

# ROC<sup>®</sup>

## Manual for Use, Installation and Maintenance



### Condensing wall mounted gas boiler

#### Suitable for:

- Installer
- Adjustment Personnel
- Maintainer

**CE** 16  
0063

PIN.NO : 0063CR7770

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# 1. Overview

## 1.1 Reading advices

These instructions are suitable for ROC wall mounted gas boilers. To ensure the correct installation, adjustment and maintenance. Please read carefully the general information provided in this instruction, and keep it well.

### To the user

Please ensure you have this complete boiler manual. It provides a record for your boiler adjustment, which provides important information for the installation of after-sales engineering personnel. The manual also supplies the contact information of installer. If you need the guide or face any gas boiler problem during the usage of gas boiler, you can contact with them.

Just like your car, if the boiler is regularly maintained, the boiler will work more reliably and efficiently. We recommend annual inspection, so that this manual will keep the boiler maintenance records.

Your legitimate rights and interests will not be affected.

### To the installer

As a part of boiler adjustment, it is vital that this manual is completed and given to the user. Please ensure that your customer is aware of the importance of keeping the manual safely as a record of the boiler installation and maintenance.

Please ensure that your customer is aware of the correct operation of the system, boiler and controls.

ROC recommends that protective clothing is used when installing and maintaining the boiler, i.e. protective gloves.

For the rejected material which is produced in installation, or when the boiler is at the end of life, please handle properly according to the local regulation.

## 1.2 Customer care

ROC, as a leading manufacturer of domestic and commercial water heating appliances, is committed to providing high quality products and good after sales service.

### Maintenance

The manufacturer's guarantee starts from the purchase date. The guarantee is invalidated if the boiler is not installed in accordance with the recommendations made herein or in a manner not approved by the manufacturer. To assist us in providing you with efficient after sales service, please return the guarantee registration card enclosed with the boiler without delay.

All the boiler installation, adjustment and maintenance must be carried out by professional personnel of compliance with present gas safe(safe and usage) in accordance with the manual provided by us.


Improper installation can result in the loss and injury to persons, animals and personal property, the manufacturer will not take possibility for such . To ensure efficient and safe operation , it is recommend that the boiler is maintained annually by professional personnel.

#### **Notice!**

If you know the boiler is faulty, please do not use it until the fault is resolved by professional personnel.

For the loss and injury caused by failure to comply with instructions, the manufacturer will not take any responsibility .

## 1.3 Advice for the installer

 The boiler installation and first ignition must be performed by qualified personnel in compliance with current national relative installation regulations, and in conformity with any requirements established by local authorities. After the boiler is installed, the installer must ensure that the end user receives the correct declaration and the operation manual, and should provide user all necessary information as to how the boiler and the devices safety should be handled.

This boiler is designed to produce domestic hot water. It should be connected to a heating system and a distribution network for domestic hot water, both of which must be compatible with its performance and power levels.

Unless specified, the usage purpose of the boiler is strictly limited .The manufacturer can not take responsibility for any damage caused by improper, incorrect and unreasonable usage of the appliance or by the failure to comply with the instructions given in this manual.

Installation, maintenance and all other work must be performed in full conformity with the governing legal regulations and the instructions provided by the manufacturer. Incorrect installation can harm persons, animals and possessions. Once you open all packaging, make sure the boiler is intact and that no parts are lost. If there is lost case, please contact with your supplier.

Keep all package materials (clips, plastic bags, polystyrene foam etc.) out of the reach of children, as it may cause a potential hazard. If the boiler occurs fault and malfunction , please turn it off, then turn off the gas valve, and do not attempt to repair it by yourself. Please contact with a qualified professional personnel instead.

Before performing any maintenance or repair work on the boiler, make sure you have pulled out the power plug, disconnected power supply, turned off the gas control valve . When you finish these work, please ask the qualified technician to check the pipework and boiler efficiency.

All the maintenance should only be used original spare parts, and be carried out by a qualified professional. Failure to comply with the above instructions could affect the safety of the boiler and partial liability failure of the manufacturer.

Use a cloth dampened with soapy water to clean external boiler. Do not use aggressive detergents, insecticides or toxic products. If the boiler is used in full compliance with current legislation, it will operate in a safe, environmentally-friendly and energy-saving manner. If using external devices or optional accessories, Please make sure they are safe.

## 1.4 CE symbol



CE symbol, make sure the boiler is in conformity with boiler CE directive  
2009/142/EC Relative gas appliance  
2014/30/EU Relative electromagnetic compatibility  
2009/125/EC Relative energy efficiency  
2014/35/EU Relative electrical safety



## 2. Safety regulation

### 2.1 Usage condition

This boiler is only for indoor installation, domestic heating and domestic hot water supply. In addition to this, other installation and usage do not meet the requirement.

The normal usage requirement for boiler is: power supply is 230V~/50Hz, Power supply capacity is more than 10A, there must be a really grounded socket. Natural gas users require the pre-furnace dynamic pressure is 17 mbar - 25 mbar; and tap water supply pressure is 1.2-2.0 bar. If failure to meet the above requirements, it may result in that the boiler can not work normally.

### 2.2 Installation and adjustment

The boiler installation, adjustment and maintenance must be carried out by the qualified personnel in accordance with local gas safety (installation and use). The technicians who undertake adjustment and maintenance must be authorized by the manufacturer.

If the boiler is installed in a small compartment, please do not block the dedicated vents and do not use this compartment as storage room.

### 2.3 When the gas smell is found

If you smell a gas smell or suspect a gas leakage, please operate it as these below steps:

- Turn off the boiler;
- Do not turn on or turn off any power switch in a hazardous area;
- Do not smoke or turn on any equipment that creates sparks in hazardous areas;
- Turn off the gas supply valve on the gas pipework;
- Ventilate the room;
- Contact with your boiler supplier or after-sales service.

## 2.4 When making modification work around the gas boiler

The following components can not be changed:

- Wall mounted boilers;
- Gas supply pipework, water supply pipework or power supply line;
- Air inlet /Smoke exhaust system;
- Safety valve for heating system;
- Any structural changes round the boiler that affect the boiler safety.

Please do not move the boiler or change the boiler usage after finishing the installation and adjustment of your boiler.

Boiler adjustment and maintenance can only be carried out by a specialist authorized by ROC distributor. Parts replacement must be used original spare parts. This is a necessary condition for boiler warranty and maintenance.

## 2.5 Far from inflammable and explosive materials

Do not use or store any flammable or explosive materials (such as gasoline, paper or paint) near the boiler.

### **Attention!**

Exhaust pipes and flammable substances must be kept sufficient distance to prevent flammable substances temperature from rising to 80 °C above.

## 2.6 Check boiler

You should make maintenance on boiler every year. It is recommended that you make an appointment with ROC distributor before heating each year.



## 3. Product description

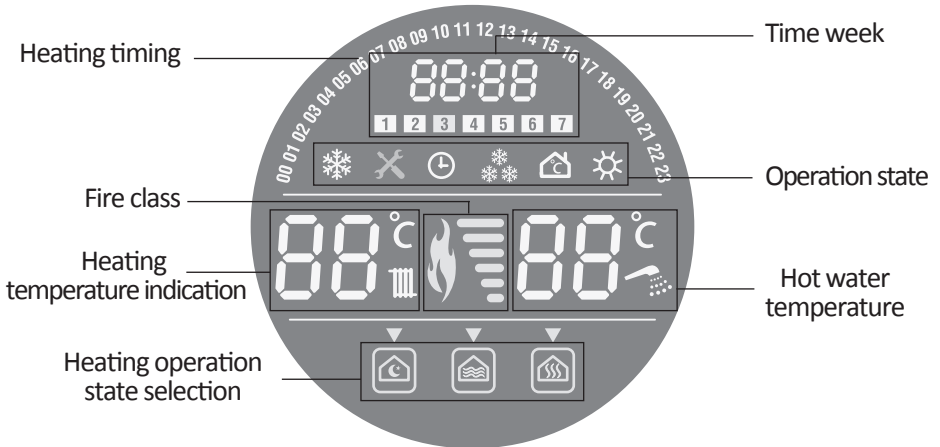
### 3.1 Control panel



- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8

- 1. Timing
- 2. Function switch
- 3. Up
- 4. ON/OFF (Power)
- 5. Information indication display
- 6. Down
- 7. Reset
- 8. Mode

### 3.2 Display



Winter mode



Malfunction



Timing



Anti-freeze



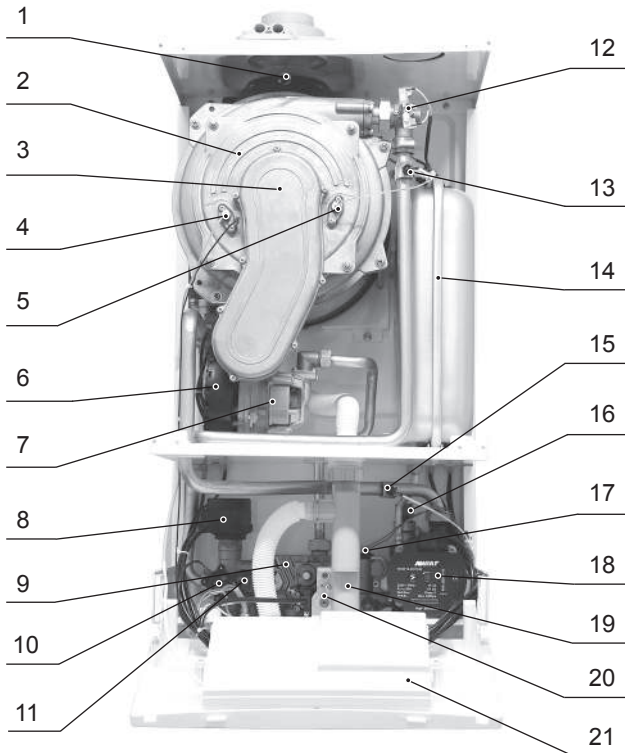
Indoor temperature control



Summer mode



### 3.3 Inner structure



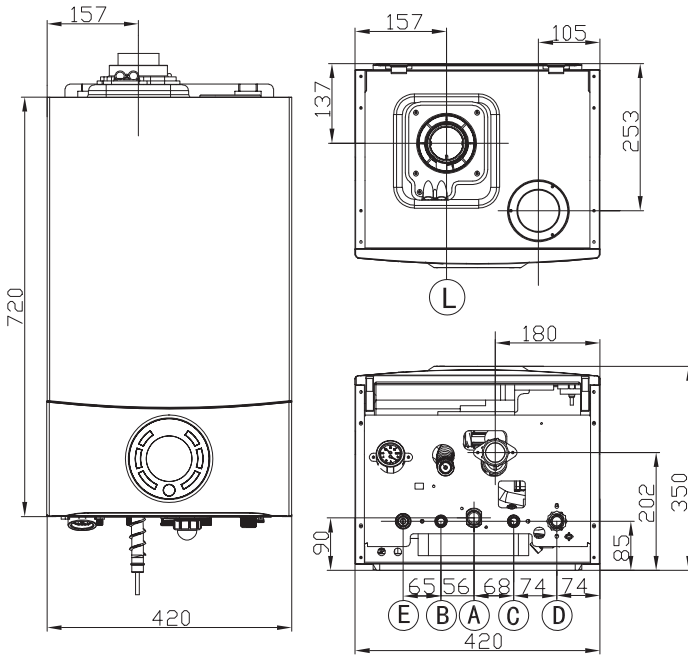
1. Flue temperature sensor
2. Heat exchanger
3. Burner
4. Ignition needle
5. Flame detection needle
6. frequency conversion fan
7. Gas and air mixer
8. Three way valve motor
9. Plate heat exchanger
10. Water pressure switch
11. Hot water temperature sensor

12. Overheat protector
13. Heating temperature sensor
14. Expansion tank
15. Back water temperature sensor
16. Safety relief valve
17. Water flow volume inductor
18. frequency conversion pump
19. Siphon
20. Gas valve
21. Electrical box

### 3.4 Overall dimension and outlet position map

Unit: mm

● **LL1GBQ24-B26CG**



- A. Gas      B. Domestic hot water      C. Cold water  
 D. Heating back water inlet      E. Heating water outlet

### 3.5 Technical data

<b>Model</b>		<b>LL1GBQ24-B26CG</b>
Gas boiler type	-	Domestic condensing gas boiler
Gas boiler type	-	C <sub>13</sub>
Gas type	-	I <sub>2H</sub>
Using gas	-	2H-G20-20 mbar
No <sub>x</sub> level	-	6
<b>Capacity</b>		
Nominal heat input (Qn)	kW	24.8
Nominal heat output (Pn)	kW	24.0
Nominal condensing output (50/30°C)	kW	26.0
Minimum heat input (Qr)	kW	5.0
Minimum heat output (Pr)	kW	5.0
<b>Efficiency</b>		
Normal heat efficiency (80/60°C)	%	96.8
Normal heat efficiency (50/30°C)	%	106.4
Heat efficiency of 30% capacity	%	108.8
<b>Technical data</b>		
Normal capacity gas consumption volume (NG)	m <sup>3</sup> /h	2.60
Flue gas temperature (NG)	°C	69
Anti-frost protection system start temperature	°C	5
Minimum domestic hot water volume	kg/min	2.5
Sanitary water maximum pressure	MPa	0.8
Sanitary water minimum pressure	MPa	0.02
Expansion tank capacity	L	6.5
Expansion tank preset pressure	MPa	0.1
Heating system maximum pressure	MPa	0.3
NG normal pressure	KPa	2.0
<b>Performance</b>		
Heating water maximum temperature	°C	85-30
Hot water maximum temperature	°C	60-30
Hot water rate ( $\Delta T=30^{\circ}\text{C}$ )	kg/min	11.2
<b>Electric circuit</b>		
Supply voltage/frequency	V~/Hz	230/50
Input electric power	W	80
Protection level		IPX4D



## 4. Boiler installation

### 4.1 Reference standard

In Europe, all boiler installation and adjustment should be performed by professional authorized by ROC company according to actual installation standards, and make sure it is compliance with safety and health standards.

### Hazardous Substances Control Regulations

The material used in the production of this boiler is harmless and requires no special care during maintenance.

Avoid installing the boiler in the air inlet which may be polluted by chemicals such as chlorine (swimming pool) or ammonia (barber shop), or alkali (laundry).

### 4.2 Ventilation

The room in which the boiler is installed does not require specific ventilation. If the boiler is installed in a cupboard or compartment ventilation is not required for cooling purposes.

### 4.3 Gas supply

The gas installation and tightness test must be in accordance with relative requirement . Ensure that the pipe size is adequate for demand including other gas appliances on the same supply.

### 4.4 Power supply

Boiler requires to use of 230V/50Hz AC, after confirming the voltage, and connect the power plug (voltage requirements  $230V \pm 15\%$ , it is suggested the users with instability voltage and high or low voltage to equip with a power regulator).

### **WARNING:**

To avoid the risk of electrical leakage, the socket used for connection to this product must have a good grounding device.

## 4.5 Water supply

The boiler is only suitable for sealed systems. The maximum working pressure for the boiler is 6bar. All fittings and pipework for the boiler should be of the same standard. If there is a possibility of the incoming mains pressure exceeding 6bar, particularly at night, then a suitable pressure limiting valve must be fitted.

### Shower

Any shower valves used with the boiler should be of a thermostatic or pressure balanced type. Refer to the performance guidance and adaptability of shower manufacturer.

### The following notes are given for general guidance:

If the boiler is installed on the existing system, any unsuitable additives must be removed. Under any circumstances, the boiler must not be ignited before the system is completely flushed.

In hard water areas or systems containing large amounts of water, it is necessary to carry out water treatment to prevent scale formation in the main heat exchanger. The formation of scale can greatly affect the efficiency of heat exchanger, because small areas of scale can cause a high increase of the temperature in the metal parts and therefore increase the heat pressure of heat exchanger. Dematerialized water is more aggressive in this situation, it is necessary to treat the water with an appropriate preservative.

Any treatment of water using additives in the system for anti-freezing protection or for anti-corrosion has to be absolutely suitable for all metals in the system.

If anti-freezing substances are to be used in system, check carefully that they are compatible with the metals used in the circuit.

Periodically check the PH balance of water/anti-freeze mixture of the boiler system and replace it when the tested amount is out of range stipulated by the manufacturer ( $7 < \text{pH} < 8$ ).

**DO NOT MIX DIFFERENT TYPES OF ANTI-FREEZE.** In floor heating system, through the use of plastic pipe with anaerobic infiltration protection on the walls and through the formation of oxides and bacterial agents, it can cause corrosion of the systems metal parts (metal piping, boiler etc.)

To prevent this problem ,it is necessary to use the pipes with an “oxygen proof barrier”. If pipes of this kind are not used, keep the system separate by installing heating exchangers of those with a specific system water treatment.

## **IMPORTANT**

Failure to carry out the water treatment procedure will invalidate the boiler guarantee.

## **System controls**

The boiler is electrically controlled and is suitable for most modern electronic time and temperature controls. The adding of such external controls can be beneficial to the efficient operation of the system.

## **Installation position**

The boiler can be installed on any suitable internal wall (sound proof is required when installing onto a stud partition wall). Provision must be made to allow for the correct routing of the flue and sighting of terminals to allow the safe and efficient removal of the flue products. A compartment or cupboard used can be built or modified for this purpose. It is not necessary to provide permanent ventilation for cooling purposes.

## Condensate Discharge

The condensate discharge pipe from the boiler must have a continuous fall of 2.5° and must be inserted by at least 50mm into a suitable acid resistant pipe –e.g. plastic waste or overflow pipe. The condensate discharge pipe must have a minimum diameter 22mm, must have a continuous fall and can be installed to prevent freezing.

- i) Connect into an drainage vertical pipe (at least 450mm above the inverted pipe). Spray gun is matched in the pipe.
- ii) A trap giving a water seal of at least 75mm must be incorporated into the pipe run, there also must be an air beak upstream of trap.
- iii) Connect into the sewage system of building such as a washing machine or underground sewage pipe. The connection of washing machine must be upwards. If the connection is downwards, then the sewage pipe should leave an additional net, and supply a minimum water seal of 75mm and an air port must be incorporated with the pipework, as above.
- iv) Terminate into a gully, below the net but above the water level
- v) Enter into a sewer

## 4.6 Install the boiler

Please check that you are familiar with the installation requirement before commencing work.

The installation accessories described in the following list are included in the boiler package:

Boiler Box:	<ul style="list-style-type: none"><li>● Gas boiler</li></ul>
Installation bag:	<ul style="list-style-type: none"><li>● Hanging plate</li><li>● Expansion screws (used to fix the hanging plate)</li></ul>
Flue Box:	<ul style="list-style-type: none"><li>● coaxial 1m terminal flue</li><li>● 90° coaxial elbow</li></ul>
Accessory bag:	<ul style="list-style-type: none"><li>● User's manual</li><li>● Warranty card</li></ul>

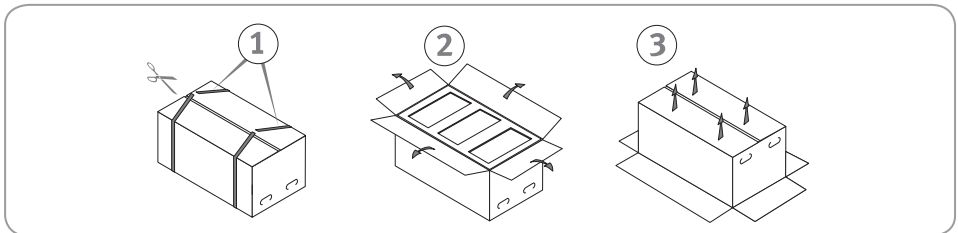
## 4.7 Pay attention to noise control during installation

Please comply with the relevant national or region standard or guidelines when installing the wall mounted gas boiler. The noise of installation should be controlled within the local standard requirement, pay special attention to the any noise control time zones.

## 4.8 Open the box

The boiler was packed in a hard box with foam protection. Pay attention that the arrow in the carton should be down when opening the box. (Refer to below diagram)

( FILLING LOOP NOT SUPPLIED )



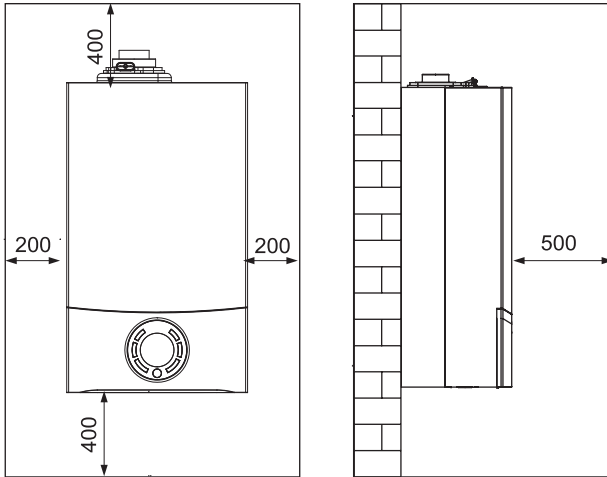
Picture 5.1 Diagram of opening package



## 4.9 Minimum distance of installation and maintenance

Both the installation and maintenance of the boiler must keep at least the following distance(refer to picture 5.2)

- Bottom distance 400mm
- Side distance 200mm
- Top distance 400mm
- Front distance 500mm



Picture 5.2 minimum distance of installation and maintenance.

- We advise that the minimum distances from inflammable materials is 500 mm.
- If the wall is sensitive to heat source such as the wood board,it should be protected by suitable insulation.
- When the gas boiler is installed above other device,the distance between the outside case of the gas boiler and other device should not less than 300mm.
- To reduce any unexpected noise, the gas boiler should be firmly installed, handle well the installation of the pipe, the special attention is that to discharge the air inside the heating pipeline.

### **▲ Note**

Be sure to check the minimum distance required above before installing the boiler. After finishing installation, if you need to make construction or alternation around the boiler(such as decoration etc),please also ensure that it is such minimum distance, otherwise it may affect the usage and maintenance of the boiler in the future.

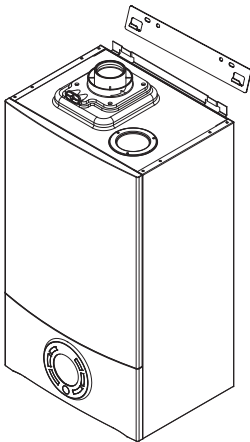
## 4.10 Dimension of flue mounting hole

The boiler should be installed on the vertical, flat, and solid load-bearing walls. Check the load-bearing capacity of all fasteners.

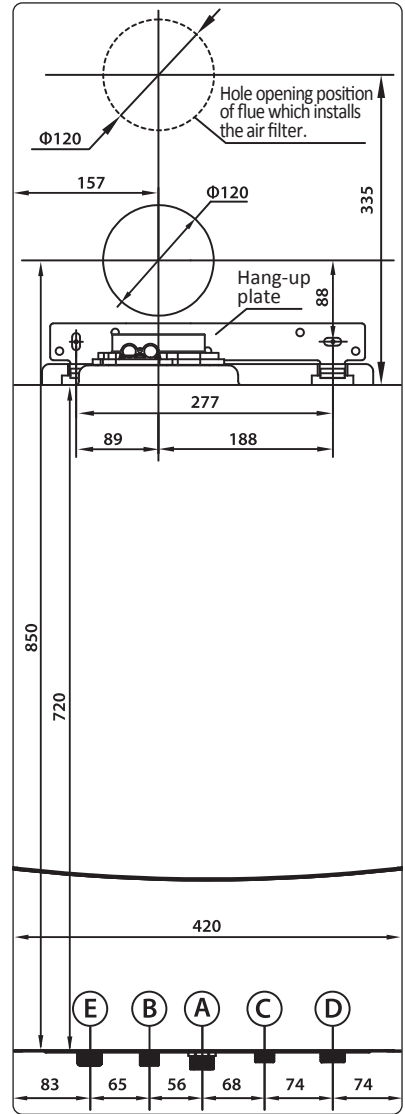
Determine the position of installing the inlet / exhaust balanced flue and mark it on the wall.(see picture 5.3)

**Tips:** the boiler shall not be installed on the combustible wall surface.

- Use the drill to make a hole with a diameter of 120mm in  $\Phi 120$  position and pass through the wall, which is used for installing forced draught flue.
- Use expansion bolts to fix the product hang up plate on the walls.
- Lift the boiler up, so that the two square holes behind horizontal hanging beam are corresponding to the hooks on the wall. And close to the wall , then put down the boiler lightly to make this two square holes of horizontal hanging beam to enter into the hook. (see picture 5.4).



Picture 5.4 Installation diagram



Picture 5.3 The mounting hole

## 4.11 Installation of the inlet/exhaust flue

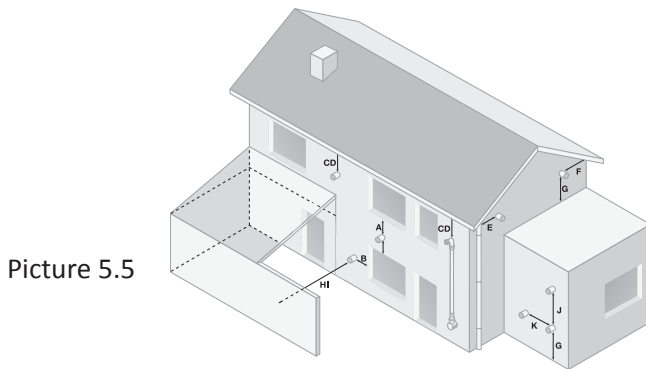
In addition to boiler , ROC distributor also supply a variety of treatment options for terminal installation of inlet/exhaust flue. Without these terminals, the boiler can not operate.

When the user buy flue himself, please read the installation manual which the flue is attached carefully. or refer to this manual but something to note here is keep the performance and soundness of boiler and flue gas pipe at end of the work.

**⚠ Note:** The boiler must be installed so that the flue terminal is exposed to outdoor air. The terminal must not discharge into another room or space such as an outdoor toilets or huts.

It is important that the flue terminal must leave a free passage for air circulation. The flue terminal installation should consider the damage or discoloration to surrounding building, and the flue must be installed in the place where the damage is impossible to occur. In cold or humid weather, water vapor can condense and leave on the flue terminal. The effect of such “steaming” must be considered.

If the flue terminal is less than 1 meters away from the balcony, ground or flat roof where people can access, then a suitable stainless steel terminal protective cover must be fitted. The minimum acceptable spacing from the flue terminal to obstructions and ventilation port are specified in diagram below.



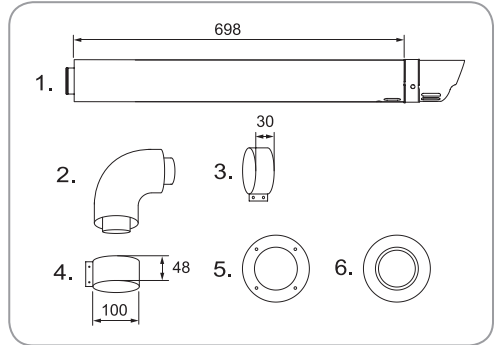
Picture 5.5

- |   |         |
|---|---------|
| ● A Directly below an open window etc           | 300 mm  |
| ● B Horizontally to an open window etc          | 300 mm  |
| ● C Below gutters, sewage pipes or drain pipes  | 75mm    |
| ● D Below eaves                                 | 200mm   |
| ● E Vertically to drain pipes or sewage pipes   | 75 mm   |
| ● F From internal or external corner            | 300 mm  |
| ● H From a surface facing the terminal          | 500 mm  |
| ● I From a terminal facing a terminal           | 500 mm  |
| ● J Vertically to a terminal on the same wall   | 1500 mm |
| ● K Horizontally to a terminal on the same wall | 300 mm  |

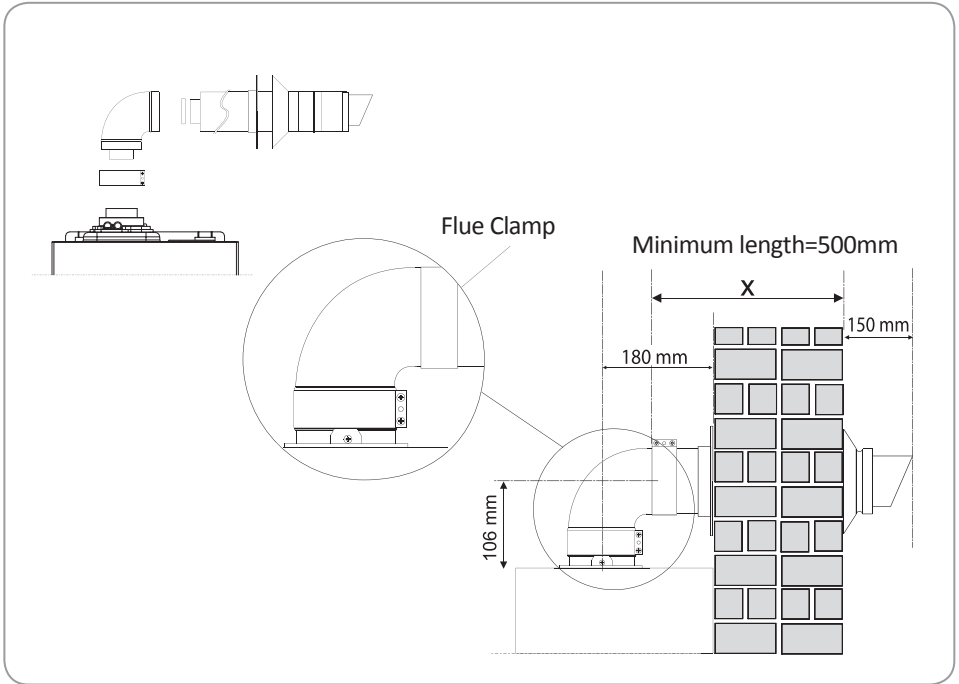
# Flue system

Standard 1000mm flue system includes:

- 1. Seal for horizontal flue duct and external wall
- 2. 90° elbow
- 3. 30mm flue clamp
- 4. 48mm flue clamp
- 5. Internal trim ring
- 6. External wall seal



# Standard flue installation



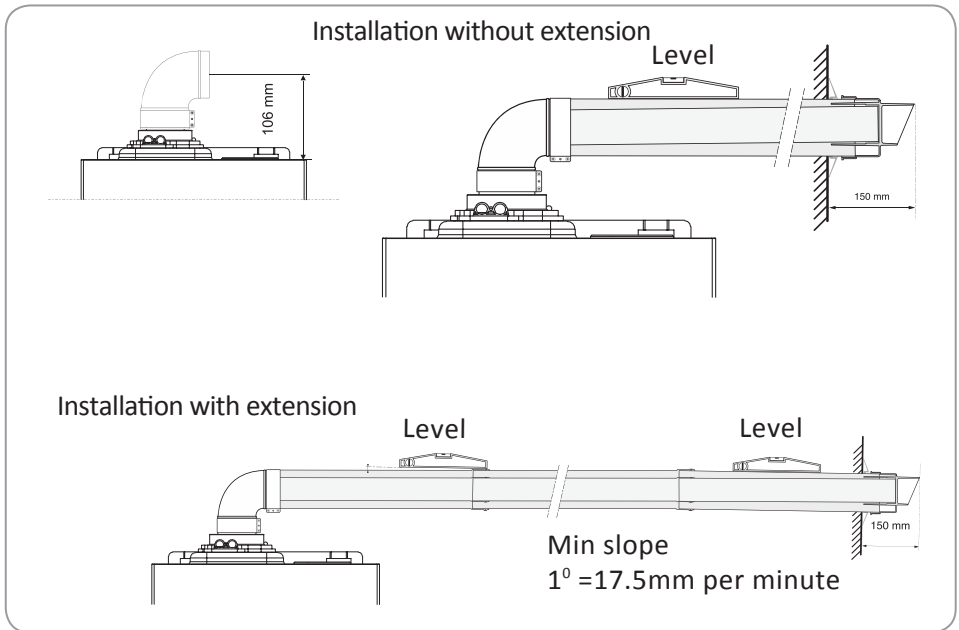
**⚠ Note:**

The flue shall not contact with or close to flammable material, and must not pass through the walls or building structures made of flammable material. When replacing an old boilers, the flue system also must be changed.

**⚠ Important**

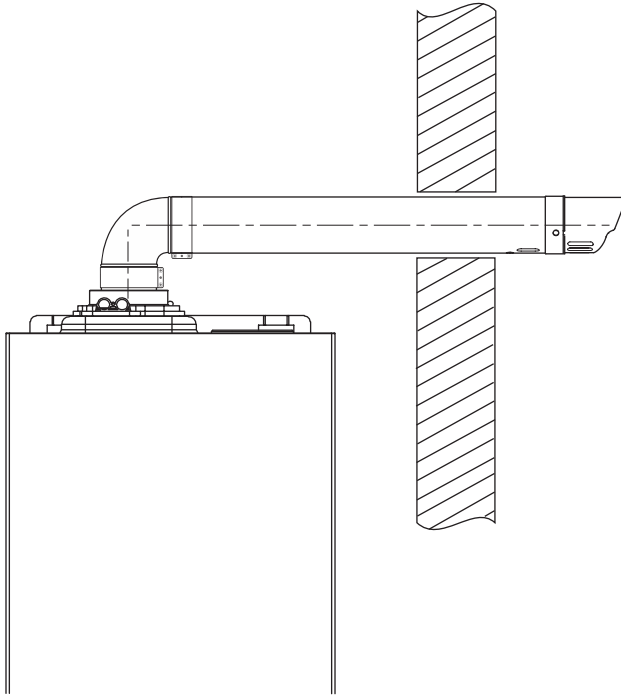
Ensure that the flue is not blocked.

Ensure that the flue is installed and fixed in accordance with below these instructions.



Coaxial pipe room accessories( $\Phi$ 60/100 level):

- 1×Silicon O ring(60mm)
- 1×Elbow (90°)
- 2 ×Include wall seal ring (internal and external)
- 1×Flue include terminal (1m-60/100)
- 2×Flue clamp
- 4 ×Screw
- 2×Seal ring



Picture 5.6

The boiler has been fixed on the wall ,and fix the flue rubber ring inside the flue connector, and insert elbow into flue sleeve and then rotate it to required position.

Tip: in the vertical axis of flue, the elbow can rotate with 360°

Before installing the flue, ensure the maximum length of flue ducting does not exceed 5m (see picture 5.6),and consider all of elbows and its bend. You should reduce the maximum length of the flue by 1m for each 90 ° elbow and 0.5m for each 45° elbow.

If the flue is bought by the users,it should meet the above requirement.

## 4.12 Installation of pipework

### Gas pipework connection

#### **Note:**

Please ensure that labels used on the package and the technical nameplate on the boiler corresponds with regulation of countries using this kind boilers, and that the gas category designed for this boiler corresponds to available gas category in the country where will use this kind boiler.

The tightness of gas pipeline valve must pass 50mbar maximum pressure detection! In the installation of gas pipeline ,you must firstly cut off the gas main valve, so as to avoid gas leakage!

The minimum diameter of gas supply pipe to must ensure that when the boiler operates with maximum power, the gas at the boiler entrance is not low than 20mbar.

### Water way connection

Before connecting the cold water pipe, make sure that the relative pipe system has been thoroughly washed. If not, please firstly thoroughly wash hot and cold water pipeline.

Check that the maximum water pressure of tap water does not exceed 6bar; if it exceeded, you must install a pressure relief valve.

Before connecting the heating pipeline with the boiler , the pipe and radiator must be washed strictly , and remove the foreign substance in the pipeline. Otherwise, these foreign substance will be deposited in the boiler which causes failure! At the same time ,make sure that the heating system has been made bulge test to ensure the tightness of the pipeline.

When installing the pipeline connector, you must be careful not to use stress, in order to avoid leakage of heating equipment.

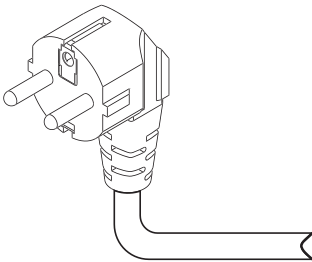
## Safety relief valve

The heating safety relief valve port must be connected with floor drainage by using pipe, otherwise when the safety relief valve discharge water ,it may injury the passerby and articles. The boiler manufacturer will not take any responsibility for this.

## 7m frequency conversional pump.curve



### 4.13 Power supply connection



The boiler uses the power of 230 V ~ /50Hz.



- Please obey the following steps when operate the gas boiler:
  - Do not touch the boiler with parts of the body that are wet or damp and/or bare feet;
  - Do not pull the power wires.
  - Do not expose the boiler to the sun and rain directly, unless it is specified clearly.
  - Do not allow children or inexperienced people to use the boiler.
- User should not change the power wires. If the power wire has been damage, please turn off the boiler. Ask an installer/engineer to change the power wire.
- For boiler electrical safety, please make the correct earth connection with accordance to local safety rules.
- The above basic safety requirements must be checked. If you have any questions, please ask the installer/engineer to check the boilers carefully. The manufacturer will not take any responsibility for any losses due to the lack of earth connection.
- Ask the installer/engineer to check the circuit line, make sure the circuit can match the maximum power capacity of the boiler. The maximum capacity is indicated in the technical label.
- Please use the plug and socket which comply with the local norms , do not use multi hole sockets, extension cords or adaptors when connecting the boiler with power. Use a two-phase switch when connecting to the power grid, the distance between the contact points should be at least 3mm, which as stipulated in the current safety rules regulations.

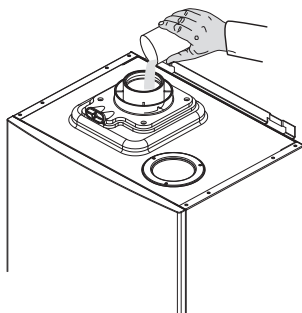


## 5. Boiler adjustment

**⚠ Warning:** The boiler can only be used for domestic hot water and indoor heating! The boiler was designed for indoors installation according to the current laws and regulations, so it cannot be installed and used outdoors. If the boiler is installed in outdoor environment, it will cause bad operation and even damage of boiler. The boiler should only be installed on closed, flat, and vertical load-bearing wall, and obey the minimum distance required for installation and maintenance. Above minimum distance is indicated in this instruction.

**⚠ Note:** Before using boiler first time, the water tank should be filled with water. Therefore, before fixing the flue system, 1/4 liter of water should be poured into the water tank through flue outlet, or open the cover at the bottom fixed position for boiler, then pour into water and close the cover.

**⚠ Warning:** Insufficient water in the tank can cause smoke to discharge into surrounding air in a short time.



At the same time, before supplying heating/domestic hot water to the users, the boiler should be connected to a heating supplying network, heat radiation device and/ or domestic hot water supplying network which match the function and capacity of the gas boiler. Before connecting the gas boiler to the system, please ask the installer/engineer to make the following operation:

- a) All of heating system pipeline must be completely washed, Any residues or dirty object in the pipe will affect the boiler's operation.
- b) Check if the current gas type is suitable for the gas boiler. Check if the instructions in the package and technical data for the applicable gas type in the data plate are consistent with the current gas type.
- c) Check if the ventilation of flue is good, and if there are any blockages. The boiler cannot be connected to a public chimney. The gas boiler and the flue pipe connector can only be installed after all the above steps are carried out.

## 5.1 Check the circuit and power

Check if the power and voltage meet the requirements, if the power polarity is correct, if the earth connection is correct and the resistance to ground is normal. Any problems with the power supply will lead to improper working and even damage of the boiler, and it may injure the operator.

## 5.2 The wash of heating system

Carefully wash the entire heating system to remove all residues that might be left in the system before it is put into operation, to avoid system blockage or damage to the boiler during the future operation.

## 5.3 Fill water to the system

### Fill water to the D.H.W system

Open the hot water tap, fill water to boiler D.H.W system fully, until the water comes out from hot water outlet.

### Fill water to heating system

- Access to the tap water and heating water adding connector, then open the tap water adding connector and heating water adding connector valve in turn, fill water to heating pipeline.
- Unscrew the automatic exhaust valve bonnet of the pump for 2 turns; also you can discharge the air by the exhaust valve on the radiator.
- Open the clockwise injection valve to fill cold water into the system fully, until the pressure reaches 1.0-1.2bar.
- Discharge the air inside the system, and open the exhaust valve of each radiator until there is water outflow;
- Check if the system pressure is lower than 1.0bar;
- If necessary, refill water to the system with pressure stabilized at 1.0-1.2 bar;
- If there is bubble during the long-term operation, the gas will be discharged through automatic exhaust valve on the upper part of the circulating pump body;
- After filling the water, remember to close the tap water and heating water connector valve.

**⚠ Warning:** The system water injection pressure should not exceed 1.2 bar. Always remember to turn off the water injection valve immediately after filling water. Otherwise it may cause the heating system safety relief valve to open.

## 5.4 Examination before start

The professional person will tell you how to use the gas boiler when trial operation or first time service at your home.

### Put into operation Note:

The first ignition must be carried out by a qualified professional installer.

Before starting the gas boiler, check the information as below:

- The data of the signs correspond to the data of electricity, water and gas supply.
- Smoke pipe unobstructed.
- The inlet / outlet balanced flue pipe is installed according to current regulations.
- Ensure minimal maintenance space when furniture, walls, or other obstructions surround the equipment.
- Make sure that all heating and domestic hot water lines connected to the wall-hung boilers have been carefully cleaned.
- Check all piping connections, leak or not?

### Attention!

Strictly prohibit children and people who do not know well about the equipment to control the gas boiler.

Please read <<manual for installation and maintenance>> and <<User's Guide>> carefully before using. If you have any question , please call the ROC distributor.

### Open the valve of pipe

- Confirm the cold water inlet valve was open. Means of exam: open the tap of D.H.W. until there is water flowing out.
- Confirm the heating water back flow valve and valve on the gas pipe are all opened.
- The safety valve is only for safety purpose, not allowed to touch it.

### Exam the pressure of system

Exam the pressure of system on the pressure gauge.

The pointer on the gauge should be between 1.0-1.2bar.when the equipment is cooled,the pointer stayed below 1.0bar , please add water to the system timely following the content of “adding water to equipment”.

## Adding water to equipment

When you notice that the pressure is below 1.0-1.2 bar on the pressure gauge , you have to add water to the equipment.

When the equipment begin to work, maybe there are some air storage in the system. And the air of system will be exhausted while the equipment keep running, in this case, the pressure will go down, so we have to add water to gas boiler in a short time. This is a normal phenomenon.

**⚠ Attention:** If the equipment needs to add water frequently after a long period working, this indicates the heating system has water leakage point. Please check the system and seal the leakage point to avoid the effect to the use life because of add water frequently.

## Precautions for gas adjustment

The gas boiler must be installed by an installer/engineer according to the current laws and regulations. Property loses and person harm may occur because of incorrect installation. The manufacturer will not take any responsibility for that.

Before installation, ensure all newly installed gas piping is clean, so that the residue does not affect the operation of the boiler.

The qualified professional installer must make the following check before the first operation;

- a) Check the leak tightness of the gas pipe;
- b) Adjust the gas pressure according to the requirement of gas boiler;
- c) The gas type must match the gas requirement indicated in technical tag.
- d) Gas supply pressure must match the requirement indicated in technical tag.
- e) Gas supply must match the requirement of gas boiler and it must be equipped with safety and test device requested by the laws and regulations.

## Particular instruction of gas use:

The gas pipe cannot be used as the ground connection of electrics.

Please turn off the gas valve when not using the appliance.

Please turn off the gas main valve when the user does not at home for long time, you should also drain out the water from heating and hot water system to avoid water freezing in the system.

When you smell the gas smell:

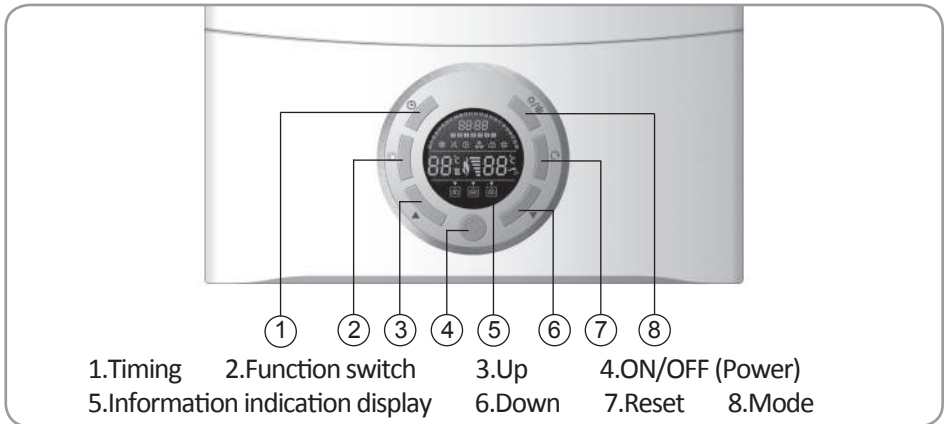
- a) Don't operate any electricity device;
- b) Open the window immediately, ventilate the room thoroughly.
- c) Turn off gas valve
- d) Contact the installer/engineer.

## 5.5 Start operation

The installer is responsible for conducting the first ignition and guide the user how to use the appliance. The gas pressure must be checked when conducting the first ignition.

**⚠ Warning:** Do not put the equipment into operation until the inlet / outlet balanced pipe is installed (the length of the flue must be appropriate).

In heating mode, the gas boiler need two minutes to reach its nominal capacity after ignition. Within these two minutes, the gas volume will be lower than the nominal capacity gas volume; this setting is for the purpose of safety ignition.



### The method of turn on/off the gas boiler

- Press [ON / OFF] button  to switch ON / OFF.

### Heating temperature setting method

- During the heating state, press the [Up ▲ / Down ▼ ] button to set the outlet heating water temperature. At this time, the preset temperature will be flash out indication and the temperature can be set to 55°C.
- In the heating, it has priority to use hot water , after turning on the hot water tap, it will operate in accordance with the set hot water temperature.
- Turn off the tap of hot water, it will be automatically restored to the heating state.

### Hot water temperature setting method




(Example) hot water temperature to 45°C,

- In Summer mode, press the [Up ▲ / Down ▼ ] button to set the hot water outlet temperature directly .








At this time, the preset temperature will be flash out indication , the temperature can be set to 45°C. (at any time to perform hot water work, these setting can be made directly.)

## Operation mode setting method




● Operation mode setting : when the gas boiler is turned on under the non-malfunction state, softly touch the mode button to switch operation mode, it is divided into three modes:

-  Sleep mode - after entering the mode, the heating temperature work according to the original set temperature value of 80%.
-  Standard Mode - after entering this mode, the variable frequency pump operates in the standard curve.
-  Comfort mode - after entering this mode, the variable frequency pump operates at the highest speed (no frequency conversion).






## Clock calibration

Clock calibration(if no pressing button and input within 20s, it will automatically save and exit.) In the OFF mode, long press the [Timing] button  for more than 5s to make minutes calibration; And coordinate [Up  / Down ] button to make calibration; then press the [Timing] button  again to make clock calibration; And press the [Timing] button  again to make week calibration; And then press the [Timing] button  again or [Power] button  to exit from calibration state. (Calibration Process: Minute-Clock-Week-Exit)

## Timing activation

In the on mode, press the [Timing] button  to activate the "Day Timing" (connect the power each time, it will default closing timing function). Press the [Timing] button  again to activate the Week Timing; then press the [Timing] button  third times to close the timing function. (Activation Process: Daily Timing - Weekly Timing - Off)



## Daily timing setting

Day timing setting (or if no input within 20s, it will automatically save and exit) In Day Timing work mode, long press [Timing] button  for more than 5s to make Day Timing setting (from 00 to 23); First timing period flashes, when pressing [Up ] button, it will allow the heating during this period, and when pressing [Down ] button, it will prohibit the heating during this period. And press again the [Timing] button  to select the next period, cycle operation can set working state of any timing periods freely, and press the [Power] button  to exit the day timing setting state.

## Week timing settings

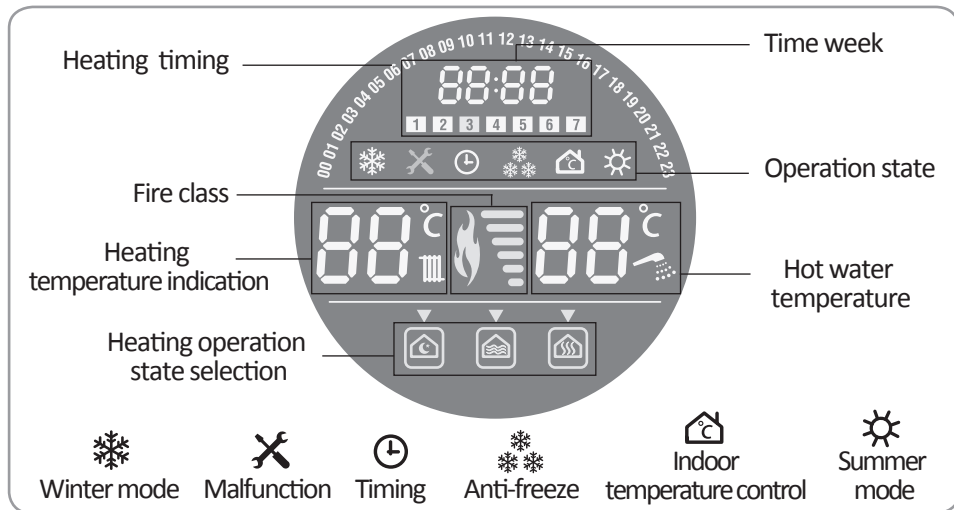
Week Timing Settings (built-in orange LED for every week icon) In the "Week Timing" mode, long press the [Timing] button  for more than 5s to set the "Week timing" (from Monday to Sunday; then every day from 0 to 23). Just enter week timing settings, Monday icon is orange flashing indication, the other icon is blue static indication, at this time press the [Up  / Down ] button to select other dates; if some day icon of the week is orange flashing indication, then press the "Timing" button to enter the day "Day Timing" setting (specific operation please refer to "Day Timing"); Press the [Reset] button  to exit the "Day Timing" setting; then press the [Power] button  or no pressing and input within 20s, it will automatically save and exit week timing setting state.

## One key matching setting

In the state of starting without error, press [mode]  /  button more than 10 seconds to enter the fan speed automatic matching state (The fan is automatically matched from low to the high level according to the setting value. It will indicate FL at low speed, and indicate FH at high speed, automatically save to quit matching state after finishing matching).

## 5.6 Control operating parameters

### 1.Screen Icon Description (no screen indication in the OFF state)











### The function of operation buttons on Panel





- [ON / OFF] button - Switch ON / OFF, and as confirmation button for setting.
- [Up] button - Rise temperature, or set parameters.
- [Down] button - Reduce temperature, or set parameter.
- [Function switch] button - Switch between these three work modes of sleep , standard and comfortable circularly.
- [Reset] button - reset and restart the machine in the event of fault , in non-fault state, can long press it more than 5 seconds to view the real-time operating parameters.
- [Timing] button - In OFF state, long press it for 3s to as the clock and week setting; in ON state, long press 3s to be regarded as the timing activation button
- [Mode] button - Switch between Winter / Summer mode.

### Screen Icon Meaning

- Winter mode icon : When we choose Winter mode, it will indicate.
- Malfunction icon : When the gas boiler occurs malfunction, it will flash indication, otherwise it will be no flash indication.
- Anti-freezing icon : When the pump is anti-freezing, it will be static indication. When it is heating the anti-freezing, it will flash indication.(It allows anti-freezing in the OFF state)
- Timing icon : Activate the Timing mode(include Day Timing mode or Week Timing mode),this icon will indicate. Otherwise it will not indicate.
- Indoor temperature control icon : When the switch is connected ,it will indicate. Otherwise it will not indicate. It will flash indication in communication mode.

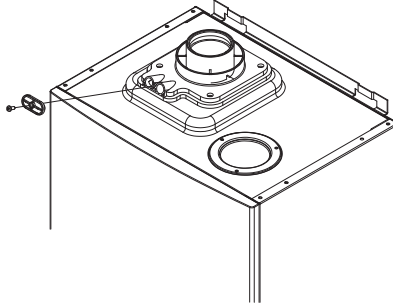


- Summer mode icon  :When you choose Summer mode, it will indicate.
- Heating icon  : When heating works, it will indicate.
- Hot water icon  : It will be dynamic indication when it receives the hot water flow signal. Otherwise it will not indicate.
- Sleep mode icon  : It will indicate when it enters the sleep mode. Otherwise ,it will not indicate.
- Standard mode icon  : It will indicate when it enters the standard mode. Otherwise ,it will not indicate.
- Comfort mode icon  : It will indicate when it enters the comfort mode. Otherwise ,it will not indicate.
- Time icon  : it indicates present time.
- Week icon  : It will indicate when it is OFF and carry out Week Timing mode, present date will be orange indication.

- Timing period icon  :When the time setting function is activated, it will indicate. And it will indicate when the timing period is valid, otherwise ,it will not indicate.
- Flame and Fire level icon  : When the gas boiler make ignition ,it will flash flame icon, after it detects the flame with fire signal, six levels will be dynamic indication according to fan rotating speed .
- Heating temperature digital  : It will indicate the heating temperature ,error code during heating working, and setting menu.
- Hot water temperature digital  :It will indicate the hot water temperature, error code and setting menu during hot water work.

## 5.7 Flue gas analysis

The boiler is equipped with two pressure test holes, you can observe the combustion gas temperature, combustible air and the oxygen and carbon dioxide mixture outside the top of the pipe enter into the pressure test hole, unscrew the flue fixing cover and seal ring.



When making flue gas analysis or power adjustment, CO<sub>2</sub> in the gas and fan speed value shall comply with the following table:

	LL1GBQ24-B26CG
Heat input	CO <sub>2</sub> %
Maximum heat input	9.2±0.2
Minimum heat input	8.8±0.2

### **⚠ Warning**

When the gas inlet pressure is not between 17 ~ 25 mbar ,then prohibit the following operation of power adjustment. After adjusting the power, you must check the air tightness of all the test points.

The pressure sampling tube of the gas valve shall be prevented from falling off or missing during installation and maintenance.

## The smoke temperature uses

1	Flue gas temperature in normal combustion condition	64°C(reference value)
2	Flue gas flow volume in normal combustion condition	About 550g/min
3	Flue gas temperature in minimum combustion condition	34°C(reference value)
4	Flue gas flow volume in minimum combustion condition	About 100g/min
5	Flue gas overheat protection temperature	90°C
6	Reference value of CO <sub>2</sub> content	8.6%-9.4%
7	The maximum allowable pressure difference between the air inlet port and flue gas outlet port of the coaxial flue.	100 Pa
8	The maximum allowable temperature of the combustion air	90°C
<p>Pay attention to the installation condition: in the windy case, the flow back flue gas can not exceed 50g/min.</p>		
<p>The condensing water in the flue can flow into the boiler internal through the internal smoke passageway (automatically recycling and emission), but the condensing water is not allowed to leak to the external of heat exchanger.</p>		



## 6. Maintenance precautions

- Installation and maintenance of the gas boiler must be performed by the installer/engineer according to the operation instructions of the manufacturer and local current standard operation rules.

### Note

Professional skill worker are those who have specialized technical skills in the manufacture and maintenance of heating and domestic hot water equipment, Professional skill worker should have the qualification certification of using national and local statutory and the manufacturer's authorization.

- Before performing any repair or maintenance operation, disconnect the power supply from the socket or switch which supply power to equipment.
- Do not block the inlet / exhaust flue terminal;
- When the equipment is damaged or done bad operation, please turn off the power, do not try to do any maintenance or direct treatment.
- The boiler can only be repaired by qualified professional, and only be used original spare parts. Violation of the above requirements will may result in equipment damage and personal injury.
- When deciding not to use the equipment, measures must be taken to prevent certain components from becoming safety hazard
- If the ownership of the appliance is transferred, or the appliance is moved or reinstalled, the <User's guide> and <Manual for installation and maintenance> should accompany the appliance. So that all the new owner or installer can read these information.
- All accessories of wall-hung boilers should be used all original components.
- This equipment can only be used for the purpose specified in the instructions. In addition to the use are not allowed, and it is dangerous.
- The manufacturers will not take any responsibility for any property loses and persons harmed caused by incorrect installation and operation of not follow the guidance from manufacture.
- After dismantling the package, make sure the contents are complete. Avoid children and Pets contact with these package(wooden frames, nails, small metal strips, plastic bags, foam, etc.), and cause accidental injury.
- Do not use the appliance if a problem emerges during installation and operation, please contact the supplier or local after-sales service department.
- For external cleaning, just use a damp cloth, soapy water available. Avoid using any cleaning agents containing abrasive or dissolved substances .

## 6.1 Anti-freeze function

The gas boiler has anti-freeze function.

If the gas and power is on, when the heating water temperature is below 5 °C, the boiler will start to work automatically, and heat the water in the system to about 30°C.

### **Warning**

The anti-freeze function shall not ensure the water can circulate in the whole heating system.

If the gas boiler stop running for several hours in very cold weather, it may cause the system to freeze. If you are not at home during freezing period, be sure to keep the heating function running, and keep the temperature of every room above the freezing point.

However, when there is some external failure, such as gas or power outage or air exhaust system are abnormal, the inner monitoring device will turn off the boiler automatically, so it can't protect against freezing. To avoid such situation, if there are no people at home for long time during freezing periods, you can ask the installer/engineer to drain out the water in heating system and gas boiler.

### **Warning**

When the gas boiler is performing the anti-freeze function, it may need to conduct combustion work. So you must ensure the gas supply is smooth and water in the heating system is enough.

## 6.2 Operation failure cause and settlement

Malfunction code	Code meaning	Malfunction reason	Malfunction type
E 1	Flue malfunction	Air pressure or air speed malfunction , flue thermocouple disconnects.	Resume automatically
E 2	Heating NTC malfunction	NTC open circuit and short circuit.	Resume automatically
E 3	Shower NTC malfunction	NTC open circuit and short circuit.	Resume automatically
E 4	Overheat malfunction	When the pipe water temperature is higher than 93°C, the overheat switch disconnects.	Lock (sensor can be resumed)
E 5	Gas valve circuit malfunction	The output circuit of the gas valve is abnormal.	Lock
E 6	Ignition failure	Cannot detect the flame.	Resume automatically
E 7	Fake fire error	Flame detection circuit is out of control.	Resume automatically
E 8	Back water NTC malfunction	NTC open circuit and short circuit. Temperature is higher than90°C	Resume automatically
E 9	Flue temperature NTC malfunction	NTC open circuit and short circuit. Temperature is higher than90°C	Resume automatically
E A	Outside NTC malfunction	NTC open circuit and short circuit.	Resume automatically
E b	Slash fire malfunction	There is fire after the boiler turns off four seconds.	Resume automatically
E C	Communication malfunction	The communication is interrupted or disturbed.	Resume automatically
E P	Pipe malfunction	0.5bar >pressure>3.5bara or the water pressure switch is not acted.	Resume automatically
E E	EEPROM malfunction	EEPROM storage data error	Lock
EL	Variable frequency pump has malfunction	Variable frequency pump has malfunction or electrical power<12W	Resume automatically
LV	Power voltage is too low	The supply voltage is lower than 150V	Resume automatically
HV	Power voltage is too high	The supply voltage is higher than 270V	Resume automatically

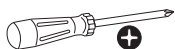


## 7. Gas boiler dismantling instruction

### 7.1 Basic dismantling

#### Basic dismantling

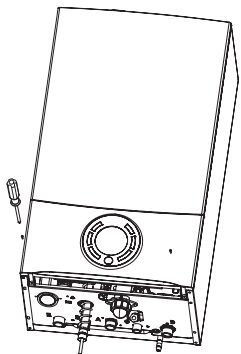
Tools



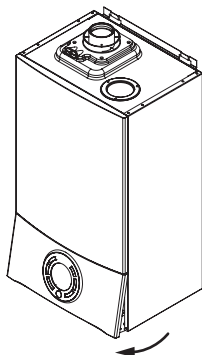
time: 3min



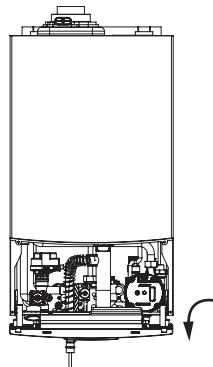
1.



Use screw driver to take out the two screws of bottom plate.



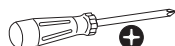
Lift the plastic panel from bottom.



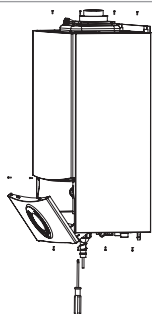
Rotate the electrical box downwards

#### Basic dismantling

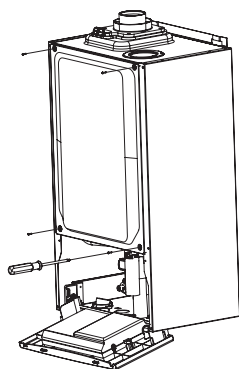
Tools



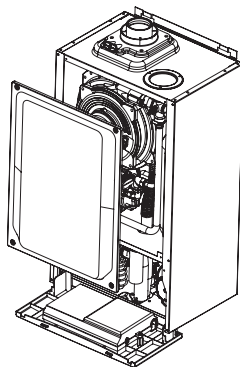
2.



Remove the upper and lower eight screws on the side plate and the two screws on the cover, remove the cover.



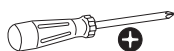
Unscrew the 4 screws of the sealing cover



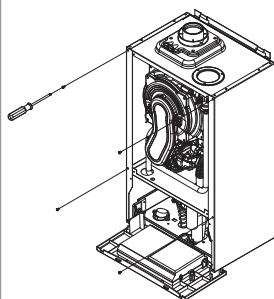
Dismantle the sealing cover

## Basic dismantling

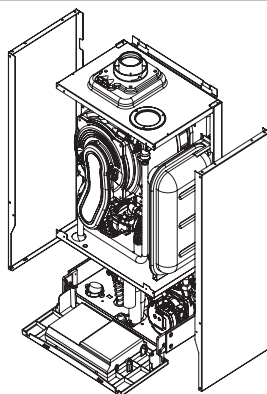
Tools



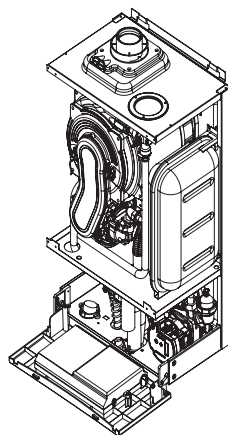
3.



Unscrew the 4 screws on the front of the side plate



Dismantle the side plate

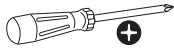




## 7.2 Circuit component

### Electrical box operation

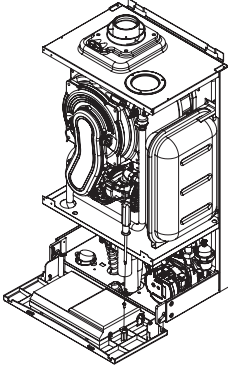
Tools



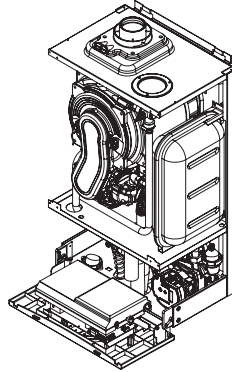
time: 4min



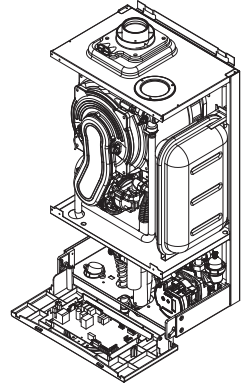
1.



Take out the screws on both sides of electrical box

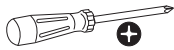


Take out the electrical box back cover upward.



### Fuse replacement

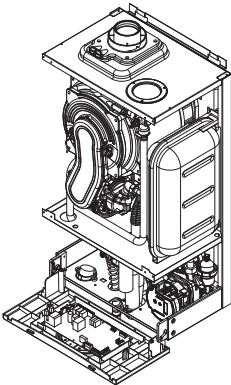
Tools



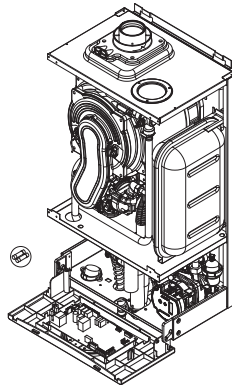
time: 4min



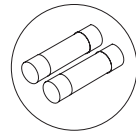
1.



Open the Electrical box as shown above

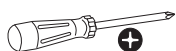


Remove the fuse



## PCB replacement

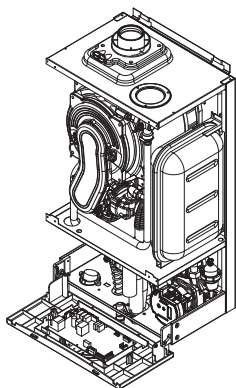
Tools



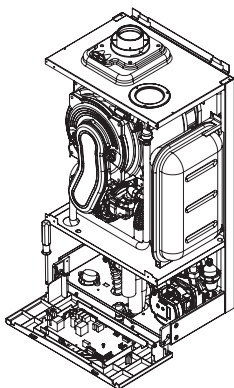
time: 6min



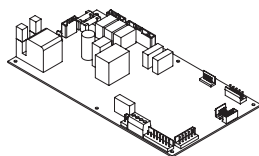
1.



Operate Electrical box as shown above



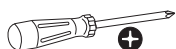
Dismantle the 4 screws on the PCB



Remove the PCB

## Display replacement

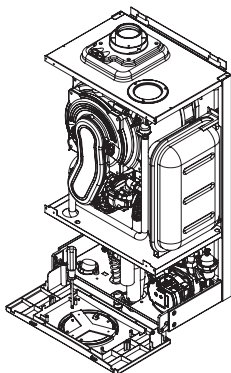
Tools



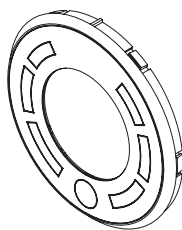
time: 13min



1.



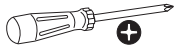
Dismantle the 3 screws on the back of display cover.



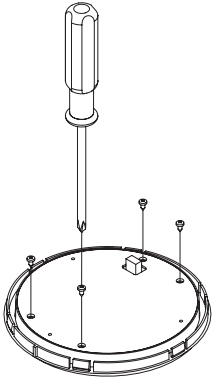
Remove the cover of display

## Display replacement

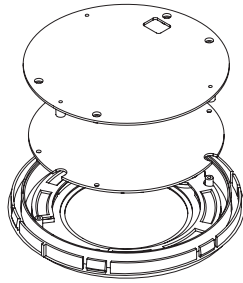
Tools



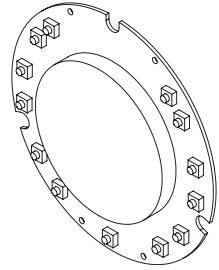
2.



Dismantle the 4 screws on the rear cover of display.



Take out the rear cover



Take out the display

## 7.3 Water system

### Three way valve dismantling

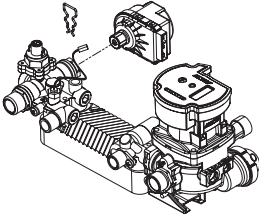
Tools



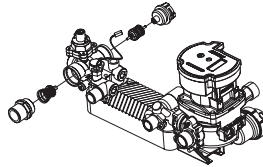
time: 5min



1.



Firstly take out the motor clip radial, and then take out the motor axially.



Unscrew the motor connector by spanner, take out the inside three way components axially

### Bypass valve dismantling

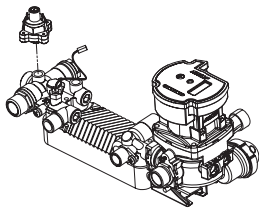
Tools



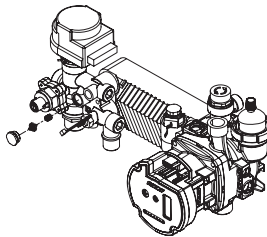
time: 5min



1.



Spin and take out the water pressure switch manually.



Unscrew the bypass valve cover axially by spanner and take it out.

## Safety valve dismantling

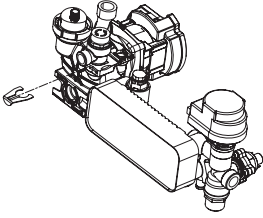
Tools



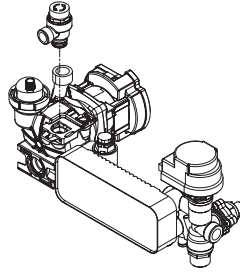
time: 5min



1.



Take out the safety valve clip



Take out the safety valve manually.

## Air exhaust valve dismantling

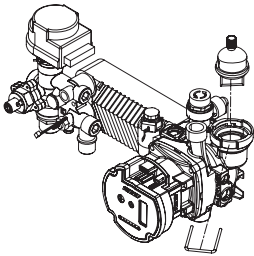
Tools



time: 2min



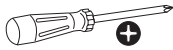
1.



Take out the air exhaust valve manually.

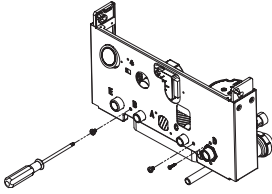
## Pump dismantling

Tools

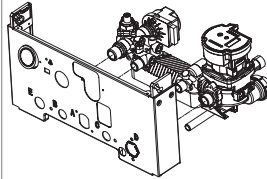


time: 12min

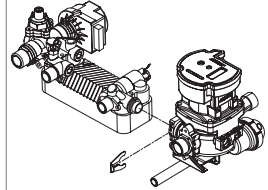
1.



Dismantle the front three screws which for connecting water hydraulic system



Separate the bottom plate and water hydraulic system



Take out the pump from right side.

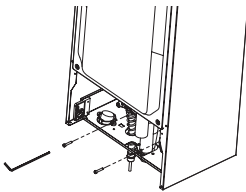
## Plate heat exchanger dismantling

Tools

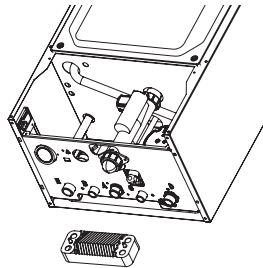


time: 3min

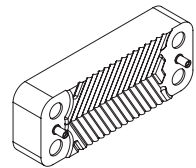
1.



Dismantle the 2 screws on plate heat exchanger by 5mm internal six angle screwdriver



Separate the bottom plate and water system as shown above.

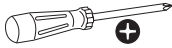


Take out the plate heat exchanger downward.

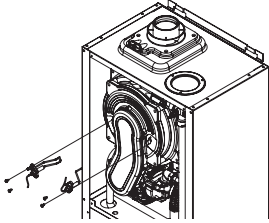
## 7.4 Combustion system

### Combustion system dismantling

Tools



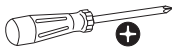
1.



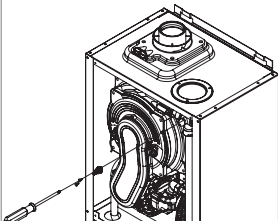
Dismantle the 2 installation screws of ignition needle and flame detection needle as shown above, then take out the ignition needle and detection needle manually.

### Combustion system dismantling

Tools



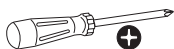
2.



Unscrew the two screws on heating temperature sensor and take the temperature sensor out.

## Fan dismantling

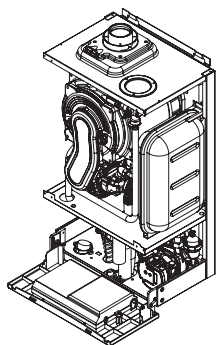
Tools



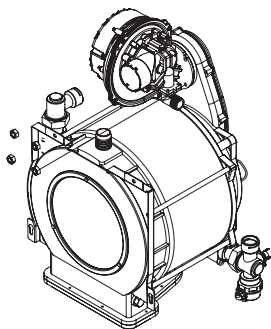
time: 8min



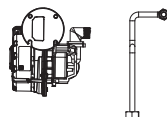
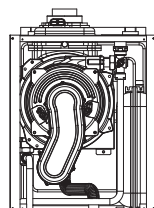
1.



Following the basic dismantling method to dismantle the combustion chamber sealing cover



Dismantle the 4 nuts connected with fan by 8mm spanner.

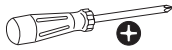


Dismantle the connection of the gas pipe by 24mm spanner, take out the fan after dismantling the gas pipe.



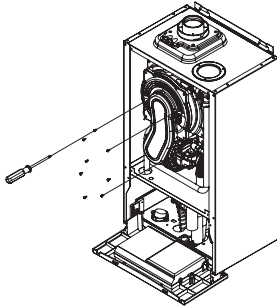
## Burner dismantling

Tools

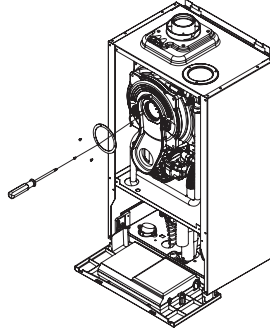


time: 12min

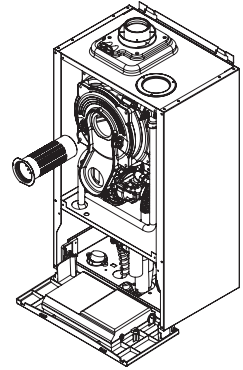
1.



Dismantle the 8 screws on the top of burner cover.



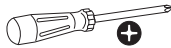
Dismantle the 3 screws on the burner cover.



Take out the burner

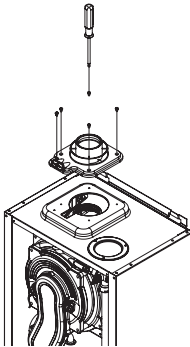
## Heat exchanger dismantling

Tools

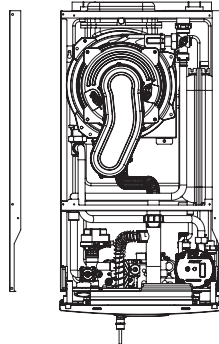


time: 23min

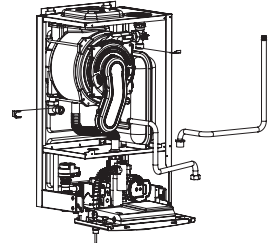
1.



Dismantle the 5 screws on the smoke pipe outlet and take out the outlet flange.



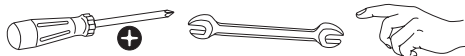
Follow the basic dismantling method, remove the left side plate.



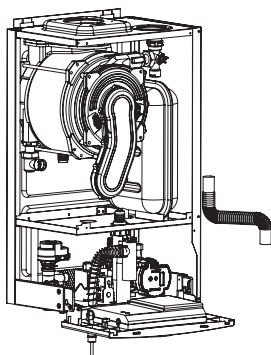
Take out the clip of heating inlet and outlet water pipe, then unscrew heating inlet and outlet water pipe connection nuts by 30mm spanner, take heating inlet and outlet water pipe out.

## Heat exchanger dismantling

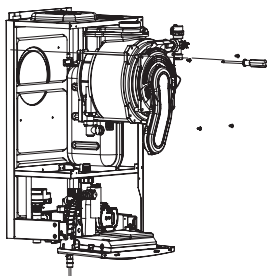
Tools



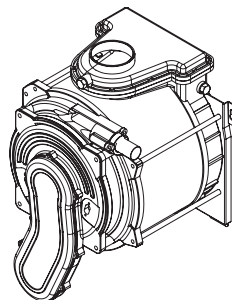
2.



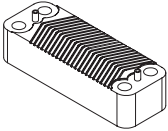
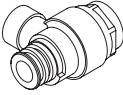

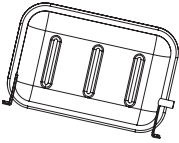
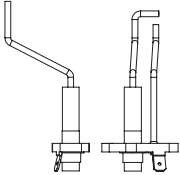

Take out the condensate water drainage bellows

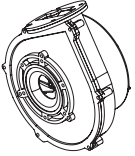
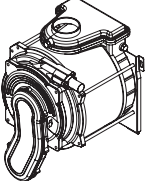
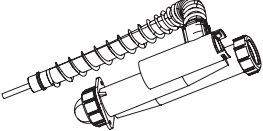
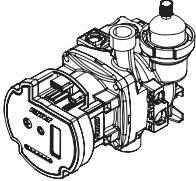


Dismantle the 4 screws which the heat exchanger connects with the bottom plate, then take out the whole heat exchanger.



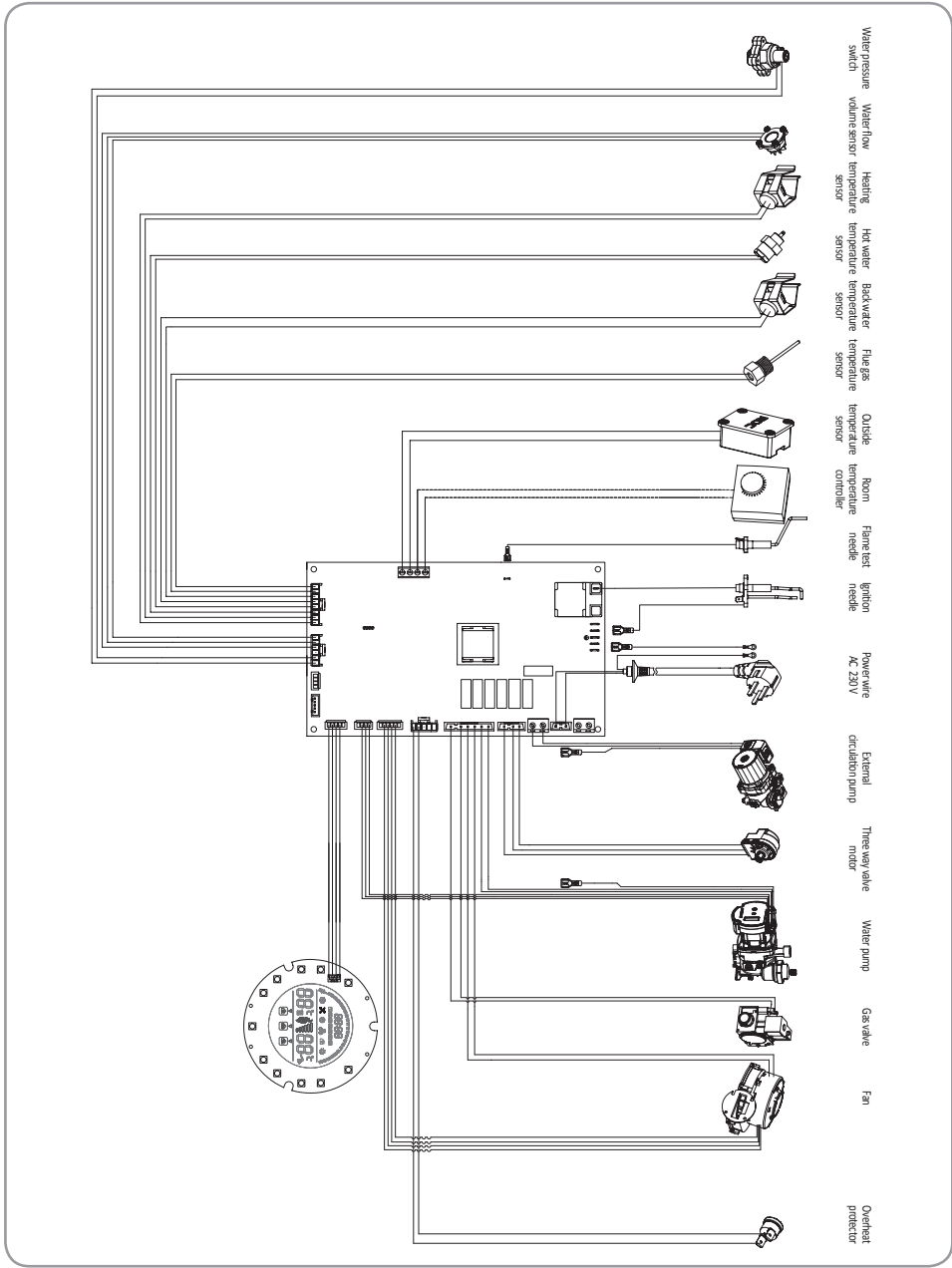
## 7.5 Maintenance plan

<p><u>Plate heat exchanger</u></p> <p>Maintenance interval: when necessary Method: evaluate the D.H.W. performance</p>	
<p><u>Safety valve</u></p> <p>Maintenance interval: yearly. Method: visual inspection/clean if necessary</p>	
<p><u>Water flow volume sensor</u></p> <p>Maintenance interval: yearly. Method: visual inspection/clean if necessary/check the water flow volume</p>	
<p><u>Expansion tank</u></p> <p>Maintenance interval: yearly. Method: the pressure should be 1 bar in the air (system water drainage)</p>	
<p><u>Flame test needle and ignition needle</u></p> <p>Maintenance interval: yearly Method: visual inspection/clean if necessary/ distance with burner/electric ion current is more than 1 <math>\mu</math> A</p>	
<p><u>Burner</u></p> <p>Maintenance interval: yearly Methods: visual inspection/clean if necessary</p>	

<p><u>Fan</u></p> <p>Maintenance interval: yearly. Methods: visual inspection/clean if necessary.</p>	
<p><u>Main heat exchanger</u></p> <p>Maintenance interval: yearly. Methods: visual inspection/clean if necessary</p>	
<p><u>Condensate water collector</u></p> <p>Maintenance interval: yearly (or after cleaning the main heat exchanger). Method: visual inspection/clean if necessary (add water before replacement).</p>	
<p><u>Pump</u></p> <p>Maintenance interval: yearly after the first ignition. Method: check the AAV if it's open/visual inspection/clean if necessary</p>	



# 8. Power connection diagram



# Memo



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The user's manual can be translated to the official language of destination country, not limited only English version.