ROC®

USER'S GUIDE

Condensing Gas Wall-hung Boiler

USER'S GUIDE

Duke series

Thank you for choosing our new generation of microcomputer control fully-automatic ROC® heating and D.H.W condensing gas boiler (hereinafter referred to as the wall-hung boiler). ROC® condensing wall-hung boiler is optimized the function design, improved quality ,by absorption of the European advanced technology, and combining with China's environment, Our products attract customers with excellent manufacture technology, high reliability, exquisite fashion design. ROC® gas boiler will provide you extremely safe, energy-saving and comfortable living environment in the future.

Before installation and usage, please be sure to read this [Guide] to ensure the correct usage of products. After using this [Guide] ,please keep it well for future reference. If you need any technical advice or maintenance service, please contact your local service center or our technical service department, we will provide the best service for you.

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The Company reserves the right to modify the contents of the Guide without notice.

Http://www.oscarboilers.gr

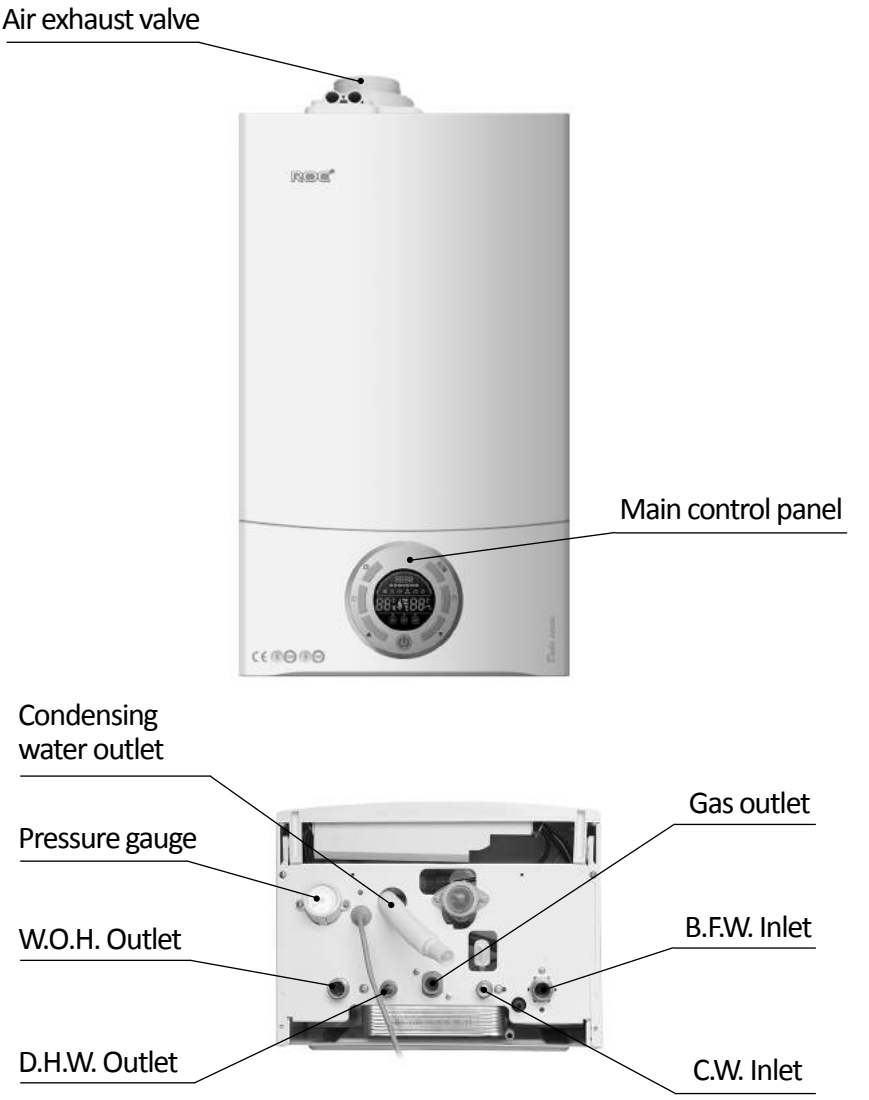
Contents

Misusage risk warning

⚠ **Warning:** Improper installation will cause harm to animals and people.
⚠ **Notice:** machine installation should strictly follow the instruction of user's guide and the relevant provisions.
⚠ **Notice:** only the agents or technicians authorized by our company can repair or replace the components or complete machine.
⚠ **Notice:** original components should be used to avoid the reduction of product security.
⚠ **Warning:** original flue should be used, not allowed to use other flue, replacing coaxial flue with single pipe flue is prohibited.
⚠ **Notice:** maintenance involving repair of gas pressure regulators and controllers should contact our after-sales service.
⚠ **Notice:** you should buy our original products, not buy modified machine from dealer. to ensure the safety.
⚠ **Notice:** you should install shut-off valve on the pipe before installing the machine.
⚠ **Notice:** The installations of machine should be far away from the stove, microwave ovens and other strong electromagnetic radiation appliances.
⚠ **Warning:** dismantling any seal components on the machine is prohibited.
⚠ **Notice:** machine cleaning should use corrosive cleaning detergent.
⚠ **Warning:** do not install the machine in the bedroom, living room, or bathroom.
⚠ **Danger:** the machine should not be used by children and people who is unable to use it, it is not allowed to let the children play it.
⚠ **Notice:** the users should not change their own heating safety valve and relief valve ,should ask professionals for help.
⚠ **Notice:** the machine should not be concealed to be installed.
⚠ **Must:** the maintenance and inspection personnel should indicate the result on the machine after operating the maintenance and inspection of the product .
⚠ **Notice:** the distribution system of room should include ground wire, the machine connection switch should not be set in the room which has bathtub or shower. The plugs, sockets should be certified by the relevant institute.
⚠ **Notice:** to avoid the freezing of machine and pipeline, the machine should exhaust the water from heating and D.H.W system when the machine is turned off long time in the winter.

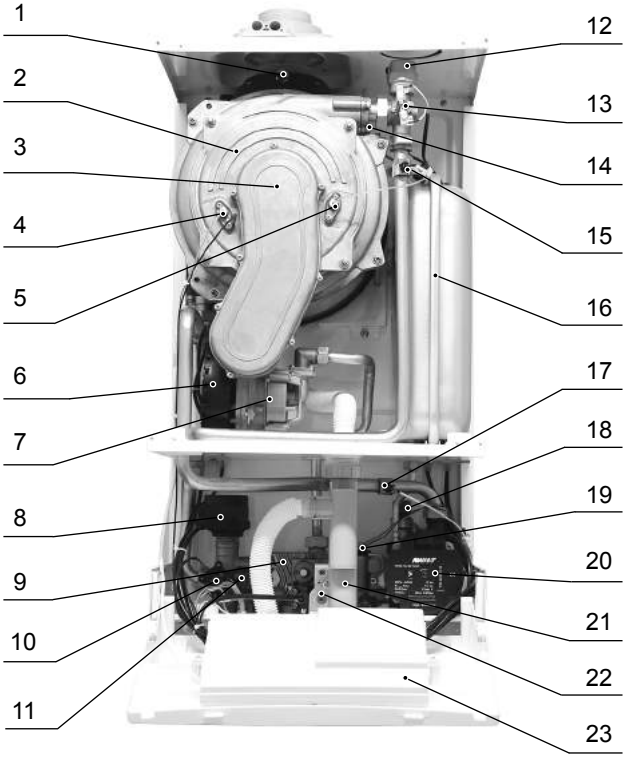
Component name

External structure-component name



Component name

Inner structure-component name



1.Flue gases temperature sensor
2.Heat exchanger
3.Burner
4.Ignition needle
5. Flame detection needle
6.Fan
7.Air-gas mixer
8.Three-way valve motor
9.Plate heat exchanger
10.Water pressure switch
11.Hot water temperature sensor
12. Air exhaust valve
13.Over heat protector
14.Fusing protector
15.Heating temperature sensor
16.Expansion tank
17.Heating back water temperature sensor
18.Safety pressure relief valve
19. Water flow volume sensor
20. Pump
21. Siphon tube
22. Gas valve
23. Electronic box

Feature of Product

Condensing Heat exchange system

The product uses condensing type heat exchange design.
The tripling circuit coil pipe design absorbs the flue gas heat adequately, efficiency can reach 108%, super low CO and NOX product. The flue gas temperature can reach 50 °C The condensing result is obvious, green and environmental.

Adopt cuspidate PWM gas proportion control technique

Our key technology is the control system. According to the feedback information from the temperature and pressure sensor. System can accommodate the gas supply volume automatically, control heating and domestic hot water temperature, which is above the temperature you have set so that you can save much energy.

Adopt multiple safe protection device

Our products have the most safe protection device in the same trade. Adopt equilibrium force air exhaust system in which the combustion chamber and air exhaust channels are completely hermetic. It can absorb the fresh air, exhaust the waste air after burning and eliminate the harm of CO for human's body. There are multiple over-heat protection device, protection for flameout, protection for flue building up, protection for over-pressure, multiple protection for preventing frostbite.

Adopt super mute running way

Adopt device for assimilating noise in the burner to assimilate all the noise when burn. At the meantime, with the low-noise excellent fan, circulation pump and flawless hermetic system, all noise will be the least. You will have a peaceful life space.

Feature of product

Adopt international one-up technique

Adopt international one-up automatic adjustment cushion design to reduce the probability of malfunction farthest. This design makes a breakthrough on international heating technology and shows our abundance.

Adopt firm and durable components

First-rate key components ensure the products' quality and usage. Inner material is machininged by thermalization and antisepsis, and the panel on which we use special coating with beautiful and elegant colour to improve products' durability and safety.

De-energize performance

If the power breaks when the machine is running, this performance will save all the orders which is saved before the power breaks. it will carry out all the orders automatically as soon as the power works like before.

Microcomputer chip controls and prevents incrustation

Heat exchange system with good quality and prevent-incrustation design connected modern microcomputer chip control temperature for use to delay the incrustation forming.

Exquisite design and simple installation

With exquisite design and compact inner structure, our products are simple to install and maintain. Coaxial supply and exhaust pipe are manufactured according to the product's model so that the installation time will be shortened a lot.

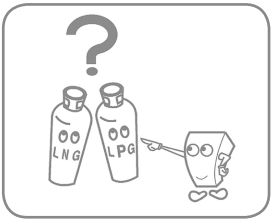
Don’t worry! we have safe device as following

Quadruple protection for overheat	There are four protection devices, preventing over temperature, preventing heatingWater overheat, preventing domestic hot water overheat, preventing exhausted air overheat. If there is overheatbthese devices will stop the gas supply automatically and stop working.
The earlier safe ignition device	For the sake of avoiding deflagration, this device only supply minimum gas in the earlier ignition.
Nduction system for unusual combustion	When there is unusual combustion, the gas supply will be cut automatically.
Device for trash elimination	There are different filter screens in the machine, which can extend the product’s life.
Device for preventing empty-combustion	This device can induce whether there is water leakage in the heating pipe. If there is leakage, combustion will be cut automatically. Machine reruns after pouring the water according to the way to first operation.
Self-diagnosesdevice	This device can avoid system safety losing control which is caused by protection damage and make sure that the system operates in the safe and reliable environment.
Device for blaze detection	After operation, this device detects the blaze signal anytime and distinguish whether the present working is normal or not.
Safe device for water flow volume	Detect the water flow volume(super-low water flow protection)to make sure that the machine works safely.
Other safe device	Safe device for preventing flue building up, safe device for refiring, protection for overpressure, automatic safe device for air pressure adjustment, safe device for preventing frostbite, anti-creep age protection, de-energize/water/gas protection and so on. please use it without any worry.

Items for safety

1.Make sure the gas type before use

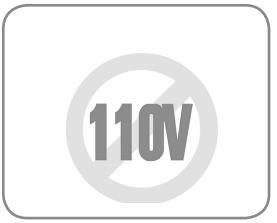
- Must use the certain gas type and pressure of gas appointed by the label on the machine.
- Forbid to change the gas type willingly. If it is necessary to change, please contact our after-sales service department.



Important items for safety!

2.Make sure the voltage (220V)

- Voltage is 220V/50hz, alternating current.
- After confirm the voltage, connect the plug. (voltage is required 220V± 15%. the subscriber had better allocate a manostat if pressure is unstable).



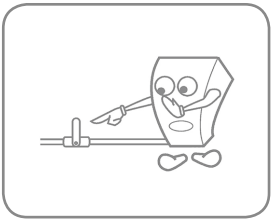
⚠ **Warning:** In order to avoid the risk of leakage, the socket must be connected with a good grounding device.

3.Close the adding water valve after adding water

- After using adding water valve to add water on the heating system , the adding water valve must be closed immediately, otherwise the safety valve will exhaust the water automatically when the pipeline pressure is greater than 3bar. To prevent accidents, please be sure to close the adding water valve.

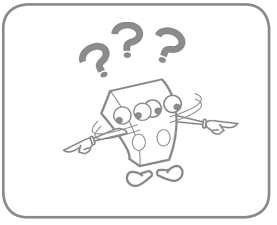
4.Check the switch for gas before use

- Check the middle switch connected on the gas pipe to see if there is leakage.
- Ensure whether pressure of gas and flow volume of gas supply meet requirement of our product.



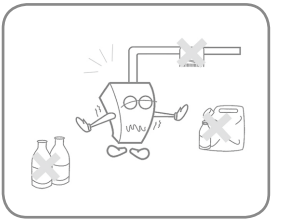
5.Make sure the connecting state of the valve for heating

- Make sure whether the valves for connecting the heater and cooling systems of each room are open or not.
- Parallel—connect pipe could not be operated less than one group cooling valve opening.



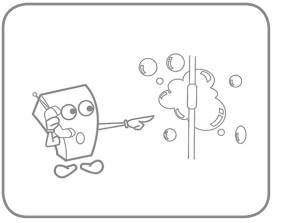
Items for safety

6.Make sure the surrounding environment of the product



- Don't put the product in the place where will be affected by weather. (rain and sunshine).
- Get rid of the combustible and explosive material surrounding the product. It is forbidden to hang clothes to dry on the flue.
- The temperature of flue and water pipe is very high. Be careful, please!

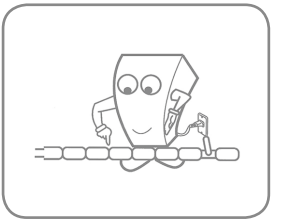
7.Make sure if there is gas leakage



- It is necessary to use soap water to check the gas pipe whether there is gas leakage. (when you put soap water on the gas pipe, if air bubble comes out, that means there is gas leakage.) Ought to close the gas immediately and contact local gas supplier.

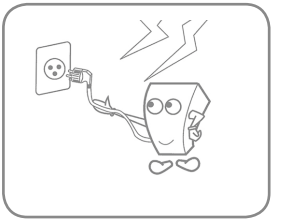
Important safety items!

8.Prevent frostbite in winter



- When heating, heater must be unimpeded. (including water, electricity, gas) There is a prevent-frostbite device in the heater, so the heater will work automatically in low temperature.
- During freezing season or no one at home for a long period, please exhaust the water in the machine and in the heating pipe, cut off the gas supply and pull out the power plug to prevent frostbite.

9.Be careful when it fullmines



- Please pull out the power plug when it fullmine so that the heater won't be damaged.

Warning!

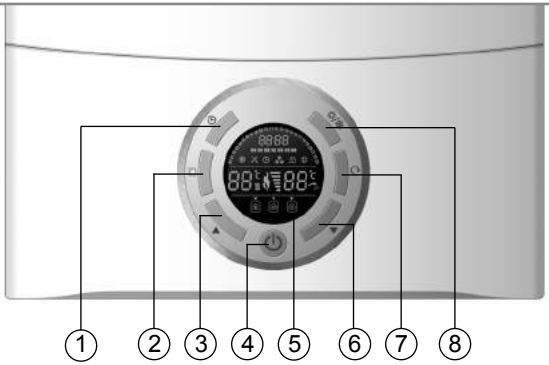
- The users should strictly follow the above security warning.
- This product must be assembled, adjusted and maintains regularly by professional people accredited by the manufactory, while the seal configuration is broken, the machine is ban to operate.

Function and usage for gas boiler control panel

- ***LL1GBQ18-B20CG / LL1GBQ24-B26CG***

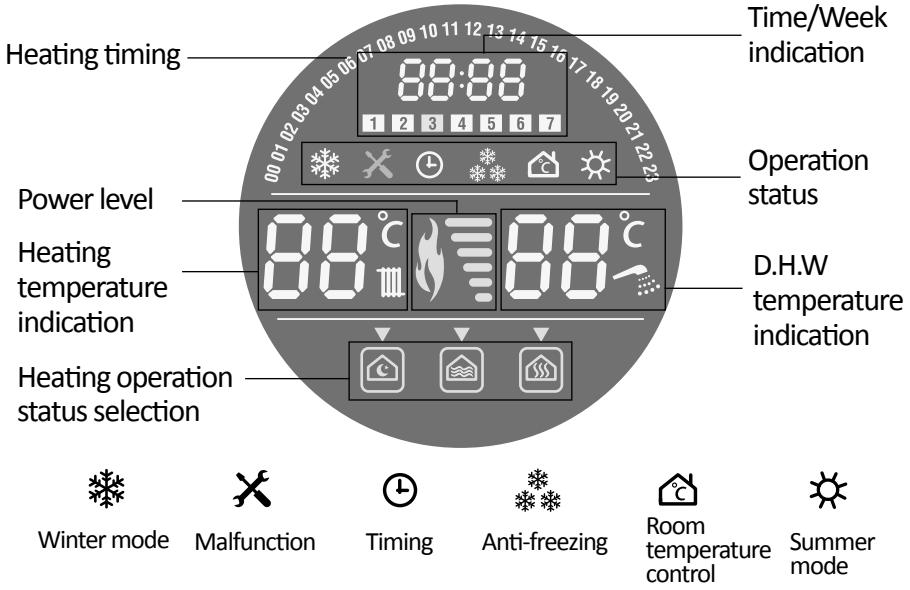
Condensing Duke Series

Each part name on the control panel



1.Timing 2.Function Switch 3.Up 4.On/Off (Power)
5.Information Indication Display 6.Down 7.Reset 8.Mode

LCD Icon Meaning



Function and usage for gas boiler control panel

The function of the buttons on control panel

- **[On / Off] Button** – witch between On / Off , as confirmation keys while setting.
- **[Up] ▲ Button** – increase the temperature, or set the parameter.
- **[Down] ▼ Button** – decrease the temperature, or set the parameter.
- **[Function Switch] Button** – Circular switch from three different working mode –Sleep ,Standard ,and Comfort .
- **[Reset] Button** – reset and restart when in malfunction; press it for more than 5S in non-malfunction status can check all the real-time operation data.
- **[Timing] Button** – under Power off status, press it for more than 5S as clock and week setting; under Power on status, is timing activation button.
- **[Mode] / Button** – switch between Winter and Summer mode.

Icon on display meaning

- Winter mode Icon : indicate when select Winter mode.
- Malfunction Icon : flash when in malfunction, otherwise no indication.
- Anti-freezing Icon : static status indicates when pump is in anti-freezing status; flash indicates when heating anti-freezing (anti-freezing also will be operated in Power off status).
- Timing Icon : Icon indicates after activating timing mode(including day timing or week timing) , otherwise no indication.
- Room Temperature Control Icon : indicate when switch is on; otherwise no indication; communication mode flash indicates.
- Summer Mode Icon : indicate when select Summer mode.
- Heating Icon : indicate when in heating mode.
- Hot Water Icon : dynamic indication when received hot water flow signal, otherwise no indication.
- Sleep Mode Icon : indicate after entering this status, otherwise no indication.
- Standard Mode Icon : indicate after entering this status, otherwise no indication.
- Comfort Mode Icon : indicate after entering this status, otherwise no indication.

Function and usage for gas boiler control panel

- Time Icon 88:88 : indicate the current time.
- Week Icon 1 2 3 4 5 6 7 : indicate when Power off or operate the weekly timing mode, current day will be indicated as color orange.
- Timing Icon  : indicate when timing function is activated; indicates when timing regional period is valid, otherwise no indication.
- Flame and Power Level Icon : flame icon flash when igniting, after detecting the flame signal and flame, 6 levels will indicate dynamically in according with the fan rotation speed.
- Heating temperature digit 88 : indicate the heating temperature, the malfunction code and setting menu in heating operation.
- D.H.W temperature digit 88 : indicate D.H.W temperature, the malfunction code and setting menu in D.H.W operation.

The method of turning on/off boiler

- Long press **[On / Off]** button to switch between startup and Shutdown.

Heating temperature setting

For example, when 55 °C heating temperature is required:

- In heating status press **[Up ▲ / Down ▼]** button directly can set the heating output water temperature, at this time the temperature flashing indicates, then set the temperature at 55 °C.
- The D.H.W is preferentially used when under heating status, open the D.H.W tap will operate according to the preset D.H.W temperature.
- Turn off the D.H.W tap, it will return to heating status.

D.H.W setting

For example, when 45 °C D.H.W temperature is required:

- In summer mode press **[Up ▲ / Down ▼]** button directly can set the output temperature, at this time the preset temperature flashing indicates, then set the temperature at 45 °C. (operate the D.H.W working mode at any time, the setting can be done directly.)

Function and usage for gas boiler control panel

Operation Mode Setting

● Operation mode setting: start in non-malfunction status, soft touch the mode button to switch the operation mode, there are 3 modes:

Sleep mode —— after entering this mode,the system will operate according to the 80% of preset temperature value.
Standard mode —— after entering this mode, the system will operate according to the standard parameter.
Comfort mode —— after entering this mode,the system will operate according to maximum power.

Clock Proofreading

Clock Proofreading (non input in 20S,it will automatic save and quit)
In Power Off mode, press **[Timing]** button for more than 5S to proofread minute, proofread by **[Up ▲ / Down ▼]** ; press the **[Timing]** button again to proofread hour; press the **[Timing]** button again to proofread week. Press the **[Timing]** button or **[Power]** button to quit the proofreading status.
(Proofreading process: Minute-Hour-Week-Quit)

Timing activation

In Power On mode, press **[Timing]** button to activate the "day timing" (every time connect to power will turn off the timing function default.); press the **[Timing]** button to activate the "week timing"; the third time press the **[Timing]** button will turn off the Timing function.
(Activation process: day timing-week timing-turn off)

"Day timing" Setting

"Day timing" setting (20S non input will automatically save and quit)
In "Day timing" operation mode, press **[Timing]** button for more than 5S to set the "Day timing"(from00:00 to 23:59); first timing period flash, press **[Up]** ▲ button to allow heating in this period; press **[Down]** ▼ button to forbid heating in this period; and press **[Timing]** button to select next period, cyclic operation can optionally set the operation status of any period, press **[Power]** button to quit the "Day timing" setting status.

Function and usage for gas boiler control panel

"Week timing" setting

"Week timing" setting (every week icon built-in orange LED)
In the " Week timing "operation mode, long press **[Timing]** button for more than 5S to set the " Week timing "(from Monday to Sunday; then everyday from 00:00 -23:59). At the beginning when entering into the " Week timing " setting, Monday icon flash indicate with orange color, and other icons static indicate with blue color, at this time press **[Up▲/ Down▼]** button to select other date; if the icon of any day in a week flash indicate with orange color, then press "Timing" button to enter the intraday "day timing" setting(specific operation please refer to the setting of "Day timing"); press **[Reset]** button to quit the "day timing" setting; and press **[Power]** button or 20S non-input will automatically save and quit the "Week timing" setting status.

Malfunction Indication and Maintenance

Malfunction Indication	Code meaning	Malfunction reason
E 1	Flue malfunction	Air pressure or air speed malfunction
E 2	Heating NTC malfunction	NTC open circuit and short circuit
E 3	Shower NTC malfunction	
E 4	Overheat malfunction	When the pipe water temperature is higher than >93°C the overheat switch disconnects
E 5	Gas valve circuit malfunction	The output circuit of the gas valve is abnormal
E 6	Ignition failure	It can not detect the flame
E 7	Fake fire error	Flame detection circuit is out of control
E 8	Back water NTC malfunction	NTC open circuit or short circuit; temperature is over 90 °C
E 9	Flue temperature NTC malfunction	
E A	Outside NTC malfunction	NTC open circuit and short circuit
E b	Slash fire malfunction	There is fire after the boiler turns off for 4S
E C	Communication malfunction	The communication is interrupted or disturbed
Et	Overheat fuse malfunction	Overheat fuse disconnected or flue smoke temperature is more than 90 °C
E P	Pipe malfunction	The water pressure switch is not acted
E E	EEPROM malfunction	EEPROM storage data error
EL	Frequency conversion pump malfunction	Frequency conversion pump manfunction or power capacity is less than 12W
LV	Supply voltage is too low	Supply voltage is lower than155V
HV	Supply voltage is too high	supply voltage is higher than 265V

First Operation (trial run)

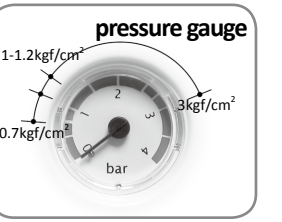
⚠ **Special Notice:**We recommend user to install and use the air filter device. The air filter will filter out the dust particles in air, to make the air which enter into the full-premix combustion chamber be earlier purified, reduce the malfunction rate and increase the service life.

⚠ **Special Notice:**We recommend user to use (FERNOX F3) system detergent, before operation, please wash the whole heating system carefully, remove the possible sundries to avoid the system blocked and device damage. (specific operation please check the user's manual of FERNOX F3 system detergent).

⚠ **Special Notice:**We recommend the user to use (FERNOX TF1) system filter. FERNOX TF1 system filter can effectively clean the magnetic and non-magnetic pollutant in system. (specific operation please check the user's manual of FERNOX TF1 system detergent).

1.Adding water to the heating system

● Turn on the **[water adding valve]** (anti-clockwise direction), at the same time, turn on the vent valve of heating in each room, turn off the vent valve until the water flow out. When the pressure gauge indicator point to 1-1.2kgf/cm2, turn off the **[water adding valve]** (clockwise direction).



⚠ **Attention:** The gas boiler supplement water pressure can not be more than 1.2 bar. Please remember that the water adding valve must be turn off after adding water, otherwise the safety pressure relief valve will be turned on to relief the pressure due to the overhigh pressure in heating system. In order to avoid the unnecessary property loss, please connect a water pipe from the safety valve outlet to floor drainage.

⚠ **Attention:** ROC company recommends user to use (FERNOX F1) system protective agent, add the system protective agent into the pipeline after the water adding is finished. The concentration of system protective agent should be around 0.5%. After adding the system protective agent, please add the protectiveagent de tected package to test the concentration of system protective agent. (specific operation please check the user's manual of FERNOX F1 system protective agent).

First Operation (trial run)

2.Operation

● Plug in and connect the power, turn on the gas valve and connect to the gas, press **[On/Off]** ⏻ button on control panel to start the boiler, circulation pump work at the same time to exhaust the air in the heating system, check the pressure gauge indicator during the exhaust process to observe if the pressure is reducing. If less than 0.7kgf/cm^2, you should supplement water again. (supplement water way is same as above) when pressure us balanced, press the **[Mode]** ☼/❄ button to confirm the system to operate in Winter mode(color screen indicate Winter icon), system switch to normal status, then ignite and burn automatically. Press **[Up▲/ Down▼]** button can set the heating output water temperature, the range is 30 ℃~80 ℃,the floor heating is 30 ℃ ~ 60 ℃ .

● If using the D.H.W, turn on the shower nozzle or hot water tap, press **[Up▲/ Down▼]** button can set the hot water output temperature(D.H.W temperature adjustment range is 30 ℃ ~ 55 ℃) . D.H.W output water flow volume depends on the hot water pipe length, the hot water must be flowed out only after all the cold water is flowed out.

⚠ **Warning !**There is condensing water flowed out from the condensing water outlet (which is over 1L/h) while the boiler is in normal operation. Please connect the water pipe to drain the condensing water to floor drainage.

Attention : Please do not change or block the condensing water outlet optionally. There is not neutralization treatment device built-in, so condensing water only can be drained into nonmetal sewage pipe.

3.Finish operation

● The trial run can finish and enter the normal operation after adjusting to comfort temperature.

● The gas boiler may lack of water after the long time operation, when the pressure indicated on pressure gauge is lower than the above value, you can supplement water according to above method.(It would be the best that the indicator on pressure gauge points at 1-1.2kgf/cm^2)

⚠ **Warning!** The first operation of gas boiler should be done after the installation and qualified examination.

Attention: Due to the reason such as installation area or environment etc, the safety pressure relief valve may flow out few water automatically during the normal operation, this is caused by the heat expansion of water inside the circle pipe. A plastic pipe can be connected to the pressure relief outlet to drain the water, or appropriate controlled the water pressure when adding water.

Turn on/off the machine correctly, Cleaning and maintenance of Product

1.Start boiler

● If restarting the gas boiler after the gas boiler turns off, abserve the pressure gauge firstly. If it is less than 0.7kgf/cm2, please pour the water again according to the pouring way in page "First Operation". Plug in and connect the power and gas, turn on the gas boiler according to the operation way in page first operation after pouring the water again. (the pressure is between 1-1.2kgf/cm^2)

2.Not be used for short Period

● Gas boiler needs to be off if it won't be used for a short period. Press ⏻ and then the machine turns off. When the gas boiler is under OFF state, please keep the current and gas supply. Gas boiler will run according to self-protection program.

3.Long period shutdown

● The gas boiler needs to be turned off if it won't be used for a long period. Press ⏻ button and the machine will turn off. Cut the current and gas supply, close the gas switches and valves for heating/domestic hot water system. For preventing frostbite, exhaust all the water in the boiler (heating and domestic hot water) and in the heating pipe, close the boiler's gas valve and pluck the plug.

4. Cleaning and Maintenance

● Gas boiler must be cleaned and maintained more than one time per year. If over one year, the trash in each pipe will make the performance debase and make some noise, which becomes the reason for malfunction. If it happens, please contact our after-sales service department and clean the boiler under the skilled man's direction. (cleaning and maintenance must be before the heating period).

Attention: recommend the user to sign the cleaning and maintenance contact with your regional technician who is authorized by our company.

Maintenance	Check once a year	Check once for two years
Check the obturator	✔	✔
Clean the heat exchanger and the flue	✔	✔
Clean the combustion chamber, fan and venturi pipe	✔	✔
Check the device for electricity and gas	✔	✔
Check the gas flow volume and pressure	✔	✔
Check all the ventilation and smoke	✔	✔
Clean the burner and exam the ignition function	✔	✔
Check the water system	✔	✔
Analyze the combustion state	–	✔
Check the lubrication of components	–	✔
Check the tightness of gas device	–	✔
Clean the secondary heat exchanger	–	✔
Check the performance of electricity and electronic components	–	✔
Volume and speed of the fan	–	✔

Attention: ✔ necessary, - not necessary.

Make sure the following items before repairing

Abnormal Phenomenon	Abnormal Reasons	Maintenance Way
There is gas smell	Close the mid-valve connected with gas pipe. Don't turn on or off the electrical equipments and then ventilate. Contact the supplier or the local after-sales service department to repair quickly. Use the suds regularly to make sure whether there is gas leakage on the connection of the gas pipe.	
It can't ignite	Does the fuse break? Does the electrical source work normally? Does the gas supply normally?	Change a new fuse(250V/3A). Check the outer electric circuit. Open the mid-valve, if the gas is used up (provided you LPG usage state), please replace the gas tank.
There is some unusual noise during start process.	Are the air supply and exhaust tube blocked? Is the heating pipe unimpeded?	Please refer to the installation guide, examine the heating pipe and mid-valve.
There is smoke smell	Is the installation for the air supply and exhaust pipe correct? Are there some gaps on the smok e pipe? Is the blaze normal? (Is there yellow blaze?)	Please refer to the installation guide. Please mend the gap. Clean and maintain more than one time per year.
Bad heating effect	Is the function selection under D.H.W mode? If the heating pipeline is blocked? Is the distributionvalve for radiator open? Is the heating temperature set too low? Is there air in the radiator?	Please adjust to heating mode. Please exam the heating pipe and mid-valve. Please compare each room's acreage firstly and compare the open state of valves for the distributors. Please set suitable temperature. Please exhaust all the air in the pipe.
There is no hot water (or hot water isn't hot)	Is the temperature set too low? Are there several places using water at the same time? Is there leakage in the hot water pipe? Is the water supply pressure too low? Does the valve for water supply close?	Please adjust to suitable temperature. Please close excessive hot water taps. Please mend the places where leak water. Please take some measures (such as adding a raise-pressure pump) when the water pressure is less than 0.02MPa(0.2kgf/cm^2). Please open the valve for water supply.

Notice: If the above malfunction remain after the inspection, excluding and restart, please contact with the after-sales service.

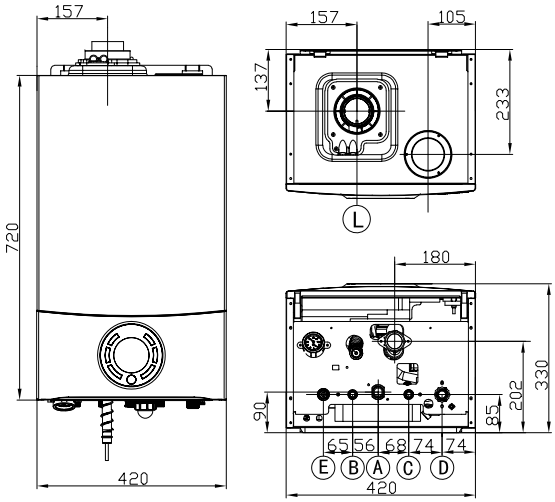
Technical data

STYLE		Duke series	
		LL1GBQ18-B20CG	LL1GBQ24-B26CG
Power			
Nominal heat input	kW	18.8	24.8
Heating nominal minimum heat input	kW	5.0	5.0
Nominal condensing output (50 °C / 30 °C)	kW	20.0	26.0
Nominal heating output (80 °C / 60 °C)	kW	18.0	24.0
Heating minimum nominal heat output(80°C/60°C)	kW	5.0	5.0
Heating minimum condensing heat output(50°C/30°C)	kW	5.0	5.0
EFFICIENCY			
Energy Efficiency rate	-	Level 1	Level 1
Nominal heat efficiency (80 °C / 60 °C)	%	97	98
Nominal heat efficiency (50 °C / 30 °C)	%	107	108
Heat efficiency in 30% capacity	%	108	108
TECHNICAL PARAMETERS			
Nominal capacity gas consumption(NG)	m^3/h	2.0	2.6
Nominal capacity gas consumption(LPG)	kg/h	1.48	1.96
Flue-gas temperature(NG)	°C	69	69
Anti-freezing system start temperature	°C	5	5
Minimum D.H.W effluent volume	kg/min	2.5	2.5
Maximum D.H.W pressure	MPa	0.8	0.8
Minimum D.H.W pressure	MPa	0.02	0.02
Expansion tank capacity	L	6.5	6.5
Expansion vessel preload capacity	MPa	0.1	0.1
Maximum heating system pressure	MPa	0.3	0.3
Nominal nature gas pressure(NG)	KPa	2.0	2.0
Nominal nature gas pressure (LPG)	KPa	2.8	2.8
PERFORMANCE			
Maximum heating water	°C	85	85
Minimum heating water	°C	30	30
Maximum D.H.W temperature	°C	60	60
Minimum D.H.W temperature	°C	30	30
D.H.W. flow rate (△T=25 K)	kg/min	10.3	13.8
D.H.W. flow rate (△T=30 K)	kg/min	8.6	11.2
Circuit			
Nominal electric power	W	80	80
Minimum electric power	W	10	10
Voltage/frequency	-	220V~/50Hz	220V~/50Hz
Appliance protection level	-	I Type	I Type
Electric insulation level	-	IPX5D	IPX5D

Product appearance diemsnion and pipe connection position

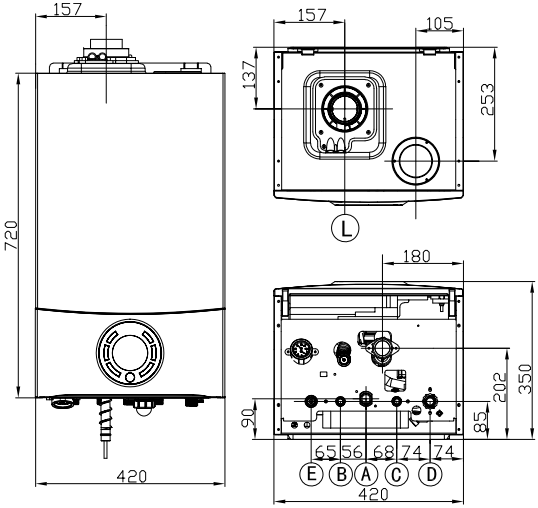
Condensing Duke Series

Unit:mm



A.Gas B. D.H.W C.Cold water D.Heating back water E.Heating water

- ***LL1GBQ18-B20CG***



A.Gas B. D.H.W C.Cold water D.Heating back water E.Heating water

- ***LL1GBQ24-B26CG***

Appendix

Complete equipment package list

Condensing Duke Series

Main body carton
- Main body

Installation package
- 1 pc product hung plate
- 6x50 six angle cross tapping screws

Flue pipe carton
- 1 pc condensing smoke pie
- 1 pc 93°coaxial elbow

Accessory bag
- 1 pc user's guide
- 1 pc warranty card

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