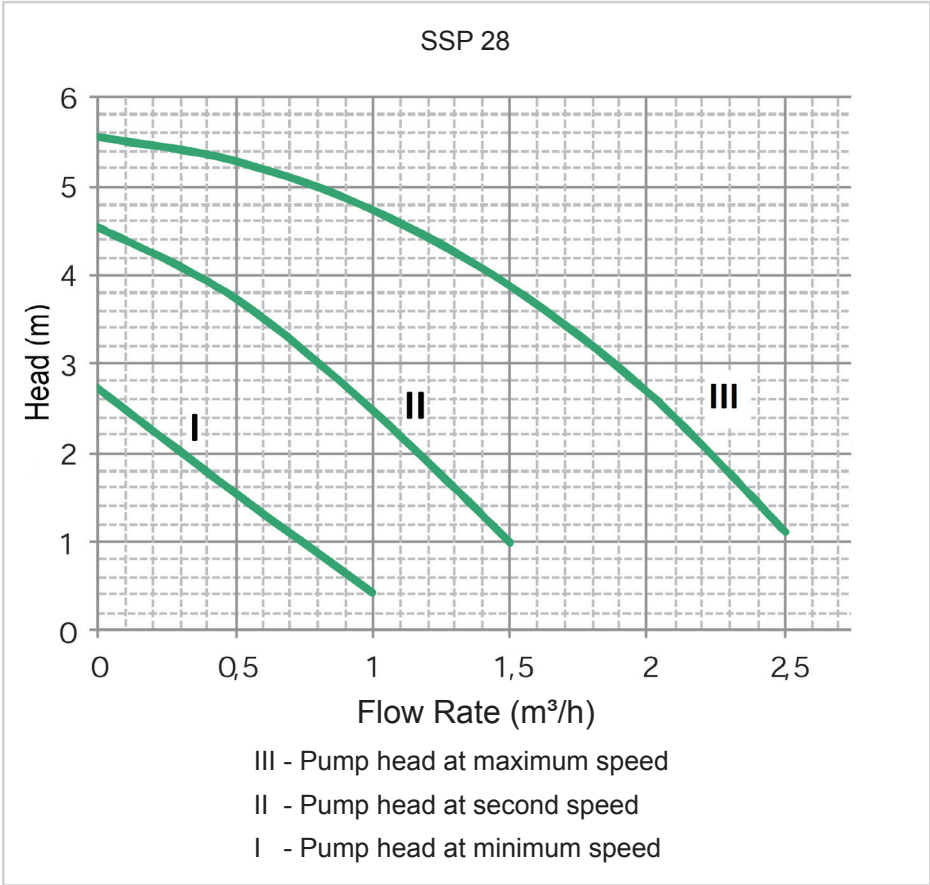


Figure 11. SSP 28 pump performance chart

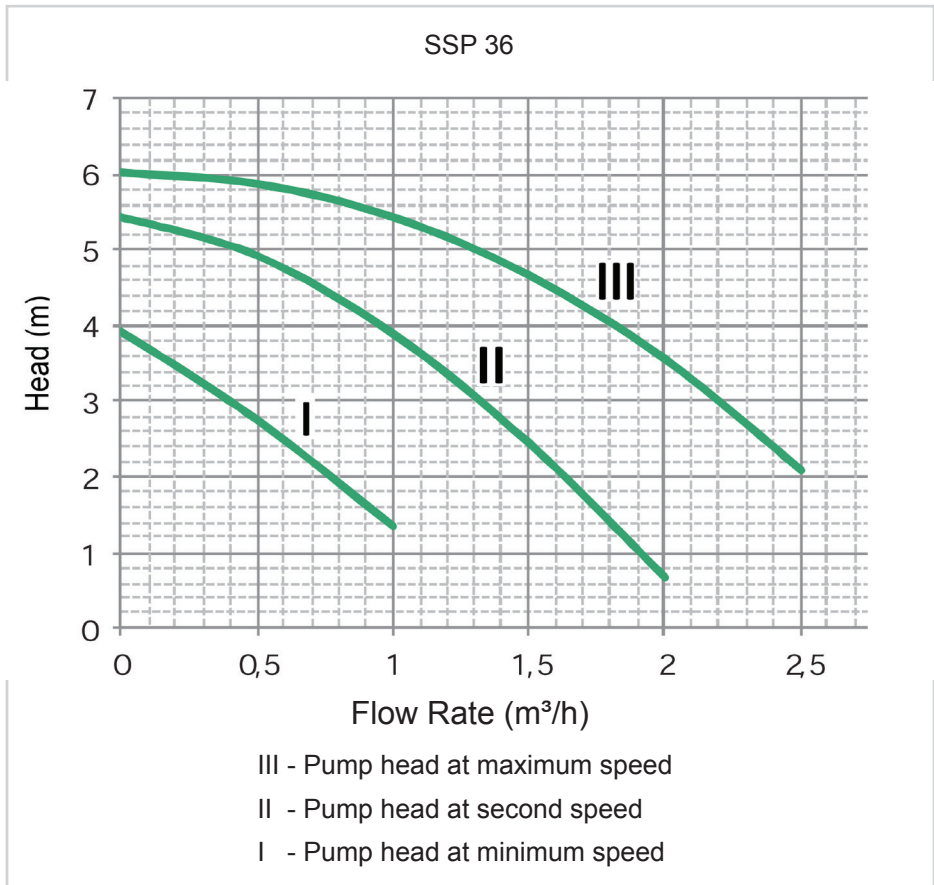


Figure 12. SSP 36 pump performance chart

3.6 Electronic Ignition and Control Board – MIAB 3005

Technical Characteristics

Below interventions which necessitate any adjustment/selection is only interfered by service personnel.

- User info menu
- Continuous flame modulation during CH and DHW cycles
- Compatible both for radiator and underfloor heating systems thanks to the standard (30/85°C) or reduced (30/45°C) central heating temperature selection
- Initial power increase time (ramp time) in CH cycle
- Activation delay period setting on CH cycle
- Anti-freeze function on CH and DHW cycles
- Chimney sweeper function
- Timed pump overrun function on CH and DHW cycles (CH, CH antifreeze, DHW, DHW antifreeze, chimney sweeper cycles)
- Parameters programming function
- External temperature compensation function (if outside sensor is used)
- Circulation pump anti-locking function
- 3 way diverting valve anti-locking function
- Remote controller communication channel (Opentherm protocol)
- Automatic flame control system
- Domestic hot water pre-heating function
- Gas type selection
- Economy (ECO) mode
- Service info menu
- Demo mode (on the purpose of demonstration on showrooms)
- Central heating circuit low water pressure protection
- Central heating circuit high water pressure protection (two stepped)
- Failure reporting with error codes.

User settings

- Summer / Winter / Only Heating / Off
- Activating/deactivating Economy (ECO) mode feature
- CH temperature setting between 30-85°C (standard regime) or between 30-45°C (reduced regime)
- DHW temperature setting between 30-60°C.

Basic Symbols on LCD Display

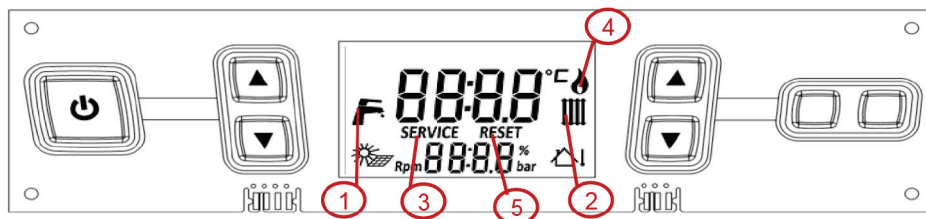


Figure 13. LCD display

Icon 1: DHW mode enabled (Icon 1 blinks when domestic hot water is in use)

Icon 2: CH mode enabled (Icon 2 blinks when central heating and pump is in use)

Icon 3: Icon 3 lights while parameter and service info menu is used

Icon 4: Icon 4 lights when flame exists in system.

Icon 5: Reset

When the boiler is switched off at the switch on the control panel, the word OFF appears on the display. The DHW and central heating frost protection system, nevertheless, remain enabled. If the boiler was previously on, it is switched off and the post-ventilation, pump overrun, circulation pump and three-way valve inactivity protection functions are enabled.

The remote control, where fitted, remains active and illuminated.




3.7 Service Info Menu

By using service info menu, you can access the specific information related to the service people as well as some basic information. You can access this menu even if the appliance is in OFF position.

Press and hold down key **(2)** and **(4)** (Figure 1) for 5 seconds to access the service info menu. You can follow several information alternately in this menu. You can use DHW water increase **(3)** and decrease **(4)** keys in order to navigate on this menu.

Service info mode includes following information respectively:

- 0- Heating (CH) water pressure (If the pressure in the system is 1.5 bar, basic digits display 1.5 and bar icon shown)

- 1- Heating water flow sensor temperature (Basic digits display temperature value and  icon shown on the screen)
- 2- Domestic hot water (DHW) sensor temperature (Basic digits display temperature value and  icon shown on the screen)
- 3- Outside temperature (Basic digits display outside sensor temperature and  icon shown on the screen. If outside sensor is not included in the system, 2 dashed lines (- -) are shown)
- 4- DHW pre-heating function enabled/disabled. If pre-heating is active "PhE" symbol is displayed on screen. If pre-heating is inactive, "Phd" symbol is displayed
- 5- Heating water return sensor temperature (For only appliances which have modulating pump inside)
- 6- Set value of power of the appliance
- 7- Instant power percentage of the appliance, it is shown together with % symbol
- 8- Instant fan revolution value (The value on the screen x10), it is shown together with **Rpm** symbol (revolution per minute)
- 9- Error history 1 (The last fault of the appliance)
- 10- Error history 2 (The second fault of the appliance from the end)
- 11- Error history 3 (The third fault of the appliance from the end)
- 12- Error history 4 (The fourth fault of the appliance from the end)
- 13- Error history 5 (The fifth fault of the appliance from the end)
- 14- Version of the software installed on the mainboard
- 15- Version of the software installed on display card

If reset key is pressed and hold down for 5 seconds in service info mode, error history is cleaned.

E00 is shown on the screen for 9, 10, 11, 12, 13 numbered infos.

3.8 Fuses, Electrodes, Thermostats and Sensors

Flue Fuse

Flue fuse is located as shown in Figure 13 and it is used to stop the system before the safety fuse is tripped. Because when the safety fuse is tripped, heat exchanger is required to be totally changed by service. If flue fuse is tripped, then E03 error code is shown and the flue fuse must be changed in this condition. If flue fuse is tripped frequently, it points that there is a serious defect in heat exchanger. The temperature for flue fuse to be tripped is $102^{\circ}\text{C} \pm 0/-10\text{K}$.



Figure 14. Flue fuse

Safety Fuse

Safety fuse may be tripped in case of excessive temperature rise (operation without water etc). If this fuse is tripped, E03 error code is shown, and the appliance is turned off. This fuse is used to prevent a probable fire. If this fuse is tripped, main heat exchanger has to be changed as whole. The location of the safety fuse is given in Figure 15.



Figure 15. Safety fuse



Figure 16. Limit thermostat

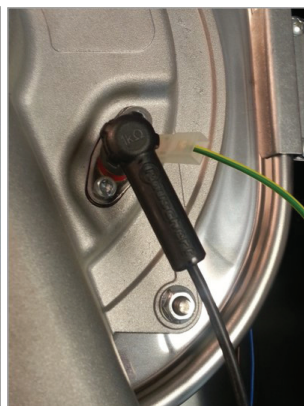


Figure 17. Electrode

Limit Thermostat

This thermostat is positioned on heating flow water pipe (Figure 16) and serves as heating safety thermostat. Closing value is $95^{\circ}\text{C} \pm 4\text{K}$ whereas opening value is $65^{\circ}\text{C} \pm 6\text{K}$. In case of error, E02 error code is shown, the boiler operates after reset.

Ignition and Ionization Electrode

Ignition and ionization electrodes are united as one electrode in Seradens Super Plus combi boilers (Figure 17). The resistance of the electrode is 1 kOhm. In case of no flame or spurious flame, E01 error code occurs on the screen, reset operation is needed.

Pressure Sensor

It checks the water pressure in the system (Figure 18). Limits of error are 0.5 bar as low pressure value (E04 error) and 2.8 bar as high pressure value (E47 error). In case of pressure sensor fault E46 error code is shown. It is automatically reset.

Flow Sensor

It checks the flow rate in the system and it is microprocessor controlled (Figure 19). It can be set between 1-4 l/min from P22 parameter. Factory set is default 2 l/min. Ignition occurs at 2 l/min flow rate and keeps operating until 1 l/min.

Temperature Sensors

Heating water (CH) and domestic hot water (DHW) sensors are used. CH sensor is clamp type (Figure 20) and mounted on flow water pipe. DHW sensor is immersion type (Figure 21) and mounted on hydraulic group.



Figure 18. Pressure sensor

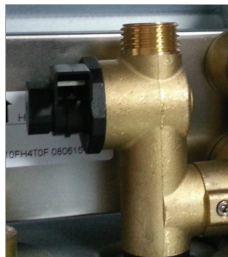


Figure 19. Flow sensor

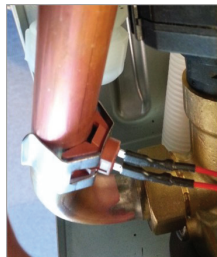


Figure 20. Heating water flow temperature sensor



Figure 21. DHW temperature sensor

3.9 Wiring Diagram

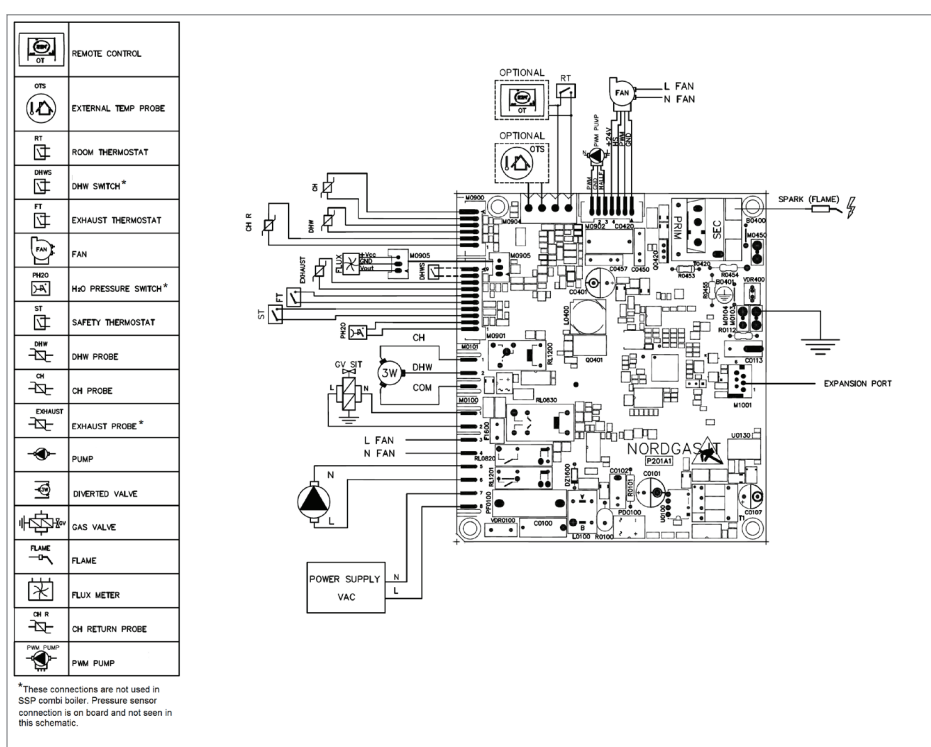


Figure 22. Seradens Super Plus wiring diagram

4. INSTALLATION

4.1 Reference Standards

This appliance meets the requirements of:

- EN 15502-1:2012+A1:2015, GAS FIRED HEATING BOILERS – PART 1: GENERAL REQUIREMENTS AND TESTS.
- EN 15502-2-1:2013, GAS-FIRED CENTRAL HEATING BOILERS - PART 2-1: SPECIFIC STANDARD FOR TYPE C APPLIANCES AND TYPE B2, B3 AND B5 APPLIANCES OF A NOMINAL HEAT INPUT NOT EXCEEDING 1 000 kW.
- EN 60335-1, HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES - SAFETY - PART 1: GENERAL REQUIREMENTS.
- EN 60335-2-102, HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES - SAFETY - PART 2-102: PARTICULAR REQUIREMENTS FOR GAS, OIL AND SOLID-FUEL BURNING APPLIANCES HAVING ELECTRICAL CONNECTIONS.
- EN 13203-2, GAS-FIRED DOMESTIC APPLIANCES PRODUCING HOT WATER - PART 2: ASSESSMENT OF ENERGY CONSUMPTION.

IPX4D – CLASSIFICATION FOR ELECTRICAL DEVICES

Gas fired boilers also comply with the following directives:

2009/142/EC, GAS APPLIANCES DIRECTIVE

92/42/CEE, BOILER EFFICIENCY DIRECTIVE

2014/35/EU, LOW VOLTAGE DIRECTIVE

Electromagnetic compatibility tests of combi boilers were performed according to the following standards:

EN 55014-1 (2006) + A1 (2009) + A2 (2011)

EN 55014-2 (1997) + A1 (2001) + A2 (2008)

EN 61000-3-2 (2014)

EN 61000-3-3 (2013)

Current gas safety regulations state that all gas appliances must be installed by a competent person in accordance with the regulations and rules in force in the countries of destination.

These appliances must be installed in accordance with relevant national and local rules and regulations in force. The manufacturer's instructions must not be

taken, in any way, as overriding to statutory obligations.

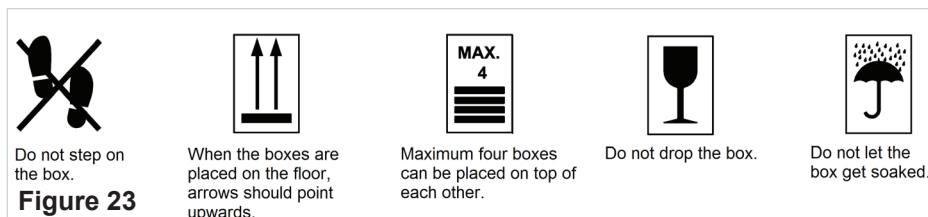
To ensure that the installation will perform to the highest standards, the system and components should also conform to any relevant national and/or local standards in addition to those mentioned in the instructions

4.2 Boiler Location

This appliance may be installed in any room provided that attention is drawn to the requirements of the relevant national and local rules, standards and regulations in force in the countries of destination.

4.3 Packaging and Transportation

The boiler is packaged in a cardboard box. Warning signs are to be observed during transport and storing.



- The boiler can be carried by two people by uplifting it through the two holes on both sides.
- The boiler should be stored in a place free of dust and moisture and should not be taken out of its package until it is to be installed.
- When stored, maximum four boxes can be placed on top of each other.
- Boilers can be installed following the completion of water and electric systems.

Opening the Package

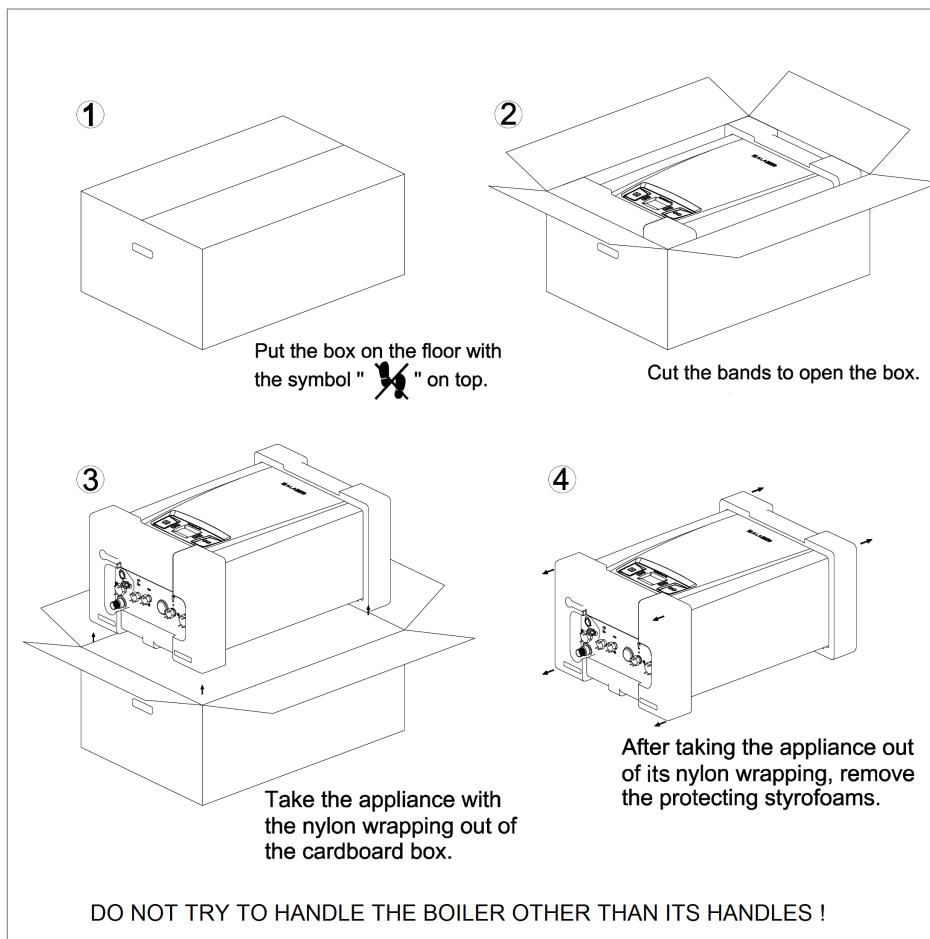


Figure 24. Opening the package

4.4 Installation of the Boiler

- The appliance must be installed exclusively on a flat vertical solid wall capable of supporting its weight.
- The boiler should be fitted within the building unless protected by a suitable enclosure in an open area such as garage, balcony.

In this manner, the boiler can be fitted inside a cupboard. Contact Alarko Carrier for proper cupboard dimensions.

- If the boiler is sited in an unheated enclosure then it is recommended to leave the power on to give frost protection. Frost protection is active even if the appliance is in OFF position.
- If the boiler is installed in a room containing a bath or shower, reference must be made to the national standards and local requirements.

In order to allow access to the interior of the boiler for maintenance purposes, it is important that the necessary clearances indicated in Figure 25 are respected.

For mounting the appliance, it is required to follow the below instructions (Figure 26). Determine the right position for the boiler with respect to the required clearances for servicing and the position of the flue.

Firstly, mark the fitting points on the wall by means of mounting template located in packaging box and a spirit level (Figure 26 – Step 1). Mount the L screws together with wall plugs from the marked points. Finally, hang the boiler from L screws (Figure 26 – Step 2).

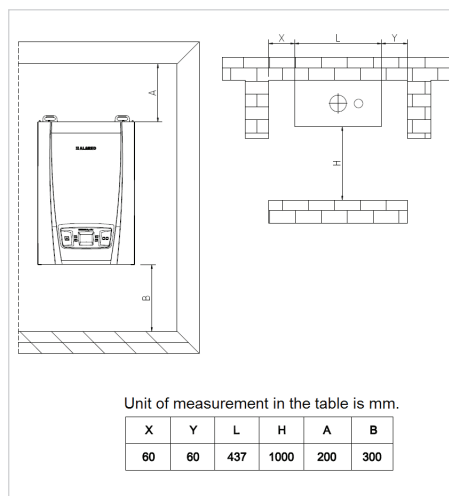


Figure 25. Minimum installation clearances

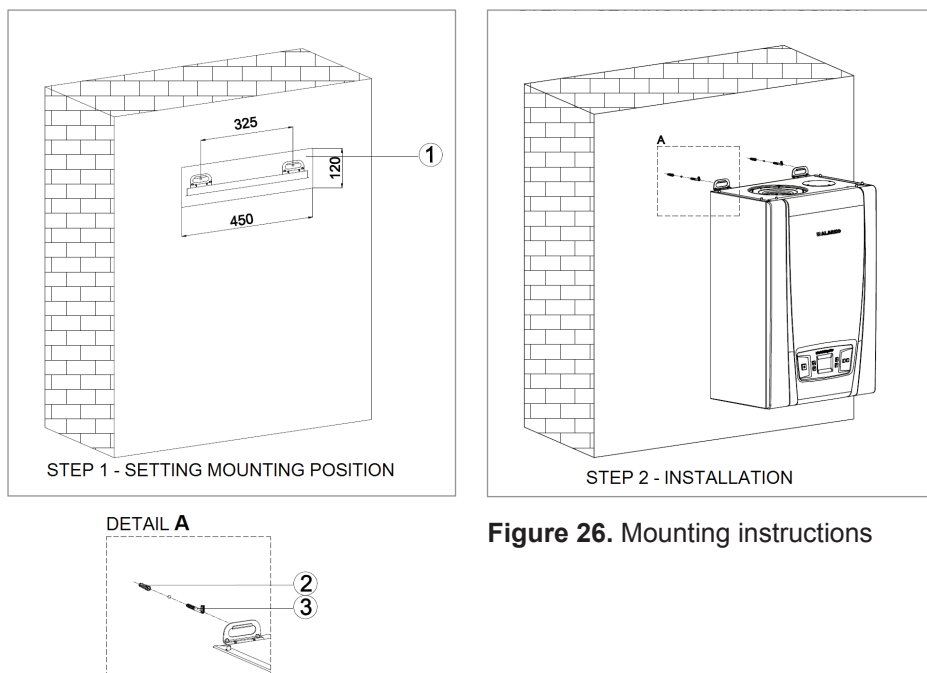


Figure 26. Mounting instructions

| No | Part name | Pieces | Note |
|----|-----------|--------|----------------------|
| 1 | Template | 1 | To be used as guide. |
| 2 | Wall plug | 2 | - |
| 3 | L screw | 2 | - |

4.5 Water Connections

- ⚠ In order to safeguard the heat exchanger and circulation pump, especially in case of boiler replacement, it is recommended that the system is hot-flushed to remove any impurities (especially oil and grease) from the pipes and radiators.
- ⚠ Make sure that the domestic water and central heating pipes are not used to earth the electrical system. The pipes are totally unsuitable for this purpose.
- ⚠ Isolation valves must be installed on the Heating and DHW circuits. This will facilitate all maintenance and service operations where boiler needs to be drained.
- ⚠ The fitting placed under pump (Figure 27a and Figure 27b – see Detail A) must be tightened with torque of maximum 18 Nm in case of rubber gasket use. This value is 30 Nm in case of cylinder head gasket use.

- To prevent vibration and noise coming from the system do not use pipes of reduced diameter, short radius elbows or severe reductions in the cross sections of the water passages.

Domestic hot water circuit

- In order to prevent scaling and eventual damage to DHW heat exchanger, the mains water supply must not have a hardness rating of more than 17,5 French hardness. It is nevertheless advisable to check the properties of the water supply and install the appropriate treatment devices where necessary.

The cold water supply pressure at the inlet to the boiler must be between 0.5 and 10 bar.

In areas with higher water inlet pressure, a pressure reducing valve must be fitted before the boiler.

The frequency of the heat exchanger coil cleaning depends on the hardness of the mains water supply and the presence of residual solids or impurities, which are often present in the case of a new installation.

If the characteristics of the mains water supply are such that require it to be treated, then the appropriate treatment devices must be installed, while in the case of residues, an in-line filter should be sufficient.

All DHW circuits, connections, fittings, etc. should be fully in accordance with relevant standards and water supply regulations.

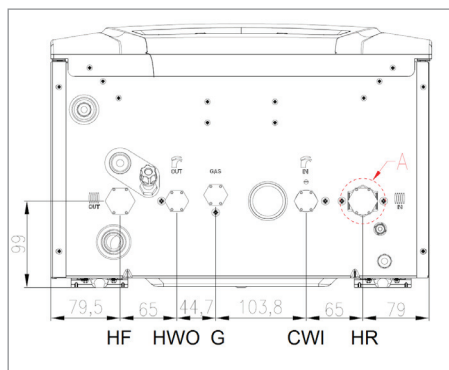


Figure 27a. Water connections
SSP 20

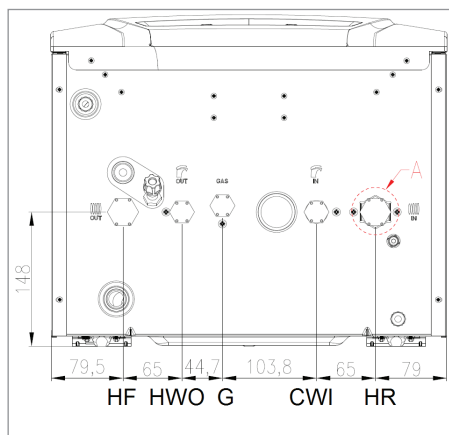


Figure 27b. Water connections
SSP 24 / 28 / 36

Central Heating Circuit

In order to prevent scaling or deposits in the main heat exchanger, the mains supply water to the Heating circuit must be treated according to the requirements of local standards. This treatment is indispensable in the case where the circuit is frequently topped-up or when the system is often either partially or fully drained.

The outlet connection of the boiler safety valve must be connected to a discharge trap. The manufacturer will not be held responsible for flooding caused by the operation of the safety valve in the case of system overpressure.

Condensate Drain

The condensate drain flexible pipe supplied with the boiler is connected

to the siphon. The condensate discharge into the drainage system is allowed by means of siphon. Condensate drain pipe must be connected to sewage drain as open connection at boiler side to prevent interruption in flow and as including U form in pipe to prevent smelling. Diameter of plastic connecting pipe must be minimum 32 mm (Figure 28).

Any condensate drain pipe work external to the building (or in an unheated part of it) must be insulated to protect against frost. If condensate water is connected to the rain water drain pipes, there is a risk of freezing. Before switching the boiler On, check the correct condensate drain.

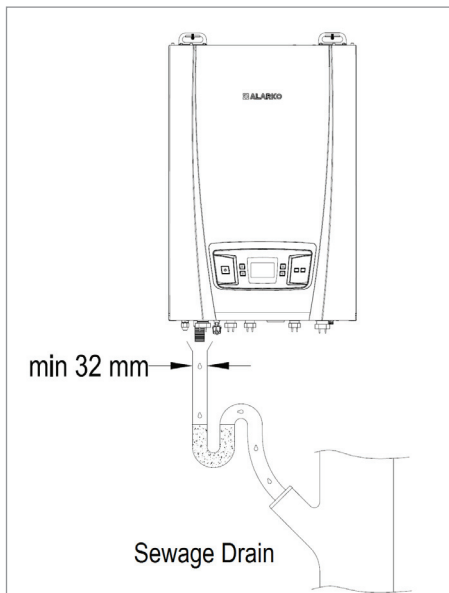


Figure 28. Drain pipe and connection to sewage drain

4.6 Appropriate Central Heating Pipes

For combi boiler not to be affected from electro cell, plumbing mud and biocide (green colored bacterium which originates in water), use of oxygen barrier pipes in accordance with DIN 4726 (a pipe having oxygen diffusion value lower than 0.1 g/m³.day at 40°C) is highly recommended.

ATTENTION!

Every covered underfloor heating pipe is not oxygen barrier pipe.

Systems Which Have Plastic Pipes without Oxygen Barrier

- These systems are not recommended to use.
- In case of use, plumbing mud can be formed in boiler and system due to the oxygen absorption to the pipes. This condition may cause the heat exchanger to be obstructed. Moreover, it may also lead to electro cell formation (cell effect) due to the change in water characteristics (especially PH value), and finally heat exchanger may be punctured.
- To prohibit above consequences, inhibitors (additives) must be added to piping water (Sentinel X 100 etc.).

Underfloor Heating Systems without Oxygen Barrier

- These systems are not recommended to use.
- In case of use, oxygen absorption to underfloor heating system may happen and green colored biocide bacterium may propagate and accumulate as colony at low water temperature. This condition causes change in water characteristics and increase its viscosity, and finally heat exchanger and pump obstructions may occur.
- To prohibit above consequences, biocide and electro cell preventive inhibitors (additives) must be added to piping water (Sentinel X700+X100 etc.).

Piping System Obstructions

- Piping system obstructions are generally encountered just after commissioning at old systems with iron pipes.
- In case of encountering piping system obstructions, inhibitors must be added to piping water (Sentinel X 400 etc.).

4.7 Gas Connection

The connection to the gas supply must be carried out by professionally qualified personnel in accordance with relevant standards.



When connecting the boiler to the gas supply pipe, only use appropriate washers and gas fittings.

Before installing the boiler, check the following:

- The pipe work must have a section appropriate for the flow rates requested and the pipe lengths installed, and must be fitted with all the safety and control devices provided for by current standards.

- The gas supply line must have an uninterrupted supply from meter to boiler and comply with current standards and regulations.
- Check the internal and external seals of the gas supply system.
- A gas shut-off valve must be installed upstream of the appliance.
- Before starting up the boiler, make sure that the type of gas corresponds to that for which the appliance has been set-up (see gas type label inside the boiler).
- The gas supply pressure must be between the values reported on the rating plate (see gas type label inside the boiler).
- Prior to installation, it is good practice to ensure that there are no machining residues on the gas supply pipe.
- Conversion of the appliance from natural gas to LPG or vice versa must be carried out by qualified personnel.

4.8 Electrical Connections

-  **The connection to the mains power supply must be carried out by professionally qualified personnel, registered in accordance with current legislation and authorized by Alarko Carrier.**
-  **Always check to make sure that the appliance has an efficient earth system. This requirement is only satisfied if it has been properly connected to an efficient earth system installed in accordance with the requirements of current safety standards and carried out by professionally qualified personnel. This basic safety measure must be checked, verified and carried out by professionally qualified personnel.**

In case of doubt, have the electrical system checked by a qualified electrician. The manufacturer will not be held liable for any damage or injury caused as a result of an inefficient or inexistent earth system.

- The boiler functions with an alternating current of 230 V and 50 Hz and has maximum power absorption of 125/132/134/140 Watt for SSP 20/24/28/36 in sequence. The appliance should be protected by a 3 A fuse. Make sure that the positions of the live and neutral wires correspond to the wiring diagram.
- Ensure the domestic power supply is checked by a qualified electrician to ensure that it can support the maximum power absorption of the appliance, as indicated on the rating plate. In particular, make sure that the cable sizes are adequate for the power absorbed by the appliance.

- The power supply cable must not be replaced by the user. If the cable is damaged in any way, switch off the appliance and have the cable replaced by a suitably qualified electrician.
- When replacing the power supply cable, only use cables of the same characteristics.

When using an electrical appliance, a few fundamental rules must be observed:

- Do not touch the appliance with damp or wet parts of the body or when barefoot.
- Do not pull on the electric wires.
- Do not leave the appliance exposed to atmospheric elements (rain, sun, etc.) unless these conditions have been expressly provided for.
- Do not allow the appliance to be used by children or anyone unfamiliar with its operation.

Outside Sensor, Remote Control, Room Thermostat Connections

Outside sensor, remote control and room thermostat cables must be connected to terminal board. These cables must be taken into the boiler after passing through PG7 cable gland positioned bottom side of the boiler. The position of this cable gland is shown in Figure 29.

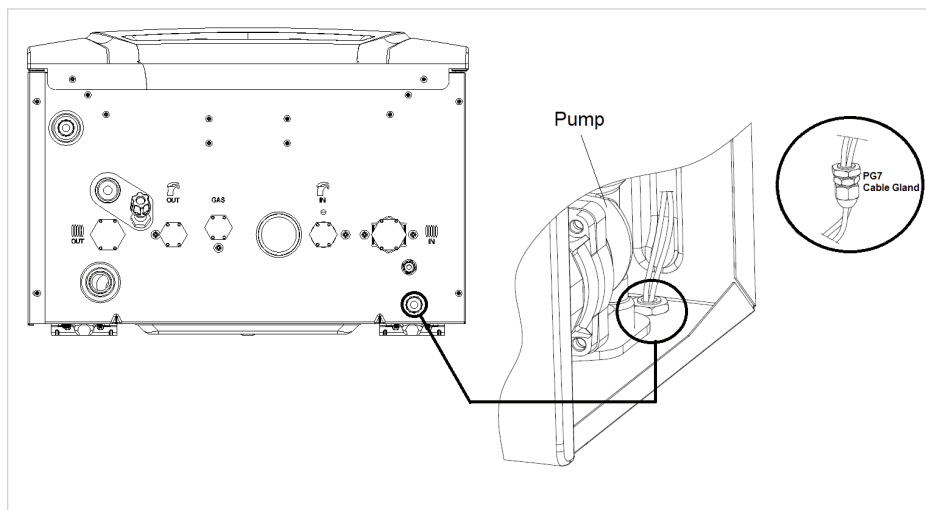


Figure 29. Cable gland and its location for outside sensor, remote control and room thermostat cables

Make outside sensor, remote control and room thermostat connections to terminal board as follows:

- a. Switch off the power supply at the main switch.
- b. Remove the front case panel of the boiler.
- c. Slacken the screws and remove the protective cover positioned right-bottom part of the plastic panel (see detail A in Figure 30).
- d. With the cover removed, connect remote control, room thermostat and outside sensor wires as shown in Figure 30 detail A.

Note: Room thermostat is in bridged condition as factory setting. If room thermostat will not be used, certainly it must be left as bridged.

- e. When the wires have been connected, place the protective cover and then front case panel again.

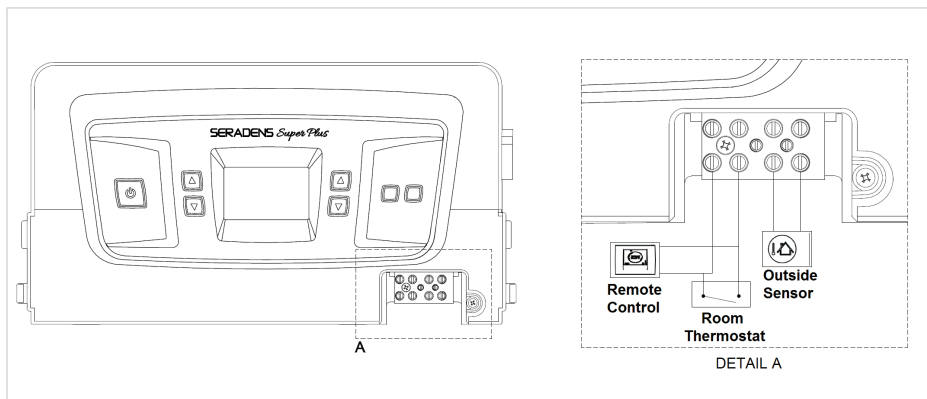


Figure 30. Electrical connections

4.9 Flue Connections

⚠ In order to ensure that the appliance functions correctly and efficiently, the flue connection between the boiler and the flue terminal must be made using original components specifically designed for condensing boilers.

⚠ Traditional flue components cannot be used for conveying exhaust fumes from condensing boilers, nor vice versa.

- Below suggestions must be taken into consideration for flue installation:
 - Horizontal air intake pipes must slope downwards by 3° at the wall towards atmosphere to prevent the entry of rain water, dust or impurities to the pipe. For horizontal flue gas pipes, situation is different. Flue gas pipes must slope upwards by 3° to facilitate the flow of condensate water in flue back to combustion chamber, to prevent the stalactite formation by freezing in winter and the risk of drop and hurting to walking people (Figure 31). In case of horizontal concentric flues, flue gas pipe (inner pipe) must slope upwards whereas air intake pipe (outer pipe) must slope downwards. Horizontal concentric flue set must be installed parallel to floor. After installation horizontally, flue gas pipe stands slopped upwards by itself as a result of special design (Figure 32).

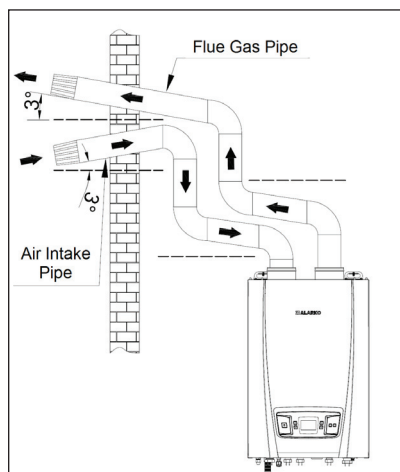


Figure 31. Angles of air intake and flue gas pipes

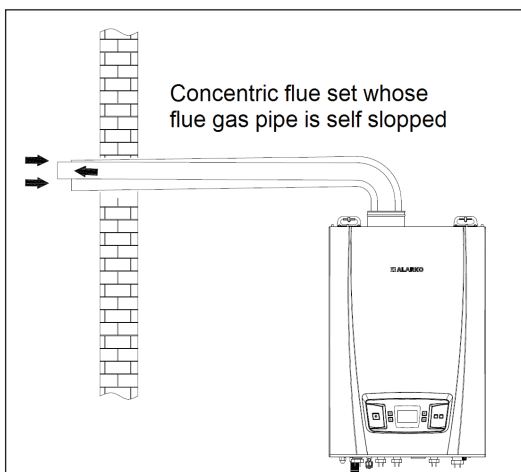


Figure 32. Concentric flue set angles

- In case of a vertical flue pipe installation, a condensate trap is fitted at the base of the flue installation and connected into drainage system (see Figure 33).

Shaft Connection

Connect the flue to the shaft according to the following specification:

- Do not allow the flue gas to protrude inside the shaft; instead terminate it before it reaches the shaft.
- The flue gas must be perpendicular to the opposite wall of the shaft (see Figure 34).

Flue Application Options

Flue application options are C13, C33, C33(x), C43, C43(x), C53, C53(x), C63, C63(x), C83, C83(x), C93, C93(x), B23 and B33. You can find explanations in Table 4.1 and visual application examples in Figure 35.

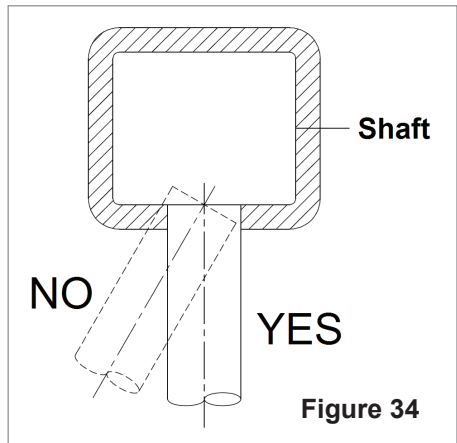
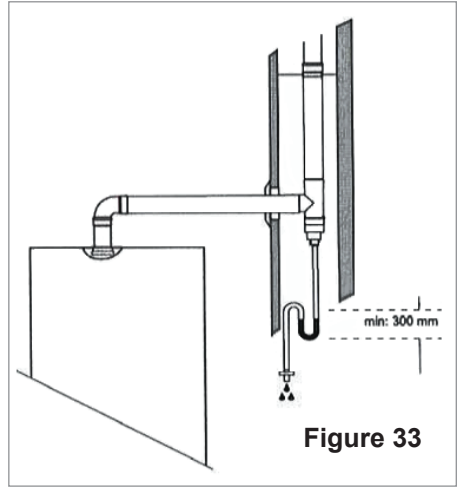


Table 4.1. Flue Types

| Flue Type | Description |
|---------------|---|
| B23 | Flue gas pipe through the shaft, combustion air directly from the location through the device (open type). |
| B33 | Flue gas pipe through the shaft, combustion air from the location, with horizontal concentric connection (open type). |
| C13(x) | Horizontal combustion air intake and flue gas discharge through side face or from the roof. Outlets are close to each other, at the same pressure area. |
| C33(x) | Combustion air intake and flue gas discharge with vertical outlet. Outlets are close to each other, at the same pressure area. |
| C43(x) | Combustion air and flue gas connections connected to multiple air-flue gas shaft system. |
| C53(x) | Combustion air intake and flue gas discharge with different lines. Outlets are at different pressure areas. |
| C63(x) | Connection design as per appliances where combustion air intake and flue gas discharge cannot be measured. |
| C83(x) | Flue gas installation is independent or with multiple connections (under pressure) and intake of independent combustion air from external environment. |
| C93(x) | Similar to C33 type combustion air intake and discharge of flue gas from the roof. Outlets are close to each other, at the same pressure area. Combustion air intake is through the building shaft on the roof partially or as a whole. |

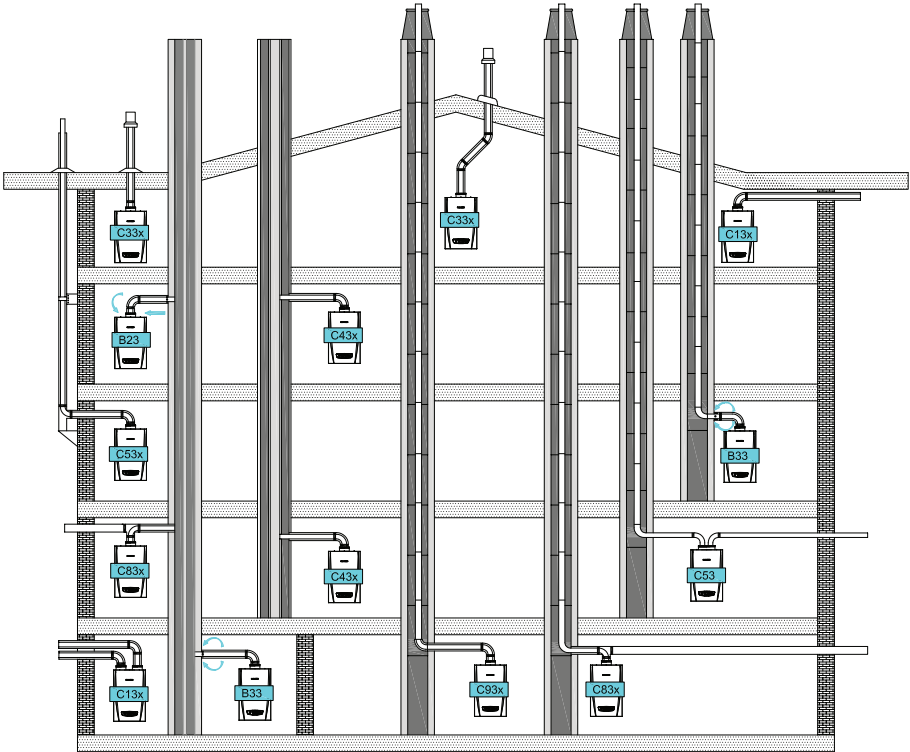


Figure 35. Flue applications

Ø60/100 Horizontal Concentric Flue Set (SSP 20/24/28)

Horizontal concentric flue set is Ø60/100 mm dimensioned and adjustable through 360°, it also has a polypropylene inner pipe proper to condensing. It discharges exhaust fumes and draws air from atmosphere.

This set is suitable for condensing boilers only.

Discharges exhaust gases and draws combustion air by means of two concentric pipes. The external Ø100 mm pipe draws the combustion air while the Ø60 mm plastic inner pipe discharges the exhaust fumes.

The flue gas pipe can be connected directly to the outside or can be connected to a suitable combined flue system.

MAXIMUM FLUE LENGTH: SSP 20: 6 m / SSP 24: 6 m / SSP 28: 5 m

The maximum flue length (linear equivalent) is obtained by summing the length of linear pipe and the equivalent lengths of each elbow fitted.

The linear equivalent is intended as being the total length of the pipe from the connection with the combustion chamber of the appliance, excluding the first elbow.

The linear equivalent of additional elbows is as follows:

Ø 60/100 x 90° elbow = 0.8 m.

Ø 60/100 x 45° elbow = 0.5 m.

NOTE: USE ONLY ALARKO TYPE-APPROVED FLUE SYSTEMS FOR DISCHARGING FLUE GASES AND INTAKE COMBUSTION AIR.

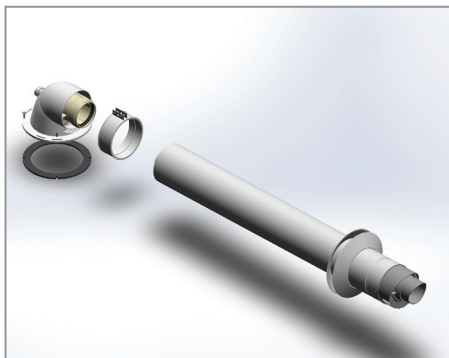


Figure 36. Ø60/100 mm horizontal flue set

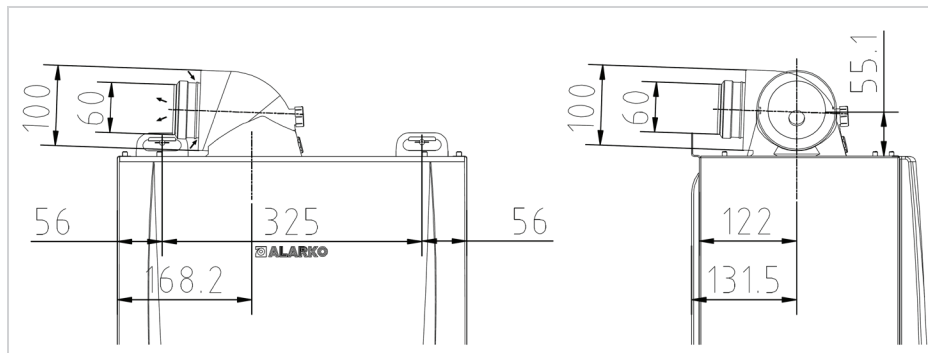


Figure 37. Ø60/100 mm horizontal flue set dimensions

Ø80/125 Horizontal Concentric Flue Set (SSP 36)

Horizontal concentric flue set is Ø80/125 mm dimensioned and adjustable through 360°, it also has a polypropylene inner pipe proper to condensing. It discharges exhaust fumes and draws air from atmosphere.

This set is suitable for condensing boilers only.

Discharges exhaust gases and draws combustion air by means of two concentric pipes. The external Ø125 mm pipe draws the combustion air while the Ø80 mm plastic inner pipe discharges the exhaust fumes.

The flue gas pipe can be connected directly to the outside or can be connected to a suitable combined flue system.

MAXIMUM FLUE LENGTH: SSP 36: 8 m

The maximum flue length (linear equivalent) is obtained by summing the length of linear pipe and the equivalent lengths of each elbow fitted.

The linear equivalent is intended as being the total length of the pipe from the connection with the combustion chamber of the appliance, excluding the first elbow.

The linear equivalent of additional elbows is as follows:

Ø 80/125 x 90° elbow = 0.8 m. / Ø 80/125 x 45° elbow = 0.5 m.

NOTE: USE ONLY ALARKO TYPE-APPROVED FLUE SYSTEMS FOR DISCHARGING FLUE GASES AND INTAKE COMBUSTION AIR

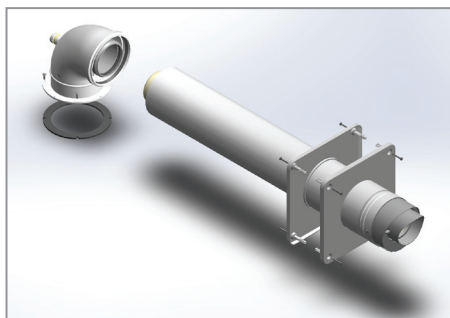


Figure 38. Ø80/125 mm horizontal flue set

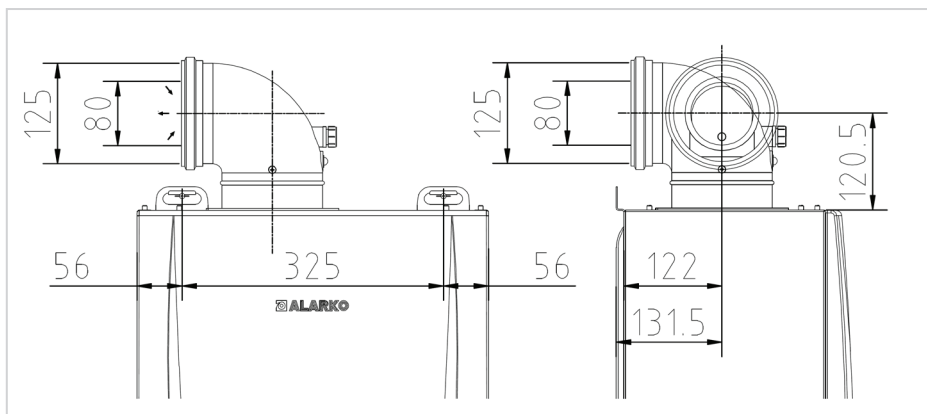


Figure 39. Ø80/125 mm horizontal flue set dimensions

Ø80+80 Twin Flue Set (SSP 20/24/28/36)

Horizontal twin pipe flue set has Ø80+80 mm dimensions, is adjustable through 360° and made of polypropylene. The dual pipe system discharges exhaust fumes by means of one pipe and draws air from atmosphere by means of the other pipe.

This set is suitable for condensing boilers only.

Discharges exhaust gases and draws combustion air through two separate pipes.

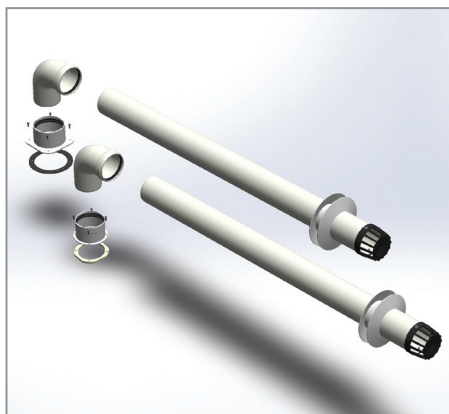


Figure 40. Twin flue set

MAXIMUM FLUE LENGTH:

Ø 80+80 : 50 m

The maximum flue length (linear equivalent) is obtained by summing the length of linear pipe and the equivalent lengths of each elbow fitted.

The linear equivalent is intended as being the total length of the pipe from the connection with the combustion chamber of the appliance, excluding the first elbow.

The linear equivalent of additional elbows is as follows:

Ø 80 x 90° elbow = 1.5 m.

Ø 80 x 45° elbow = 1.2 m.

NOTE: USE ONLY ALARKO TYPE-APPROVED FLUE SYSTEMS FOR DISCHARGING FLUE GASES AND INTAKE COMBUSTION AIR

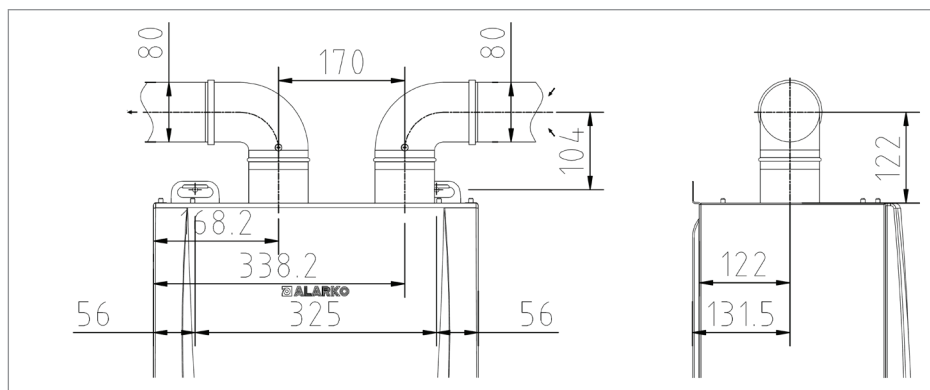


Figure 41. SSP 20/24/28/36 twin flue set dimensions

Ø60/100 Vertical Concentric Flue Set (SSP 20/24/28)

Vertical concentric flue set is Ø60/100 mm dimensioned and adjustable through 360°, it also has a polypropylene inner pipe proper to condensing. It discharges exhaust fumes and draws air from atmosphere.

This set is suitable for condensing boilers only.

Discharges exhaust gases and draws combustion air by means of two vertical concentric pipes. The external Ø100 mm pipe draws the combustion air while the Ø60 mm plastic inner pipe discharges the exhaust fumes.

MAXIMUM FLUE LENGTH:

SSP 20: 6 m

SSP 24: 6 m

SSP 28: 5 m

The maximum flue length (linear equivalent) is obtained by summing the length of linear pipe and the equivalent lengths of each elbow fitted.

The linear equivalent is intended as being the total length of the pipe from the connection with the combustion chamber of the appliance, excluding the first elbow.

The linear equivalent of additional elbows is as follows:

Ø 60/100 x 90° elbow = 0.8 m.

Ø 60/100 x 45° elbow = 0.5 m.

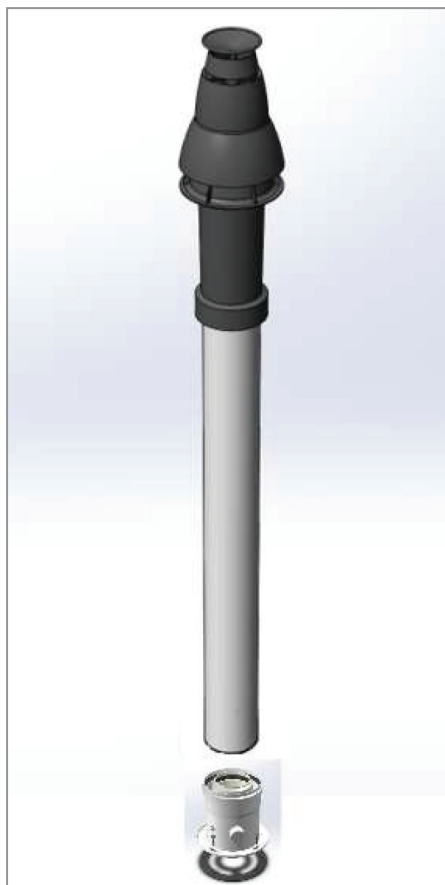


Figure 42. Vertical flue set SSP 20/24/28

NOTE: USE ONLY ALARKO TYPE-APPROVED FLUE SYSTEMS FOR DISCHARGING FLUE GASES AND INTAKE COMBUSTION AIR

Ø80/125 Vertical Concentric Flue Set (SSP 36)

Vertical concentric flue set is Ø80/125 mm dimensioned and adjustable through 360°, it also has a polypropylene inner pipe proper to condensing. It discharges exhaust fumes and draws air from atmosphere.

This set is suitable for condensing boilers only.

Discharges exhaust gases and draws combustion air by means of two vertical concentric pipes. The external Ø125 mm pipe draws the combustion air while the Ø80 mm plastic inner pipe discharges the exhaust fumes.

MAXIMUM FLUE LENGTH:

SSP 36: 8 m

The maximum flue length (linear equivalent) is obtained by summing the length of linear pipe and the equivalent lengths of each elbow fitted.

The linear equivalent is intended as being the total length of the pipe from the connection with the combustion chamber of the appliance, excluding the first elbow.

The linear equivalent of additional elbows is as follows:

Ø 80/125 x 90° elbow = 0.8 m.

Ø 80/125 x 45° elbow = 0.5 m.

NOTE: USE ONLY ALARKO TYPE-APPROVED FLUE SYSTEMS FOR DISCHARGING FLUE GASES AND INTAKE COMBUSTION AIR

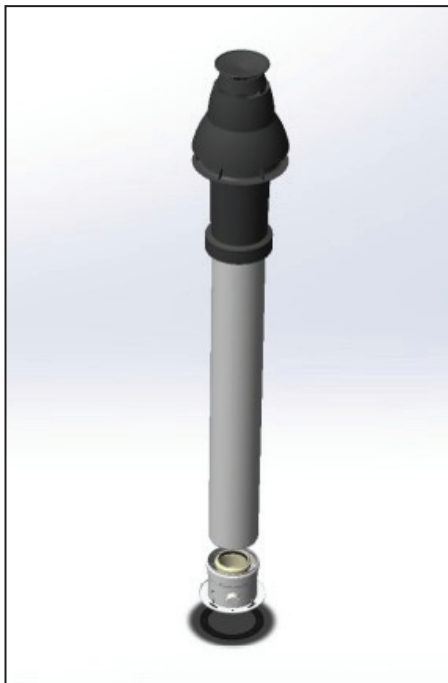





Figure 43. Vertical flue set SSP 36

5. COMMISSIONING THE APPLIANCE

-  **The following operations must be carried out by professionally qualified personnel, registered in accordance with current legislation.**
-  **Commissioning of the appliance by an unauthorized company or unauthorized people invalidates the guarantee.**
-  **Alarko Carrier does not take any responsibility for the damage or injury on persons, animals or objects caused by commissioning by unauthorized people.**

5.1 Parameter Settings (Authorized Service)

It is NOT an obligation to be in OFF position for setting parameters but it is recommended. The appliance re-operates automatically when the parameters related to fan speed are changed, in this way the influence of the parameter change can be easily followed.

Parameter Entry


1. The appliance is turned off by pushing key **(1)**.
2. Key **(2)** and **(6)** are pressed and hold down simultaneously for 5 seconds.
3. P00 and attention (Icon 3 in Figure 12) symbol are shown on the screen.
4. Navigation among parameters is done with keys **(5)** and **(6)**.
5. Target parameter is reached.
6. Key **(1)** is pressed and hold down for 2 seconds to enter into the target parameter.
7. The last adjusted value of the parameter and attention symbol blinks on the screen.
8. Parameter is adjusted by keys **(3)** and **(4)**.
9. After the requested value is reached on the screen, blinking twice of the attention symbol must be waited before saving the parameter.
10. New parameter value is saved by pressing key **(1)** and holding down for 2 seconds.
11. After saving is completed, the last entered parameter number and the attention symbol lights continuously on the screen.
12. All requested parameter modifications are done by repeating all steps between step 3 and step 9. It is possible to exit the parameter menu by pressing key **(2)** and holding down for 2 seconds.
13. If desired; after completing step 7, it is also possible to save the new parameter value and exit the parameter menu by pressing and holding down key **(2)**.

Parameter List

Table 5.1 Table of Parameters

| Parameter | Setting Range [min-max] | Unit | Description | Selection | Default Value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|----------------------------|------|---|--|--|-----|-----|-----|---|---|----|---|---|----|---|---|----|---|---|----|---|---|----|---|---|----|---|---|----|---|---|----|---|---|----|---|---|----|---|---|----|---|---|----|---|---|----|---|---|----|---|---|----|---|---|----|
| P00 | 1-1 | - | Type of the appliance | 1: Monothermic | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P01 | 0-5 | - | Model of the appliance | 0: SRS 20 1: SSP 20 2: SRS 28 3: SSP 28 4: SRS 36 5: SSP 36 6: SRS 24 7: SSP 24 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P02 | 0-1 | - | Gas type | 0: Natural gas 1: LPG | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P03 | 0-1 | - | Working temperature range on heating (CH) cycle | 0: Heating with radiators (30-85°C) 1: Underfloor heating (30-45°C) | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P04 | 60-200 | - | Fan speed at start-up (during ignition) (rpm equivalent of this fan speed is calculated by multiplying entered value by 40) | Depending on P01 and P02. | <table><tr><th>P01</th><th>P02</th><th>P04</th></tr><tr><td>0</td><td>0</td><td>90</td></tr><tr><td>1</td><td>0</td><td>90</td></tr><tr><td>2</td><td>0</td><td>90</td></tr><tr><td>3</td><td>0</td><td>90</td></tr><tr><td>4</td><td>0</td><td>90</td></tr><tr><td>5</td><td>0</td><td>90</td></tr><tr><td>6</td><td>0</td><td>90</td></tr><tr><td>7</td><td>0</td><td>90</td></tr><tr><td>0</td><td>1</td><td>90</td></tr><tr><td>1</td><td>1</td><td>90</td></tr><tr><td>2</td><td>1</td><td>68</td></tr><tr><td>3</td><td>1</td><td>90</td></tr><tr><td>4</td><td>1</td><td>90</td></tr><tr><td>5</td><td>1</td><td>90</td></tr><tr><td>6</td><td>1</td><td>90</td></tr><tr><td>7</td><td>1</td><td>90</td></tr></table> | P01 | P02 | P04 | 0 | 0 | 90 | 1 | 0 | 90 | 2 | 0 | 90 | 3 | 0 | 90 | 4 | 0 | 90 | 5 | 0 | 90 | 6 | 0 | 90 | 7 | 0 | 90 | 0 | 1 | 90 | 1 | 1 | 90 | 2 | 1 | 68 | 3 | 1 | 90 | 4 | 1 | 90 | 5 | 1 | 90 | 6 | 1 | 90 | 7 | 1 | 90 |
| P01 | P02 | P04 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 0 | 90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 0 | 90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 0 | 90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 0 | 90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 0 | 90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 0 | 90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 0 | 90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 1 | 90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 1 | 90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 1 | 68 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 1 | 90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 1 | 90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 1 | 90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 1 | 90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 1 | 90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P05 | 60-150 | - | Fan speed at minimum capacity for DHW cycle (rpm equivalent of this fan speed is calculated by multiplying entered value by 40) | Depending on P01 and P02. | <table><tr><th>P01</th><th>P02</th><th>P05</th></tr><tr><td>0</td><td>0</td><td>76</td></tr><tr><td>1</td><td>0</td><td>78</td></tr><tr><td>2</td><td>0</td><td>77</td></tr><tr><td>3</td><td>0</td><td>81</td></tr><tr><td>4</td><td>0</td><td>67</td></tr><tr><td>5</td><td>0</td><td>71</td></tr><tr><td>6</td><td>0</td><td>80</td></tr><tr><td>7</td><td>0</td><td>80</td></tr><tr><td>0</td><td>1</td><td>68</td></tr><tr><td>1</td><td>1</td><td>68</td></tr><tr><td>2</td><td>1</td><td>73</td></tr><tr><td>3</td><td>1</td><td>73</td></tr><tr><td>4</td><td>1</td><td>68</td></tr><tr><td>5</td><td>1</td><td>68</td></tr><tr><td>6</td><td>1</td><td>73</td></tr><tr><td>7</td><td>1</td><td>73</td></tr></table> | P01 | P02 | P05 | 0 | 0 | 76 | 1 | 0 | 78 | 2 | 0 | 77 | 3 | 0 | 81 | 4 | 0 | 67 | 5 | 0 | 71 | 6 | 0 | 80 | 7 | 0 | 80 | 0 | 1 | 68 | 1 | 1 | 68 | 2 | 1 | 73 | 3 | 1 | 73 | 4 | 1 | 68 | 5 | 1 | 68 | 6 | 1 | 73 | 7 | 1 | 73 |
| P01 | P02 | P05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 0 | 76 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 78 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 0 | 77 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 0 | 81 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 0 | 67 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 0 | 71 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 0 | 80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 0 | 80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 1 | 68 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 1 | 68 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 1 | 73 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 1 | 73 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 1 | 68 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 1 | 68 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 1 | 73 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 1 | 73 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |


| Parameter | Setting Range [min-max] | Unit | Description | Selection | Default Value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------|----------------------------|------------|---|---------------------------|---|------------|------------|------------|---|---|-----|---|---|-----|---|---|-----|---|---|-----|---|---|-----|---|---|-----|---|---|-----|---|---|-----|---|---|-----|---|---|-----|---|---|-----|---|---|-----|---|---|-----|---|---|-----|---|---|-----|---|---|-----|
| P06 | 60-250 | - | Fan speed at maximum capacity for DHW cycle (rpm equivalent of this fan speed is calculated by multiplying entered value by 40 and adding 2500) | Depending on P01 and P02. | <table><tr><td><u>P01</u></td><td><u>P02</u></td><td><u>P06</u></td></tr><tr><td>0</td><td>0</td><td>188</td></tr><tr><td>1</td><td>0</td><td>240</td></tr><tr><td>2</td><td>0</td><td>197</td></tr><tr><td>3</td><td>0</td><td>235</td></tr><tr><td>4</td><td>0</td><td>200</td></tr><tr><td>5</td><td>0</td><td>240</td></tr><tr><td>6</td><td>0</td><td>220</td></tr><tr><td>7</td><td>0</td><td>233</td></tr><tr><td>0</td><td>1</td><td>150</td></tr><tr><td>1</td><td>1</td><td>176</td></tr><tr><td>2</td><td>1</td><td>160</td></tr><tr><td>3</td><td>1</td><td>188</td></tr><tr><td>4</td><td>1</td><td>160</td></tr><tr><td>5</td><td>1</td><td>198</td></tr><tr><td>6</td><td>1</td><td>176</td></tr><tr><td>7</td><td>1</td><td>186</td></tr></table> | <u>P01</u> | <u>P02</u> | <u>P06</u> | 0 | 0 | 188 | 1 | 0 | 240 | 2 | 0 | 197 | 3 | 0 | 235 | 4 | 0 | 200 | 5 | 0 | 240 | 6 | 0 | 220 | 7 | 0 | 233 | 0 | 1 | 150 | 1 | 1 | 176 | 2 | 1 | 160 | 3 | 1 | 188 | 4 | 1 | 160 | 5 | 1 | 198 | 6 | 1 | 176 | 7 | 1 | 186 |
| <u>P01</u> | <u>P02</u> | <u>P06</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 0 | 188 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 240 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 0 | 197 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 0 | 235 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 0 | 200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 0 | 240 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 0 | 220 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 0 | 233 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 1 | 150 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 1 | 176 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 1 | 160 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 1 | 188 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 1 | 160 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 1 | 198 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 1 | 176 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 1 | 186 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P07 | 60-150 | - | Fan speed at minimum capacity for CH cycle (rpm equivalent of this fan speed is calculated by multiplying entered value by 40) | Depending on P01 and P02. | <table><tr><td><u>P01</u></td><td><u>P02</u></td><td><u>P07</u></td></tr><tr><td>0</td><td>0</td><td>76</td></tr><tr><td>1</td><td>0</td><td>78</td></tr><tr><td>2</td><td>0</td><td>77</td></tr><tr><td>3</td><td>0</td><td>81</td></tr><tr><td>4</td><td>0</td><td>67</td></tr><tr><td>5</td><td>0</td><td>71</td></tr><tr><td>6</td><td>0</td><td>80</td></tr><tr><td>7</td><td>0</td><td>80</td></tr><tr><td>0</td><td>1</td><td>68</td></tr><tr><td>1</td><td>1</td><td>68</td></tr><tr><td>2</td><td>1</td><td>73</td></tr><tr><td>3</td><td>1</td><td>73</td></tr><tr><td>4</td><td>1</td><td>68</td></tr><tr><td>5</td><td>1</td><td>68</td></tr><tr><td>6</td><td>1</td><td>73</td></tr><tr><td>7</td><td>1</td><td>73</td></tr></table> | <u>P01</u> | <u>P02</u> | <u>P07</u> | 0 | 0 | 76 | 1 | 0 | 78 | 2 | 0 | 77 | 3 | 0 | 81 | 4 | 0 | 67 | 5 | 0 | 71 | 6 | 0 | 80 | 7 | 0 | 80 | 0 | 1 | 68 | 1 | 1 | 68 | 2 | 1 | 73 | 3 | 1 | 73 | 4 | 1 | 68 | 5 | 1 | 68 | 6 | 1 | 73 | 7 | 1 | 73 |
| <u>P01</u> | <u>P02</u> | <u>P07</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 0 | 76 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 78 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 0 | 77 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 0 | 81 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 0 | 67 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 0 | 71 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 0 | 80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 0 | 80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 1 | 68 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 1 | 68 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 1 | 73 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 1 | 73 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 1 | 68 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 1 | 68 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 1 | 73 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 1 | 73 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P08 | 60-250 | - | Fan speed at maximum capacity for CH cycle (rpm equivalent of this fan speed is calculated by multiplying entered value by 40 and adding 2500) | Depending on P01 and P02. | <table><tr><td><u>P01</u></td><td><u>P02</u></td><td><u>P08</u></td></tr><tr><td>0</td><td>0</td><td>185</td></tr><tr><td>1</td><td>0</td><td>205</td></tr><tr><td>2</td><td>0</td><td>197</td></tr><tr><td>3</td><td>0</td><td>200</td></tr><tr><td>4</td><td>0</td><td>200</td></tr><tr><td>5</td><td>0</td><td>215</td></tr><tr><td>6</td><td>0</td><td>200</td></tr><tr><td>7</td><td>0</td><td>195</td></tr><tr><td>0</td><td>1</td><td>150</td></tr><tr><td>1</td><td>1</td><td>150</td></tr><tr><td>2</td><td>1</td><td>160</td></tr><tr><td>3</td><td>1</td><td>160</td></tr><tr><td>4</td><td>1</td><td>160</td></tr><tr><td>5</td><td>1</td><td>170</td></tr><tr><td>6</td><td>1</td><td>150</td></tr><tr><td>7</td><td>1</td><td>150</td></tr></table> | <u>P01</u> | <u>P02</u> | <u>P08</u> | 0 | 0 | 185 | 1 | 0 | 205 | 2 | 0 | 197 | 3 | 0 | 200 | 4 | 0 | 200 | 5 | 0 | 215 | 6 | 0 | 200 | 7 | 0 | 195 | 0 | 1 | 150 | 1 | 1 | 150 | 2 | 1 | 160 | 3 | 1 | 160 | 4 | 1 | 160 | 5 | 1 | 170 | 6 | 1 | 150 | 7 | 1 | 150 |
| <u>P01</u> | <u>P02</u> | <u>P08</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 0 | 185 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 205 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 0 | 197 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 0 | 200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 0 | 200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 0 | 215 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 0 | 200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 0 | 195 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 1 | 150 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 1 | 150 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 1 | 160 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 1 | 160 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 1 | 160 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 1 | 170 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 1 | 150 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 1 | 150 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P09 | 0-10 | minute | The elapsed time starting from flame formation until maximum fan speed is reached for operation on CH mode | Any | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P10 | 0-10 | minute | Minimum waiting time without formation of flame after the appliance achieves intended temperature and stops, even if there is a need of heating | Any | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Parameter | Setting Range [min-max] | Unit | Description | Selection | Default Value |
|-----------|----------------------------|--------|--|---|---------------|
| P11 | 0-240 | second | The time pump keeps rotating after room thermostat reaches set temperature. If there is no room thermostat connected in the system (bridged), software supposes that there is always need of heating and keeps the pump rotating. The pump doesn't stop even if in transition from DHW to CH. | Any | 180 |
| P12 | 0-1 | - | Flame modulation method for DHW mode. There are two choices, fixed or according to set value. If set value is chosen, the flame goes out if the temperature reaches the set value plus 5°C. When the temperature decreases back to the set temperature plus +4°C, the flame is again formed, the temperature gets a stable value after some temperature fluctuations related to the flow rate. | 0: Fixed 1: According to set value. | 1 |
| P13 | 40-200 | - | Fan speed during ventilation (rpm equivalent of this fan speed is calculated by multiplying entered value by 40) | Any | 100 |
| P14 | 0-3 | - | Type of info to be shown on additional digit area | 0: Nothing shown 1: Central heating instant water pressure value and bar symbol are shown 2: Instant capacity of burner as percentage and % symbol are shown 3: External temperature (If there is outside temperature sensor) and  symbol are shown. | 1 |
| P15 | 0-240 | second | Additional working time of pump after DHW need ends, if there is also no CH need | Any | 20 |
| P16 | 0-30 | - | It is used for commissioning modulating pump if it is used in the appliance. | 0: No modulating pump 1-30: The difference between flow and return water temperatures is tried to be kept constant by modulating pump according to set parameter value. | 0 |
| P17 | 10-240 | second | Modulating pump control algorithm interval time. If there is modulating pump in the appliance, this parameter determines the control frequency of flow-return temperatures. | Any | 30 |
| P18 | 50-70 | % | Modulating pump minimum power (% of pump maximum speed) | Any | 50 |
| P19 | 70-100 | % | Modulating pump maximum power (% of pump maximum speed) | Any | 100 |

| Parameter | Setting Range [min-max] | Unit | Description | Selection | Default Value |
|-----------|-------------------------|--------|--|---|---------------|
| P20 | 0-1 | - | Modulating pump brand/model selection | 0: Wilo / Yonos Para 1: Grundfos / UPM – UPM2 | 0 |
| P21 | 0-30 | - | Outside temperature compensation coefficient (KD in Figure 3). KD value equals the value of this parameter divided by 10. Ex: For the curve numbered 2, this parameter must be set to 20. | Any | 30 |
| P22 | 0-1 | - | The type of the flow sensing component used in the appliance. If flow sensor is used, the flame is generated according to the flow rate. If the parameter value is set to 10, then the flame is formed at flow rate of 1 l/min. Likewise, if it is 20, then the flame generation flow rate is 2 l/min. | 0: Flow switch 10-40: Flow sensor | 20 |
| P23 | 0-240 | second | The time interval in which fan speed falls from a set value (threshold value) to the minimum fan speed. Fan speed drops suddenly until the threshold value, it decreases in time from this value to the minimum. This property is used to prevent fan speed from falling to "0" suddenly when heating need is instantly over (for example when hot water tap is closed). 200 value of this parameter corresponds to approximately 5 seconds. The service people must not modify this parameter unless there is an emergency condition. | Any | 200 |
| P24 | 33-150 | - | The threshold value which is the first stop point of suddenly falling fan speed in case the heating need is over (rpm equivalent of this fan speed is calculated by multiplying entered value by 40). The service people must not modify this parameter unless there is an emergency condition. | Any | 150 |
| P25 | 0-255 | second | The time interval for monitoring threshold value and start-up curves after the cycle begins. The service people must not modify this parameter unless there is an emergency condition. | 0: Function disabled 1-255: Monitoring time | 0 |
| P26 | 0-2 | - | The type of the pressure sensing component used in the appliance. | 0: Pressure switch 1: Pressure sensor | 1 |
| P27 | 0-1 | - | DHW pre-heating function enabled/disabled. If there is no room thermostat connected or it is bridged, this function only works in summer mode, it doesn't work in winter and only heating modes. | 0: Pre-heating disabled 1: Pre-heating enabled | 0 |
| P28 | 0-1 | - | Demo mode enabled/disabled. Demo mode makes it possible to navigate on menu without encountering any error code. It can be used in exhibition halls or showrooms to introduce the appliance to customers only with an electrical connection. | 0: Demo mode disabled 1: Demo mode enabled | 0 |

5.2 Chimney Sweeping Function

Chimney sweeping function can only be activated on “WINTER” and “ONLY HEATING” modes. Therefore, the appliance is firstly set to “Winter” or “Only Heating” modes by key **(1)** (Figure 1). Chimney sweeping function is activated by pressing key **(2)** and **(3)** simultaneously and holding down for 8 seconds.

When this function is active, basic digits show CH water temperature, whereas additional digits show –HI- (stands for high) and –CS- (stands for chimney sweeping) words alternately. Moreover, Icon 1, 2 and 4 (Figure 13) is seen on the screen and the appliance starts to operate at maximum capacity. If chimney sweeping function is activated on “ONLY HEATING” mode,  symbol (Icon 1) is not seen on the screen. In order to operate the appliance at minimum capacity, key **(6)** (Figure 1) must be pressed. Meanwhile, –LO- (stands for low) and –CS- (stands for chimney sweeping) words are shown alternately on the screen. Press key **(5)** to operate the appliance again at maximum capacity. When the appliance achieves maximum capacity again, –HI- and –CS- words are shown alternately on the screen. When this function is on, the appliance operates at set capacity (maximum or minimum) for approximately 10 minutes, then automatically exits.

In order to exit the appliance from this mode, key **(1)** (Figure 1) must be used and the appliance must be turned OFF.

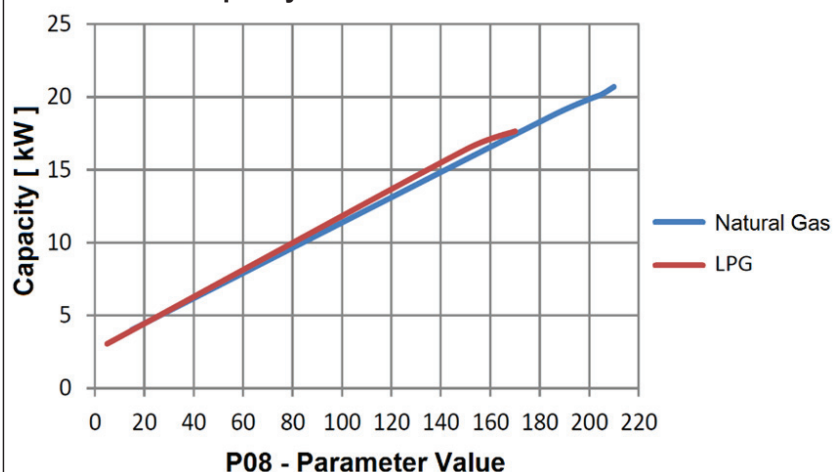
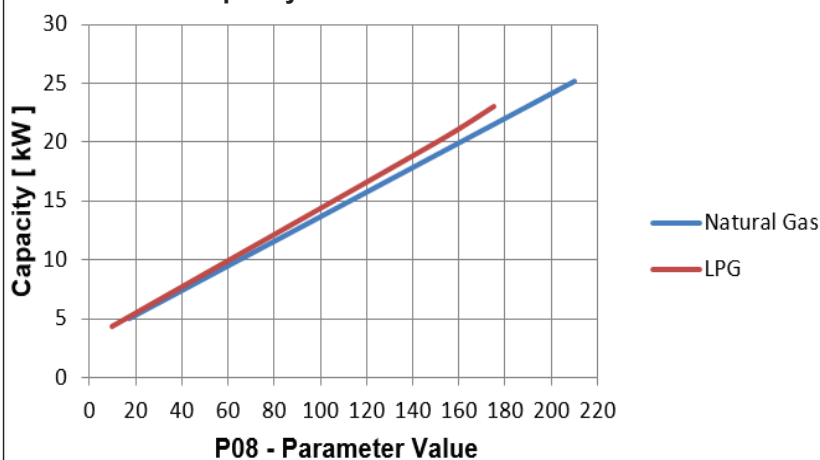
5.3 Capacity Adjustment

Heating powers (capacities) for both CH and DHW are set to approximately maximum value at the factory. This settings can be modified for the places whose heating needs are lower. For this setting, heating capacity-parameter value relation tables are used.

If the capacity setting is done correctly, the modulation becomes better and gas consumption is minimized. Moreover due to the lowered number of start-stops, ignition numbers are also lowered, it extends the lifetime of the boiler together with better gas consumption.

In order to reach maximum CH and DHW capacities, an offset of 2500 rpm was added to related parameters (P06 and P08). For example, if P08=200 then fan speed at maximum capacity is $200 \times 40 + 2500 = 10500$ rpm. There is no offset at remaining parameters, parameter value $\times 40$ gives fan speed. For example, if P07=70 then fan speed at minimum capacity for CH is $70 \times 40 = 2800$ rpm.

The relation graphs between heat capacity and P08 parameter are given in Figure 44 for SSP 20, 24, 28 and 36.

SSP 20 Capacity-Parameter Value Relation**SSP 24 Capacity-Parameter Value Relation**

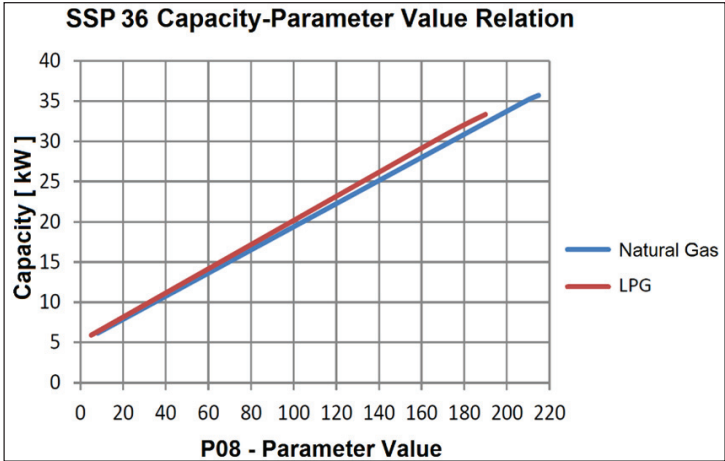
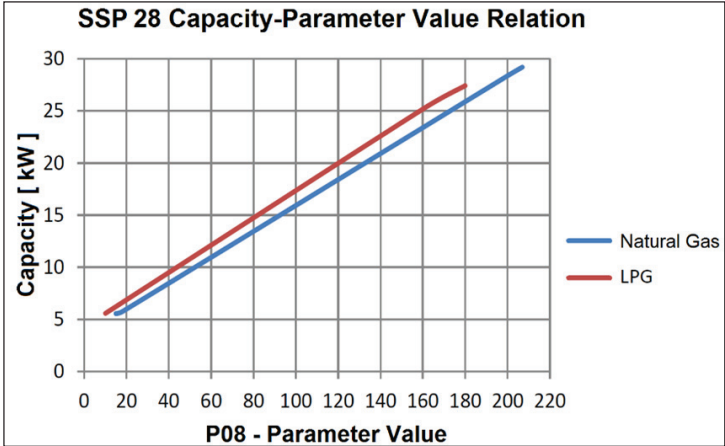


Figure 44. Influence of P08 parameter on the capacity

5.4 Gas Valve Adjustment

Gas valve adjustment locations of Seradens Super Plus combi boilers are given in Figure 44 for both minimum and maximum operating capacities.

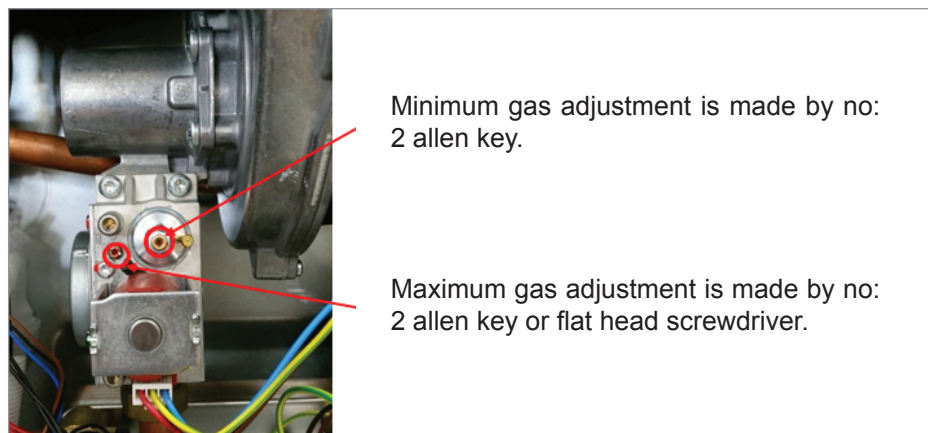


Figure 45. Gas valve adjustment

5.5 Emissions

Factory adjusted CO₂ emission values of SSP 20/24/28/36 combi boilers are given in Table 5.2 for both natural gas and LPG use.

Table 5.2. CO₂ Reference Values

| Gas Type | CO ₂ Reference Values | | | |
|--------------------------|----------------------------------|--------|--------|--------|
| | SSP 20 | SSP 24 | SSP 28 | SSP 36 |
| Natural Gas (G20) | 8,70% | 9,10% | 8,80% | 8,90% |
| LPG (G30) | 10,30% | 10,30% | 10,40% | 10,20% |

Acceptable emission ranges of Seradens Super Plus combi boilers are given in Table 5.3 for both natural gas and LPG use.




Table 5.3. Seradens Super Plus Emission Values

| | CO | | CO ₂ | λ |
|-------------|-----------------|----------|-----------------|-----------|
| Natural Gas | @ Max. capacity | <100 ppm | 8,7-9,2% | 1,31-1,35 |
| | @ Min. capacity | <10 ppm | | |
| LPG | @ Max. capacity | <100 ppm | 10-11% | |
| | @ Min. capacity | <10 ppm | | |

6. PERIODIC MAINTENANCE AND CLEANING

6.1 Periodic Maintenance of the Combi Boiler (Authorized Service)

During and also after guarantee period you must keep taking maintenance once a year (before winter) to provide safe use, fuel saving and long service life.

-  **All maintenance operations must be carried out by professionally qualified personnel, authorized by Alarko Carrier.**
-  **In order to guarantee the long life of the appliance and in accordance with the current gas safety regulations, only use original spare parts.**
-  **Alarko Carrier does not take any responsibility for the damage or injury on persons, animals or objects caused by maintenance by unauthorized people or service.**

6.2 Maintenance Content

Maintenance includes below points:

- Main heat exchanger cleaning
- Control of burner and electrode
- Fan motor balance control and fin cleaning
- Control of thermostat and sensors
- Cleaning of siphon
- Control of condensate water drain
- Control of expansion tank pressure, filling if low
- Control of flue leak proofing
- Flue gas analysis and combustion control
- Leakage control of pipe and venturi lines after gas valve with detector or detergent foam
- Cleaning of dirt separator
- Cleaning of filters
- Control of accurate operating of the appliance
- Filling the authorized service form

6.3 Cleaning of the Combi Boiler (User)

Wipe the outer case of the appliance with soft, humid fabric. Don't use hard, abrasive cleaning materials.

6.4 Maintenance Details

Switching Off and Discharging Water Inside the Boiler:

1. Prior to starting maintenance operations, run and ensure proper operation of the boiler both in CH and DHW cycles.
2. Cut off the electricity of the boiler (Turn off the cutout switch and/or unplug the boiler).
3. Close the gas valve.
4. Demount the front panel and side panels which are required to be disassembled for maintenance.
5. Close the CH in-out and DHW valves of the boiler.
6. Discharge the water inside the boiler. To do this, close the DHW inlet valve located under the appliance.
7. Open a HOT water tap in the kitchen or bathroom (Closest tap to the appliance must be preferred).
8. Open the filling tap located under the appliance.
9. As soon as the filling tap is opened, the water in CH system will begin to flow from hot water tap.
10. Reduce the heating water pressure to 1.2 bar in a controlled manner by following user info menu.
11. When the appropriate pressure value is reached, close the hot water tap and the filling tap, and open the DHW inlet valve under the appliance.

Maintenance of the Main Heat Exchanger

12. Remove fan and venturi group to separate them from heat exchanger (After disassembling fan and venturi group, isolate outlet part of the gas valve with an appropriate band to prevent any impurity from entering inside).
13. Demount the electrode cable.
14. Demount the burner hood.
15. Check the gasket, slag wool isolation, burner and electrode.
16. Replace electrode if any crack in ceramic part, any oxidation or deforma-

tion in metal part or any other defect.

17. Ensure that any hole on the burner is not blocked.
18. Clean with nylon brush if any residual material or oxidation is encountered on the burner.
19. Clean the internal part of the heat exchanger with vacuum cleaner.
20. Clean the heat exchanger pipes with nylon brush.
21. Re-clean with vacuum cleaner to take lastly formed residuals.
22. Rinse the internal part of the heat exchanger by pouring water.
23. Spray apple cider vinegar or stainless steel cleaner to heat exchanger pipes.
24. Wait for 3-5 minutes.
25. Re-clean heat exchanger pipes with nylon brush.
26. Rinse with water.
27. Clean the condensate water siphon and refill with water.
28. Remount the burner hood.
29. Reassemble the electrode cable.

ATTENTION!

If plumbing water is not cleaned before the boiler installation, if the hardness value of the water is bigger than 17,5 French hardness and if algaecide chemicals are not added to plumbing water, some residues like in Figure 46 may form, this may necessitate the heat exchanger replacement.



Figure 46

Fan Control:

30. Check the balance of the fan motor. Clean the fins of the fan with a proper plastic brush without affecting balance.
31. Remount the fan and venturi group.

Hermetic Flue and Tightness Control:

32. Check the hermetic flue tightness.
33. Check the slope of the flue.
34. Ensure that hermetic flue is not damaged during the assembling and dis-assembling of the heat exchanger.

Maintenance and Cleaning of the Hydraulic Group:

35. Clean the plumbing system with a proper chemical after demounting the heat exchanger.
36. Check the 3 ways valve and replace if needed.
37. Separate the motor of the pump from the volute, clean the rotor and re-mount the motor (Ensure that there is no any wear or friction on the pump, fan and rotor surfaces).
38. Check the limit thermostat, CH sensor, DHW sensor and pressure sensor located on water circuit. Replace if needed.
39. Mount the DHW heat exchanger.
40. Mount the 3 ways valve.
41. Demount the strainers on CH return and DHW inlet parts, clean and re-mount.
42. Check the air of the expansion tank, if insufficient, add air/nitrogen.

Final Checks :

43. Deaerate the boiler from the pump. If you discharged the water in the radiators, deaerate the radiators, too.
44. Check the water pressure, if it is below 1.2 bar, then add water to system.
45. Check the condensate drain.
46. Ensure that the pump circulates water before combustion begins.
47. Open the gas valve slowly after inserting a proper manometer on the gas inlet measurement nipple located on the gas valve.
48. After the gas pressure gets fixed, close the main gas valve and check if the pressure decreases or not. In this way, you can see if any leakage is in the system until the gas valve inlet.
49. Open the DHW inlet and let the boiler to get combustion.
50. During combustion, check gas leakage of the pipes and venturi next to gas valve by a proper gas leak detector or detergent bubble.

Flue Gas Analysis and Combustion Check:

51. Activate the chimney sweeping function.
52. Select summer mode, open hot water tap and then check the emission values at min and max capacities.
53. Select winter mode, and check the emission values for CH cycle at min and max capacities.
54. If the emissions are not acceptable, then adjust air-gas mixing ratio and related specs.
55. Note the final values you get after adjustment on the service document.
56. Ensure that the ignition of the boiler during start-up sounds soft and acceptable.
57. If the ignition sound is noisy, then set the ignition pressure again.
58. Ensure that the boiler makes modulation both in DHW and CH cycles.
59. Check the set parameter values.

Final:

60. Remount disassembled panels of the boiler.
61. Fill the authorized service document after all operation is done.

6.5 Troubleshooting

Error Diagnostics:

Table 6.1. Error Diagnostics

| Error Description | Code | Action |
|--|------|---|
| No flame | E01 | Reset |
| Spurious flame | E01 | Reset |
| Limit thermostat error | E02 | Reset |
| Flue fuse or safety fuse malfunction | E03 | Automatic, after 10 minutes waiting following solution of the error |
| Low heating water pressure error | E04 | Automatic |
| Heating water flow temperature sensor error | E05 | Automatic |
| DHW temperature sensor error | E06 | Automatic |
| Heating water return temperature sensor error (active only if modulating pump is used) | E15 | Automatic |
| Fan error | E16 | Automatic |
| Electronic card microprocessor error | E22 | Power off /on |
| Remote control error | E31 | Power off /on |
| Main board communication error | E32 | Automatic |
| Flame detection error | E35 | Automatic |
| Pressure sensor error | E46 | Automatic |
| High heating water pressure error | E47 | Automatic |
| LCD card communication error | E62 | Automatic |
| Main power error | E98 | Automatic |
| Internal safety error – safety shut down | E99 | Automatic |

Troubleshooting:

Table 6.2. Troubleshooting

| ERROR CODE | PROBLEM | POSSIBLE CAUSE | REMEDY |
|------------|---|---|--|
| E01 | NO FLAME OR SPURIOUS FLAME | <ol style="list-style-type: none"> 1. NO GAS. 2. IGNITION ELECTRODE IS BROKEN. 3. GAS VALVE MALFUNCTION. 4. MECHANICAL MINIMUM ADJUSTMENT SCREW (ON GAS VALVE) IS TOO LOW OR IGNITION PARAMETER (P04) IS TOO HIGH OR TOO LOW. 5. GAS VALVE INLET PRESSURE IS TOO HIGH (FOR ONLY LPG BOILERS). 6. IGNITION-IONISATION ELECTRODE MALFUNCTION. 7. IGNITION-IONISATION ELECTRODE CABLE DISCONNECTED. | <ol style="list-style-type: none"> 1. CHECK MAINS GAS SUPPLY. 2. REPLACE MAIN BOARD. 3. REPLACE GAS VALVE. 4. REGULATE MINIMUM ADJUSTMENT, MODIFY P04 PARAMETER IF NEEDED. 5. CHECK THE MAXIMUM PRESSURE SETTING. 6. REPLACE ELECTRODE. 7. CHECK THE CABLE CONNECTION, IF ERROR PERSISTS REPLACE THE CABLE. |
| E02 | LIMIT THERMOSTAT ERROR | <ol style="list-style-type: none"> 1. LIMIT THERMOSTAT MALFNCTION. 2. CABLE MALFUNCTION. 3. LIMIT THERMOSTAT IS BLOCKED. | <ol style="list-style-type: none"> 1. REPLACE LIMIT THERMOSTAT. 2. CHECK THE CABLE CONNECTION, IF ERROR PERSISTS REPLACE THE CABLE. 3. ENSURE THAT HEATING WATER DOESN'T MAKE THERMOSTAT TRIPPED BY OVER-HEATING, ENSURE THE HEAT EXCHANGER MAINTENANCE IS BEING DONE REGULARLY AND THERE IS NO REDUCTION IN PIPE SECTIONS. |
| E03 | FLUE FUSE OR SAFETY FUSE MALFUNCTION | <ol style="list-style-type: none"> 1. FLUE FUSE OR SAFETY FUSE IS BLOCKED. 2. CABLE MALFUNCTION. | <ol style="list-style-type: none"> 1. FLUE GAS MAY MAKE THE FUSE TRIPPED BY OVER-HEATING, ENSURE THE HEAT EXCHANGER MAINTENANCE IS BEING DONE REGULARLY AND THERE IS NO REDUCTION IN PIPE SECTIONS. REPLACE THE FLUE FUSE, IF THE ERROR PERSISTS, REPLACE THE MAIN HEAT EXCHANGER. 2. CHECK THE CABLE CONNECTION, IF ERROR PERSISTS REPLACE THE CABLE. |
| E04 | LOW HEATING WATER PRESSURE ERROR | <ol style="list-style-type: none"> 1. INSUFFICIENT WATER PRESSURE IN THE SYSTEM. | <ol style="list-style-type: none"> 1. FILL THE SYSTEM UNTIL PRESSURE INCREASES TO 1.2 BAR. |
| E05 | HEATING WATER FLOW TEMPERATURE SENSOR ERROR | <ol style="list-style-type: none"> 1. CABLE MALFUNCTION. 2. SENSOR MALFUNCTION OR CALIBRATION FAIL (RESISTANCE VALUE IS 10 KΩ AT ΔT25°C β=3435) <p>NOTE: IF SENSOR ITSELF OR ITS CALIBRATION FAIL DUE TO TECHNICAL REASONS, ANY ERROR CODE CAN'T BE SHOWN ON THE SCREEN. HEATING SENSORS MUST BE CHECKED. HEATING SENSORS MUST BE CHECKED IN NEGATIVE CASES ABOUT HEATING PERFORMANCE.</p> | <ol style="list-style-type: none"> 1. CHECK THE CABLE CONNECTION, IF ERROR PERSISTS REPLACE THE CABLE. 2. REPLACE HEATING SENSOR. |

| ERROR CODE | PROBLEM | POSSIBLE CAUSE | REMEDY |
|------------|---------------------------------------|---|---|
| E06 | DHW TEMPERATURE SENSOR ERROR | 1. CABLE MALFUNCTION. 2. SENSOR MALFUNCTION OR CALIBRATION FAIL (RESISTANCE VALUE IS 10 KΩ AT ΔT25°C β=3435) NOTE: IF SENSOR ITSELF OR ITS CALIBRATION FAIL DUE TO TECHNICAL REASONS, ANY ERROR CODE CAN'T BE SHOWN ON THE SCREEN. HEATING SENSORS MUST BE CHECKED. HEATING SENSORS MUST BE CHECKED IN NEGATIVE CASES ABOUT HEATING PERFORMANCE. | 1. CHECK THE CABLE CONNECTION, IF ERROR PERSISTS REPLACE THE CABLE. 2. REPLACE DHW SENSOR. |
| E16 | FAN ERROR | 1. FAN MALFUNCTION. 2. FAN CONTINUOUSLY ROTATES AT HIGH SPEED. 3. CABLE MALFUNCTION. | 1. REPLACE FAN. 2. CHECK THE FAN PWM CABLE CONNECTION (IN CASE OF MODULATING PUMP USAGE), IF ERROR PERSISTS REPLACE THE CABLE. 3. CHECK THE POWER CABLE CONNECTION, IF ERROR PERSISTS REPLACE THE CABLE. |
| E22 | ELECTRONIC CARD MICRO-PROCESSOR ERROR | 1. ELECTRONIC CARD MALFUNCTION. | 1. RESET THE APPLIANCE AFTER POWERING OFF. IF ERROR PERSISTS, REPLACE THE MAIN BOARD. |
| E31 | REMOTE CONTROL ERROR | 1. CONNECTION ERROR | 1. CHECK THE REMOTE CONTROL CABLE CONNECTION AND STATUS OF THE BATTERY. IF NOT SOLVED, RESET THE APPLIANCE AFTER POWERING OFF. IF THE ERROR PERSISTS, CHECK THE ELECTRONIC CARD. IF IT IS SOURCED FROM ELECTRONIC CARD, REPLACE IT. |
| E32 | MAIN BOARD COMMUNICATION ERROR | 1. CONNECTION INTERRUPTED BETWEEN MAIN BOARD AND LCD CARD. | 1. CHECK THE CABLE CONNECTING LCD CARD AND MAIN BOARD, IF MALFUNCTIONED, REPLACE. IF IT IS OK, THEN REPLACE MAIN BOARD. |
| E35 | FLAME DETECTION ERROR | 1. IONISATION ELECTRODE MALFUNCTION 2. IONISATION ELECTRODE CABLE MALFUNCTION 3. PRINTED CIRCUIT BOARD MALFUNCTION | 1. CLEAN IT OR REPLACE IONISATION ELECTRODE. 2. REPLACE IONISATION ELECTRODE. 3. REPLACE PRINTED CIRCUIT BOARD. |
| E46 | PRESSURE SENSOR ERROR | 1. PRESSURE SENSOR MALFUNCTION 2. CABLE MALFUNCTION. | 1. REPLACE THE PRESSURE SENSOR. 2. CHECK THE CABLE CONNECTION, IF ERROR PERSISTS REPLACE THE CABLE. |
| E47 | HIGH HEATING WATER PRESSURE ERROR | 1. HEATING WATER PRESSURE IS TOO HIGH. | 1. DISCHARGE WATER FROM SYSTEM UNTIL PRESSURE DECREASES TO 1.2 BAR. |
| E62 | LCD CARD COMMUNICATION ERROR | 1. CONNECTION INTERRUPTED BETWEEN MAIN BOARD AND LCD CARD. | 1. CHECK THE CABLE CONNECTING LCD CARD AND MAIN BOARD, IF MALFUNCTIONED, REPLACE. IF IT IS OK, THEN REPLACE LCD CARD. |
| E98 | MAIN POWER ERROR | 1. IT HAPPENS IF MAINS VOLTAGE IS TOO HIGH OR TOO LOW. | |
| E99 | INTERNAL SAFETY ERROR | 1. IT HAPPENS IF SYSTEM DETECTS AN HARDWARE ERROR RELATED TO MAIN BOARD OR ANOTHER CONNECTED APPLIANCE. | 1. CHECK THE MAIN BOARD AND CONNECTED OTHER APPLIANCES. IF REQUIRED, REPLACE THE ELECTRONIC CARD. |

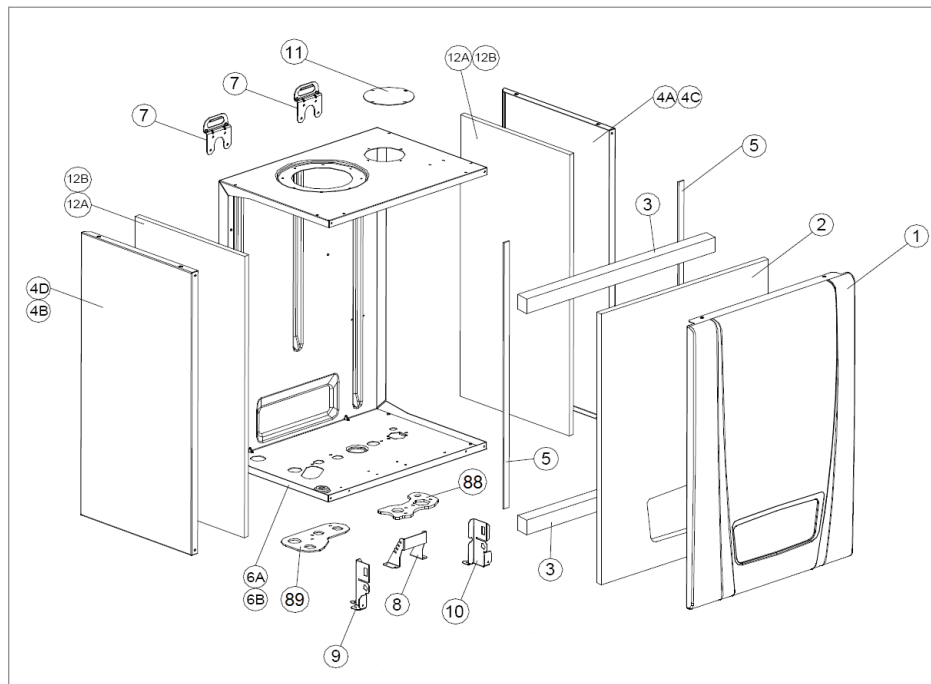
6.6 Spare Parts List

Table 6.3. Spare Parts List

| POSE NO | NAME | ARTICLE CODE |
|---------|---|--------------|
| 01 | FRONT COVER SSP 20 / 24 / 28 / 36 | 58990440114 |
| 02 | FRONT COVER SEAL GASKET SSP 20 / 24 / 28 / 36 | 58990440082 |
| 03 | FRONT COVER SEAL FOAM SSP 20 / 24 / 28 / 36 | 58990440064 |
| 04A | SIDE COVER - RIGHT SSP 24 / 28 / 36 | 58990440112 |
| 04B | SIDE COVER - LEFT SSP 24 / 28 / 36 | 58990440113 |
| 04C | SIDE COVER - RIGHT SSP 20 | 58990440046 |
| 04D | SIDE COVER - LEFT SSP 20 | 58990440047 |
| 05 | SIDE COVER SEAL GASKET SSP 20 / 24 / 28 / 36 | 58990440090 |
| 06A | CHASSIS SSP 20 | 58990440038 |
| 06B | CHASSIS SSP 24 / 28 / 36 | 58990440115 |
| 07 | HOLDING BRACKET SSP 20 / 24 / 28 / 36 | 58990440042 |
| 08 | BOARD CASING SUPPORT BRACKET SSP 20 / 24 / 28 / 36 | 58990440043 |
| 09 | BOARD CASING HOLDER - LEFT SSP 20 / 24 / 28 / 36 | 58990440045 |
| 10 | BOARD CASING HOLDER - RIGHT SSP 20 / 24 / 28 / 36 | 58990440044 |
| 11 | AIR IN COVER SSP 20 / 24 / 28 / 36 | 58990240046 |
| 12A | SIDE COVER SEAL PLATE SSP 20 | 58990440068 |
| 12B | SIDE COVER SEAL PLATE SSP 24 / 28 / 36 | 58990440083 |
| 13 | BOARD CASING BACK COVER SSP 20 / 24 / 28 / 36 | 58990440003 |
| 14 | NORDGAS MIAB 3005 CONTROL BOARD SSP 20 / 24 / 28 / 36 | 58990440015 |
| 15A | BOARD CASING FRONT COVER SSP 20 / 24 / 28 / 36 | 58990440002 |
| 15B | DECORATIVE PART - LEFT / SSP 20 / 24 / 28 / 36 | 58990440005 |
| 15C | DECORATIVE PART - RIGHT / SSP 20 / 24 / 28 / 36 | 58990440006 |
| 16 | ROOM THERMOSTATE TERMINALS SSP 20 / 24 / 28 / 36 | 58990440091 |
| 17 | TERMINAL COVER SSP 20 / 24 / 28 / 36 | 58990440004 |
| 18 | LCD BOARD NORDGAS SSP 20 / 28 / 36 | 58990440017 |
| 19A | EXCHANGER HOLDER SSP 20 | 58990440188 |
| 19B | EXCHANGER HOLDER SSP 24 / 28 / 36 | 58990440189 |
| 20A | EXCHANGER SSP 20 | 58990440010 |
| 20B | EXCHANGER SSP 24 / 28 | 58990440011 |
| 20C | EXCHANGER SSP 36 | 58990440012 |
| 21A | FLUE FUSE TSD 2921 SSP 20 / 24 / 28 / 36 | 58990440028 |
| 21B | FLUE FUSE TSD 2920 SSP 20 / 24 / 28 / 36 | 58990440185 |
| 22A | EXCHANGER LOCK SSP 20 / 28 | 58990440190 |
| 22B | EXCHANGER LOCK SSP 36 | 58990440191 |
| 23 | FAN GASKET SSP 20 / 24 / 28 / 36 | 58990440032 |
| 24A | EBM FAN + VENTURI + GAS VALVE SET SSP 20 / 24 | 58990440033 |
| 24B | EBM FAN + VENTURI + GAS VALVE SET SSP 28 / 36 | 58990440034 |
| 25 | GASKET - CH FLOW SSP 20 / 24 / 28 / 36 | 58990440057 |
| 26A | GAS PIPE SSP 20 | 58990440097 |

| POSE NO | NAME | ARTICLE CODE |
|---------|--|--------------|
| 26B | GAS PIPE SSP 24 / 28 | 58990440098 |
| 26C | GAS PIPE SSP 36 | 58990440099 |
| 27A | EXPANSION TANK SSP 20 / 24 / 28 | 58990440056 |
| 27B | EXPANSION TANK SSP 36 | 58990440101 |
| 28 | EXPANSION TANK HOLDER SSP 20 / 24 / 28 / 36 | 58990440040 |
| 29 | SIPHON HOLDER SSP 20 / 24 / 28 / 36 | 58990440041 |
| 30 | SIPHON HOSE SSP 20 / 24 / 28 / 36 | 58990440102 |
| 31 | NUT - G 1/2" SSP 20 / 24 / 28 / 36 | 58990230070 |
| 32 | SIPHON SSP 20 / 24 / 28 / 36 | 58990440084 |
| 33A | CH FLOW PIPE SSP 20 | 58990440121 |
| 33B | CH FLOW PIPE SSP 24/28 | 58990440122 |
| 33C | CH FLOW PIPE SSP 36 | 58990440124 |
| 34 | CH PIPES CLIPS SSP 20 / 24 / 28 / 36 | 58990440031 |
| 35 | HIGH TEMPERATURE LIMIT THERMOSTAT SSP 20 / 24 / 28 / 36 | 58990250019 |
| 36 | CH PIPE O-RING SSP 20 / 24 / 28 / 36 | 58990440060 |
| 37 | SENSOR - T CONTROL 008 SSP 20 / 24 / 28 / 36 | 58990440026 |
| 38 | 3 WAYS VALVE MOTOR SSP 20 / 24 / 28 / 36 | 58990440013 |
| 39A | DHW PLATE EXCHANGER SSP 20 | 58990250010 |
| 39B | DHW PLATE EXCHANGER (14 PLATES) SSP 24/28 | 58990440023 |
| 39C | DHW PLATE EXCHANGER (16 PLATES) SSP 36 | 58990440024 |
| 40 | PLATE EXCHANGER GASKET SSP 20 / 24 / 28 / 36 | 58990440078 |
| 41 | 3 WAYS VALVE MOTOR CLIPS SSP 20 / 24 / 28 / 36 | 58990440079 |
| 42 | PUMP NIPPEL O-RING SSP 20 / 24 / 28 / 36 | 58990440062 |
| 43 | PUMP NIPPEL CLIPS SSP 20 / 24 / 28 / 36 | 58990440081 |
| 44 | DHW PIPE O-RING (Ø13,94x2,62) SSP 20 / 24 / 28 / 36 | 58990440061 |
| 45 | PUMP NIPPEL SSP 20 / 24 / 28 / 36 | 58990440077 |
| 46A | HYDRAULIC GROUP - RETURN SSP 20 (12 l/min) | 58990440074 |
| 46B | HYDRAULIC GROUP - RETURN SSP 24 / 28 (17 l/min) | 58990440075 |
| 46C | HYDRAULIC GROUP - RETURN SSP 36(22 l/min) | 58990440076 |
| 47 | HYDRAULIC GROUP – FLOW SSP 20 / 24 / 28 / 36 | 58990440070 |
| 48 | PRESSURE SENSOR SSP 20 / 24 / 28 / 36 | 58990440027 |
| 49 | SENSOR T CONTROL 025 SSP 20 / 24 / 28 / 36 | 58990440025 |
| 50A | CH RETURN PIPE SSP 20 | 58990440118 |
| 50B | CH RETURN PIPE SSP 24 / 28 / 36 | 58990440119 |
| 51 | CH RETURN PIPE GASKET (Ø22xØ29x2) SSP 20 / 24 / 28 / 36 | 58990440058 |
| 52 | PUMP – EXPANSION TANK O-RING SSP 20 / 24 / 28 / 36 | 58990440063 |
| 53 | EXPANSION TANK HOSE SSP 20 / 24 / 28 / 36 | 58990440069 |
| 54 | ON - OFF BUTTON SET SSP 20 / 24 / 28 / 36 | 58990440018 |
| 55 | SETTING BUTTONS SET SSP 20 / 24 / 28 / 36 | 58990440019 |
| 56 | 3 WAYS VALVE MOTOR CABLE SSP 20 / 24 / 28 / 36 | 58990440086 |
| 57 | LIMIT THERMOSTAT & FLUE FUSE CABLE GROUP SSP 20 / 24 / 28 / 36 | 58990440087 |
| 58 | FAN SIGNAL CABLE SSP 20 / 24 / 28 / 36 | 58990440088 |
| 59 | GAS VALVE, FAN, PUMP & POWER CABLES BU SSP 20 / 24 / 28 / 36 | 58990440089 |
| 60 | SCREEN PCB CABLE SSP 20 / 24 / 28 / 36 | 58990440022 |
| 61 | PRESSURE SENSOR CABLE SSP 20 / 24 / 28 / 36 | 58990440095 |

| POSE NO | NAME | ARTICLE CODE |
|---------|---|--------------|
| 62 | TEMPERATURE SENSOR CABLE SSP 20 / 24 / 28 / 36 | 58990440094 |
| 63 | FLOW SENSOR CABLE SSP 20 / 24 / 28 / 36 | 58990440093 |
| 64 | IGNITOR CABLE SSP 20 / 24 / 28 / 36 | 58990440014 |
| 65 | IONIZATION EARTH CABLE SSP 20 / 24 / 28 / 36 | 58990440092 |
| 66 | MAIN EARTH CABLE SSP 20 / 24 / 28 / 36 | 58990440096 |
| 67 | CONDENSATE HOSE SPRING ø23 SSP 20 / 24 / 28 / 36 | 58990440127 |
| 68 | CONDENSATE HOSE SPRING ø20,5 SSP 20 / 24 / 28 / 36 | 58990440126 |
| 69A | PUMP (3 STAGED) SSP 20 / 24 / 28 | 58990440035 |
| 69B | PUMP (3 STAGED) SSP 36 | 58990440036 |
| 70 | 3 BAR SAFETY RELEASE VALVE SSP 20 / 24 / 28 / 36 | 58990440141 |
| 71 | 3 WAYS VALVE REPAIR SET SSP 20 / 24 / 28 / 36 | 58990440139 |
| 72 | FILLING TAP SSP 20 / 24 / 28 / 36 | 58990440140 |
| 73 | NIPPEL GROUP SSP 20 / 24 / 28 / 36 | 58990440194 |
| 74 | FLOW SENSOR GROUP SSP 20 / 24 / 28 / 36 | 58990440146 |
| 75 | FLOW SENSOR TURBINE GROUP SSP 20 / 24 / 28 / 36 | 58990440145 |
| 76A | FLOW LIMITER 12 L/MIN | 58990440150 |
| 76B | FLOW LIMITER 17 L/MIN | 58990440151 |
| 76C | FLOW LIMITER 21 L/MIN | 58990440152 |
| 77 | DHW INLET FILTER SSP 20 / 24 / 28 / 36 | 58990440147 |
| 78 | ELECTRODE SCREW SSP 20 / 24 / 28 / 36 | 58990440195 |
| 79A | EXCHANGER ALUMINUM DOOR + BURNER SSP 20 | 58990440172 |
| 79B | EXCHANGER ALUMINUM DOOR + BURNER SSP 24 / 28 | 58990440161 |
| 79C | EXCHANGER ALUMINUM DOOR + BURNER SSP 36 | 58990440162 |
| 80 | ELECTRODE GASKET SSP 20 / 24 / 28 / 36 | 58990440163 |
| 81 | ELECTRODE SSP 20 / 24 / 28 / 36 | 58990440164 |
| 82 | EXCHANGER DOOR NUTS SSP 20 / 24 / 28 / 36 | 58990440196 |
| 83 | EXCHANGER DOOR GASKET SSP 20 / 24 / 28 / 36 | 58990440165 |
| 84 | EXCHANGER DOOR INSULATION SSP 20 / 24 / 28 / 36 | 58990440166 |
| 85 | AUTO AIR PURGER CLIPS SSP 20 / 24 / 28 / 36 | 58990440167 |
| 86 | AIR PURGER WITH GASKET SSP 20 / 24 / 28 / 36 | 58990440168 |
| 87 | FLUE OUTLET GASKET ø80 SSP 20 / 24 / 28 / 36 | 58990440169 |
| 88 | HYDRAULIC GROUP SEAL - RETURN SSP 20 / 24 / 28 / 36 | 58990440065 |
| 89 | HYDRAULIC GROUP SEAL - FLOW SSP 20 / 24 / 28 / 36 | 58990440066 |
| 90 | SOLAR CONNECTION SET BODY | 58990440136 |
| 91 | SOLAR CONNECTION SET PIPES | 58990440138 |
| 92 | SOLAR CONNECTION SET GASKETS (7 PIECES) | 58990020023 |
| 93 | THERMOSTATIC CARTRIDGE (SOLAR CONNECTION SET) | 58990440197 |
| 94A | CH RETURN PIPE SSP 20 | 58990440103 |
| 94B | CH RETURN PIPE SSP 24 / 28 | 58990440104 |
| 94C | CH RETURN PIPE SSP 36 | 58990440105 |
| 95A | DHW FLOW PIPE SSP 20 | 58990440120 |
| 95B | DHW FLOW PIPE SSP 24 / 28 / 36 | 58990440123 |
| 96 | DHW PIPE CLIPS SSP 20 / 24 / 28 / 36 | 58990440030 |
| 97 | ø18.64*3.53 EPDM 70SH O-RING SSP 20 / 24 / 28 / 36 | 58990440062 |
| 98 | PIPE SEAL | 58990140123 |
| - | COMBUSTION CHAMBER ISOLATION SRS 20 / 24 / 28 / 36 | 58990440170 |

Chassis Group:**Figure 47. Seradens Super Plus chassis group**

Combustion Group:

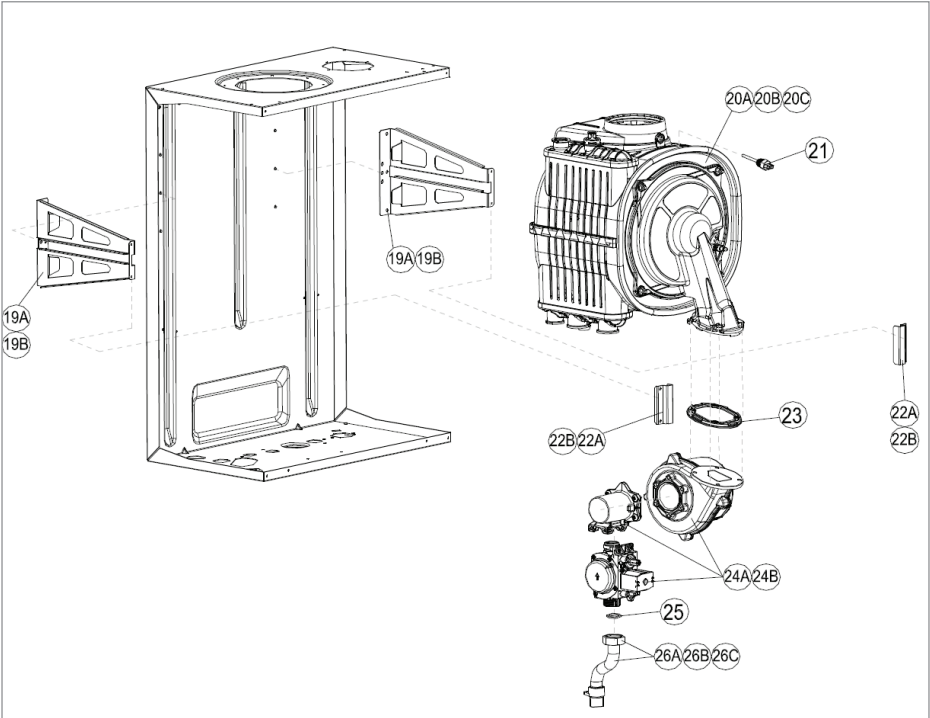


Figure 48. Seradens Super Plus combustion group

Water Group:

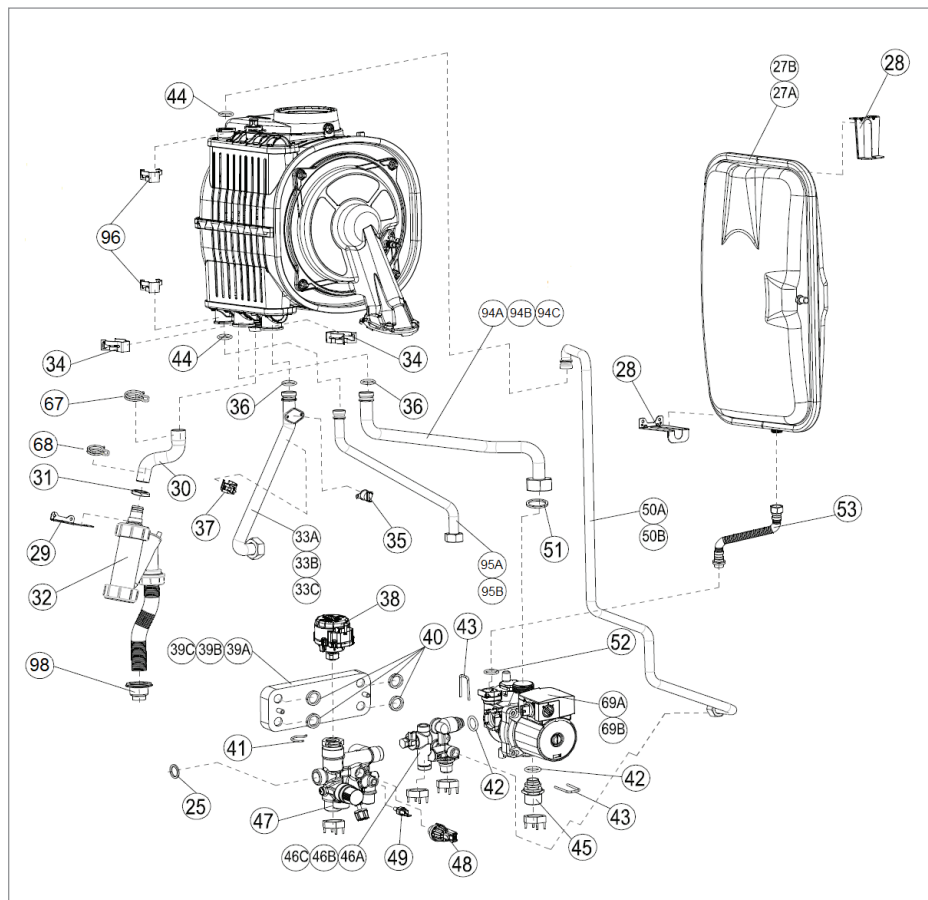


Figure 49. Seradens Super Plus water group

Cable Group:

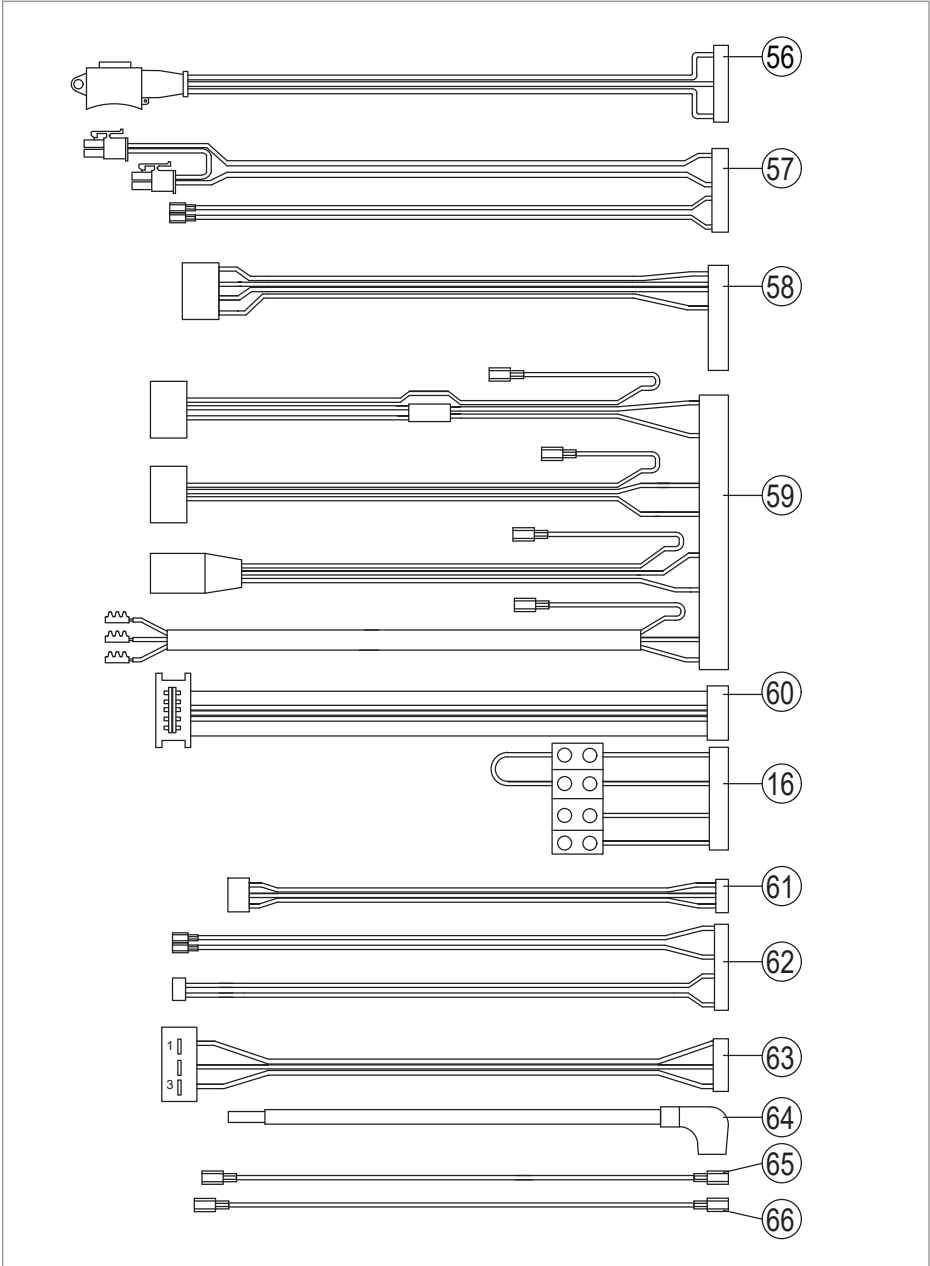


Figure 50. Seradens Super Plus cable group

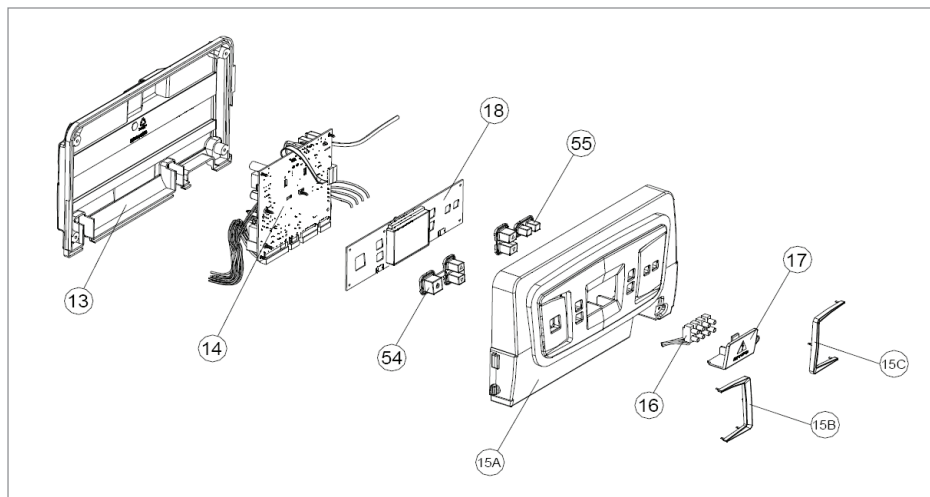
Control Panel:

Figure 51. Seradens Super Plus control panel

Hydraulic Group-Flow:

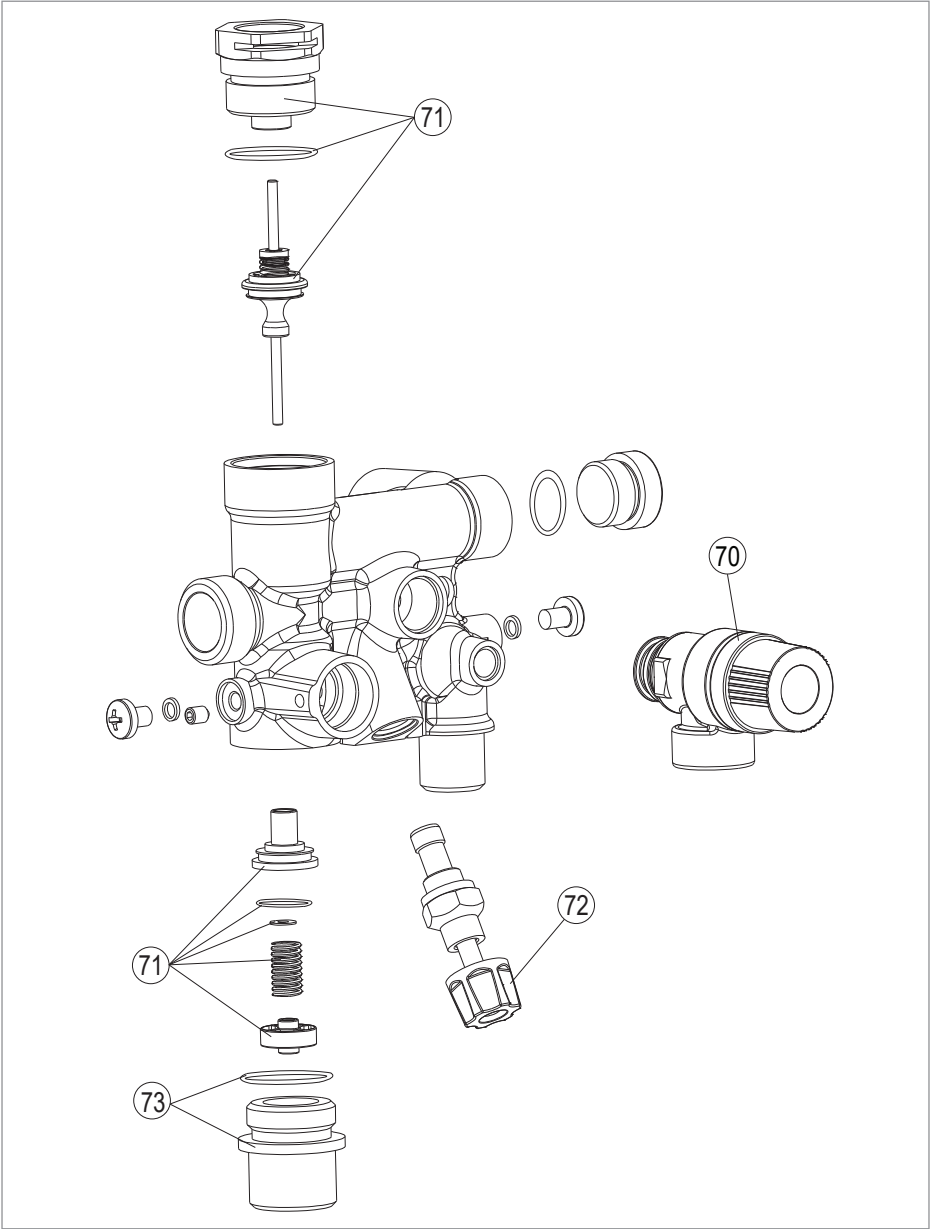


Figure 52. Seradens Super Plus hydraulic group-flow

Hydraulic Group-Return:

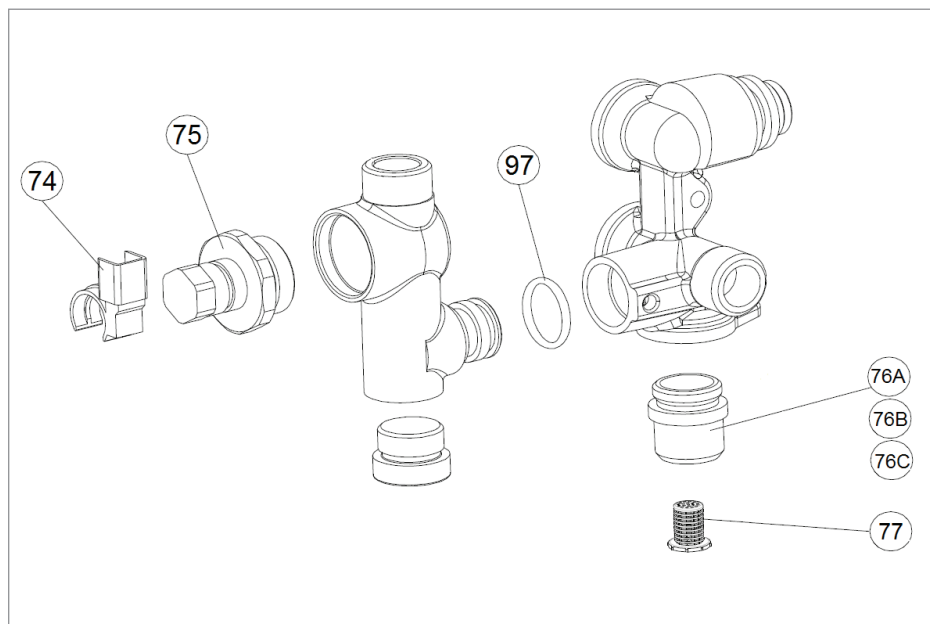


Figure 53. Seradens Super Plus hydraulic group-return

Main Heat Exchanger Group:

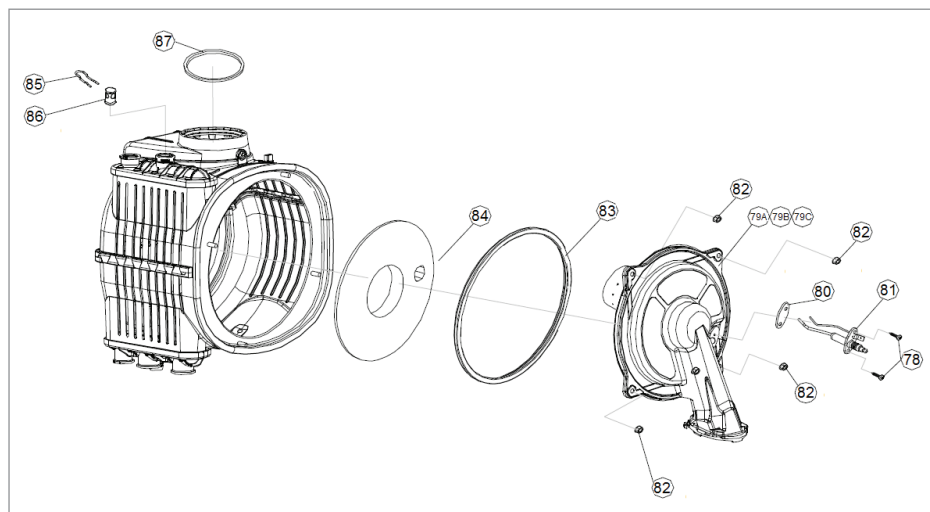


Figure 54. Seradens Super Plus heat exchanger group

Solar Connection Set:

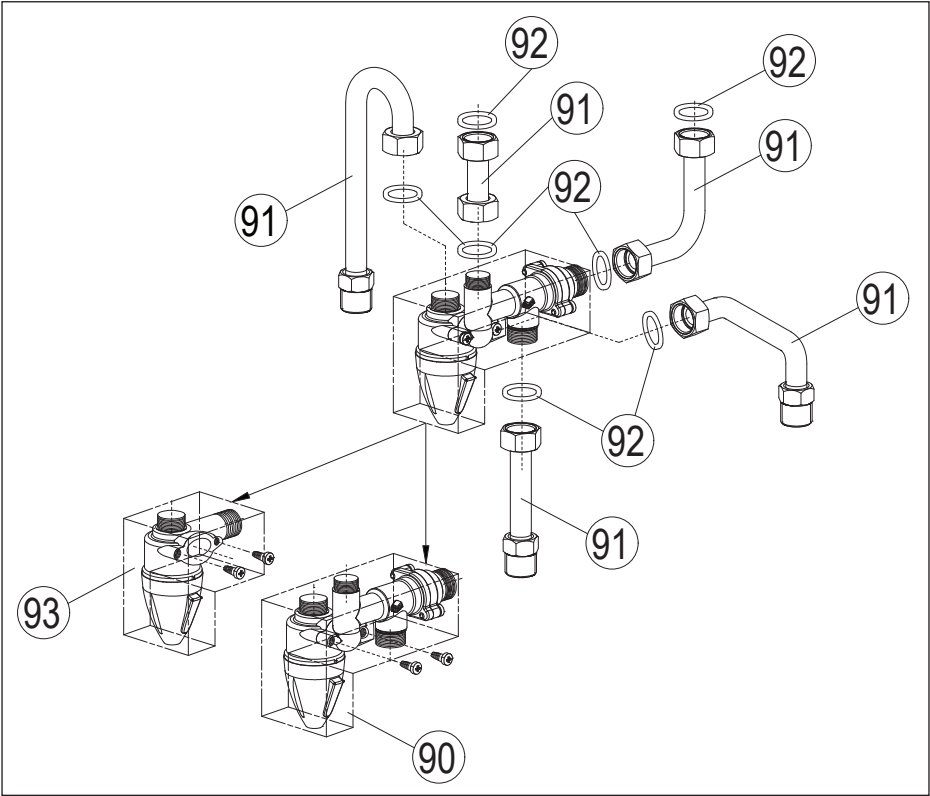


Figure 55. Seradens Super Plus Solar Connection Set



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