



**SUPER FIT 24/28/35
GAS FIRED COMBI BOILER
INSTALLATION AND OPERATING
INSTRUCTIONS**

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1. GENERAL INFORMATION

Thank you for choosing ALARKO brand.







This booklet covers ALARKO branded premix condensing Super Fit 24/28/35 model gas fired combi boilers in, 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 production 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 production. 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 form 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.**
 - ⚠ Children should not play with the device. Cleaning and user maintenance should not be made by children without supervision.**
 - ⚠ This appliance can be used by children aged 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children should not play with the device. If cleaning and user maintenance will be done by children, it must be done under supervision.**
- 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 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 Declaration of Conformity





AT UYGUNLUK BEYANI

EC DECLARATION OF CONFORMITY

ALARKO - CARRIER SAN. VE TİC. A.Ş.

GOSB - Gebze Organize Sanayi Bölgesi, Şahabettin Bilgisu Cad. 41480
Gebze - KOCAELİ / TURKEY

Alarko Carrier San. ve Tic. A.Ş. tanımlanmış olan ürünlerin aşağıda bahsedilen yönetmelikler ve standartlara uyum sağladığını beyan eder.

Alarko Carrier San. ve Tic. A.Ş. declares that the described products are in conformity with the below mentioned directives and standards.

Bu beyan ürünün teslimat durumundaki son şekliyle geçerlidir. Ürün üzerinde yapılacak herhangi bir modifikasyonda, bu beyan geçerliliğini yitirmiş olacaktır.

This declaration refers to the product in delivery status. Any modifications of the product will invalidate this declaration.

ÜRÜN TANIMI:

Gaz Yakan Kombi Cihazları

PRODUCT DESCRIPTION:

Gas Fired Combi Boilers

MODEL/TİP:

Super Fit 24kW (SUF 24),
Super Fit 28kW (SUF 28)
Super Fit 35kW (SUF 35)

MODEL/TİP:

Super Fit 24kW (SUF 24),
Super Fit 28kW (SUF 28)
Super Fit 35kW (SUF 35)

YÖNETMELİKLER:

2016 / 426 / AB Gaz Uygulamaları Yönetmeliği
2009 / 125 / AT Ekodizayn Yönetmeliği
2014 / 35 / AB Alçak Gerilim Yönetmeliği
2014 / 30 / AB Elektromanyetik Uyumluluk Yönetmeliği
92 / 42 / AT Verimlilik Yönetmeliği

DIRECTIVES:

2016 / 426 / EU Gas Appliances Directive
2009 / 125 / EC Eco Design Directive
2014 / 35 / EU Low Voltage Directive
2014 / 30 / EU Electromagnetic Compatibility Directive
92 / 42 / EEC Efficiency Directive

UYGULANAN UYUMLAŞTIRILMIŞ STANDARTLAR:

EN 15502-1+A1, EN 15502-2-1+A1, EN 55014-2
EN 55014-1, EN 60335-1, EN 60335-2-102
EN 13203-2, EN 61000-3-2, EN 61000-3-3

APPLIED HARMONIZED STANDARDS:

EN 15502-1+A1, EN 15502-2-1+A1, EN 55014-2
EN 55014-1, EN 60335-1, EN 60335-2-102
EN 13203-2, EN 61000-3-2, EN 61000-3-3

İMALATCI ADINA - SIGNED ON BEHALF OF THE MANUFACTURER

AD_SOYAD- NAME_SURNAME
GÖREV - POSITION
YER / TARİH - PLACE / DATE
İMZA - SIGNATURE

: Murat Çopur
: Genel Md. Yrd./Fabrikalar - Vice President/Factories
: Gebze-KOCAELİ / 12-02-2020





ALARKO CARRIER
SANAYİ VE TİCARET A.Ş.

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

With premix technology, i.e. full condensing combi boiler with gas-air pre-mixing feature, flue gas temperatures 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 vapor 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 vapor, 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 Super Fit gas fired 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.

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 gas fired 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 gas fired 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.
- TURN OFF the kitchen stove if it is on.
- 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. 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 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 Control Panel

1. Operating mode setting knob (Summer / Winter / Heating Only / Off).
2. Reset button
3. Heating water temperature decrease button.
4. Heating water temperature increase button.
5. Domestic hot water (DHW) temperature increase button.
6. Domestic hot water (DHW) temperature decrease button.
7. LCD display for temperature, error codes and operating mode.

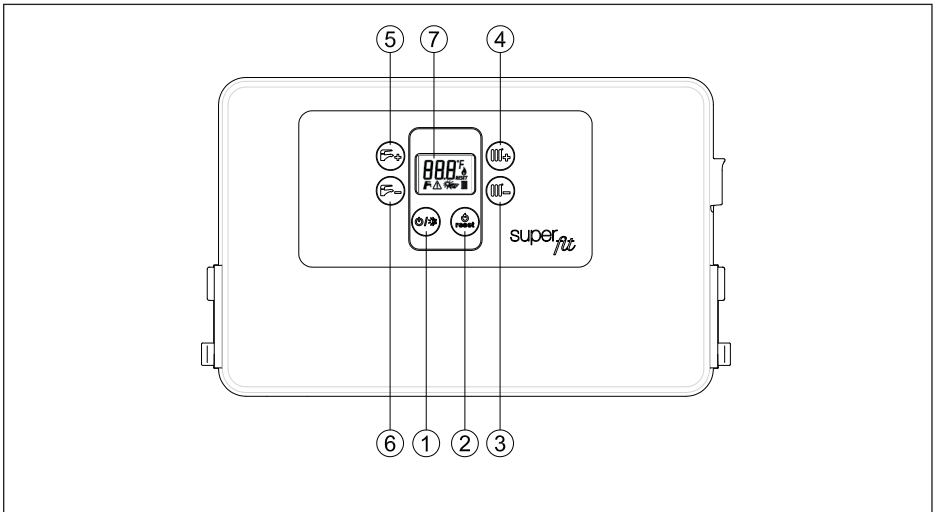


Figure 1. Control panel

2.5 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 (Water pressure can be observed from the manometer located right-bottom corner of the boiler). Filling operation must be done while the boiler is cold and in OFF condition.

Manometer is included in Super Fit gas fired combi boilers. After all connections (electric, fittings and flue) are completed, system could be filled by means of filling tap (D) which is positioned at left-bottom side of the boiler (Figure 3). Filling operation must last until 1.2 bar value is seen on the manometer (Figure 2).

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 (D) in Figure 3. Check the pressure value from the manometer to avoid filling the system excessively.

Keep filling the system until the pressure reaches 1.2 bar, then close the filling tap.

If water pressure exceeds 3 bars, discharge the proper amount of water by means of drainage tap (B) (Figure 3)

It is necessary for the water pressure to remain within the range of 1-3 bars (indicated by the color green on the manometer) for the safe operation of the boiler.

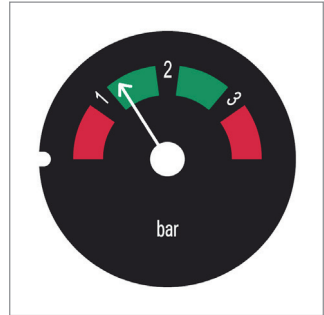


Figure 2. Manometer 1,2 bar

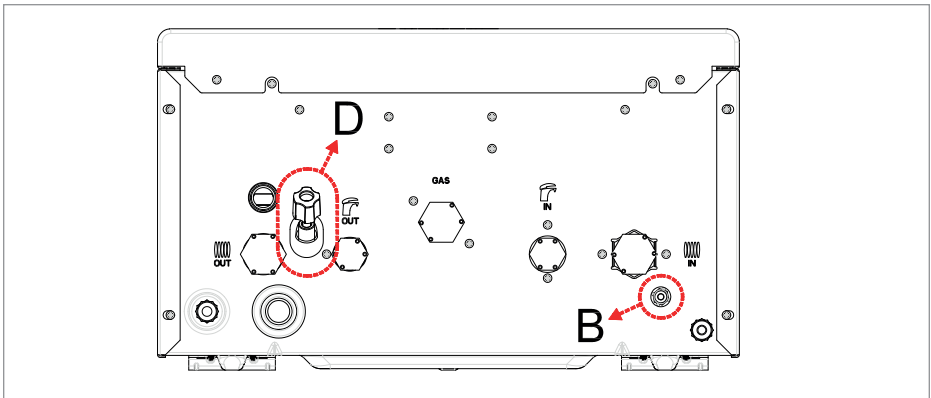


Figure 3. Bottom view of Super Fit combi boiler

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 excessive water pressure 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).

2.6 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.




“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.

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 **(1)** (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 2.8). 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 2.6.

Setting Heating (CH) Temperature

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

- Pushing key **(3)** will decrease the CH set point temperature.
- Pushing key **(4)** will increase 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 25°C to a maximum of 45°C.

When display backlight is off, pushing key number **(3)** or **(4)** once leads to set temperature value to be shown on the display. 5 seconds later backlight turns off and the display keeps showing the instant temperature.

Setting Domestic Hot Water (DHW) Temperature

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

- Pushing key **(5)** will increase the DHW set point temperature.
- Pushing key **(6)** 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 **(5)** or **(6)** once leads to backlight turning on and to set temperature value to be shown on the display. 5 seconds later backlight turns off and the display keeps showing the instant temperature.

ATTENTION!

When the device is switched on and after every power failure, the venting function works for safe operation. The venting function takes about 3 minutes and “PnP run” appears on the display during this period.

2.7 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 Error

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

E04 Low Water Pressure Error

This error occurs related to the low pressure on heating (CH) system.

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

- Check the water pressure in the CH circuit from the manometer.
- 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.

There is no error code for excessive water pressure. In such case follow the instructions below to discharge water from the 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 from the manometer and decrease CH pressure to 1.2 bar.
4. When you see desired pressure value on the manometer; 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.

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.

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.

2.8 Automatic Control Devices (Optional)

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

1- On/off control devices

a- Room Thermostat

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

b- Weekly Programmable Room Thermostat

This digital device is used to set your boiler to run at desired time intervals and temperatures during the week. Wired and wireless models are available.

c- 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.

2- Opentherm Room Controllers

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 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 wired and wireless models. In case of using with telephone interface card you can operate combi boiler from a distance by phone.

3- 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.

4- Outside Temperature Sensor

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

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).

2.9 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 parameter menu of electronic card only by authorized services. Parameter settings are only done by authorized services.

While outside sensor is connected, central heating flow temperature is set between 30 to 85°C in the systems including radiators. As for floor heating systems, this range is between 25 to 50°C.

2.11 Solar Connection Set (Optional)

By taking advantage of solar energy, it is possible to get domestic hot water more economically with Super Fit gas fired 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 Super Fit. 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.

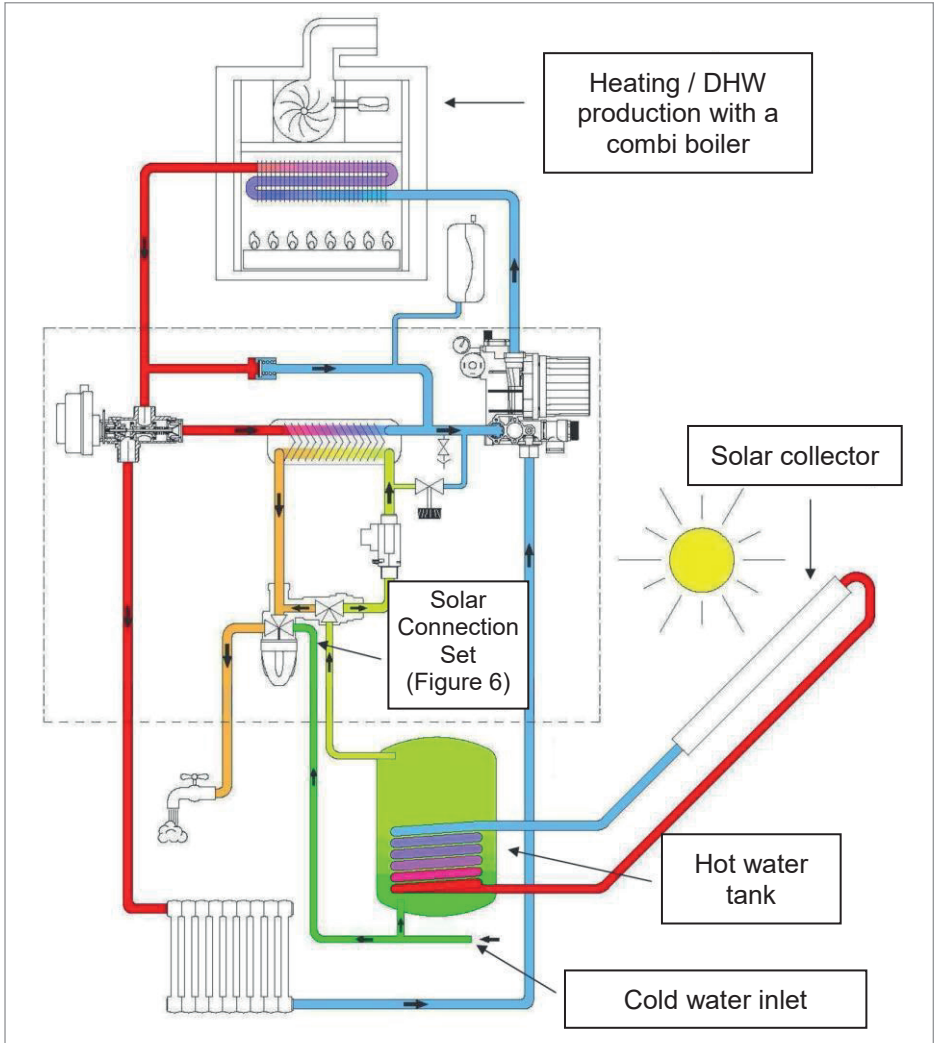


Figure 4. Solar Connection Set Application

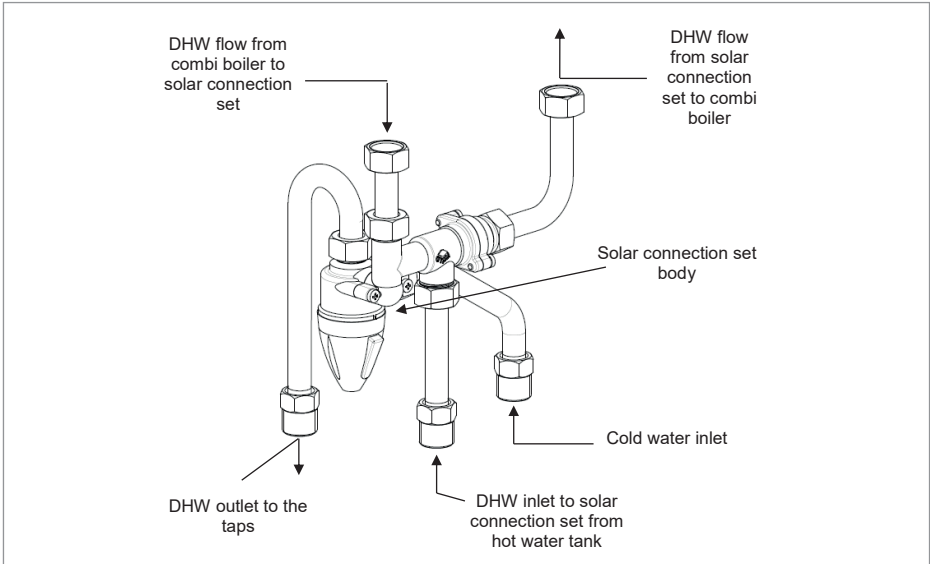


Figure 5. Solar Connection Set

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.

2.12 Use with Propane LPG

Your combi boiler can be used with propane LPG. The boiler must be adjusted to work with propane LPG by authorized service. The boiler is suitable to work with minimum two propane LPG tubes (depending on capacity) for only if they are connected to the boiler via a special “collector kit”. In cold environments, the use of thermostatic hot water buckets might be necessary to prevent fuel in the tubes and gas line to be liquified. In case thermostatic hot water buckets are used to heat up the propane LPG tubes; water temperature should not exceed 22°C.

Do not place the boiler and the propane LPG tubes in the same cabinet.

Use certified tubes only.

Do not shake or lay the tubes.

Only use a certified 30 mbar (300 mmSS) regulator at every tube exit.

The LPG regulator to be supplied must be suitable for the LPG consumption of the combi model you will use. These consumption values are 1.7, 2.0 and 2.3 kg/h for SUF 24-28-35 models, respectively.

If you smell gas, turn the tubes 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 are used with the boiler.

3. TECHNICAL CHARACTERISTICS

3.1 Technical Data

MODEL	UNIT	SUPER FIT		
		SUF 24	SUF 28	SUF 35
CE Certification		1312DL6438		
Appliance Category		II _{2H3P}		
Central Heating Technical Specifications				
Seasonal Space Heating Energy Efficiency Class		A	A	A
Seasonal Space Heating Energy Efficiency (η_s)	%	92	91,86	91,03
Useful Efficiency at 30% of Nominal Heat Output (η_1) (50-30°C)	%	97,9	97,42	96,97
Useful Efficiency at Nominal Heat Output (η_4) (80-60°C)	%	87,65	88,32	87,61
Rated Heat Output (Prated) (80-60°C)	kW	22	26	32
Nominal Heat Output(P4) (80-60°C)	kW	22,1	25,7	32,1
Minimum Heat Output (80-60°C)	kW	4,9	6,2	7,7
Nominal Heat Output (50-30°C)	kW	24,3	27,9	34,9
30% of Nominal Heat Output (P1) (50-30°C)	kW	7,404	8,503	10,66
Minimum Heat Output (50-30°C)	kW	5,4	6,8	8,3
Auxiliary Electrical Consumption at Full Load (elmax) (80-60°C)	kW	0,082	0,083	0,117
Auxiliary Electrical Consumption at Part Load (elmin) (80-60°C)	kW	0,034	0,035	0,067
Annual Energy Consumption (QHE)	GJ	42	50	63
Central Heating Temperature Setting Range (Min. - Max.)	°C	30 - 85 (Radiator Heating) / 25 - 45 (Underfloor Heating)		
Central Heating Operating Pressure (Min. - Max.)	bar	0,5 - 3		
Domestic Hot Water Technical Specifications				
Water Heating Energy Efficiency Class		A	A	A
Water Heating Energy Efficiency (η_{WH})	%	86	86	85
Water Heating Load Profile		XL	XL	XL
DHW Flow Rate at ΔT_{30K}	lt/min	13	14	16
Maximum DHW Flow Rate	lt/min	14	18	18
Daily Electrical Power Consumption (Q_{elie})	kWh	0,186	0,181	0,19
Annual Electricity Consumption (AEC)	kWh	41	40	42
Daily Gas Consumption (Q_{uel})	kWh	22,838	23	22,442
Annual Fuel Consumption (AFC)	GJ	18	18	18
DHW Temperature Setting Range (Min. - Max.)	°C	30 - 60		
DHW Operating Pressure (Min. - Max.)	bar	0,5 - 10		
General Technical Specifications				
NOx Class		6	6	6
Emissions of Nitrogen Oxide (NO _x)	mg/kWh	39,32	42,72	43,18
Sound Power Level, Indoors (L _{WA})	dB	54	54	57
Auxiliary Electrical Consumption in Standby Mode (P _{se})	kW	0,004	0,004	0,004
Standby Heat Losses (P _{sbv})	kW	0,073	0,062	0,059
Ignition Bumer Energy Consumption (P _{qin})	kW	0	0	0
Flue Gas Temperature (50-30°C, Min. - Max.)	°C	45-52	46-53	45-61
Flue Gas Temperature (80-30°C, Max.)	°C	71,6	70,8	72,5
Gas Consumption (Natural Gas - LPG)	m ³ /h - kg/h	2,3 - 1,7	2,7 - 2,0	3,3 - 2,3
Electrical Power Consumption	W	82	84	117
Physical Properties				
Flue Connection Types		B23-B33-C13-C13(x)-C33-C33(x)-C43-C43(x)-C53-C53(x)-C63-C63(x)-C83-C83(x)-C93-C93(x)		
Standard Horizontal Concentric Flue System - Max. Length	ø - m	60/100 - 8		
Vertical Concentric Flue System - Max. Length	ø - m	60/100 - 8		
Twin Flue System - Max. Length	ø - m	80+80 - 50		
Dimensions (Width x Height x Depth)	mm	437 x 640 x 256		
Weight (Net)	kg	28,9	30,8	32
Expansion Tank Capacity	lt	8		
Central Heating Flow - Return Diameters	ø	3/4"		
Cold Water Inlet - DHW Outlet Diameters	ø	1/2"		
Gas Inlet Diameter	ø	3/4"		
Gas Inlet Pressure (Natural Gas - LPG)	mbar	20 - 30		
Power Supply	V/Hz	230/50		
Protection Class	IP	X4D		

3.2 Product Fiche

The product data presented below complies with the requirements of EU regulations 811/2013 and 813/2013.

Models		SUF 24	SUF 28	SUF 35
Space heating – Temperature application		Medium	Medium	Medium
Water heating – Declared load profile		XL	XL	XL
Seasonal space heating energy efficiency class		A	A	A
Water heating energy efficiency class		A	A	A
Rated heat output	kW	22	26	32
Space heating – Annual energy consumption	GJ	42	50	63
Water heating – Annual fuel consumption	GJ	18	18	18
Water heating – Annual electricity consumption	kWh	41	40	42
Seasonal space heating energy efficiency	%	92	92	91
Water heating energy efficiency	%	86	86	85
Sound power level L_{WA} , indoors	dB	54	54	57

3.3 Technical Documentation

The product data presented below complies with the requirements of EU regulations 811/2013 and 813/2013

Model/s:				SUF 24			
Condensing Boiler/s:				Yes			
Low Temperature (***) Boiler/s:				No			
B11 Boiler/s:				No			
Cogeneration Space Heater:				No			
Combination Heater:				Yes			
				Equipped with a supplementary heating system:			
				No			
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Nominal heat output	P_{rated}	22,1	kW	Seasonal space heating energy efficiency	η_s	92,0	%
				Energy efficiency class			
<i>For boiler space heaters and boiler combination heaters: Useful heat output</i>				<i>For boiler space heaters and boiler combination heaters: Useful efficiency</i>			
At nominal heat output and high-temperature regime (*)	P_4	22,1	kW	At nominal heat output and high-temperature regime (*)	η_4	87,7	%
At 30% of nominal heat output and low-temperature regime (**)	P_1	7,4	kW	At 30% of nominal heat output and low-temperature regime (**)	η_1	97,9	%
<i>Auxiliary electricity consumption</i>				<i>Other items</i>			
At full load	e_{lmax}	0,082	kW	Standby heat losses	P_{stby}	0,073	kW
At part load	e_{lmin}	0,034	kW	Ignition burner energy consumption	P_{ign}	0,000	kW
In standby mode	P_{SB}	0,004	kW	Annual energy consumption	Q_{HE}	42	GJ
				Sound power level, indoors	L_{WA}	54	dB
				Emissions of nitrogen oxides	NO_x	39,321	mg/kWh
For boiler combination heaters:							
Declared load profile:	XL			Domestic hot water production efficiency	η_{WH}	85,9	%
				Energy efficiency class		A	
Daily electrical power consumption	Q_{elec}	0,188	kWh	Daily gas consumption	Q_{fuel}	22,510	kWh
Annual electricity consumption	AEC	41,370	kWh	Annual fuel consumption	AFC	17,828	GJ
Contact information	ALARKO CARRIER SAN. TIC. A.Ş., GOSB - Gebze O.S.B., Şahabettin Bilgisi Cad., 41400, Gebze/Kocaeli/Turkey						
(*) High temperature regime means 60 °C on return and 80 °C on flow.							
(**) Low temperature regime means 30 °C for condensing boilers, 37 °C for low-temperature boilers and 50 °C for for other appliances on return temperature.							

Model/s:				SUF 28			
Condensing Boiler/s:				Yes			
Low Temperature (**) Boiler/s:				No			
B11 Boiler/s:				No			
Cogeneration Space Heater:				No			
Combination Heater:				Yes			
				Equipped with a supplementary heating system:			
				No			
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Nominal heat output	P _{rated}	25,7	kW	Seasonal space heating energy efficiency	η _s	91,9	%
				Energy efficiency class		A	
<i>For boiler space heaters and boiler combination heaters: Useful heat output</i>				<i>For boiler space heaters and boiler combination heaters: Useful efficiency</i>			
At nominal heat output and high-temperature regime (*)	P _a	25,7	kW	At nominal heat output and high-temperature regime (*)	η ₄	88,3	%
At 30% of nominal heat output and low-temperature regime (**)	P ₁	8,5	kW	At 30% of nominal heat output and low-temperature regime (**)	η ₁	97,4	%
<i>Auxiliary electricity consumption</i>				<i>Other items</i>			
At full load	e _{f,max}	0,083	kW	Standby heat losses	P _{stby}	0,062	kW
At part load	e _{f,min}	0,035	kW	Ignition burner energy consumption	P _{ign}	0,000	kW
In standby mode	P _{SB}	0,004	kW	Annual energy consumption	Q _{IE}	50	GJ
				Sound power level, indoors	L _{WA}	54	dB
				Emissions of nitrogen oxides	NO _x	42,728	mg/kWh
For boiler combination heaters:							
Declared load profile:	XL			Domestic hot water production efficiency	η _{WH}	85,7	%
				Energy efficiency class		A	
Daily electrical power consumption	Q _{elec}	0,181	kWh	Daily gas consumption	Q _{fuel}	22,619	kWh
Annual electricity consumption	AEC	39,828	kWh	Annual fuel consumption	AFC	17,915	GJ
Contact information	ALARKO CARRIER SAN. TIC. A.Ş., GOSB - Gebze O.S.B., Şahabettin Bilgisi Cad., 41400, Gebze/Kocaeli/Turkey						
(*) High temperature regime means 60 °C on return and 80 °C on flow.							
(**) Low temperature regime means 30 °C for condensing boilers, 37 °C for low-temperature boilers and 50 °C for for other appliances on return temperature.							

Model/s:				SUF 35			
Condensing Boiler/s:				Yes			
Low Temperature (**) Boiler/s:				No			
B11 Boiler/s:				No			
Cogeneration Space Heater:				No			
Combination Heater:				Yes			
				Equipped with a supplementary heating system:			
				No			
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Nominal heat output	P _{rated}	32,1	kW	Seasonal space heating energy efficiency	η _s	91,0	%
				Energy efficiency class		A	
<i>For boiler space heaters and boiler combination heaters: Useful heat output</i>				<i>For boiler space heaters and boiler combination heaters: Useful efficiency</i>			
At nominal heat output and high-temperature regime (*)	P ₄	32,1	kW	At nominal heat output and high-temperature regime (*)	η ₄	87,6	%
At 30% of nominal heat output and low-temperature regime (**)	P ₁	10,7	kW	At 30% of nominal heat output and low-temperature regime (**)	η ₁	97,0	%
<i>Auxiliary electricity consumption</i>				<i>Other items</i>			
At full load	e _{f,max}	0,117	kW	Standby heat losses	P _{stby}	0,059	kW
At part load	e _{f,min}	0,067	kW	Ignition burner energy consumption	P _{ign}	0,000	kW
In standby mode	P _{SB}	0,004	kW	Annual energy consumption	Q _{IE}	63	GJ
				Sound power level, indoors	L _{WA}	57	dB
				Emissions of nitrogen oxides	NO _x	43,181	mg/kWh
For boiler combination heaters:							
Declared load profile:	XL			Domestic hot water production efficiency	η _{WH}	85,2	%
				Energy efficiency class		A	
Daily electrical power consumption	0	0,189	kWh	Daily gas consumption	Q _{fuel}	22,770	kWh
Annual electricity consumption	AEC	41,631	kWh	Annual fuel consumption	AFC	18,034	GJ
Contact information	ALARKO CARRIER SAN. TIC. A.Ş., GOSB - Gebze O.S.B., Şahabettin Bilgisi Cad., 41400, Gebze/Kocaeli/Turkey						
(*) High temperature regime means 60 °C on return and 80 °C on flow.							
(**) Low temperature regime means 30 °C for condensing boilers, 37 °C for low-temperature boilers and 50 °C for for other appliances on return temperature.							

3.4 Dimensions

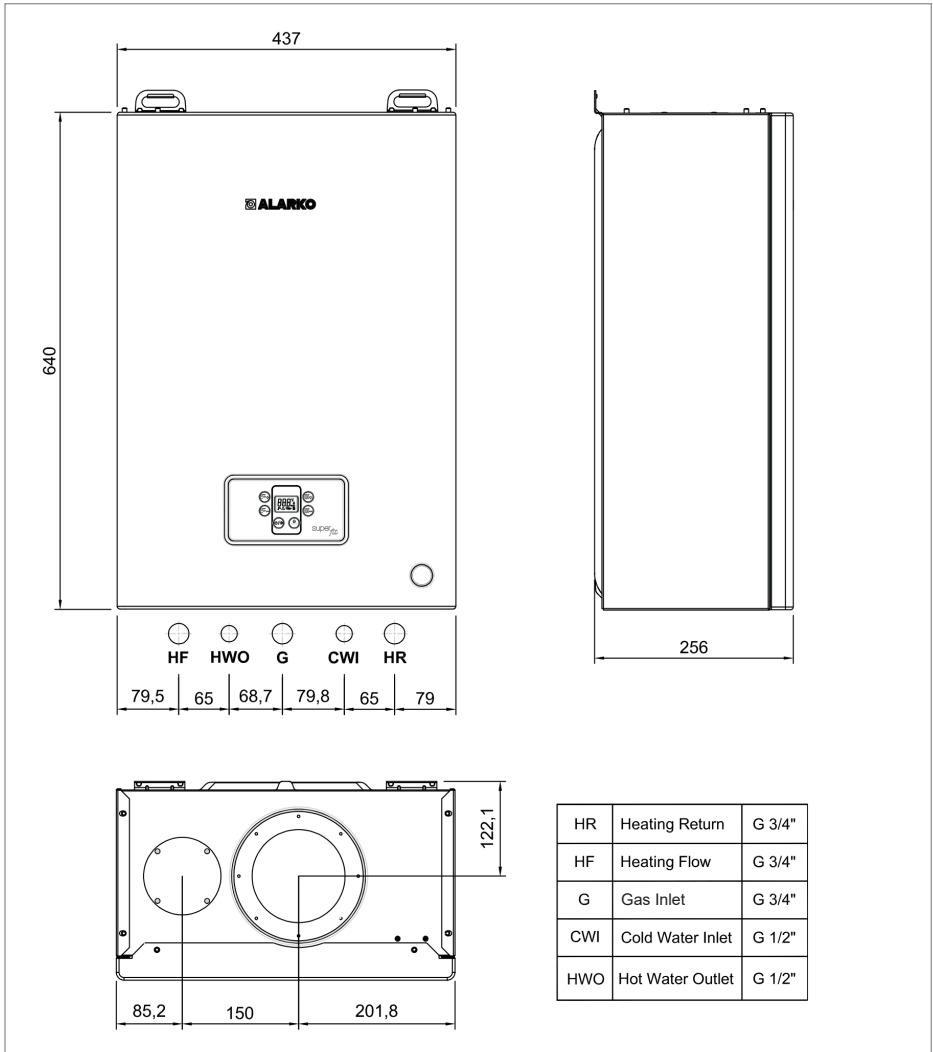


Figure 7. Dimensions

3.5 Internal Parts of Boiler

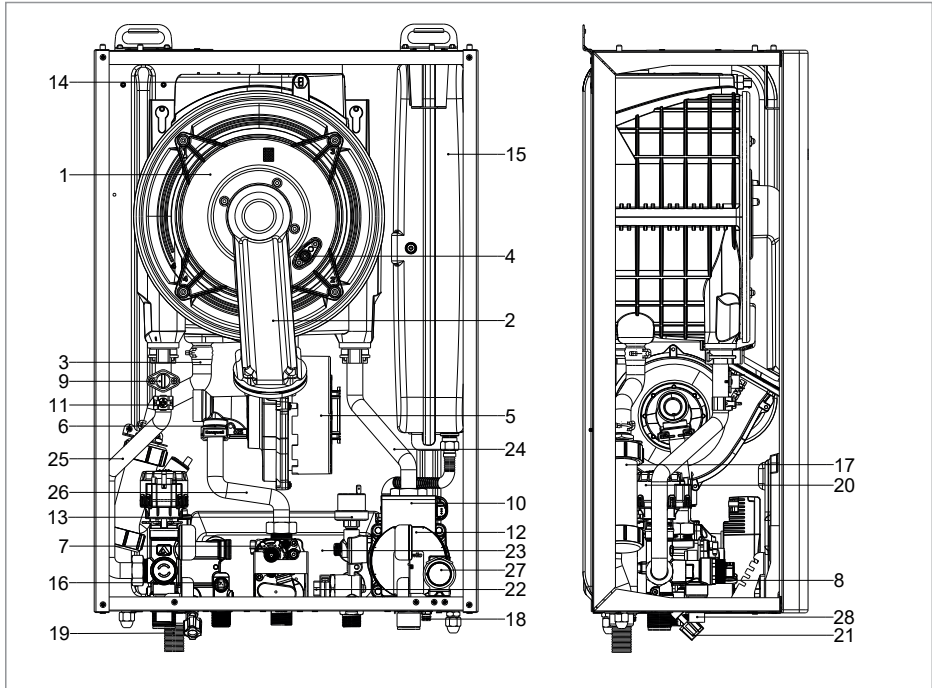


Figure 7. Main parts of the boiler

- | | |
|--|---|
| 1. MAIN CONDENSING HEAT EXCHANGER | 15. EXPANSION TANK |
| 2. REMIX BURNER UNIT (GAS MANIFOLD + BURNER) | 16. DOMESTIC HOT WATER (DHW) TEMPERATURE SENSOR |
| 3. SIPHON INLET PIPE | 17. SIPHON |
| 4. IONIZATION 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 SENSOR | 25. HEATING FLOW PIPE |
| 12. PUMP | 26. GAS INLET PIPE |
| 13. PRESSURE SWITCH | 27. MANOMETER |
| 14. FLUE FUSE | 28. PLASTIC DRAINAGE FITTING |

3.6 Water Circuit

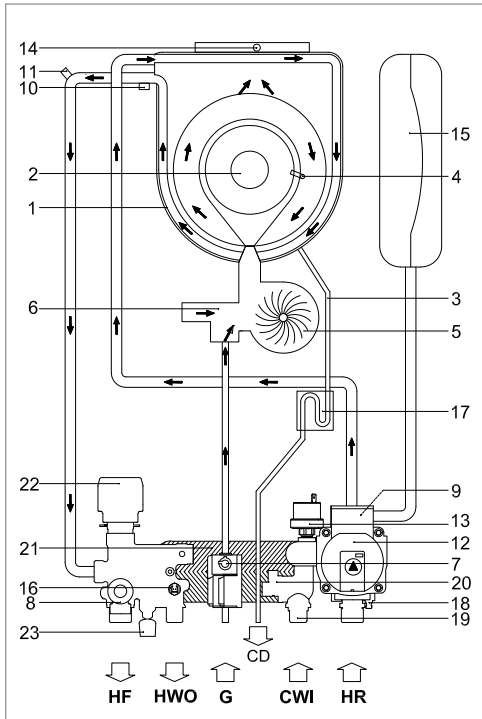


Figure 8. Water circuit schematic diagram

1. MAIN CONDENSING HEAT EXCHANGER
2. PREMIX BURNER UNIT (GAS MANIFOLD + BURNER)
3. CONDENSATE DRAINAGE PIPE
4. IONIZATION AND INGICTION 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 SWITCH
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

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

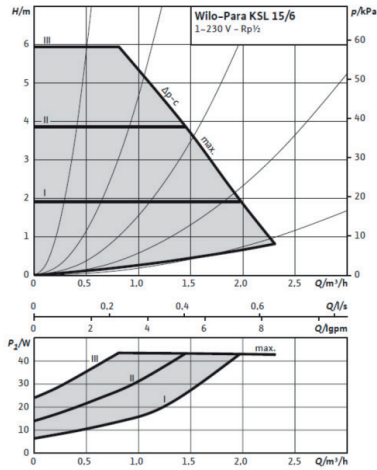
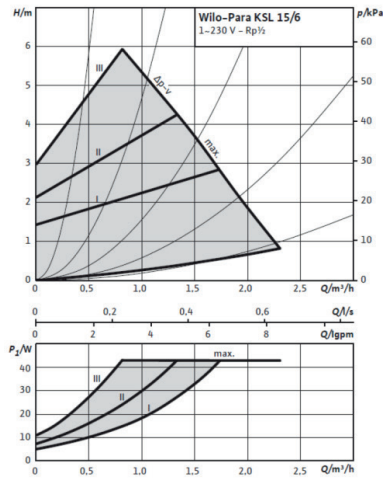
3.7 Circulation Pump

High efficiency and ErP ready ($EEL \leq 0,23$) circulation pumps are used on Super Fit gas fired combi boilers. Control mode and delivery head (differential pressure) are adjustable. EEL value of this modulating circulation pump is $\leq 0,20$.

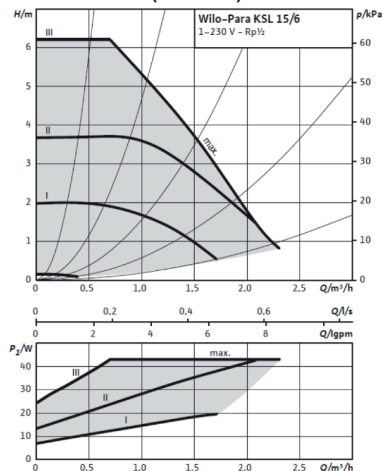
Circulation Pump Performance Chart SUF 24/28

Variable Differential Pressure Curve (Curve 1)

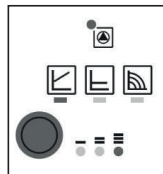
Constant Differential Pressure Curve (Curve 2)



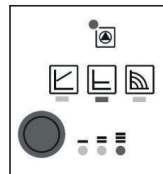
Constant Speed (3-Stages) Curve (Curve 3)



Curve 1 setting



Curve 2 setting



Curve 3 setting

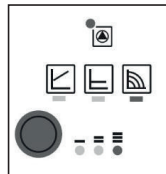
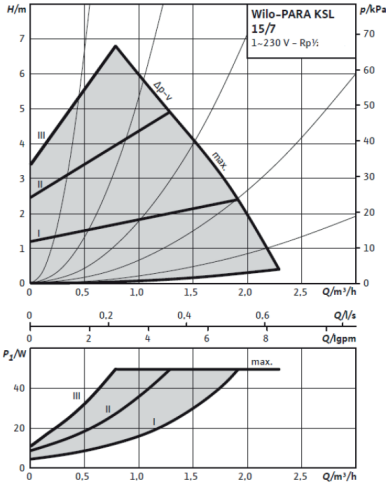
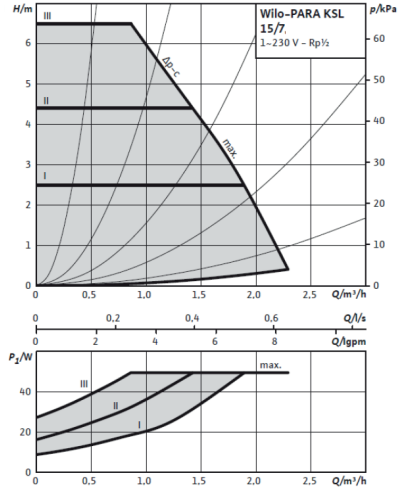


Figure 9. SUF 24/28 pump performance chart.

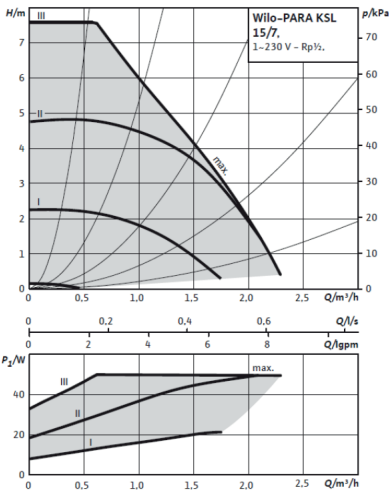
Variable Differential Pressure Curve (Curve 1)



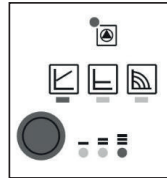
Constant Differential Pressure Curve (Curve 2)



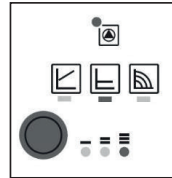
Constant Speed (3-Stages) Curve (Curve 3)



Curve 1 setting



Curve 2 setting



Curve 3 setting

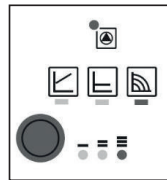


Figure 10. SUF 35 pump performance chart.

3.8 Electronic Ignition and Control Board – MIAB 3105

Technical Characteristics

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

- Parameters programming function
- 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 (25/45°C) central heating temperature selection
- External temperature compensation function (if outside sensor is used)
- Initial power increase time (ramp time) in CH cycle
- Timed pump overrun function on CH and DHW cycles (CH, CH antifreeze, DHW, DHW antifreeze, chimney sweeper cycles)
- Anti-freeze function on CH and DHW cycles
- Chimney sweeper function
- Alternative pump controls
- Circulation pump anti-locking function
- 3 way diverting valve anti-locking function
- Remote controller communication channel (Opentherm protocol)
- 6 keys matrix user interface
- Failure reporting with error codes.
- Alternative CH request devices
 - Room thermostat
 - Remote controller communication channel (Opentherm protocol)
- Water pressure switch
- Safety thermostat (high limit switch)
- Flue thermostat
- Temperature sensor integrity control
- Fan speed control
- Automatic flame control system
- Demo mode (on the purpose of demonstration on showrooms)

User settings

- Summer / Winter / Only Heating / Off
- CH temperature setting between 30-85°C (standard regime) or between 25-45°C (reduced regime)
- DHW temperature setting between 30-60°C.

Basic Symbols on 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

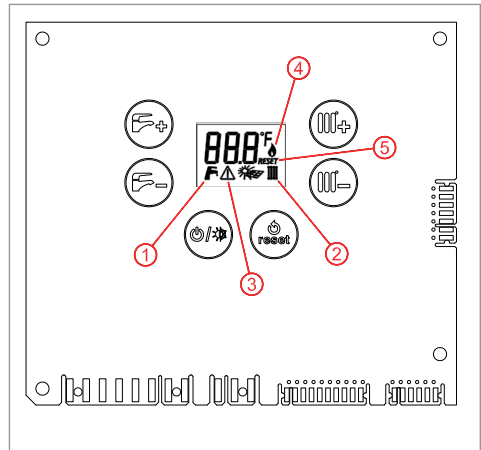


Figure 12. LCD display

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.

4. INSTALLATION

4.1 Reference Standards

This appliance meets the requirements of:

- EN 15502-1+a1: Gas fired heating boilers – Part 1: General requirements and tests.
- EN 15502-2-1+a1: 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 1000 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 and regulations:

- 2016/426/EU: Regulation on appliances burning gaseous fuels
- 811/2013: Energy labelling of space heaters and combination heaters
- 813/2013: Ecodesign requirements for space heaters and combination heaters
- 2014/35/EU: Low voltage directive

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

- EN 55014-1: Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission
- EN 55014-2: Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity - Product family standard
- EN 61000-3-2: Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current less than or equal to 16 A per phase)
- EN 61000-3-3: Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection.

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.

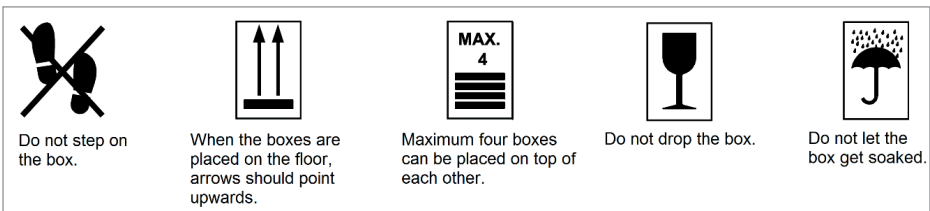


Figure 12

- 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

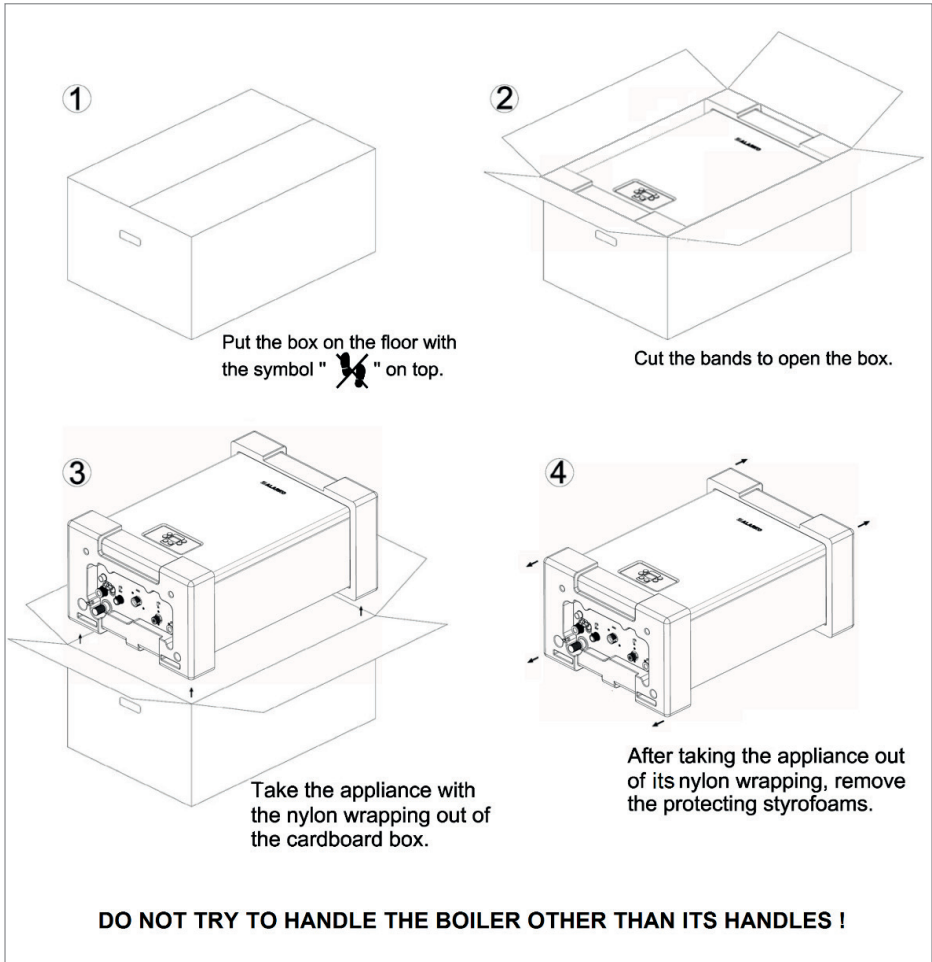


Figure 13. Opening the package

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.

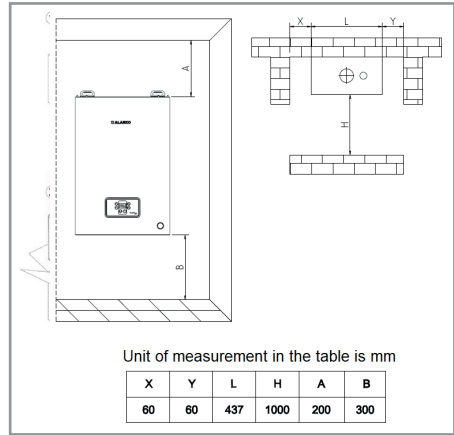
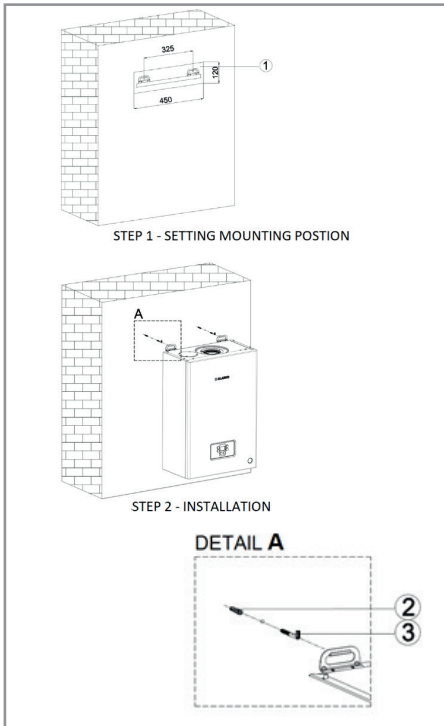


Figure 14. Minimum installation clearances

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 14 are respected. For mounting the appliance, it is required to follow the below instructions (Figure 15). 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 15 – Step 1). Mount the L screws together with wall plugs from the marked points. Finally, hang the boiler from L screws (Figure 15 – Step 2).

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

Figure 15. Mounting Instructions

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 16 – 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.

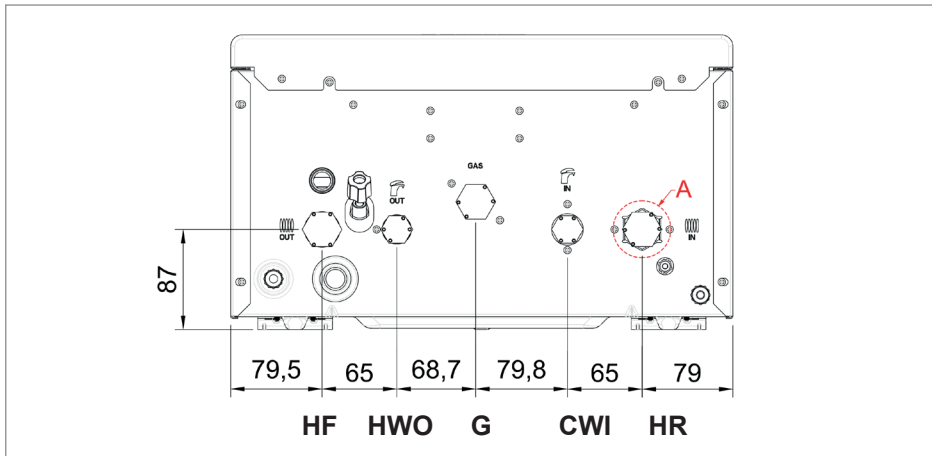


Figure 16. Water connections

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.

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.

Condensation Drainage

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 17).

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.

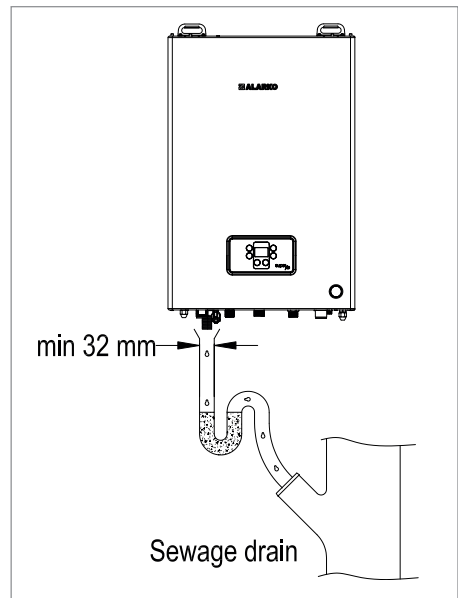


Figure 17. Drainage pipe and connection to sewage drain

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 X100 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 X400 etc.).

ATTENTION!

Due to the large wall thickness of plastic pipes, their inner diameters are lower compared to steel or copper pipes with the same outer diameter. For this reason, if plastic pipes are used in the installation, an upper diameter should be selected and used.



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.

ATTENTION!

The manufacturer shall not be held responsible for damage to property and life caused by the lack of an effective grounding system.

In buildings without a grounding line, if there is an application where neutral and ground connection is combined, the device should never be connected to this line. If connected, the manufacturer cannot be held responsible for damage to property or life.

- The boiler functions with an alternating current of 230 V and 50 Hz and has maximum power absorption of 82/84/117 Watt for SUF 24/28/35 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 18.

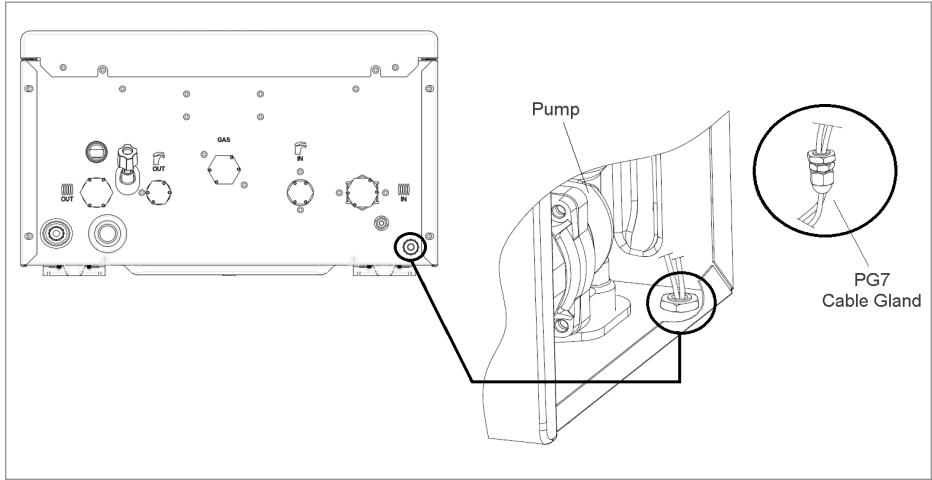


Figure 18. Cable grand and its location for outside sensor, remote control and room thermostat cables

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. Bend the plastic panel holding sheets to the sides to release the rectangular protrusions of the plastic panel.
- d. Lower the plastic panel 90 degrees by tilting it towards the outside of the boiler.
- e. Remove the back cover of the plastic panel after demounting 4 screws on the corners.
- f. Connect remote control, room thermostat and outside sensor wires as shown in Figure 19 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.

- g. When the wires have been connected, place the back cover of the plastic panel, bring the plastic panel to its initial position and place the front case panel of the boiler back.

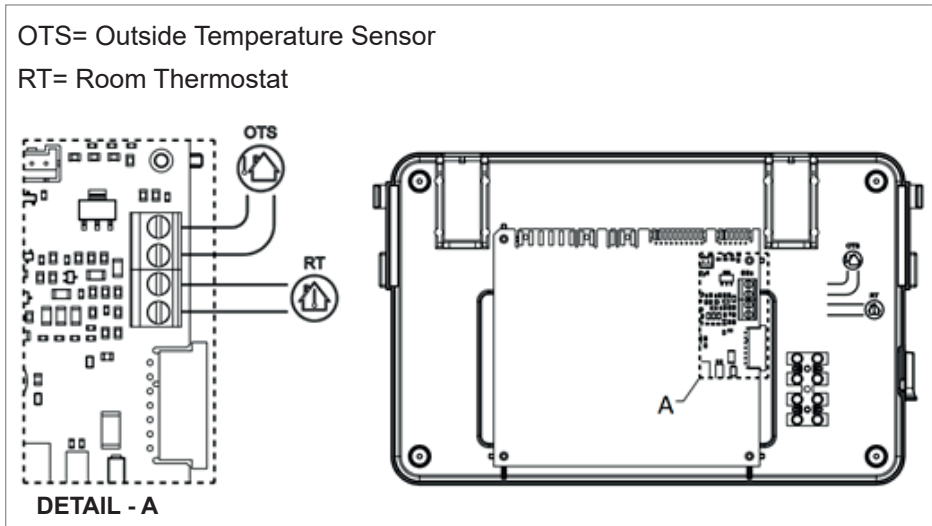


Figure 19. Interior view of the plastic panel

4.9 Flue Connection

⚠ 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 20). 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 21).

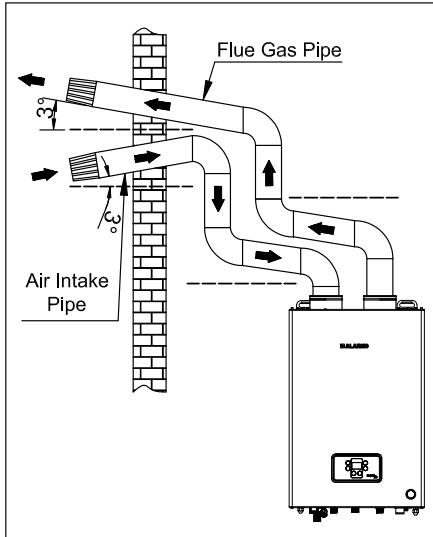


Figure 20. Angles of air intake and exhaust pipes

- 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 22).

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 23).

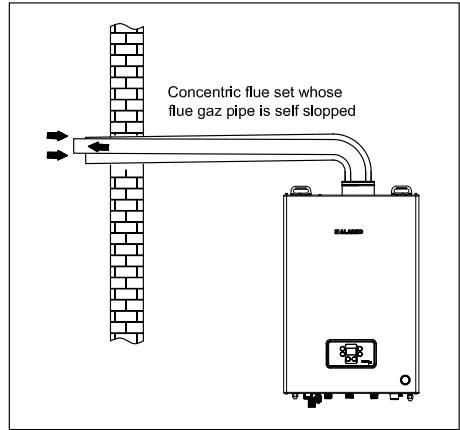


Figure 21. Concentric flue set angles

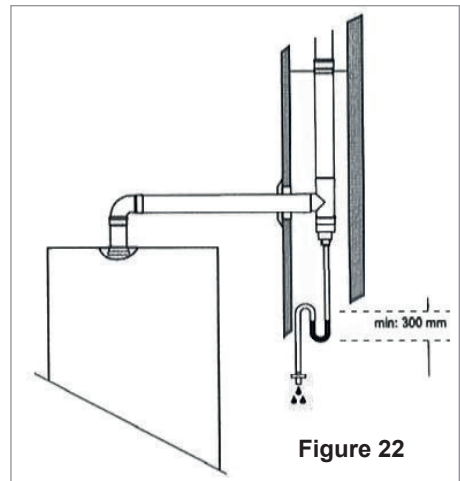


Figure 22

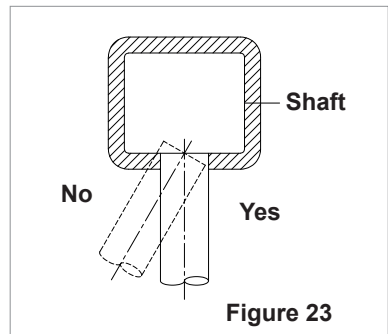


Figure 23

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 24.

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)	They are the type of chimneys where combustion air intake is sucked from a building shaft and flue gas is discharged from the roof. The air suction pipe enters the shaft horizontally and ends by bending up with an elbow. The flue gas pipe goes up to the roof. It can operate up to a total linear length of 50 meters including standard horizontal concentric flue length (1 meter) with Ø60 / 100 mm flue system in all types.

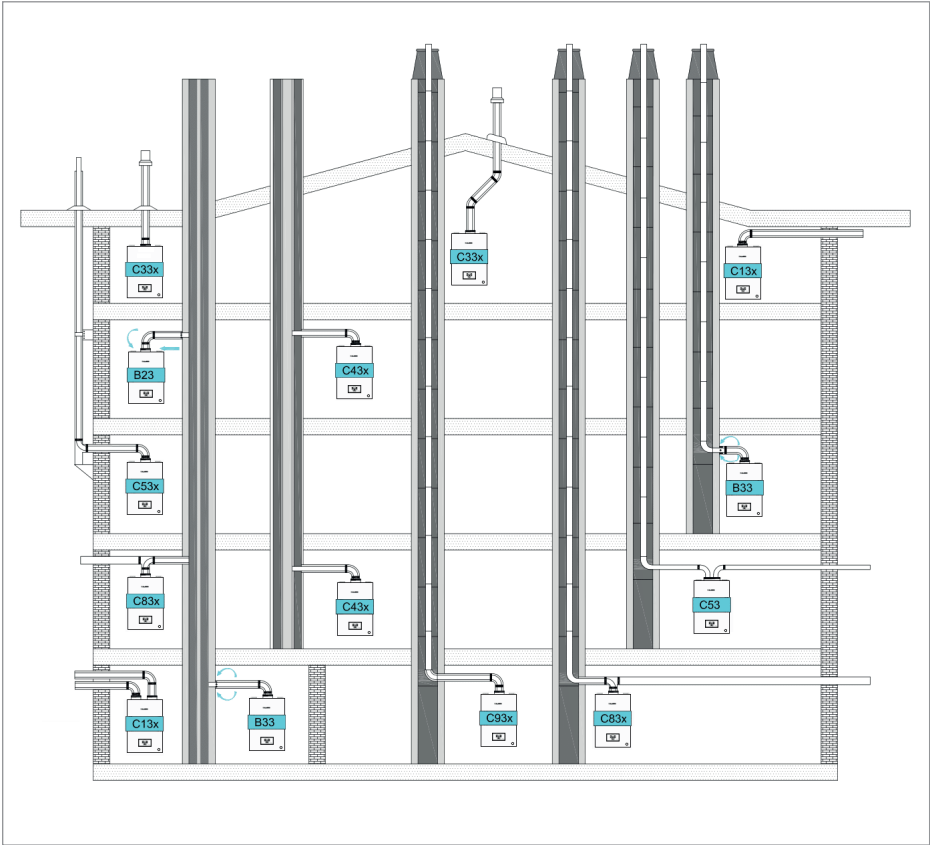


Figure 24. Flue applications

Ø60/100 Horizontal Concentric Flue Set (SUF 24/28/35)

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: 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 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.

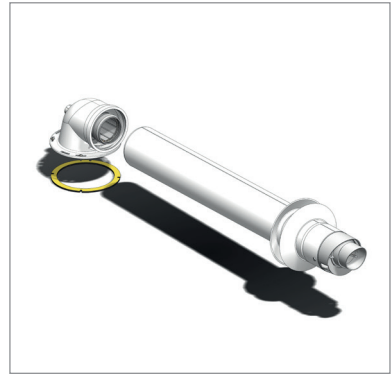


Figure 25. Ø60/100 mm horizontal flue set

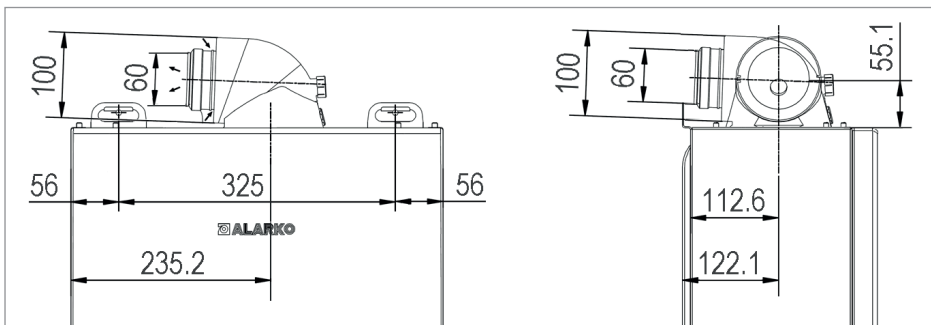


Figure 26. Ø60/100 mm horizontal flue set dimensions

Ø80+80 Twin Flue Set (SUF 24/28/35)

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.

MAXIMUM FLUE LENGTH: Ø80+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:

Ø80 x 90° elbow = 1.5 m.

Ø80 x 45° elbow = 1.2 m.

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

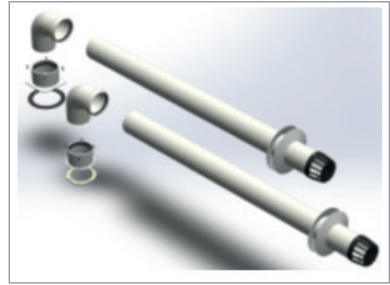


Figure 27. Twin flue set

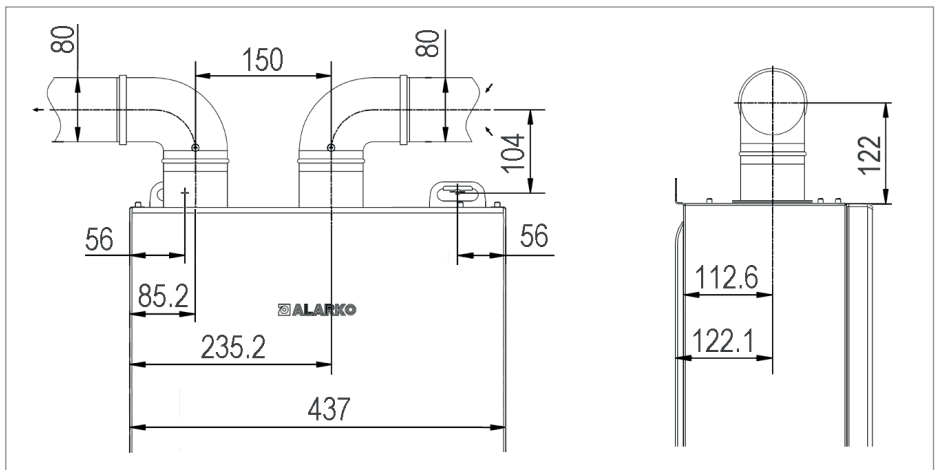


Figure 28. SUF 24/28/35 twin flue set dimensions

Ø60/100 Vertical Concentric Flue Set (SUF 24/28/35)

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: 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 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

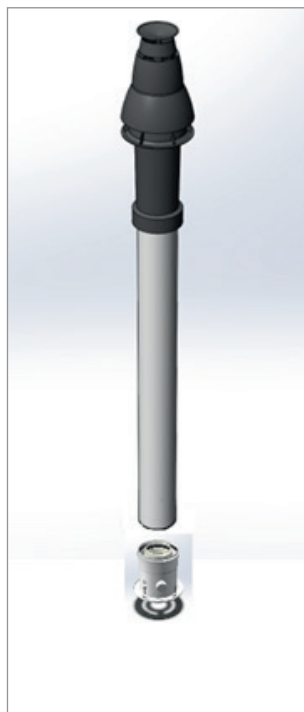


Figure 29. Vertical flue set
SUF 24/28/35

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.

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 filters
- Cleaning of dirt separators
- 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.

 **ALARKO**



**ALARKO CARRIER
SANAYİ VE TİCARET A.Ş.**

GOSB-Gebze Organize Sanayi Bölgesi

Şahabettin Bilgisu Cad. 41480 Gebze-Kocaeli/TURKEY

Phone : (90)(262) 648 60 00 PBX

Telefax : (90)(262) 648 61 01

web : www.alarko-carrier.com.tr

e-mail : info@alarko-carrier.com.tr