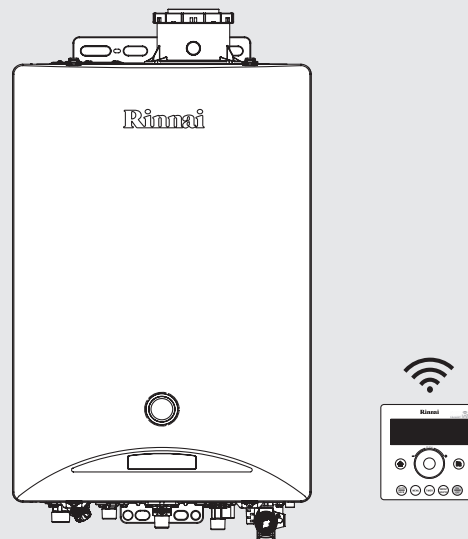


Zen Series

REB-KBI2424FF – Zen I24 – Condensing ZI24

REB-KBI2929FF – Zen I29 – Condensing ZI29

REB-KBI3535FF – Zen I34 – Condensing ZI34



**Gas-fired, condensing, wall-hung combi boilers, with
WiFi room thermostat
Installation and maintenance**

Rinnai



The Rinnai gas-fired combi-boilers are CE certified under Regulation 2016/426/EU and Directive 2014/53/EU.

Zen I24 - ZI24 - REB-KBI2424FF

Zen I29 - ZI29 - REB-KBI2929FF

Zen I34 - ZI34 - REB-KBI3535FF



Quality system standard

ISO 9001

The design, development and manufacture of gas heating appliances done under Rinnai's quality management system is certified under the quality management system Standard ISO 9001.

Certified by: Japan Gas Appliances Inspection Association - JIA-QA Center

Rinnai, constantly striving to improve the products, reserves the right to modify the details given in this documentation at any time and without notice.

From the time this manual is printed and attached to the product, to the time the product is purchased and installed, the instructions and warnings may have changed: for Your interest and Your protection we recommend that You follow the instructions and warnings reported on the most recent version of the manual which is always available on the Rinnai UK web site (www.rinnai-home.co.uk).

Rinnai disclaims any liability due to printing or transcription errors and reserves the right to update and change any technical and commercial lists without prior notice.

Dear Customer, our compliments for having chosen a Rinnai top quality product, able to assure well-being and safety for a long period of time. As a Rinnai Customer you can also count on a qualified aftersales service to guarantee a constant efficiency of Your appliance.

The following pages are very important and contain useful instructions and suggestions on the correct use of Your appliance.

GENERAL ADVICE

Rinnai products are provided with a packaging suitable for transport. The product must be stored in dry environments and protected from bad weather.

This manual is part of the product and must be left to the new user in the case of property change of the appliance. The manual must be kept in a safe place and carefully consulted as all warnings provide important safety instruction for the installation, the use and the maintenance.

This manual contains technical information on how to install the product: for any issue related to the installation, comply with the national and local laws in force and technical standards. According to legislation in force, the systems must be designed by qualified technicians. Installation and maintenance must be performed in compliance with the regulation in force, according to the manufacturer's instructions and by qualified personnel.

An improper installation or assembly of the appliance (components, accessories, kits, etc.) can cause unexpected problems to people, animals and property.

The product must be destined to the use for which it is designed for. Any other use will be considered as improper and therefore potentially dangerous.

In case of any errors in the installation, the use or the maintenance due to non compliance of the laws in force, Standards or manufacturer's instructions, the manufacturer is excluded from any contractual and extra contractual liability for any damages and the appliance warranty is invalidated.

The user may not install or adjust the appliance in any way that requires the removal of the front cover of the unit: to remove the front cover of the unit you must be certified competent to do so.

IMPORTANT

According to local laws in force, heating and hot water systems are subject to regular maintenance and regular checking of the heating performance. To comply with these obligations we invite You to contact the Rinnai local service.



Information on disposal of the product: the symbol shown here indicates that, according to the laws and local regulations, the product must not be disposed of with household waste. At the end of its life, the appliance must be delivered to a collection point identified by local authorities. The separate collection and recycling of the product at the time of disposal will help conserve natural resources and ensure that it is recycled in order to protect health and the environment.

For further information on regulations related to the installation of the water heater or to find out your closest authorised Rinnai service company You can contact:

Rinnai UK Ltd

9 Christleton Court

Manor Park

Runcorn

WA7 1ST

www.rinnai-home.co.uk

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1. INSTALLER'S INSTRUCTIONS

*The following section provides specific instructions for a correct installation of the product.
It is intended for the exclusive use of qualified technical personnel.*

The following instructions are designed for the user of the boiler. The user may not install or adjust the appliance in any way that requires the removal of the front cover of the unit. To remove the front cover of the unit you must be certified competent to do so.

Information for the Installer is given on page 19.

All work done on this appliance must be done by a qualified gas engineer. A qualified gas engineer must carry an up to date GAS SAFE Registered Gas Installer photo identification card while working on gas appliances. If you are unsure do not be afraid to ask the engineer to show you the card. If you are still not satisfied call GAS SAFE on 0800 408 5500 and verify the engineer's name with their database. This is for your own safety.

Responsibilities of the USER

The user must abide by all warnings given in this book. The user must only reference the user section of the book, and may not carry out any procedure listed in the installer section. This installation manual should be kept with the appliance for maintenance and user information.

The user must have the unit checked and maintained annually by a gas engineer.

The user must periodically check the water filter on the inlet to the appliance.

The user must not use the appliance in any way that it was not meant to be used. The user may only use the heater as detailed in the User portion of this manual.

Interference with a sealed component is not permitted. In case of defect parts only use genuine Rinnai components for replacement.

Conversion to other gas types should only be carried out by a qualified installer or a gas distributor according to the practice in the country where the unit is installed.

The user must not store or use any flammable vapors or liquids in the vicinity of this or any other appliance.

The user should familiarise themselves with the water heaters gas service valve and the main gas valve to the premises.

ATTENTION: air surrounding the water heater, venting and vent termination(s) is used for combustion and must be free of any compounds that cause corrosion of internal components. These include corrosive compounds that are found in aerosol sprays, detergents, bleaches, cleaning solvents, oil based paints/ varnishes, and refrigerants. Therefore Rinnai recommends outdoor models be used for these locations where possible.

The water heater, venting and vent termination(s) should not be installed in any areas where the air may contain these corrosive compounds. If it is necessary for a water heater to be located in areas which may contain corrosive compounds, Rinnai strongly recommends the following:

Indoor/Internal Water Heaters:

- * DO NOT install in areas where contaminated air is present
- * Consider before installation where air has the ability to travel within the building
- * Where possible, install the water heater in a sealed closet so that it is free of contaminated indoor air
- * Chemicals that are corrosive in nature should not be stored or used near the water heater

Outdoor/External Water Heaters and Vent Terminations of Indoor/Internal Water Heaters:

- * Install as far away as possible from exhaust vent hoods
- * Install as far away as possible from air inlet vents. Corrosive fumes may be released through these vents when air is not being brought in through them.
- * Chemicals that are corrosive in nature should not be stored or used near the water heater or vent termination.

Damage and repair due to corrosive compounds in the air is not covered by warranty.

The exhaust outlet may change colour over time due to the condensate in the exhaust gases. This discoloration does not damage the part or its form, fit or function.



Benchmark places responsibilities on both manufacturers and installers.

The purpose is to ensure that customers are provided with the correct equipment for their needs, that it is installed, commissioned and serviced in accordance with the manufacturer's instructions by a competent person(s) and that it meets the requirements of the appropriate Building Regulations. The Benchmark Checklist can be used to demonstrate compliance with Building Regulations and should be provided to the customer for future reference.

Installers are required to carry out installation, commissioning and servicing work in accordance with the Benchmark Code of Practice which is available from the Heating and Hot water Industry Council who manage and promote the Scheme. Visit www.centralheating.co.uk for more information.

IF YOU SMELL GAS

Isolate the gas supply and get out of the building. Do not try to light any appliance. Do not turn any light or other electrical switch on or off. Do not use any telephone in the building. Call your gas engineer from a safe location and follow their instructions. If you cannot reach your gas engineer ring the following: National Grid 0800 111 999

Important Information

This appliance may only be installed by someone certified competent to do so. At the time of printing the only people deemed competent to install this appliance are those that are **GAS SAFE** Registered for this type of appliance in this type of location who have a current ACS certificate.

Gas safety (Installation & Use) regulations are the 'Rules in force'. In your own interest and that of safety, it is law that all gas appliances are installed by competent persons in accordance with the above regulations. Failure to install appliances correctly could lead to prosecution. Other persons should NOT attempt to install this equipment.

The appliance must also be installed in accordance with and comply to, IET Regulations, Building Regulations relevant for each county of installation in GB and Ireland, local water by laws, Health & Safety Document 635, EU Regulations 811/2013 Energy Labeling and any other local requirements.

British Standards

British Standards should be followed when no specific instruction is given

BS7074:1 - Code of practice for domestic and hot water supply

BS6891 - Installation of low pressure gas pipe work up to 35mm

BS5546 - Installation and maintenance of gas-fired water-heating appliances of rated input not exceeding 70 kW net

BS5440:1 - Flueing and ventilation for gas appliances of rated input not exceeding 70 kW net (Flues)

BS5440:2 - Flueing and ventilation for gas appliances of rated input not exceeding 70 kW net (Ventilation)

BS7593 - Code of practice for the preparation, commissioning and maintenance of domestic central heating and cooling water systems

BS6798 - Specification for selection, installation, inspection, commissioning, servicing and maintenance of gas-fired boilers of rated input not exceeding 70 kW net

EN12828 - Heating systems in buildings. Design for water-based heating systems

LPG Installations

An appliance using LPG must not be installed in an internal space below ground level

Timber Framed Buildings

Where the boiler is to be fitted to a timber framed building the guidelines laid down in BS5440 Part 1 and IGE Gas installations in Timber Frame Buildings should be adhered to.

CH Water

Artificially softened water must not be used to fill the central heating system.

Such other specifications and regulations that may supersede or complement the above documents.

It is the installer's responsibility to ensure that the unit has been installed to all current requirements.

Please be sure that you are fully aware of your obligations and responsibilities under these regulations.










In case of defective parts only use genuine Rinnai components for replacement failure to do so will invalidate any warranty.


Disposal Information:

Under the laws and local regulations, this product must be disposed separately from household waste. When this product reaches the end of useful life, it should be taken to a collection point identified by the local authorities. The recycling of the product at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects human health and environment.

1.1 IMPORTANT SAFETY INFORMATION

Meaning of the symbols used in the manual for important information concerning your safety:

	Indicates a situation of potential serious danger, to respect and follow carefully.
	Indicates a potentially hazardous situation which, if not avoided, may lead to injury or property damage.
	Indicates an important information.
	Information on the correct use, installation and operation of the product.
	Indicates a potential condition of serious danger which must be complied.
	Indicates a condition which should be avoided.
	Indicates a ground connection for the prevention of an electric shock.
	Warns of a risk of fire. Keep the area clean and free from flammable materials.
	Warns of a risk of injury or property damage when contacting.



The appliance must be installed by qualified personnel only.

It is possible to install Zen boilers in outdoor areas, always open-air and well ventilated, or in partially protected areas (not exposed to direct atmospheric precipitation).

It is always mandatory to install an approved exhaust system.

Use the appliance exclusively for the use for which it was designed.

Rinnai boilers from the Zen range have been designed for wall installations only. They are built for domestic or similar uses, for the production of domestic hot water and the heating of water at a temperature lower than that of boiling at atmospheric pressure. They must be electrically powered, connected to a gas, heating and a domestic hot water distribution system suited to their performance and power

Only a professional licensed company is authorised to install Rinnai gas appliances. The installation must follow the requirements of the BS and IET Standards, current legislation and local technical regulations, according to the indications of good technique.

Do not make any changes to the appliance: do not attempt to repair, replace components, open sealed parts or disassemble the appliance. Any tampering can lead to risks to health, damage to property, compromise the safety and proper functioning of the product: for any type of repair, modification of settings or maintenance of the product and its accessories, we recommend contacting the Rinnai technical service center.

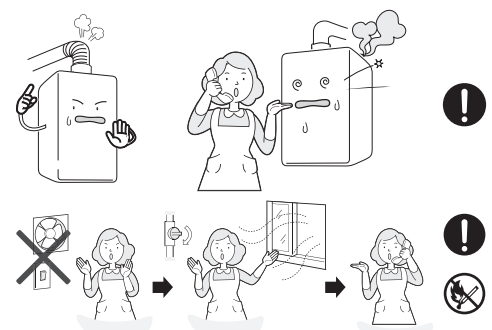
Use only original Rinnai parts.

If you notice unusual noises, smells or vibrations, stop the appliance immediately and contact the Rinnai technical service company.

If you smell gas:

- Close the main gas tap;
- Open doors and windows to ventilate the room;
- Contact Your technician and wait outside the house.

In the event of an earthquake, fire, gas leaks, noises, stop the gas and electricity supply and open doors and windows.



1.2 INSTALLATION WARNINGS



The following section contains technical guidelines concerning the product's installation. It is necessary to respect the dictates of the existing legislation and the principles of proper technical skills, as regards installation issues (safety, environmental protection, injury prevention, etc). Under the legislation in force, the installations must be projected and carried out by authorised professionals.

Rinnai Zen boilers have been designed only for wall-mounted installations. They are made for domestic (or similar) use, for the production of domestic hot water and for water heating (at a lower temperature than the atmospheric boiling point).

They have to be electrically powered, connected to a heating gaseous-fuelled installation and to a domestic hot water supply network, both of them in line with the boiler's performances and power.

1.2.1 LOCATION

The boiler can be installed outside in a sheltered position is suggested for the installation. It is necessary to provide proper insulation for the plumbing pipes to prevent frost; always ensure electrical power and sufficient quantity of gas; always make sure that the exhaust system is properly installed and sealed. The allowed temperatures of use in external environment are: -20°C - 40°C.

For indoor installations, the room must be provided with an adequate ventilation system to the boiler's capacity.

The installation in fire hazard places (garages, box, etc.), on cooking appliances or in particularly humid areas is forbidden; to store flammable material, chemical products, corrosive substances (or similar materials) nearby the boiler is installed is forbidden.

The air surrounding the appliance, the exhaust and inlet air system, is used for the flame's combustion: air must be devoid of each element that could cause the corrosion of the components (it means air must not contain corrosive substances, for instance, aerosol, spray, detergents, chemical solvents, oiled-base paints, refrigerants, etc.). The boiler and its exhaust and ventilation systems must not be installed in environments where corrosive, chemical and combustible substances can be found. Damages and repair due to corrosive chemicals compounds are not covered by warranty.

Installations in coastal areas require more frequent maintenance: this is due to corrosive phenomenon of the air from the sea.

The appliance must be fixed to a flat vertical support wall, with the gas and water connections facing downwards. The wall that will support the boiler must be plain and able to hold the water heater (35-40kg), so it has to be built in solid or perforated bricks. Both the brackets (upper and lower) must be fixed to the wall with metallic screws.

The boiler must be easily accessible and maintainable: its position must ensure a risk-free accessibility for inspection, repair and emergency measures. Sufficient space to remove components and properly maintaining the product must be ensured.

It is necessary to provide an electrical outlet with AC230V / 50Hz power supply with grounding nearby the appliance, sufficiently far from the gas and water connections of the appliance and from the exhaust outlet. For outdoor installations it is necessary to provide a protected and waterproof plug. The electrical cable of the appliance is 1.5m long.

The positioning of the exhaust terminal must comply with the provisions of the current legislation and the minimum distances from the architectural elements.

Connect the vent valve to a proper conveying system.

Provide an adequate liquid waste disposal system in the lower part of the boiler, in order to collect and dispose of liquid waste. This will prevent damages to goods and properties in case of pipes accidental breakage.

1.3 UNPACKING THE BOILER

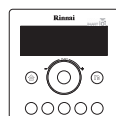
Prior to use, verify that the boiler is set up for the correct type of gas and that the appliance is intact. If the appliance is clearly damaged do not proceed with the installation: call your supplier or Rinnai immediately. Together with the appliance, you will find the following parts and accessories in the packaging:



Instructions manual
and documentation



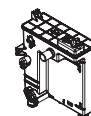
Straws' kit and wall plugs for
the device



WiFi chronothermostat
(WF-P100W)



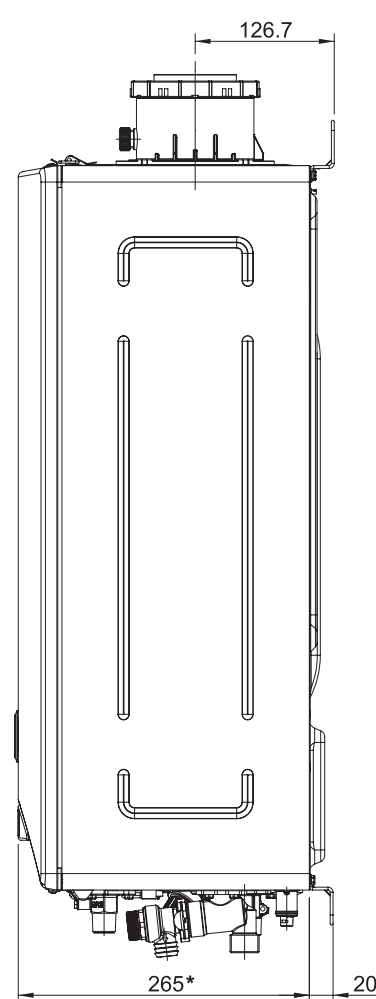
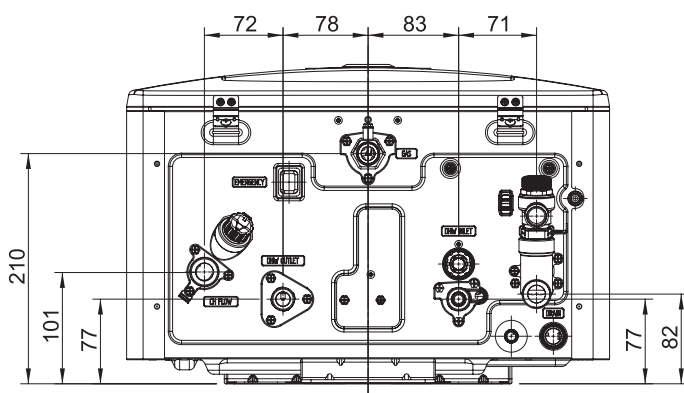
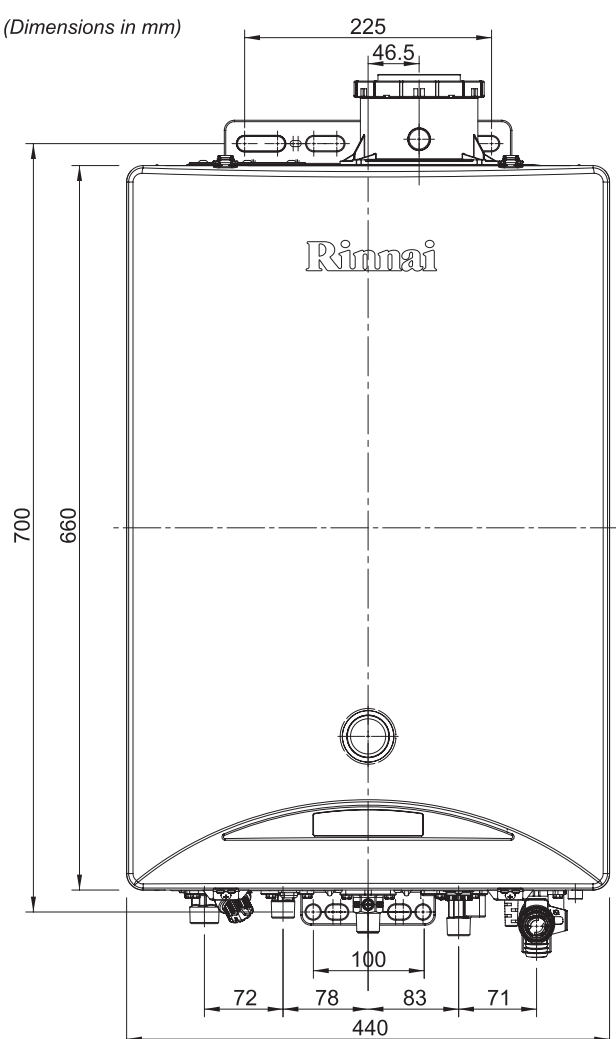
Connection cable
for chronothermostat
(of different brand)



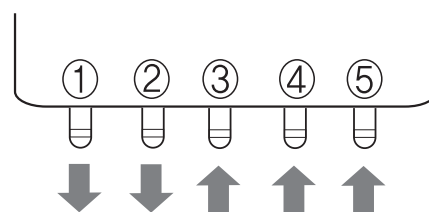
Condensate neutralizer
(preloaded in the siphon)

1.4 DIMENSIONS

(Dimensions in mm)

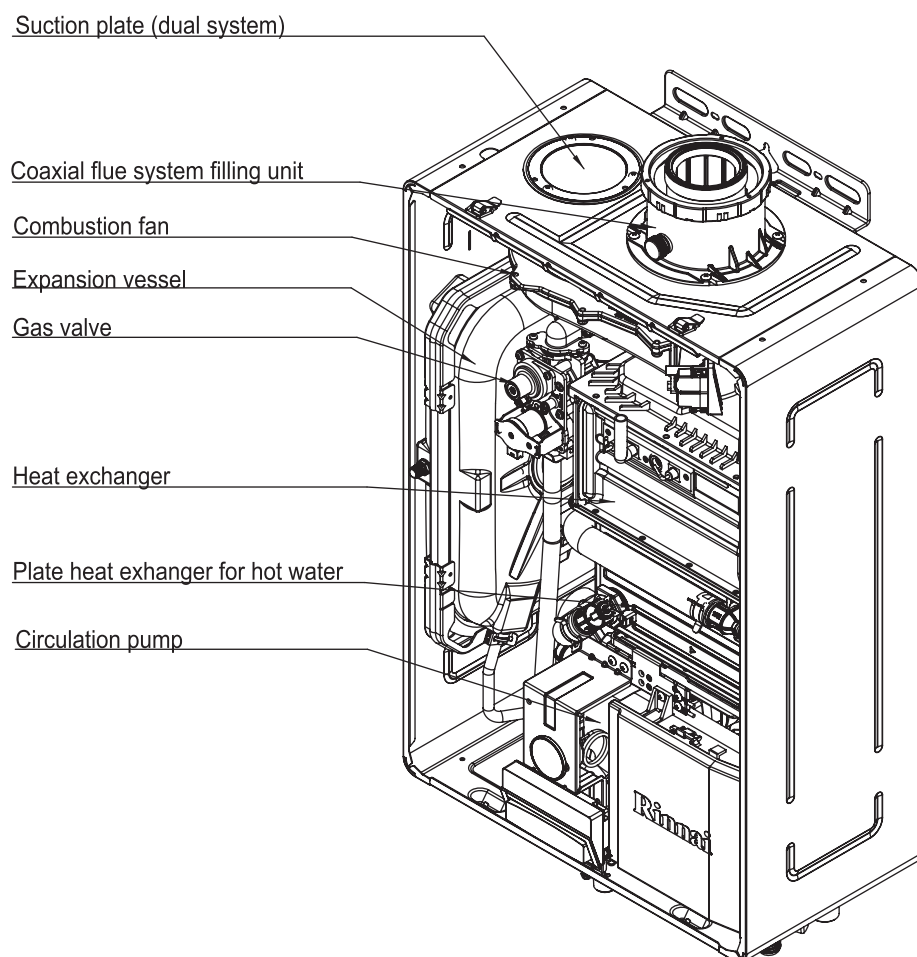
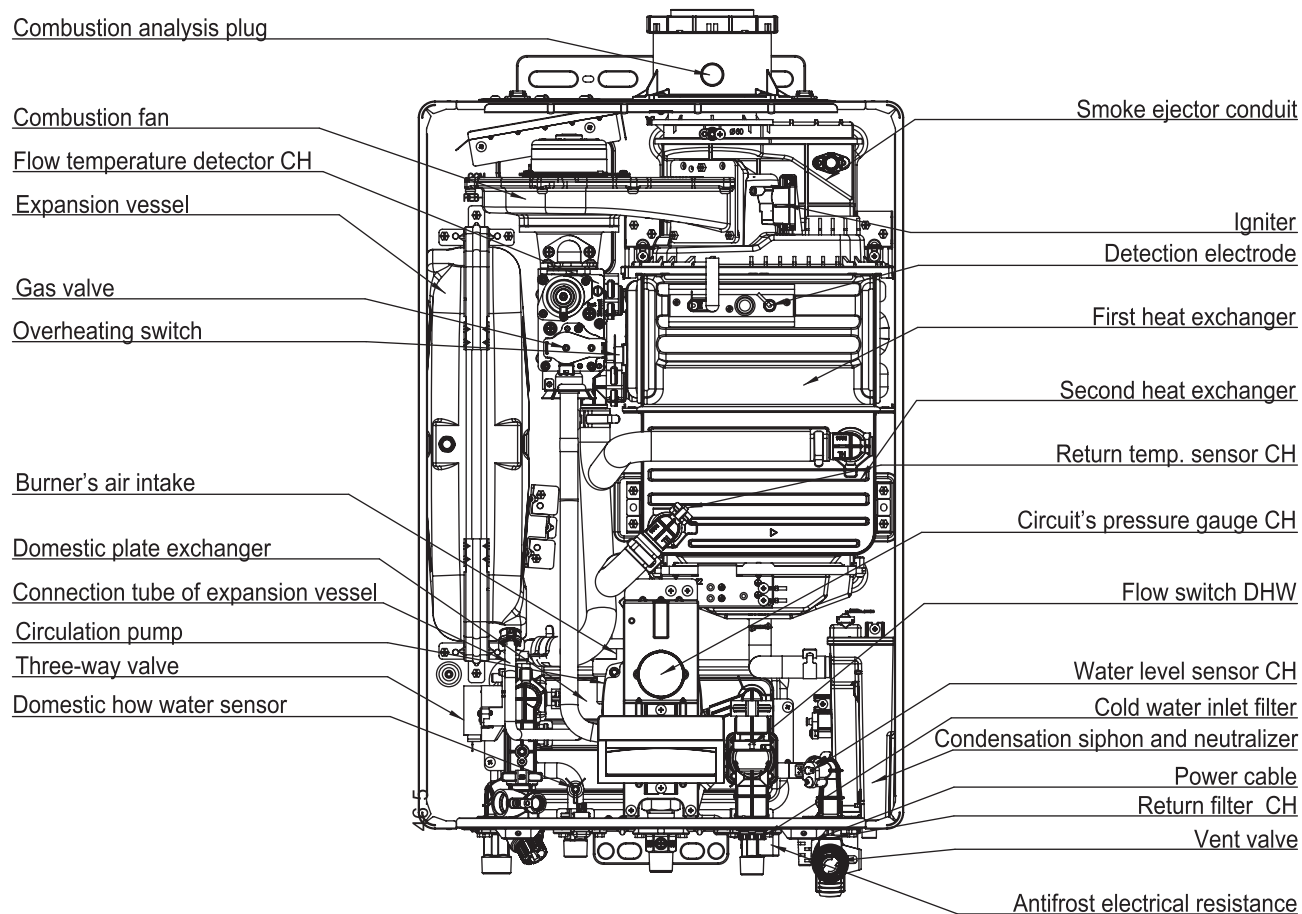


* REB-KBI3535FF = 315



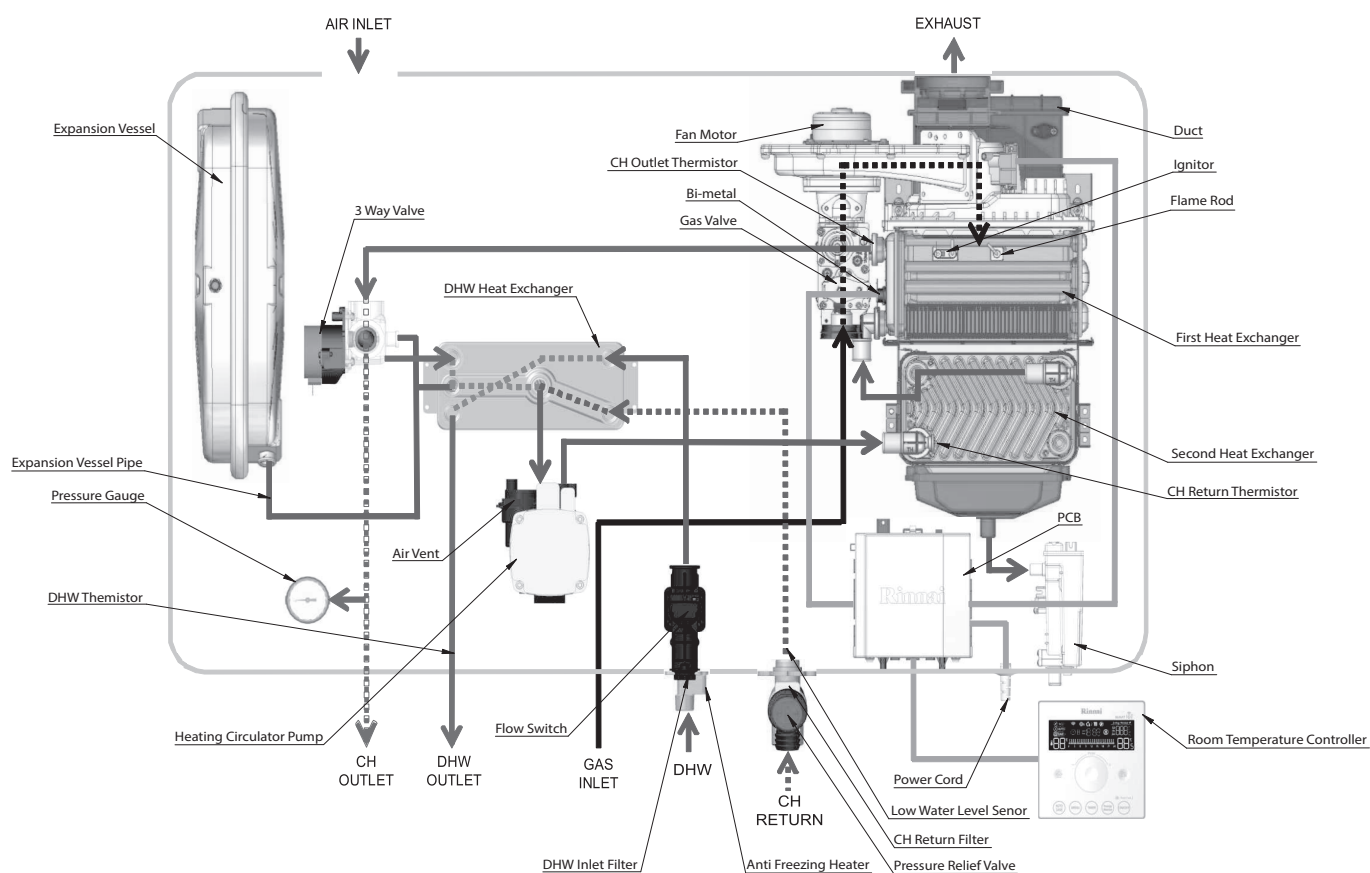
- ① Heating flow - 3/4"
- ② Hot water outlet - 1/2"
- ③ Gas - 1/2"
- ④ Cold water inlet - 1/2"
- ⑤ Heating return - 3/4"

1.5 MAIN COMPONENTS

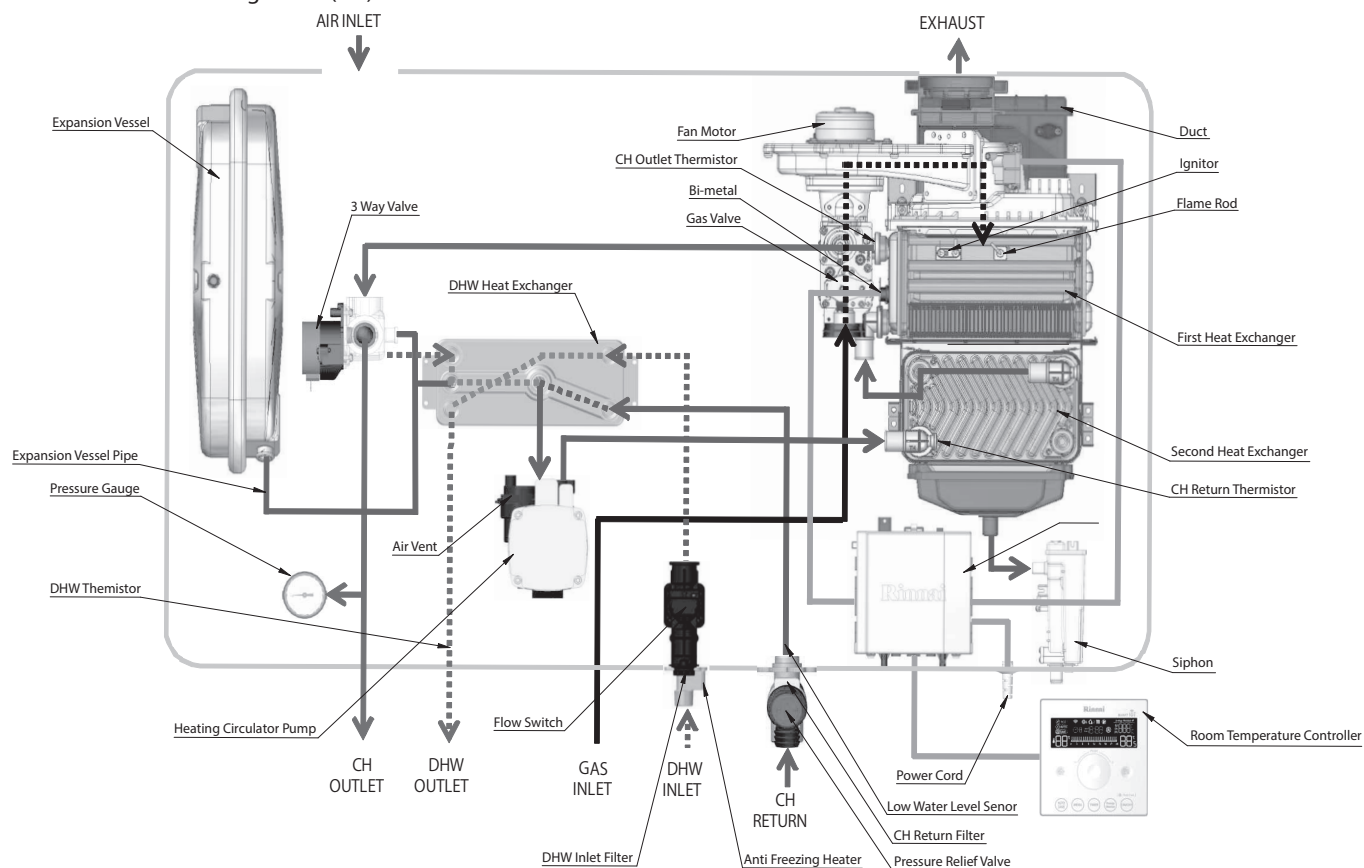


1.6 GENERAL SCHEME AND OPERATION PRINCIPLES

Domestic Hot Water Mode (DHW)



Heating Mode (CH)



1.7 INSTALLATION

1.7.1 HYDRAULIC COUPLINGS



Before connecting the boiler up to the central heating system it is important to thoroughly flush the system first, follow guidance in BS7593. This flush is intended to remove any build up of debris and sludge that may have occurred which could impact the boiler performance. Failure to flush the system correctly may invalidate the warranty.

The dimensioning and the layout of hydraulic pipes must be properly designed in order to ensure an adequate water flow rate to the appliance.

Domestic hot water

The DHW connections are: 1/2" male type.

Where the water supply pressure exceeds 10bar, an approved pressure regulator must be fit at the inlet of the appliance. To achieve the maximum flowrate, a water supply pressure of 1.5bar is required. The unit will operate at lower pressures but the maximum flow rate may not be achieved. The minimum pressure to ensure the nominal flowrate is equal to: 0.7Bar (Zen I24), 1.10Bar (Zen I29), 1.2Bar (Zen I34).

Connect the hot and cold water supply pipes. An approved isolation valve and strainer MUST be installed on the cold water inlet pipe. An approved isolation valve and draining point should be installed on the hot water outlet pipe. Do not connect the valves directly onto the appliance.

If the boiler is installed in a hard water area, a suitable water conditioning system must be installed to prevent limescale damages to the heat exchanger: damages by scaling are not covered by the manufacturer's warranty. Below are some limit values of substances dissolved in water:

Description	pH	Tot. dissolved solid	Total hardness	Chlorides	Magnesium	Calcium	Sodium	Iron
Maximum recommended levels	6.5-9.0	600mg/litre	150mg/litre	300mg/litre	10mg/litre	20mg/litre	150mg/litre	1mg litre

The hydraulic pipes must be insulated to optimize energy efficiency and reduce heat loss.

Heating

The CH connections are: 3/4" male type.

The pressure relief valve must be connected to an adequate drain pipe and discharge in a safe manor so as not to cause any harm or away from any potential hazards.

When connecting the water supply pipes, it is recommended to have an approved isolation valve and a filter on the return pipe from the system, and an approved isolation valve on the flow connection. Do not connect the valves directly on to the boiler.

Condensate drain pipe

During operation, the appliance can produce a significant amount of condensate as a product of the combustion of a highly-efficient system. The condensate is mild acid and non-potable: to prevent damages and disposal problems, the boiler is equipped with a sealed condensate trap siphon, already filled with an acid-neutraliser (the duration of use is estimated to be eight - ten years long - it is necessary to check the PH regularly).

Connect a non-metallic pipe to the siphon's base (PVC, PVC-U, ABS, PVC-C or PP): it drains and eliminates excess of condensate. The connected pipe must have minimum slope of 2.5°. It is recommended to install the condensate drain pipe indoor to prevent freezing; if it is installed outside, it must be connected to a tube of Ø≥32mm and an adequate protection against frost must be provided to the pipe. The condensate pipework must be connected to a suitable drain or soak-away.



Once the condensate drain is connected, proceed with filling the siphon by pouring water into the exhaust duct until the siphon is overflowed: pay attention to this phase because a siphon that is not correctly filled can spread harmful combustion products into the room where the boiler is installed.

1.7.2 GAS CONNECTION



Before connecting the appliance to the gas mains, in order not to invalidate the warranty, it is necessary to clean the pipe and remove any impurities or production residues that could cause the product to malfunction.

Make sure that the appliance is set up for the correct type of gas.

The gas connection is: R1/2" male type.

Check that the gas meter and the gas pipes are sized correctly (and of all the appliances connected to the same gas line): the gas network must be designed by qualified professionals and according to current regulations and must provide adequate dynamic pressure based on the rated power of the device. BS6891 must be used for the gas supply installation.

Insufficient gas supply may cause premature damage to the appliance.

The gas supply pressure directly affects the delivered power and can cause problems if it is not correct.

When connecting the gas piping, it is recommended to have an approved isolation valve for emergency situations and to facilitate maintenance; do not connect the valve directly on to the boiler.

Fuel quality: the appliance is designed to work with combustible gas without impurities. If this is not the case, an adequate filtration system should be installed upstream of the appliance, in order to restore the necessary quality.

LPG tanks: inert gas residues (e.g. nitrogen, etc...) could remain inside new tanks resulting in a poor gas mixture and could cause incorrect operation or product failure. The gases in the mixture could stratify during storage, causing the variation of the fuel calorific value and altering the appliance efficiency.

1.7.3 FLUE SYSTEM CONNECTION



The exhaust system operates under positive pressure: it must be carried out by competent personnel, qualified according to the law, following the manufacturer's instructions and respecting the provisions of the law and the technical regulations in force.

The type of the flue system must be listed into the classes mentioned on the data plate (located on the side of the appliance). Rinnai provides a specific flue system for the appliance. Detailed installation instructions are supplied with the flue elements. For more information contact Rinnai.

Zen boilers must be installed by always connecting a Rinnai flue system: they can not be used without having installed the flue system. The flue system is considered an integral part of the appliance: it is only possible to install certified and tested flue systems in combination with the appliance.

Before proceeding with the installation of the flue system, it is necessary to carefully check that each component is not damaged: install the component only if free from defects. Use of faulty or damaged components and improper installation can cause serious damage to people or property.

Make sure that the flue terminal is not obstructed or blocked.

Coaxial flue system

In the upper part of the appliance there is a coaxial connection (Ø60 / 100mm) for the intake of combustion air (external pipe) and for the expulsion of combustion products (inner pipe) with a socket for combustion analysis.

It is possible to install the flue system by connecting the specific flue accessories to the predisposed connection: the flue system (coaxial extensions and curves) must have a diameter not inferior to the initial connection, be made of materials suitable for the appliance flue temperatures and have 'male / female' watertight seal. Traits exposed to direct sunlight must be homologated for such use or be adequately protected.

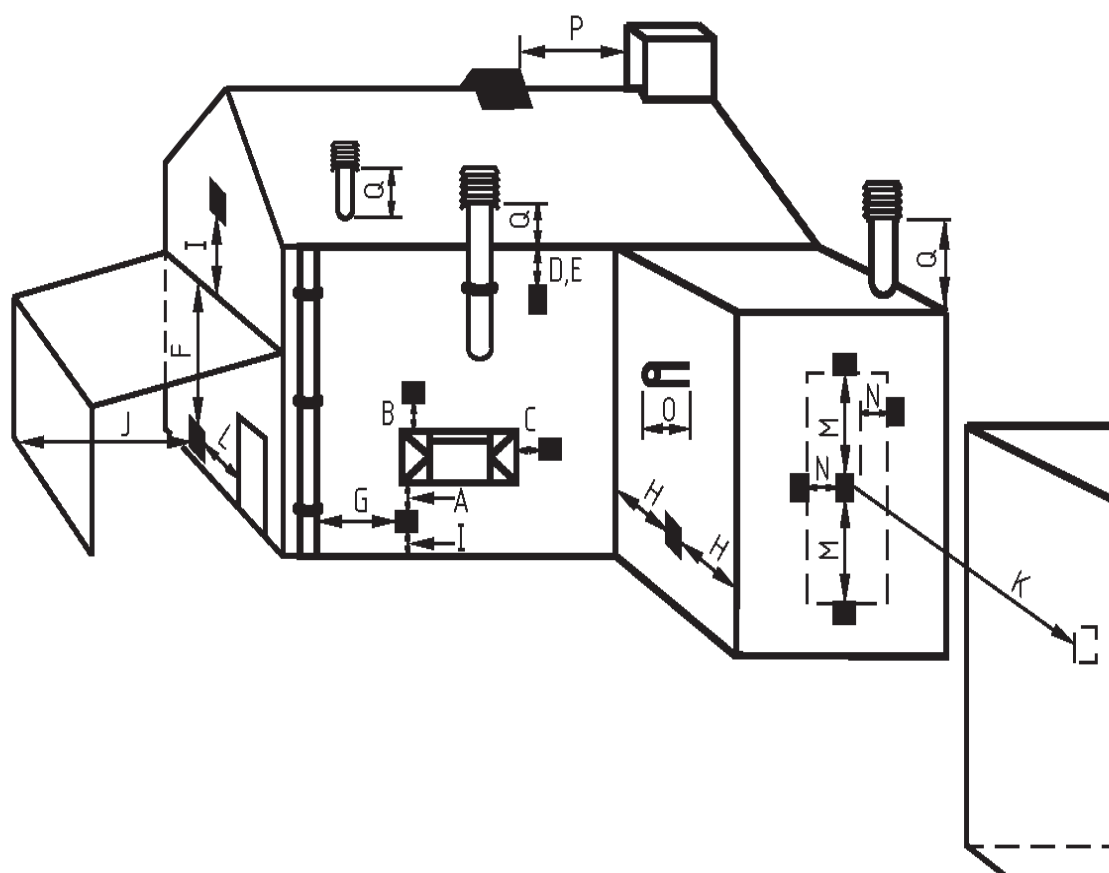
Using a Ø60/100mm coaxial exhaust system, the maximum equivalent length allowed is 30m. It is necessary to subtract 2.0m for each 90° bend used and 1.0m for each 45° bend from the maximum equivalent length.

Beyond the 12m the boiler power is progressively reduced depending on the equivalent length of the exhaust system.

The maximum number of 90° bends is three (six for 45° bend).

It is allowed the use of any possible combination of curves and extensions that respects the maximum equivalent length and the maximum number of bends for each section.

Distances of the flue terminal from architectural elements



Symbol	Terminal Position	Dimensions
A	Directly below an opening, air brick, opening windows, etc.	300mm
B	Above an opening, air brick, opening window, etc.	300mm
C	Horizontally to an opening, air brick, opening window, etc.	300mm
D	Below plastic gutters, soil pipes, drain pipes, etc.	75mm
E	Below eaves	200mm
F	Below balconies or car port roof	200mm
G	From vertical drain pipe or soil pipe	150mm
H	From and internal or external corner	300mm
I	Above ground, roof or balcony level	300mm
J	From surface facing the terminal	600mm
K	From terminal facing terminal	1200mm
L	From opening in the car port (eg door, window etc) into the dwelling	1200mm
M	Vertically from terminal on the same wall	1500mm
N	Horizontally from terminal on the same wall	300mm
O	From the wall on which the terminal is mounted	0mm
P	From a vertical structure on the roof	N/A
Q	Above intersection with the roof	300mm

1.7.4 ELECTRICAL CONNECTION



Connect the boiler to a 230V $\pm 10\%$ / 50Hz power supply.

Do not use the gas or hydraulic lines for the grounding.

The electricity safety is ensured only when the device is provided with an appropriate grounding and when the grounding system has been realized according to the safety requirements envisaged by the law.

Make sure that the electrical system is adequate for the maximum power absorbed and is equipped with an omnipolar dis-connector with class III over-voltage category.

The appliance is supplied with an electric cable already fitted with a plug: in case of replacement, contact a qualified technician and use only original Rinnai spare parts to avoid invalidating the warranty..

Do not use adaptors, multiple sockets and extensions cords.

The device fulfils the requirements of European Directives:

- "Low voltage" Directive;
- "Electromagnet compatibility" Directive.

The boilers are in IPx5D protection class.

1.7.5 RINNAI WIFI CHRONOTHERMOSTAT

The boiler is supplied ready for the use with the Rinnai WiFi chronothermostat. The controller is pre-set to operate by controlling the flow temperature of the heating system.

To operate, the remote control must remain connected via cable (two wires) to the device, which supplies it electrically in low voltage: it is possible to extend the supplied electric cable with a cable of the same section.



The controller must be installed on an accessible wall, at a height of 1.2-1.5m from the ground; in a place that is significant for the home, especially if it is used in 'room-thermostat' mode.

Avoid installing it in areas where the temperature is $>40^{\circ}\text{C}$, $<-20^{\circ}\text{C}$ or with a high humidity level, where it is directly affected by solar light, subjected to splashes of water, to the effect of chemical agents or fouling (in particular of fatty substances).

The electrical wiring of the remote control must be in good condition: in case of damage or deterioration it is necessary to replace it.

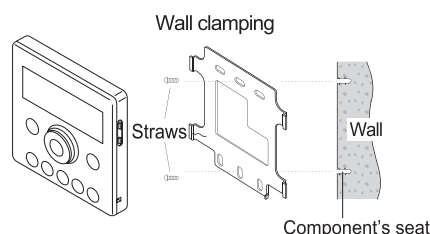
Do not use electrical conduits already used for high voltage cables (230V): in this case it is necessary to replace the supplied cable with a suitably shielded cable to avoid electromagnetic interferences.

WiFi Rinnai chronothermostat installation

Prior to begin the installation, it is necessary to electrically isolate the appliance by disconnecting it from the electrical socket.

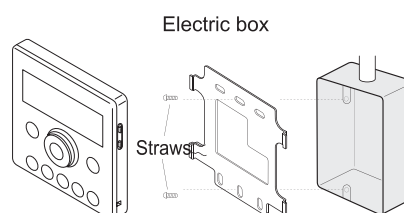
Wall mounted:

- Separate the metal bracket from the controller;
- Use the bracket as template to prepare the holes for the plug ($\varnothing 6.0 \times 35\sim 40\text{mm}$);
- Insert the plugs in the holes prepared;
- Fasten the bracket with the screws;
- Fix the two ends of the supplied electric cable to the two poles of the control (rear part);
- Install the control to the metallic bracket.



Installation in electric box:

- Separate the metal bracket from the controller;
- Fix the bracket to the electric box;
- Fix the two ends of the supplied electric cable to the two poles of the control (rear part);
- Install the control to the metallic bracket.





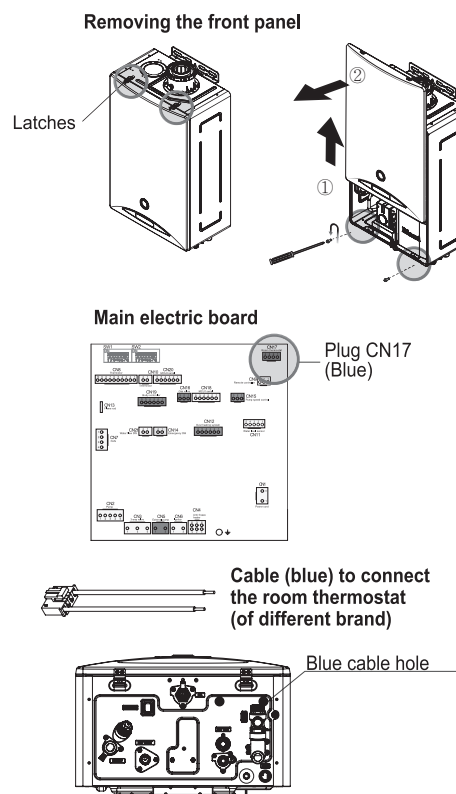
1.7.6 CHRONOTHERMOSTAT OF A DIFFERENT BRAND

The Rinnai boiler can work by connecting a chronothermostat (optional). Or it can work by connecting a chronothermostat (optional), keeping the Rinnai WiFi chronothermostat connected: in this second configuration the Rinnai command transfers the room temperature control function to the optional chronothermostat. In order to connect the room thermostat of another brand to the boiler's electronic board, a special connector (blue) is supplied as standard.

Installation of the chronothermostat (of a different brand)

Isolate the appliance electrically by disconnecting it from the electrical socket:

- Remove the front panel from the boiler body taking care not to damage the pressure gauge, first lifting it upwards and then moving it away from the boiler body;
- Remove the protective cover of the main electronic board (PCB) and connect the supplied cable to the CN17 port at the top right of the PCB;
- Insert the cable through the holes provided in the lower part of the appliance casing and connect the secondary room chronothermostat to the cable installed;
- Check that the type of chronothermostat connected is in 'open contact': if it is a 'closed contact' type it is necessary to modify the **parameter nr.14 of menu B**;
- Close the PCB protection cover and assemble the front panel;
- Electrically power the appliance, switch on the remote control and activate the heating function by pressing the button : the boiler must be set on 'flow temperature' mode (); check if it operates correctly.



1.7.7 FILLING THE SYSTEM

Once the hydraulic, gas and electrical connections have been completed and the drainage system is connected, proceed with filling the boiler heating circuit using an approved filling loop method.

A suitable inhibitor must be used when filling the system. Failure to do so can lead to debris and sludge building up within the system itself which can reduce the effectiveness and efficiency of the system and boiler. It can also cause damage to the boiler which would invalidate the warranty. For suitable water treatment products please find contact details of manufacturers below.

Sentinel - www.sentinelprotects.com

Fernox - www.fernox.com

Adey - www.adey.com



The filling of the circuit must be carried out in a very slow way: this prevents the formation of air bubbles that cause slowdowns in the commissioning of the system and can cause more problems in the initial phase of use.

Once the boiler has been installed, before operating it, always make sure that the system is filled correctly and that the pressure gauge on the front panel indicates, when the heating circuit is still cold, values from the green sector (0.5 ÷ 1.5bar). In case of necessity, restore the correct values by operating the appropriate tap at the base of the boiler.

The boiler has a vent valve built-in, on the circulation pump: make sure the valve cap is loose and free to vent air.

Open the bleed valves of the hydraulic system and the radiators, bleeding air until only water comes out.

By connecting the power supply cable, the boiler performs an automatic venting cycle of 60-120 min (and some internal control operations): during this phase, you do not have to press any button on the remote control until the cycle is completed (during this phase some symbols may light up on the display and/or disappear).

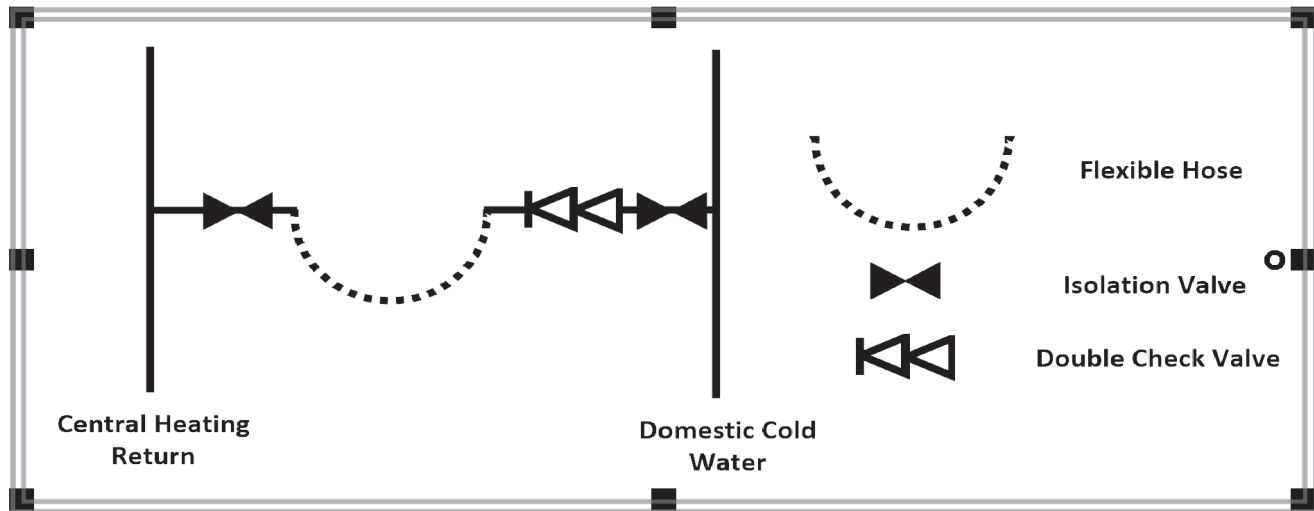
At the end of the venting cycle it is possible that the system pressure has fallen below the minimum recommended value: restore the correct value by acting on the load tap.

If the de-aeration cycle is not sufficient to expel most of the air in the system, it is suggested to disconnect the power supply cable and reconnect it to repeat the boiler vent procedure.

In the first uses and with a certain regularity it is advised to check that the pressure gauge on the front panel always indicates a normal pressure value: if necessary top up the system by operating the filling valve and restore the system pressure.

1.7.8 FILLING LOOP

Below is a typical installation of a filling loop to allow the central heating system to be filled with mains water. The flexible hose must be disconnected once the system has been filled.

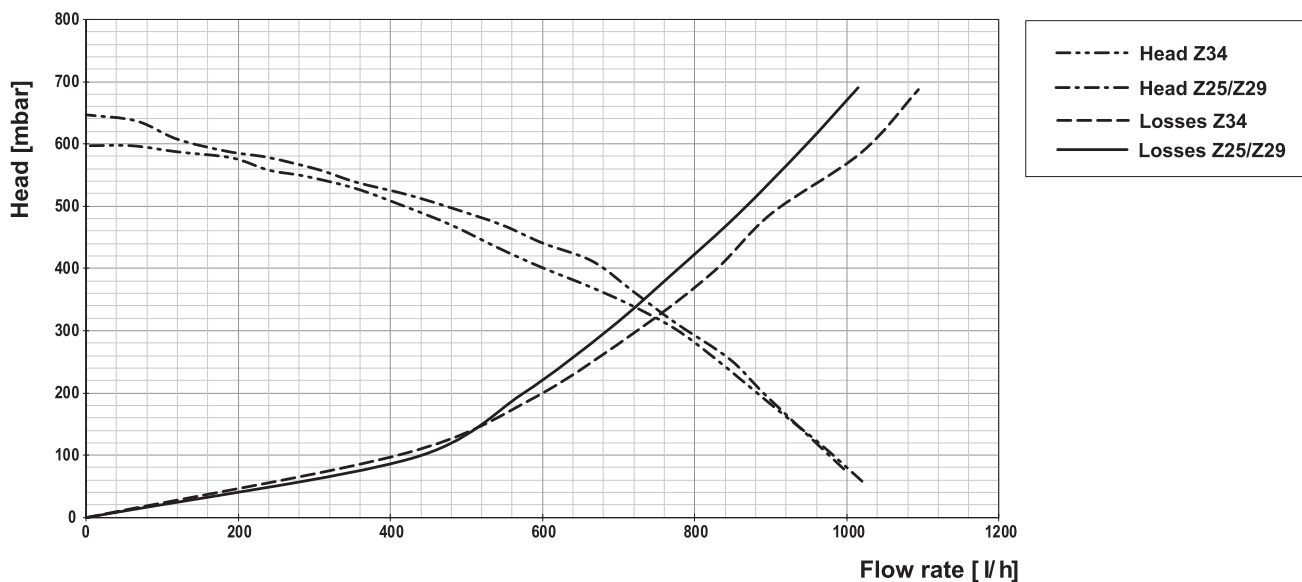


1.8 CIRCULATION PUMP

The boiler is supplied, as standard, with a built-in circulator with high energy efficiency, already compliant with Regulation 641/2009/EU.

The pump is directly managed by the PCB of the boiler and has an automatic operation: it is set for the most suitable operation based on the measured temperature difference between flow and return.

In the lower diagram are shown the specific curve of the pump and the losses of the heat exchanger:



Secondary circulating pump

In specific applications, due to the high losses in the system, the free head of the circulation pump may be poor or insufficient for the correct circulation of water in the heating circuit. For this purpose an optional accessory is available to connect a secondary pump external to the boiler. The operation of the secondary pump is managed, quite simply, like the operation of the primary pump: the pump is activated during the heating phases, when antifreeze protection is required, and when the initial functional test (de-aeration cycle) is performed.

The characteristics of a compatible supplementary pump are:

Voltage: 230V AC, 50Hz

Amperage: <1 A

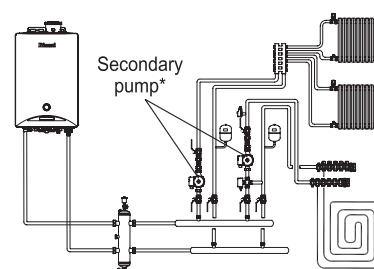
Inrush current: <1.5 A

(Pumps with special and different technical characteristics may cause the improper functioning of the boiler and damage the PCB).

Installation:

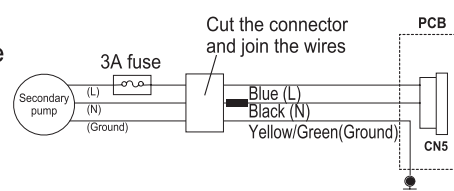
- Unplug the boiler;
- Install the pump into the CH system;
- Connect the pump wire to the blue CN5 connector on the PCB;
- Remove the connector from the free end of the wire and join it to the pump following the electrical scheme on the right side;
- The installation of a 3Amp fuse is recommended.

System connection

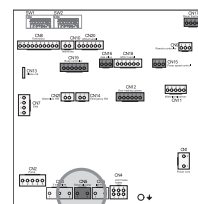


* = it is possible to connect only one secondary pump

Electrical connection of the secondary pump



Main electric board



CN5 (blue) port

1.9 COMMISSIONING THE BOILER



The operations listed below must be carried out only by professionally qualified personnel and only in the presence of professionals.

Below are some general operations for a final verification:

Inspection type	Verification procedure	Notes
General inspections	1. Verify that the product has been installed in accordance with the instruction manual.	The installation must be performed in accordance with the manufacturers instructions.
	2. Verify that the hydraulic circuits are clean before connecting or using the device.	Remove deposits, sediments, dirt or cutting waste.
	3. Check the electrical connection, the flue system, eventual gas or water losses.	
Condensate drain	1. Check the preparation of the condensate drain.	In case of improper connection, the device could be damaged.
Filling phase of systems CH and DHW	1. Open the isolation valve of the hydraulic circuits.	Check for eventual water losses.
	2. Open the load tap of the device.	
	3. Fill the heating circuit until the pressure gauge is on the level (0.5~1.5bar).	
	4. Open the radiator or CH manifold's vent valves	
	5. Vent the air of the circuit until only water flows out.	
	6. Plug the device and wait for the end of the automatic venting cycle.	
	7. Press the buttons CH and DHW to adjust the desired temperature.	
Thermal insulation and trimmings	1. Verify that the pipes are correctly insulated and protected against frost.	
	2. Clean the location when the procedure is completed.	

A copy of the Benchmark commissioning sheet must be provided to the user this can be found in the User Manual; this certificate must be carefully kept together with the product documentation and presented on request during the subsequent technical maintenance operations.

The installer must check on commissioning of the boiler:

- Verify the Declaration of Conformity issued by the installer;
- Check the correspondence between the gas used and the one for which the product is prepared;
- Check that the electrical mains connection (230V, 50Hz) and grounding are correctly performed;
- Verify that the heating system is loaded correctly and at the correct pressure (0.5 ÷ 1.5bar);
- Check that the de-aeration valve is working and the system is well drained;
- Make sure that the boiler operates correctly;
- Check the gas pressures (both for DHW & CH operation) are correct;
- **Check the CO₂ emissions, both maximum and minimal flows;**
- Check if the intake/exhaust system is properly connected and clear of obstruction;
- Seal the gas regulation devices (in case of variation);
- Check the hydraulic circuits tightness;
- Check the aeration in the water heater's location.

In case of negative evaluation of one of these conditions, the commissioning cannot be performed.

1.10 ANTIFROST PROTECTION

The boiler is equipped with an automatic anti-freeze function to protect the heating and DHW heating circuit of the appliance from the cold temperatures.

When the water temperature in the heating circuit drops to 6°C, or the ambient temperature in which the boiler is installed drops to 3°C, a first level of protection activates the pump making it run a four-minute cycle of circulation on the heating circuit and a thirty-second cycle on the DHW circuit.

When the water temperature in the heating circuit falls below 5°C, a second level of protection activates the appliance burner for a maximum period of sixty seconds, or until the temperature of the circuit goes back to 55°C for at least two seconds.

If the temperature of the heating circuit drops to 2°C, or the temperature of the environment in which the boiler is installed falls to 5°C, electrical resistances are activated to protect the DHW circuit.

The frost protection functions are guaranteed only if:

- **The appliance is constantly supplied with an adequate gas flow and is electrically powered;**
- **The boiler is not blocked (error code);**
- **The appliance is not damaged.**

Under the above conditions the boiler is protected against freezing up to an ambient temperature of -20°C.

If the appliance is at risk of freezing due to very low temperatures or if it is not intended to be used for prolonged periods, it is advisable to carry out an emptying procedure.



Particular care must be taken to also protect the condensate drainage system from freezing. It is suggested the use of electric heating elements in particular for the domestic water supply pipes.

All pipes and connections at risk of freezing must be suitably insulated.

Frost damages are not covered by the warranty.

2. MAINTENANCE INSTRUCTIONS

2.1 PARAMETERS MENU



For safety reasons, it is advisable not to modify the parameters of the menus without having fully understood the meaning of the parameters themselves and the consequences produced on the boiler.

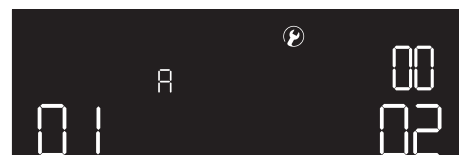
It is recommended to always contact Rinnai UK in advance so as not to damage the boiler or the plant to which it is connected and to exclude potential risks for the user.

Parameter unit of measurement

The value of the displayed parameter is shown on the right side of the WiFi thermostat display:

00 - The value is expressed in hundreds (1 = 100);

02 - The value is expressed in units.



Parameters of B menu

The B menu mainly collects the parameters relating to the use of the boiler:

Nr par.	Parameter	Values	Parameter description	Unit / Default value
1	Gas type	1~4	1: NG - G20; 2: Propane - G31; 3: Air/Propane - G230; 4: GPL - G30.	
2	Hours of combustion in CH mode	0~1999	Total hours of operating in CH.	1 = 100h
3	Hours of combustion in DHW mode	0~1999	Total hours of operating in DHW.	1 = 100h
4	Flame failure during operation	0~1999	Total flame failures during combustion.	
5	Burner ignitions in CH mode	0~1999	Total burner ignitions in CH.	1 = 100 times
6	Burner ignitions in mode DHW	0~1999	Total burner ignitions in DHW.	1 = 100 times
7	Black-out	0~1999	Total detected black-out .	1 = 10 times
8	Gas consumption in CH mode	0~1999	Total gas consumption in CH.	1 = 100 (m ³ or Kg)
9	Gas consumption in DHW mode	0~1999	Total gas consumption in DHW.	1 = 100 (m ³ or Kg)
10	Power limiter CH	Min~100%	The boiler power is limited to the set % value, de-powering the CH function only (range rated boiler).	100%
11	Modulating pump	ON/OFF	Pump operation: modulating flow or max. ON = modulating operation / OFF = max	ON
12	Pump activation	ON/OFF	OFF: pump active during combustion; ON: pump always active.	OFF
13	Switching time DHW-CH 3-way valve	ON = 30 sec OFF = 3 min	Waiting time of the 3-way valve before switching from DHW to CH after the use of hot water.	OFF
14	Room thermostat type	A = closed B = open	Type of contact of the room thermostat. (Closed contact = heat request with closed circuit)	B
15	Earthquake sensor	ON/OFF	Activate / deactivate the earthquake sensor.	ON
16	Chimney sweep function	ON/OFF	Activate the boiler at max power for ten minutes.	OFF

Parameters of C menu

The C menu shows the history of twenty error codes detected (from the most recent one):

Nr par.	Parameters	Values	Parameter description
1	Error code Nr.01	Error code & number of events	Shows: - the last twenty error codes registered (position 1 = the most recent); - the number of events occurred.
2	Error code Nr.02	Error code & number of events	
...			
20	Error code Nr.20	Error code & number of events	
21	Total error codes		Total of all error codes detected.

Parameters of D menu

The D menu shows the value detected by the many sensors of the boiler:

Nr par.	Parameters	Values	Parameter description	Unit / Default value
1	Outdoor temperature	-50°C~50°C	Detected temperature by the external temperature sensor.	°C
2	Flow temperature (CH)	-9°C~161°C	Flow temperature of heating circuit.	°C
3	Return temperature (CH)	-9°C~161°C	Return temperature from the heating system.	°C
4	Hot water temperature (DHW)	-9°C~161°C	Hot water temperature.	°C
5	Antifrost sensor temperature	-50°C~50°C	Detected temperature by the antifrost sensor.	°C
6	Exhaust sensor temperature	-9°C~161°C	Detected temperature by the exhaust sensor.	°C
7	Fan speed (Input)		It shows the rotation speed required to the fan.	RPM
8	Fan speed (Output)		It shows the detected rotation speed of the fan.	RPM
9	PWM of the fan (Input)	0~1023	It shows the PWM of the fan.	BIT

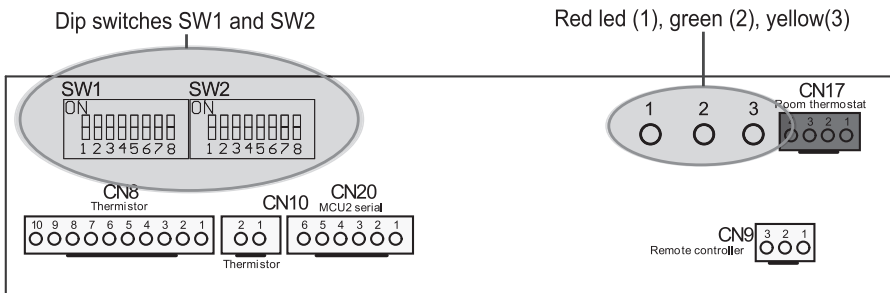
2.2 PCB

The main board (PCB) of the boiler is protected by a plastic cover that must be removed to access to the micro-switches on the board. The circuits of the electronic board are protected by a coating: this particular treatment protects it from stray currents, humidity, dust and tampering, guaranteeing a longer component longevity.



For safety reasons and in order not to damage the boiler itself, every time you work on the PCB it is necessary to disconnect the plug from the electrical outlet: the boiler switch off via the ON/OFF button of the control is not sufficient.

At the top of the PCB, on the left, there are two banks (SW1 and SW2) of eight microswitches each; on the right, there are three LED's of different colours (red, green and yellow).



Meaning of microswitches SW1

Some boiler settings can be changed by changing the sequence of the micro switches on the SW1 bank according to the following table:

Nr.	Bank SW1																
1	OFF	NG (G20)	ON	Prop. (G31)	OFF	Air-prop. (G230)	ON	LPG (G30)	OFF	Not in use	ON	Not in use	OFF	Not in use	ON	Not in use	
2	OFF		OFF		ON		OFF		ON		ON						
3	OFF		OFF		OFF		OFF		OFF		ON		ON		ON		
4	OFF	Model:			ON	Model:			OFF	Not in use			ON	Model:			
5	OFF	REB-KBI2424FF			OFF	REB-KBI2929FF			ON				ON	REB-KBI3535FF			
6	OFF	Low altitude installation (to 900m asl)								ON	High altitude installation (above 900m asl)						
7	OFF	Normal operation mode								ON	Microswitch setting change enabled						
8	OFF									ON							



For safety reasons, the electronic board accepts the changes of the microswitches only if the microswitches no. seven and eight (ON) are enabled in advance; otherwise, the board ignores any change of the microswitches, interpreting their displacement as accidental, involuntary, and the boiler goes to lock, showing the error code 20.

At the end of the changes it is necessary to restore the microswitches no. seven and eight to OFF.

LED meaning

The LEDs of the PCB help as a visual guide during the changes to the microswitches of the bank SW1.

The ignition and the flashing have a precise meaning:

	Red led = gas type	Green led = model	Yellow led = altitude
One blink	NG (G20)	REB-KBI2424FF	Low altitude setting
Two blinks	Propane (G31)	REB-KBI2929FF	High altitude setting
Three blinks	Air/propane (G230)		
Four blinks	LPG (G30)	REB-KBI3535FF	

Meaning of microswitches SW2

Some boiler settings can be changed by changing the sequence of the micro switches on the SW2 bank according to the following table:

Nr.	Bank SW2									
1	OFF	Discontinuous combustion			ON	Continuous combustion				
2	OFF	Not in use			ON	Not in use				
3	OFF	Not in use			ON	Not in use				
4	OFF	Normal combustion	OFF	Forced combustion min	ON	Forced combustion partial load	ON	Forced combustion max		
5	OFF		ON		OFF		ON			
6	OFF	Normal operation mode			ON	Microswitch setting change enabled				
7	OFF				ON					
8	OFF	Not in use			ON	Not in use				



For safety reasons, the electronic card accepts the changes of the microswitches one, four and five only if the six and seven microswitches (ON) are enabled in advance; otherwise, the card ignores any change in the microswitches, interpreting the displacement as accidental, involuntary.

At the end of the operations it is necessary:

- Verify that the microswitches four and five are in 'OFF position';
- Set the microswitches number six and seven back to OFF position.

To preserve the boiler and for safety reasons, after two hours from their activation, the forced-mode combustion settings are ignored and the boiler returns to normal combustion operation.

2.3 GAS CONVERSION AND PRESSURE ADJUSTMENT



This procedure can only be performed by qualified technical personnel.

Any tampering by unqualified personnel will result in immediate forfeiture of the product warranty.

The gas valve assembly and the electronic board are electronically calibrated at the factory during product testing.

The appliance does NOT need to be adjusted during installation.

The conversion procedure to a different type of gas consists of three phases:

1. Modification of the microswitches of the electronic board and selection of the new type of gas;
2. Gas nozzle replacement;
3. Verification of CO₂ and possible regulation of gas pressure (at minimum and maximum forced regime).

Phase 1

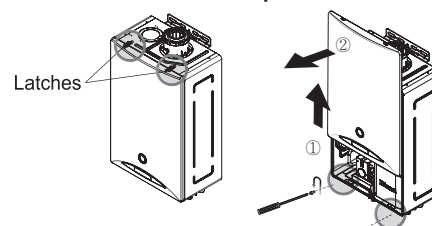
- Close the gas supply valve and disconnect the plug from the socket;
- Remove the front panel;
- Verify that the type of gas selected by the microswitches of the bank SW1 coincides with the gas used in the system:

Nr.	SW1							
1	OFF	NG (G20)	ON	Prop. (G31)	OFF	Air-prop. (G230)	ON	LPG (G30)
2	OFF		OFF		ON		ON	
3	OFF		OFF		OFF		OFF	



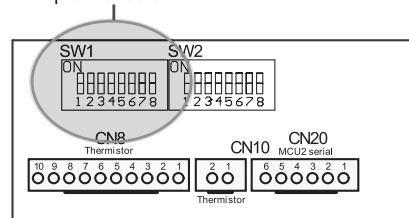
The specific procedure described in PCB paragraph must be followed, in order to make any change to the microswitches effective.

Remove the front panel

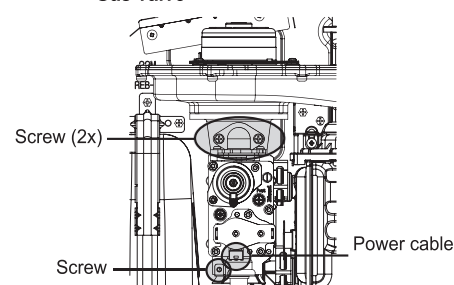


Main electronic board

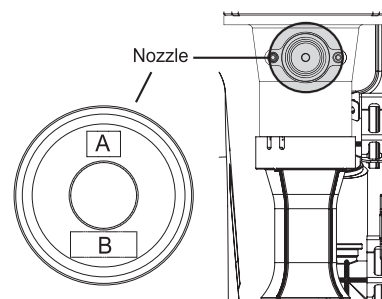
Dip switches SW1



Gas valve



Gas nozzle



Phase 2

- Disconnect the gas valve supply cable;
- Unscrew the screws (3x) that fix the gas valve;
- Remove the valve taking care not to damage the sealing O-rings;
- Replace the gas nozzle:

Model	Letter mark				
	A	B			
REB-KBI2424FF REB-KBI2929FF	29	G20	G30	G31	G230
REB-KBI3535FF	35	G20	G30	G31	G230

- Assemble the gas valve taking care not to damage the o-rings;
- Open the gas supply valve and check that there are no gas leaks from the circuit.

Phase 3

- Connect the plug to the electrical outlet;



The following part of the procedure is particularly sensitive. **To avoid irreparable damage to the boiler, it is necessary to use calibrated equipment and the utmost care: if in doubt, do not proceed further and contact Rinnai UK before proceeding.**

- Remove the combustion test plug cap and insert the combustion analyser probe;
- Turn on the boiler in domestic hot water mode;
- Force the appliance to minimum combustion mode by means of the microswitches of the bank SW2:

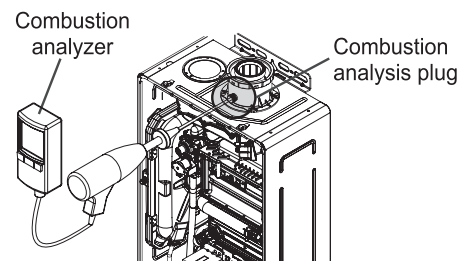
Nr.	SW2							
4	OFF	Norm comb	OFF	Comb. min	ON	Partial load	ON	Comb. max
5	OFF		ON		OFF		ON	



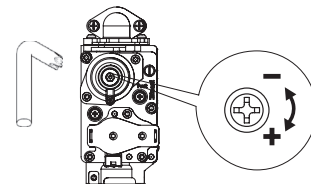
The specific procedure described in PCB paragraph must be followed, in order to make any change to the microswitches effective.

- Compare the CO₂ value detected on minimum forced combustion with the data reported in the paragraph 'combustion parameters';
- If necessary, to modify the CO₂, remove the black cap on the gas valve adjustment screw and turn the screw clockwise to increase (in the opposite direction to decrease);
- Force the appliance at maximum combustion rate by means of the microswitches of the bank SW2;
- Compare the CO₂ value detected on maximum forced combustion with the data reported in the paragraph 'combustion parameters';
- If necessary, to modify the CO₂, remove the black cap of the gas valve adjustment screw and turn the screw clockwise to increase (in the opposite direction to decrease);
- Bring the microswitches of the bank SW2 back to 'normal' mode and switch off the boiler;
- Mount the front panel;
- Update the last row of the appliance data plate (on the right side) by pasting the adhesive corresponding to the type of modified gas.

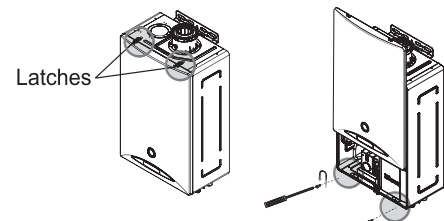
Combustion analysis



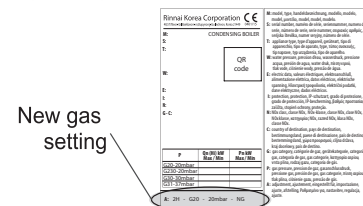
Adjustment of CO₂



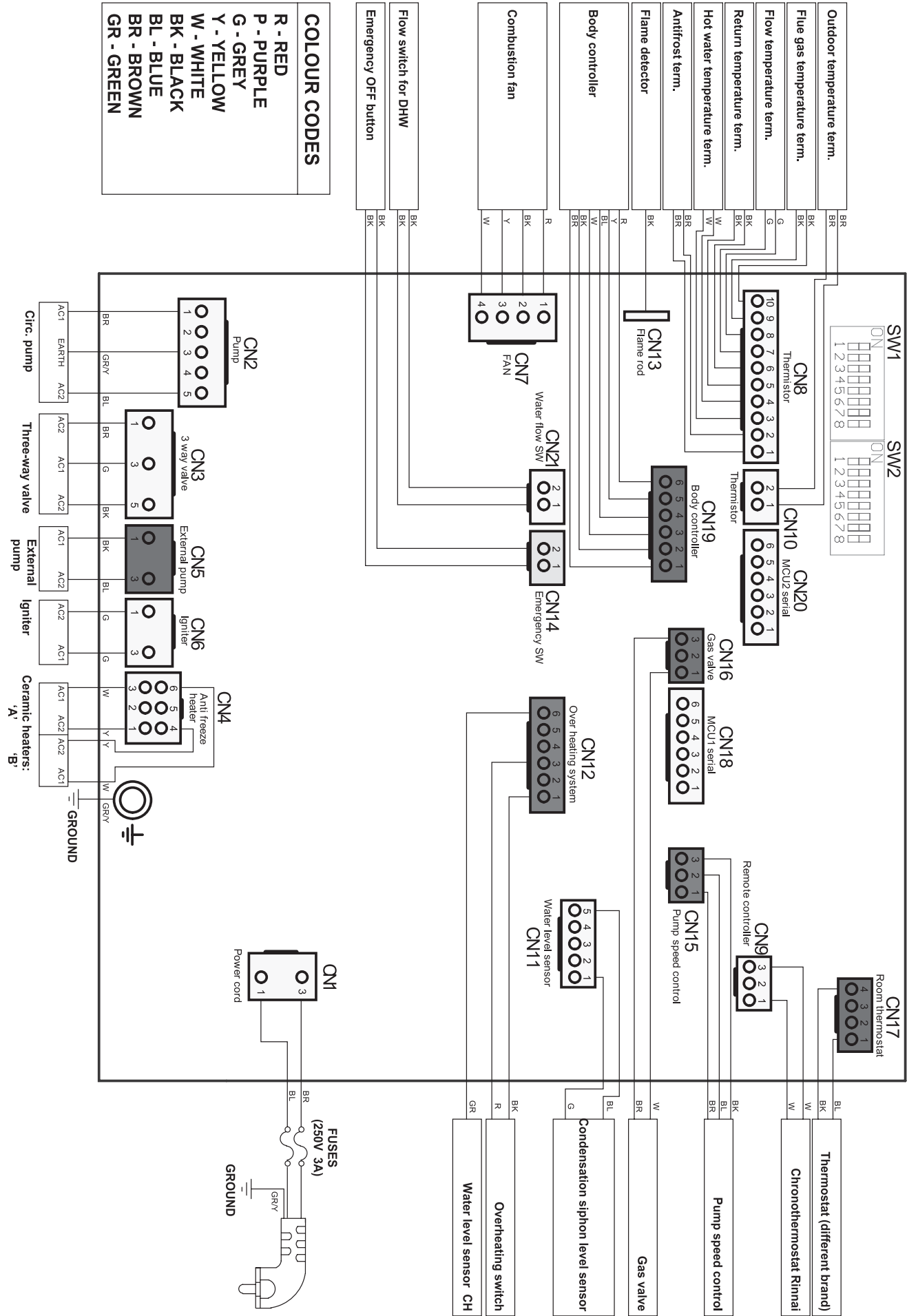
Repositioning the front panel



Data plate update



2.4 WIRING DIAGRAM AND DIAGNOSTIC POINTS



Components	Measuring point		Standard values	Notes
	CN/ Con.re	Wiring colors		
Electric power supply cable	1	Bl-Br	AC 195.5~253V	
Circulating pump	2	Br-Bl	AC 195.5~253V	Working
Three-way valve	3	Br-G	AC 195.5~253V	In mode CH
		Bk-G	AC 195.5~253V	In mode DHW
Anti-freeze resistances	4	Y-W	AC 195.5~253V	Working
External circulating pump	5	Bk-Bl	AC 195.5~253V	Working
Scintillator	6	G-G	AC 195.5~253V	Working
Combustion fan	7	R-Bk	DC 2~54V	Working
		Y-Bk	DC 10~14V	
Anti-freeze thermistor	8	Br-Br	-10°C : 16.5~18.1kΩ 0°C : 9.6~12.2kΩ 10°C : 6.3~7.9kΩ 20°C : 4.2~ 5.2kΩ	Disconnect the thermistor and measure the resistance
Domestic hot water thermistor		W-W	15°C : 11.9~13.3kΩ	Disconnect the thermistor and measure the resistance
Return temperature thermistor CH		Bk-Bk	30°C : 6.7~ 7.41kΩ	
Discharge temperature thermistor CH		G-G	45°C : 4.0~ 4.3kΩ 60°C : 2.4~ 2.6kΩ	
Exhaust temperature thermistor		Bk-Bk	20°C : 0.7~ 0.9kΩ	
Rinnai Chronothermostat	9	W-W	DC 10V~14V	
External temperature thermistore	10	Br-Br	-20°C : 26.7~29.8kΩ -10°C : 16.5~18.1kΩ 0°C : 9.6~12.2kΩ 10°C : 6.3~ 7.9kΩ 20°C : 4.2~ 5.2kΩ	Disconnect the thermistor and measure the resistance
Overheating circuit	12	Bk-Gr	DC 10V~14V	
		R-Gr	DC 10V~14V	
Flame sensor	13	Bk-TERRA	AC 0V	In standby
			AC 50~100V	Working
Emergency switch	14	Bk-Bk	DC 4.5V~5.5V	
Speed control pump	15	Br-Bl	Working pump: DC 0.01V~1.0V Pump off: DC 4.5V~5.5V	
		Bk-Bl	Working pump: DC 0.1V~1.5V Pump off: DC 4.5V~5.5V	
Gas valve	16	W-Br	DC 10V~14V	Measure the voltage with valve ON; Measure resistance with valve OFF
Ambient thermostat (other label)	17	Bl-Bk	DC 4.5V~5.5V	
Body controller	19	Bl-Bk	DC 4.5V~5.5V	
		R-Bk	DC 10V~14V	
Domestic hot water flow switch	21	Bk-Bk	DC 4.5V~5.5V	In standby
		Bk-Bk	DC 0V~0.5V	Working

2.5 TECHNICAL DATA

Model	REB-KBI2424FF	REB-KBI2929FF	REB-KBI3535FF	Unit
CH Input (Max/Min), (G20), (Hi)	24.0 / 5.8	29.0 / 5.8	34.88 / 7.9	kW
CH Input (Max/Min), (G230), (Hi)	-	-	-	kW
CH Input (Max/Min), (G30), (Hi)	24.6 / 5.9	29.7 / 5.9	34.88 / 8.1	kW
CH Input (Max/Min), (G31), (Hi)	24.5 / 5.9	29.6 / 5.9	34.88 / 8.1	kW
CH Output (Max/Min), 80°C/60°C, (G20)	23.2 / 5.3	28.0 / 5.3	33.7 / 7.3	kW
CH Output (Max/Min), 80°C/60°C, (G230)	-	-	-	kW
CH Output (Max/Min), 80°C/60°C, (G30)	23.2 / 5.3	28.0 / 5.3	33.0 / 7.3	kW
CH Output (Max/Min), 80°C/60°C, (G31)	23.2 / 5.3	28.0 / 5.3	33.0 / 7.3	kW
CH Output (Max/Min), 50°C/30°C, (G20)	24.8 / 5.8	30.0 / 5.8	36.1 / 8.0	kW
CH Output (Max/Min), 50°C/30°C, (G230)	-	-	-	kW
CH Output (Max/Min), 50°C/30°C, (G31)	24.8 / 5.8	30.0 / 5.8	35.3 / 8.0	kW
CH Output (Max/Min), 50°C/30°C, (G30)	24.8 / 5.8	30.0 / 5.8	35.2 / 7.3	kW
CH Output @ partial load (30%), return 30°C, (G20)	7.7	9.3	11.2	kW
CH Output @ partial load (30%), return 30°C, (G230)	-	-	-	kW
CH Output @ partial load (30%), return 30°C, (G30)	7.7	9.3	11.0	kW
CH Output @ partial load (30%), return 30°C, (G31)	7.7	9.3	11.0	kW
DHW Input (Max/Min), (G20), (Hi)	24.0 / 5.8	29.0 / 5.8	34.88 / 7.9	kW
DHW Input (Max/Min), (G230), (Hi)	-	-	-	kW
DHW Input (Max/Min), (G30), (Hi)	24.6 / 5.8	29.7 / 5.8	34.88 / 7.9	kW
DHW Input (Max/Min), (G31), (Hi)	24.5 / 5.8	29.6 / 5.8	34.88 / 7.9	kW
DHW Output (Max/Min), (G20)	23.5 / 5.4	28.4 / 5.4	33.1 / 7.4	kW
DHW Output (Max/Min), (G230)	-	-	-	kW
DHW Output (Max/Min), (G30)	23.5 / 5.4	28.4 / 5.4	33.4 / 7.4	kW
DHW Output (Max/Min), (G31)	23.5 / 5.4	28.4 / 5.4	33.4 / 7.4	kW
Efficiency CH (Max/Min), 80°C/60°C, (G20), (Hi)	97.2 / 92.0	97.2 / 92.0	97.2 / 92.2	%
Efficiency CH (Max/Min), 80°C/60°C, (G230), (Hi)	-	-	-	%
Efficiency CH (Max/Min), 80°C/60°C, (G30), (Hi)	94.8 / 89.7	94.8 / 89.7	94.8 / 89.9	%
Efficiency CH (Max/Min), 80°C/60°C, (G31), (Hi)	95.1 / 90.0	95.1 / 90.0	95.1 / 90.2	%
Efficiency CH (Max/Min), 50°C/30°C, (G20), (Hi)	103.4 / 100.7	103.5 / 100.7	103.5 / 101.0	%
Efficiency CH (Max/Min), 50°C/30°C, (G230), (Hi)	-	-	-	%
Efficiency CH (Max/Min), 50°C/30°C, (G30), (Hi)	100.8 / 98.2	100.9 / 98.2	100.9 / 98.5	%
Efficiency CH (Max/Min), 50°C/30°C, (G31), (Hi)	101.1 / 98.5	101.3 / 98.5	101.2 / 98.8	%
Efficiency CH @ partial load (30%), return 30°C, (G20), (Hi)	109.6	109.4	109.2	%
Efficiency CH @ partial load (30%), return 30°C, (G230), (Hi)	-	-	-	%
Efficiency CH @ partial load (30%), return 30°C, (G30), (Hi)	106.9	106.7	106.4	%
Efficiency CH @ partial load(30%), return 30°C, (G31), (Hi)	107.2	107.0	106.8	%
Gas cathegory	II2H3P, II2H3B/P, II2HM3B/P			
Noise level (L _{WA})	43	44	40	dB
NOx class	6			
NOx pondered (G20)	52	50	35	mg/kWh
Expansion tank capacity	8		10	l
Pressure of expansion tank's pre-inflation	1			bar
Working maximum pressure CH - PMS	3.0			bar

Working maximum temperature CH	80			°C
Temperature range CH (mode: flow heating mode / space heating mode)	35-80 / 5-40			°C
Working maximum pressure DHW - PMS	10			bar
Working minimum pressure DHW (portata nominale)	0.7	1.1	1.2	bar
Activation minimum load DHW	2.0			l/min
Temperature range DHW	35-60			°C
Rated flow DHW (ΔT=25°C)	13.5	16.3	19.6	l/min
Rated flow DHW (ΔT=30°C)	11.2	13.6	16.3	l/min
Rated flow DHW (ΔT=35°C)	9.6	11.6	14.0	l/min
Maximum smoke temperature	85			°C
Exhaust temperature @ rated flow CH (80-60°C)	73	73	73	°C
Exhaust temperature @ min flow CH (50-30°C)	45	45	45	°C
Exhaust temperature @ rated flow & max temperature DHW	66	66	66	°C
Exhaust temperature @ min flow DHW & min flow DHW	45	45	45	°C
Exhaust temperature@ rated output CH (80-60°C)	11.7	13.6	17.0	g/s
Mass flow @ min flow CH (50-30°C)	2.8	2.8	4.0	g/s
Mass flow @ rated flow & max temperature DHW	11.7	13.6	17.0	g/s
Mass flow @ min flow DHW & min flow DHW	2.8	2.8	4.0	g/s
Exhaust flue system diameters (intake-discharge)	Coaxial system: Ø60/100 Parallel system: Ø80-80, Ø60-60			mm
Device type	B23, B53, C13, C33, C53, C63, C83, C93 C(10)3, C(12)3, C(13)3, C(15)3			-
Protection class IP	IPX5D			-
Activation power	13	13	19	kW
Max. Time for starting attempt (TSA)	4.0~6.0			s
Receptacle dimensions CH / DHW / Gas	20A / 15A / 15A			
Dimensions (A x L x P)	660 × 440 × 285		660×440×335	mm
Weight (unladen)	33		37	Kg
Electricity supply	230 / 50			V/Hz
Electric fuses (internal)	3.0			A
Electrical absorption (CH / DHW)	83 / 85	100 / 105	95 / 98	W

Model		REB-KBI2424FF	REB-KBI2929FF	REB-KBI3535FF	
Condensing boiler		YES	YES	YES	
Low temperature boiler		NO	NO	NO	
B1 Boiler		NO	NO	NO	
Cogeneration space heater		NO	NO	NO	
Combination heater		YES	YES	YES	
Element	Symbol	Level			Unit
Rated heat output	P_{nominal}	23	28	34	kW
Useful heat output @ rated heat output (80/60°C)	P_4	23.2	28.0	33.7	kW
Useful heat output @ 30% of rated heat output (30°C return)	P_1	7.7	9.3	11.2	kW
Seasonal space heating energy efficiency CH	η_s	92.0	92.1	92.2	%
Useful efficiency @ rated heat output (80/60°C)	η_4	87.5	87.5	87.5	%
Useful efficiency @ 30% of rated heat output (30°C return)	η_1	98.6	98.4	98.2	%
Auxiliary electricity consumption @ full load	el_{max}	0.083	0.100	0.095	kW
Auxiliary electricity consumption @ partial load	el_{min}	0.065	0.066	0.066	kW
Auxiliary electricity consumption in stand-by mode	P_{SB}	0.003	0.003	0.003	kW
Standby heat loss	P_{stby}	0.065	0.065	0.065	kW
Ignition burner power consumption	P_{ign}	0.000	0.000	0.000	kW
Emissions of nitrogen oxides	NO_x	50	50	35	mg/kWh
Declared load profile (DHW)		L	XL	XL	
Daily electricity consumption	Q_{elec}	0.084	0.117	0.122	kWh
Water heating energy efficiency	η_{wh}	84	88	86	%
Daily fuel consumption	Q_{fuel}	14.188	21.916	22.604	kWh

Values setted with gas G20-20mbar - gross calorific value (Hs) - According to Reg.Ue813/2013

2.6 COMBUSTION PARAMETERS

REB-KBI2424FF	Unit	G20	G230	G30	G31
Supply pressure	mbar	20	20	30	30, 37, 50
CH Input Q_n (Max/Min) - (Hi)	kW	24.0 / 5.8	-	24.5 / 5.9	24.5 / 5.9
Gas flow V_m (Max/Min)	m ³ /h	2.529 / 0.611	-	0.741 / 0.178	0.972 / 0.233
CO ₂ (Max) - (front panel on)	%	9.7 ± 0.6	-	12.1 ± 0.6	11.3 ± 0.6
CO ₂ (Min) - (front panel on)	%	9.4 ± 0.6	-	13.0 ± 0.8	10.7 ± 0.7
CO ₂ (Max) - (without front panel)	%	9.6 ± 0.6	-	12.0 ± 0.6	11.2 ± 0.6
CO ₂ (Min) - (without front panel)	%	9.2 ± 0.6	-	12.5 ± 0.8	10.5 ± 0.7
CO/CO ₂ (Max)	ppm	< 300	-	< 800	< 300
CH NO _x @ Q _n - 80°C/60°C	mg/kWh	40	-	180	65
CH NO _x @ 30%Q _n - temp. return 30°C	mg/kWh	30	-	90	40
DHW CO/CO ₂ (Max)	ppm	< 300	-	< 800	< 300
DHW NO _x (Max/Min)	mg/kWh	35 / 30	-	170 / 50	60 / 35

REB-KBI2929FF	Unit	G20	G230	G30	G31
Supply pressure	mbar	20	20	30	30, 37, 50
CH Input Q_n (Max/Min) - (Hi)	kW	29.0 / 5.8	-	29.7 / 5.9	29.6 / 5.9
Gas flow V_m (Max/Min)	m ³ /h	3.056 / 0.611	-	0.895 / 0.178	1.170 / 0.233
CO ₂ (Max) - (front panel on)	%	9.5 ± 0.6	-	12.0 ± 0.6	11.0 ± 0.6
CO ₂ (Min) - (front panel on)	%	9.4 ± 0.6	-	13.0 ± 0.8	10.7 ± 0.7
CO ₂ (Max) - (without front panel)	%	9.4 ± 0.6	-	11.9 ± 0.6	10.8 ± 0.6
CO ₂ (Min) - (without front panel)	%	9.2 ± 0.6	-	12.5 ± 0.8	10.5 ± 0.7
CO/CO ₂ (Max)	ppm	< 300	-	< 800	< 300
CH NO _x @ Q _n - 80°C/60°C	mg/kWh	40	-	180	70
CH NO _x @ 30%Q _n - temp. return 30°C	mg/kWh	30	-	86	50
DHW CO/CO ₂ (Max)	ppm	< 300	-	< 800	< 300
DHW NO _x (Max/Min)	mg/kWh	35 / 30	-	165 / 50	60 / 35

REB-KBI3535FF	Unit	G20	G230	G30	G31
Supply pressure	mbar	20	20	30	30, 37, 50
CH Input Q_n (Max/Min) - (Hi)	kW	34.88 / 7.9	-	34.88 / 8.1	34.88 / 8.1
Gas flow V_m (Max/Min)	m ³ /h	3.676 / 0.833	-	1.051 / 0.244	1.379 / 0.320
CO ₂ (Max) - (front panel on)	%	9.2 ± 0.6	-	12.3 ± 0.6	10.9 ± 0.6
CO ₂ (Min) - (front panel on)	%	8.1 ± 0.6	-	11.1 ± 0.8	9.7 ± 0.7
CO ₂ (Max) - (without front panel)	%	9.0 ± 0.6	-	12.2 ± 0.6	10.7 ± 0.6
CO ₂ (Min) - (without front panel)	%	8.2 ± 0.6	-	11.1 ± 0.8	9.8 ± 0.7
CO/CO ₂ (Max)	ppm	< 200	-	< 800	< 300
CH NO _x @ Q _n - 80°C/60°C	mg/kWh	25	-	120	70
CH NO _x @ 30%Q _n - temp. return 30°C	mg/kWh	20	-	55	40
DHW CO/CO ₂ (Max)	ppm	< 200	-	< 800	< 300
DHW NO _x (Max/Min)	mg/kWh	25 / 15	-	110 / 35	65 / 25


2.7 PRODUCT FICHE

	Power generator			Unit
Supplier's name	Rinnai UK Ltd			
Supplier's model	REB-KBI2424FF	REB-KBI2929FF	REB-KBI3535FF	
	Gas condensing combi-boiler			
Declared load profile - DHW	L	XL	XL	
Seasonal space heating energy efficiency class (η_s)	A	A	A	
Water heating energy efficiency class (η_{wh})	A	A	A	
Rated heat output (P_n) - (80~60°C)	23	28	34	kW
Annual energy consumption - CH (Q_{HE}) - (Hs)	73	88	105	GJ/annum
Annual electricity consumption - DHW (AEC)	18	25	26	kWh/annum
Annual fuel consumption - DHW (AFC) - (Hs)	11	17	17	GJ/annum
Seasonal space heating energy efficiency - CH (η_s) - (Hs)	92	92	92	%
Water heating energy efficiency - DHW (η_{wh}) - (Hs)	84	88	86	%
Sound power level, indoor (L_{WA})	40	44	43	dB

Values setted with gas G20-20mbar - High calorific value (Hs) - According to Reg.UE813/2013

	Temperature control device	Unit
Supplier's name	Rinnai UK Ltd	
Supplier's model	WF-P100W_EU	
Class of the temperature control	V	
Contribution of the control to the seasonal space heating energy efficiency CH	3	%

2.8 DATA PLATE

Rinnai Korea Corporation


48,577Beon-Gil,Baekbeom-ro,Bupyeong-Gu Incheon, Korea 21449

M: CONDENSING BOILER
S:
T:

Wp:

E:
I:
N:
G-C:

P	Qn (Hi) kW Max /Min	Pn kW Max /Min
G20-20mbar		
G230-20mbar		
G30-30mbar		
G30-50mbar		
G31-37mbar		
G31-50mbar		

A:

M: model, type, handelsbezeichnung, modello, modelo, model, μοντέλο, model, model, modelo.

S: serial number, numéro de série, seriennummer, numero di serie, número de serie, serie nummer, σειριακός αριθμός, serijska številka, numer seryjny, número de série.

T: appliance type, type d'appareil, geräteart, tipo di apparecchio, tipo de aparato, type, τύπος συσκευής, tip naprave, typ urządzenia, tipo de aparelho.

Wp: water pressure, pression d'eau, wasserdruck, pressione acqua, presión de agua, water druk, πίεση νερού, tlak vode, ciśnienie wody, pressão de água.

E: electric data, valeurs électriques, elektroanschluss, alimentazione elettrica, datos eléctricos, elektriske spanning, Ηλεκτρική τροφοδοσία, električni podatki, dane elektryczne, dados eléctricos.

I: protection, protection, IP-schutzart, grado di protezione, grado de protección, IP-bescherming, βαθμός προστασίας, zaščita, stopień ochrony, proteção.

N: NOx class, classe NOx, NOx-klasse, classe NOx, clase NOx, NOx klasse, κατηγορία NOx, razred NOx, klasa NOx, classe NOx.

C: country of destination, pays de destination, bestimmungsland, paese di destinazione, país de destino, bestemmingsland, χώρα προορισμού, ciljna država, kraj docelowy, país de destino.

G: gas category, catégorie de gaz, gerätekategorie, categoria gas, categoria de gas, gas categorie, κατηγορία αερίου, vrsta plina, rodzaj gazu, categoria de gás.

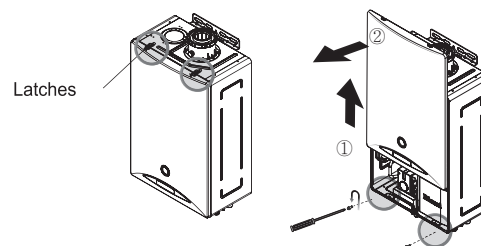
P: gas pressure, pression de gaz, gasanschlussdruck, pressione gas, presión de gas, gas categorie, πίεση αερίου, tlak plina, ciśnienie gazu, pressão de gás.

A: adjustment, ajustement, eingestellt für, impostazione, ajuste, afstelling, Ρυθμιζόμενο για, nastavitev, regulacja, ajuste.

2.9 MAIN COMPONENTS DISASSEMBLY

Front panel

- Isolate the appliance electrically by disconnecting it from the electrical socket;
- Remove the two fixing screws at the base of the panel;
- Unhook the bolts in the upper part;
- Remove the front panel from the boiler body taking care not to damage the pressure gauge: first lift it upwards and then away from the boiler body.



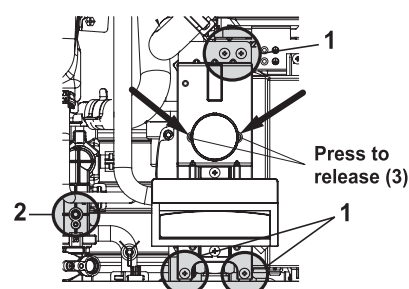
Manometer

- Isolate the appliance electrically by disconnecting it from the electrical socket and closing the heating circuit and gas taps;
- Remove the plastic filter on the flow connection and completely empty the CH circuit of the boiler;



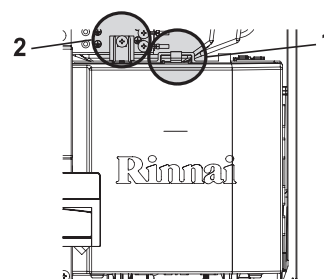
Completely drain the heat exchanger not to flood the boiler during the next phases.

- Remove the front panel;
- Remove the screws (4x) of the fixing plate (1);
- Remove the pressure gauge tube locking screw (2);
- Press the tabs (located behind the plate) to release the pressure gauge (3).



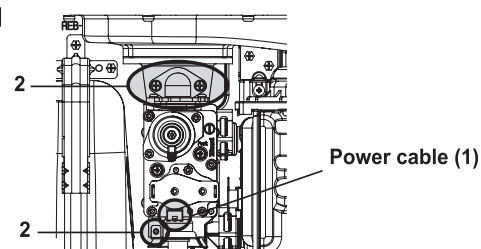
PCB

- Isolate the appliance electrically by disconnecting it from the electrical socket;
- Remove the front panel;
- Remove the plastic protection by pressing the tab (1);
- Disconnect the electrical wiring on the PCB;
- Remove the fixing screw (2) and remove the electronic board.



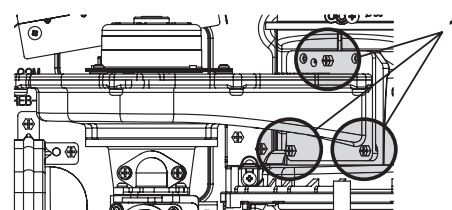
Gas valve

- Isolate the appliance electrically by disconnecting it from the electrical socket;
- Close the gas valve;
- Remove the front panel;
- Disconnect the gas valve electric cable (1);
- Unscrew the screws (3x) that fix the gas valve (2);
- Remove the valve taking care not to damage the sealing O-rings.



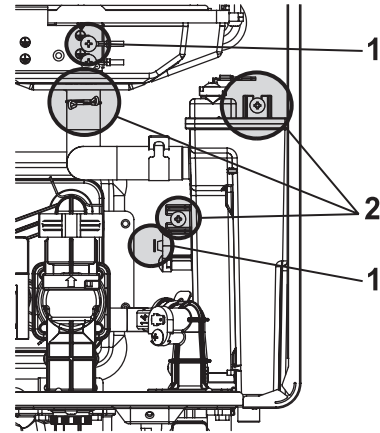
Combustion fan

- Insulate the device by disconnecting it from the electrical outlet;
- Close the gas valve;
- Remove the front panel and the gas valve;
- Disconnect the fan's power cable from the PCB;
- Unscrew the screw (3x) that bolt the fan (1) and remove the fan.



Condensate trap

- Electrically isolate the appliance by disconnecting it from the electrical socket;
- Remove the front panel and the PCB;
- Disconnect the earth cable and the condensate sensor connector (1);
- Unscrew the screws (2x) and the fixing clip of the condensate drain pipe that fix the siphon (2);
- Remove the siphon.



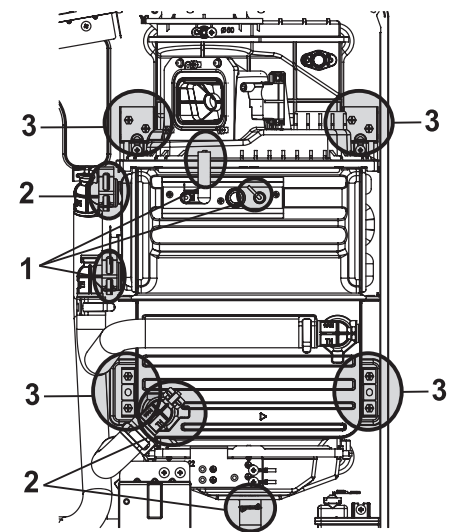
Heat exchanger

- Electrically isolate the appliance by disconnecting it from the electrical socket and closing the cocks of the heating and gas circuit;
- Remove the plastic filter on the flow connection and completely empty the CH circuit of the boiler;



Empty the exchanger completely so as not to flood the boiler in the subsequent disassembly phases.

- Remove front panel, pressure gauge, PCB, gas valve and fan;
- Disconnect the scintillator, overheating switch and flame sensor from the heat exchanger (1);
- Disconnect the fixing clips of the connection pipe to the pump, to the three-way valve and to the condensate siphon (2);
- Unscrew the screws fixing the exchanger to the chassis (3);
- Remove the exchanger.



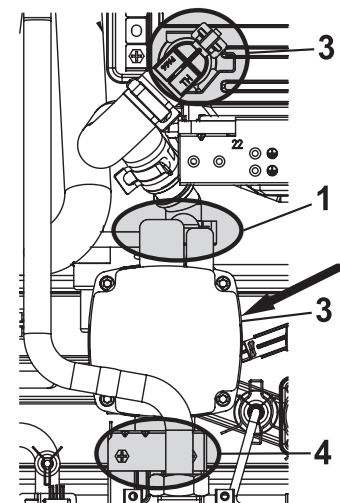
Circulation pump

- Electrically isolate the appliance by disconnecting it from the electrical socket and closing the cocks of the heating and gas circuit;
- Remove the plastic filter on the delivery nozzle and completely empty the CH circuit of the boiler;



Empty the exchanger completely so as not to flood the boiler in the subsequent disassembly phases.

- Remove front panel, pressure gauge, PCB;
- Disconnect the electrical wiring of the pump (1);
- Disconnect the fixing clip of the connection tube to the heat exchanger (2);
- Remove the clip (3) - it remains hidden behind the pump;
- Unscrew the fixing screws of the pump to the chassis (4);
- Remove the pump taking care not to damage the rear seal o-ring.



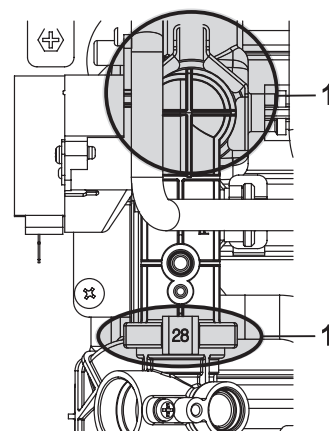
Connection joint - flow

- Electrically isolate the appliance by disconnecting it from the electrical socket and closing the cocks of the heating and gas circuit;
- Remove the plastic filter on the delivery nozzle and completely empty the CH circuit of the boiler;



Empty the exchanger completely so as not to flood the boiler in the subsequent disassembly phases.

- Remove front panel and pressure gauge;
- Disconnect the fixing clips of the joint (1);
- Remove the joint taking care not to damage the upper and lower sealing o-rings.



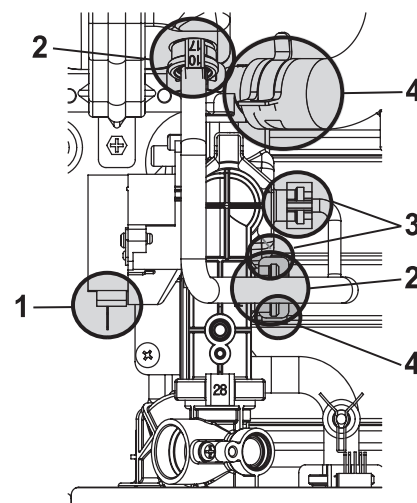
Three-way valve

- Electrically isolate the appliance by disconnecting it from the electrical socket and closing the cocks of the heating and gas circuit;
- Remove the plastic filter on the delivery nozzle and completely empty the CH circuit of the boiler;



Empty the exchanger completely so as not to flood the boiler in the subsequent disassembly phases.

- Remove front panel, pressure gauge and delivery connection joint;
- Disconnect the three-way valve power cable (1);
- The connection tube to the expansion vessel (2) and the by-pass (3) by removing the fixing clips;
- Disconnect the fixing clips to the delivery pipe and to the sanitary exchanger (4);
- Remove the three-way valve taking care not to damage the sealing o-ring.



Connection joint - return

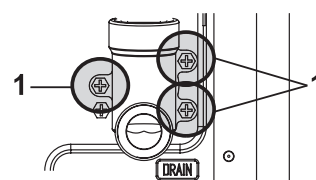
- Electrically isolate the appliance by disconnecting it from the electrical socket and closing the cocks of the heating and gas circuit;
- Remove the plastic filter on the delivery nozzle and completely empty the CH circuit of the boiler;



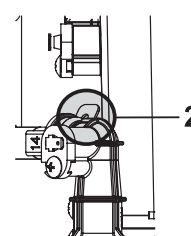
Empty the exchanger completely so as not to flood the boiler in the subsequent disassembly phases.

- Remove front panel and PCB;
- Unscrew the anchor bolts of the return pipe union to the chassis (1);
- Remove the fixing clip to the connection joint to the sanitary exchanger (2);
- Remove the joint.

Bottom view



Front view



Flow switch

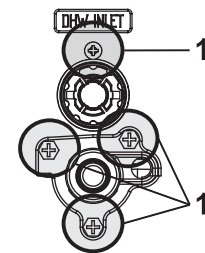
- Electrically isolate the appliance by disconnecting it from the electrical socket and closing the cocks of the heating and gas circuit;
- Remove the plastic filter on the delivery nozzle and completely empty the CH circuit of the boiler;



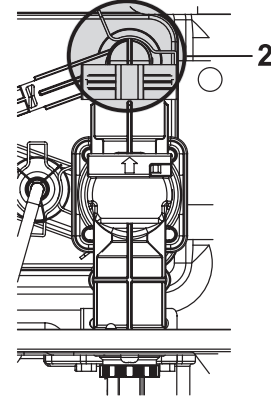
Empty the exchanger completely so as not to flood the boiler in the subsequent disassembly phases.

- Remove front panel and PCB;
- Unscrew the anchor screw of the coupling and the cold water inlet union to the chassis (1);
- Remove the fixing clip of the joint to the sanitary exchanger (2);
- Remove the joint.

Bottom view



Front view



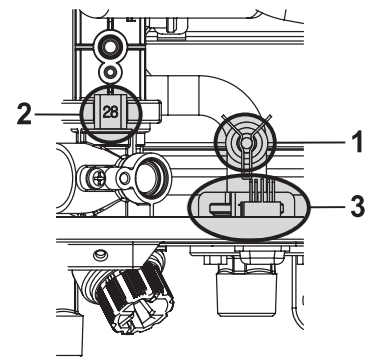
Hot water connection joint

- Electrically isolate the appliance by disconnecting it from the electrical socket and closing the cocks of the heating and gas circuit;
- Remove the plastic filter on the delivery nozzle and completely empty the CH circuit of the boiler;



Empty the exchanger completely so as not to flood the boiler in the subsequent disassembly phases.

- Remove the front panel;
- Remove the hot water sensor fixing clip (1);
- Remove the fixing clip of the joint to the sanitary exchanger (2);
- Remove the fixing clip of the joint to the filler (3);
- Remove the joint.



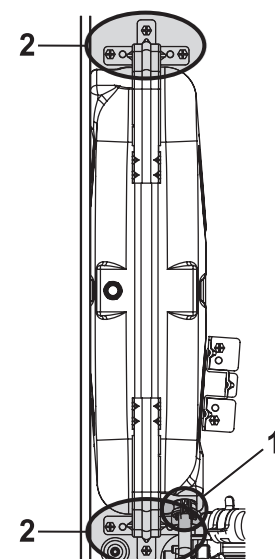
Expansion vessel

- Electrically isolate the appliance by disconnecting it from the electrical socket and closing the cocks of the heating and gas circuit;
- Remove the plastic filter on the delivery nozzle and completely empty the CH circuit of the boiler;



Empty the exchanger completely so as not to flood the boiler in the subsequent disassembly phases.

- Remove the front panel;
- Remove the fixing clips of the connection tube to the expansion vessel (1);
- Unscrew the anchoring screws of the expansion vessel to the chassis (2);
- Remove the vessel.



‘Rinnai WiFi Thermostat’ product fiche

Name of the product		Rinnai WiFi thermostat
Name of the type		WF-P100W_EU
Installation		Wall clamping
Dimensions (mm)		120 (A) x 120 (L) x 16.6 (P)
Weight (gr)		237 (Remote control only)
		460 (With packaging)
Power supply		DC 12V
Temperature regulation	CH	Heating at flow temperature : 35~80°C / Room temperature : 5~40°C
	DHW	35 ~ 47°C adjusted from 1°C and higher than 50°C is adjusted to 50,55, 60°C
Energy consumption (W)		3.5 (Remote control only)
Energy consumption in Stand-by (W)		0.5 (Remote control only)
Frequency range		2412-2472 MHz
Max conveyed capacity		16.95 dBm
Antenna type		PCB Pattern Antenna
Modulation		DSSS, OFDM
Functioning modulation		Duplex
WiFi		IEEE 802.11b/g/n, 2.4GHz
Communication		Network WiFi 2.4GHz with safety protocol WPA, WPA2
Operating temperature		-20°C / 70°C
Builder		Rinnai Korea Corporation 48, BAEKBEOM-RO 577BEON-GIL, BUPYEONG-GU, INCHEON, KOREA Tel. +82-32-570-8300 Fax. +82-32-578-7024 www.rinnai.co.kr

SIMPLIFIED EU DECLARATION OF CONFORMITY

Rinnai Korea Corporation declares that the radio instrumentation WF-P100W_EU complies with the Directive 2014/53/EU.

The full text of the Declaration of Conformity is available on this by contacting Rinnai UK Ltd

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