

KYUNG DONG BOILER

KyungDong Condensing Gas Boiler

– User's Manual –

 **MODEL**

KDB-181/201/251/301 KCA

<Condensing Model>

SATURN



KyungDong Boiler

Kyung Dong Oil Boiler

User's manual

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※ This manual is subject to change without notice for quality improvement.

Kyung Dong Oil Boiler

User's Manual

I General Warnings



This instruction booklet is considered an integral part of the product and must be delivered to the user together with the appliance. It must follow the appliance also in every passage of property.

Store the booklet in a safe place and read it carefully before using the appliance as it contains important information to ensure safe installation, operation and maintenance.

This appliance must be installed following the National and the Local law and standard in force.

Installation and maintenance must be performed according to National and Local standard in force and according to the manufacturer's instruction and by qualified personnel skilled in the specific sector as foreseen by the law.

Incorrect installation can cause damage or physical injury and the manufacturer declines all liability for failure to observe instruction and standards.

In particular maintenance must be performed by qualified personnel. In this case, an Authorized Manufacturer Service Centre represents a guarantee of professional and qualified services.

The appliance must be used according to the applications as specified in the design. Any other use has to be considered improper and therefore hazardous.

The manufacturer declines all contractual or not-contractual responsibility for damages caused by incorrect installation and incorrect operation and failure to observe the relative instructions.



2 Safety Warnings



The cautions issued by this user's manual include critical information for the safety while using the product. When the user fails to adhere to the following requirements can cause death, serious damages, and a great property loss.



For safety, according to the level of danger, we have indicated by 'Danger', 'Warning', 'Caution' and the definitions for these terms are as follows :

Danger	When the required terms are not followed, it indicates an urgent danger that may cause death or serious bodily injury.
Warning	When the required terms are not followed, it indicates latent danger that may cause death or serious bodily injury.
Caution	When the required terms are not followed, it indicates latent danger that may cause light injury or semi-serious injuries.
Caution	When the required terms are not followed, it indicates it may cause property damage, product malfunction or performance reduction.

1) The definitions of the symbols indicated on the product and user's manual are as follows :



This symbol indicates "Caution" for bodily injury under particular conditions.



This symbol indicates "Stop" for possible bodily injury or property damage.



This symbol indicates a "Must" follow sign.

2) Since the specified warnings and cautions in the user's manual are not all inclusive cautions when using the product, more care is necessary for safety when using the product.



Please read and understand this user's manual completely for safe use of this product.



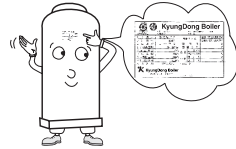
When disposing of the product, it must be done through the installer.



Kyung Dong Oil Boiler

Warnings

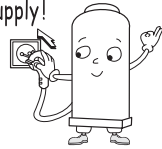
Check the oil!



Be sure to check the fuel prior to use.

- Use of the oil, other than the one specified on the name plate on the front of the boiler, may result in a fire or explosion.

Check the power supply!



Be sure to check the power supply.

- The power supply, if higher or lower than the one specified on the front of the boiler, may cause a fire.

Precautions against a fire



Never place any inflammable objects near the boiler.

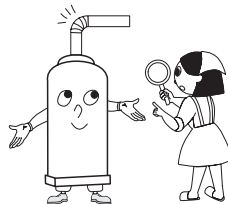
- Highly inflammable materials, such as volatile oil or alcohol, may cause a fire during ignition of the boiler

Precautions against a fire



Never place any combustible objects near the boiler.

- Any combustible objects such as vinyl nearby the boiler may cause expansion of a fire.



Check if the chimney pipe (chimney) is incorrectly connected or pulled out.

- If the chimney pipe (chimney) is incorrectly connected with the boiler, exhaust gas may flow into the indoors during operation, which may cause a carbon oxide poisoning.

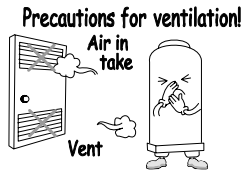
Close the door!



Close all the boiler room doors leading to the indoors before use.

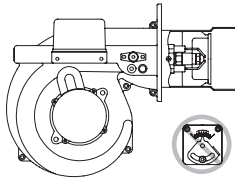
- Exhaust gas, if flowing into the indoors, may cause a carbon oxide poisoning.

Warnings



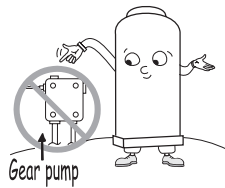
Do not stop up the air intake and the vent to prevent a draft in the winter.

- Incomplete combustion due to oxygen deficiency may lead to a carbon oxide poisoning.



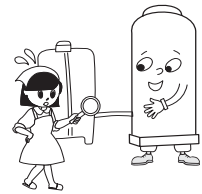
Do not adjust the damper (air controller) on the burner at will.

- Adjustment of the damper on the burner at will may cause a fire due to incomplete combustion.



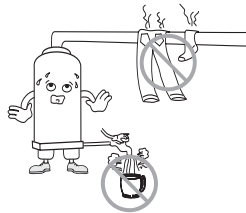
Do not adjust the pressure of the gear pump at will.

- Adjustment of the damper on the burner at will may cause a fire due to incomplete combustion.



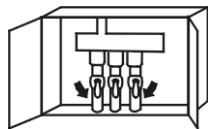
Check if there is any oil leak on the oil tank, the oil pipe, and the boiler (inside/outside).

- Operation of the boiler, with oil leak or stagnant oil, may cause a fire.



Use the boiler only for heating and supplying hot water.

- Use of the boiler for drying clothes may result in a fire.
- Use of the boiler for cooking may result in a personal injury.

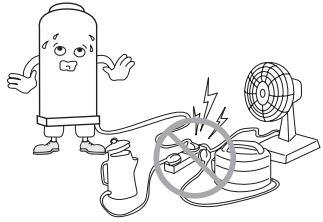


When the boiler is operating, open at least one valve of the distributor.

- When operating the boiler with the distributor valve closed, there is a possibility for fire and damages to the boiler due to overheating.

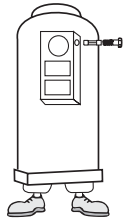
Kyung Dong Oil Boiler

⚠ Cautions



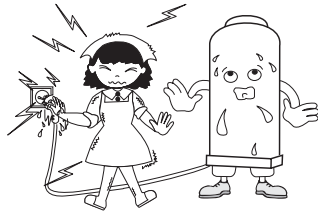
Do not insert several power plugs into one power outlet.

- Several power plugs inserted into one power outlet may cause a fire.



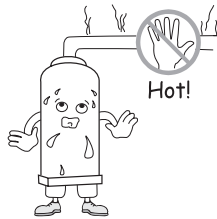
Replace the fuse, if burnt out, with the one complying with the specifications. (Refer to the Electric wiring diagram)

- Random use of a non-rated fuse may cause a fire.



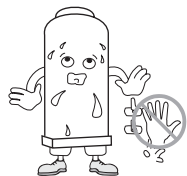
Do not touch the power cord with wet hands.

- An electric shock may be caused.



When the boiler is operating or right after the boiler is turned off, do not touch the portions near the vent or the chimney pipe (chimney).

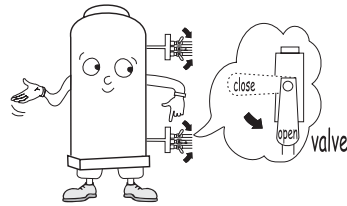
- Hot temperature on the chimney pipe (chimney) or nearby the vent may result in a burn.



Do not touch the pipeline when the boiler is operating.

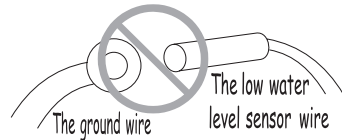
- Hot temperature on the pipeline may result in a burn.

Cautions



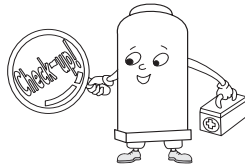
Open the distributor valve and the oil middle valve when you go outside in the winter.

- The boiler shall keep operating not to get frozen or burst during the winter. If the distributor valve or the oil middle valve is closed, the boiler stops operation, which may cause the boiler and pipeline implosion.



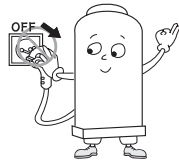
Do not make a short circuit between the low water level sensor wire and the ground wire inside the panel.

- Failure to detect the level (water) inside the boiler may result in malfunction of the boiler.



Please submit a request for inspection of your unit at least once a year.

- Please receive A/S regular inspection at least once a year from the dealer where you purchased the unit for safe and lengthened use of your boiler.



Never shut off the power supply, nor set the power switch at the off position in the winter.

- Failure of the anti frost function may result in implosion of the boiler and its pipeline.



Disposal and replacement of the boiler, if necessary, shall be performed by the installation personnel.

- Random disposal may result in a safety accident, especially to children or the old and the weak.

Recommended Items

- Please place the unit in a location where there is sufficient space for regular inspection and repair.
- For repair and inspection, there should be at least 1000mm of space in front of the unit.

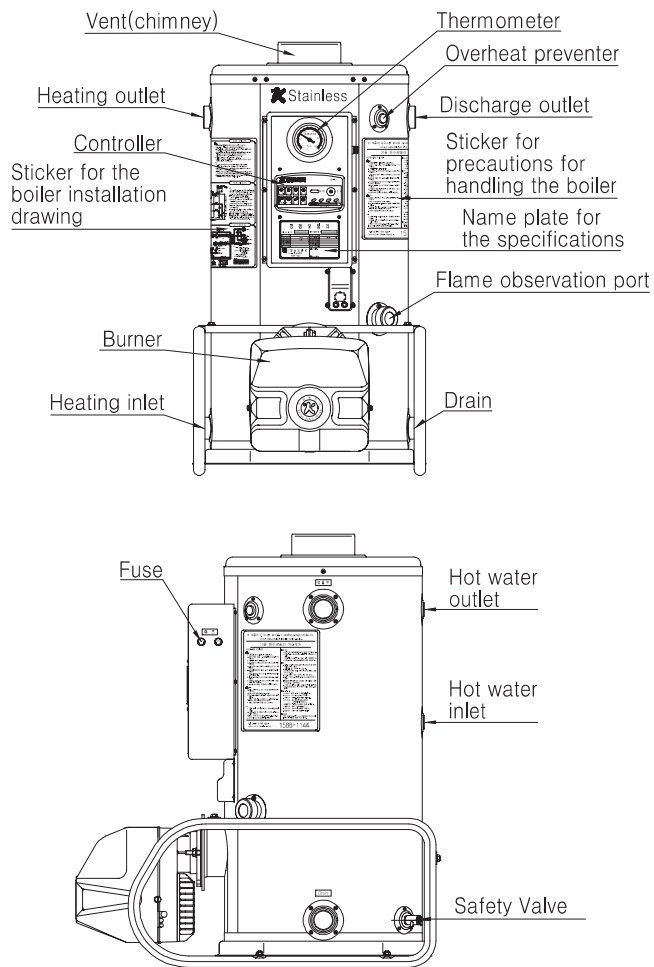


Please should be prepare water discharge hole(Device) at boiler installation.

3 Parts and structure

Boiler

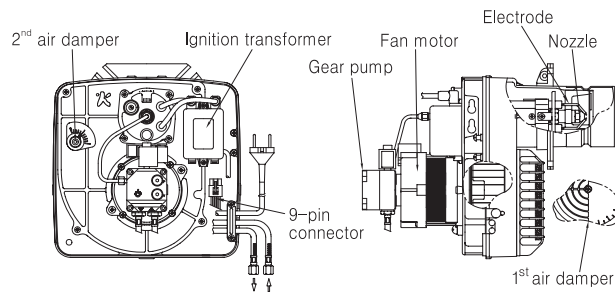
■ Model No.: KDB-535/735 RTD



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Burner

- Model No.: KPO-50A/70A
 - KDB-535 RTD
 - KDB-735 RTD



- Flame detector : to detect the flame of the burner for safe burner operation.
- Gear pump : This device sucks and pressurizes oil for combustion.
- Air damper : to adjust the air volume for the fan
- Ignition transformer : to generate high voltage to ignite the fuel
- Electrode : to ignite the fuel with the high voltage from the ignition transformer. Do not touch the electrode when the power is on, as electricity is flowing through the electrode. (▲ Warning)
- Fan motor : to circulate the fan to supply air for combustion
- Nozzle : to spray the fuel to be ignited

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4 Safety Device

1. **Safety device for power failure**
This device automatically shuts off the oil to stop operation during power failure.
2. **Safety device for power recovery**
When the boiler recovers from power failure, this device helps the boiler to automatically re-start for normal operation (which functions for 2 hours).
3. **Non-ignition protection device (Flame detection)**
 - This device automatically shuts off the oil supply when the boiler does not ignite.
 - This device also shuts off the oil supply automatically, when the flame goes out during normal combustion.
4. **Quasi flame protection device**
This device stops boiler operation, when there is any flame remaining inside the boiler prior to normal operation.
5. **Anti overheat device (for prevention of hot temperature)**
This device shuts off the oil supply for stopping the boiler operation automatically, when the heat exchange is overheated
6. **Low water level shut off device**
This device indicates that the boiler has run out of water and stops the boiler operation.
7. **Temperature controller protection device**
This device stops the boiler operation, if there is any abnormality in the temperature sensor.
8. **Anti frost device**
This device automatically circulates water and raises the water temperature in order to keep the boiler from getting frozen with the anti frost function, when you go outside in the winter.
9. **Short circuit protection device**
This devices stops boiler operation by cutting off the fuse, when there is any abnormality in the wires (short circuit) inside the boiler or when the over current is generated to exceed the rated capacity of the fuse.
10. **Lightening and static electricity protection device**
The protection device to prevent a lightning strike (lightening) and the electrostatic discharge is supplied in the controller.

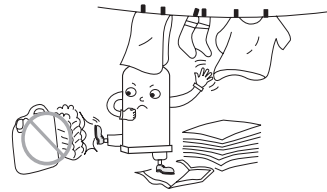


5 Checkups before use of the boiler

Precautions against a fire


Warning

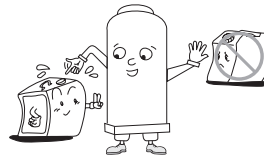
Check if there is any inflammable or combustible material nearby the boiler. Keep away the material, if any, from the boiler prior to operation.



Precautions for the fuel

- Use boiler oil and light oil. (Never use volatile oil and alcohol.)

 If the temperature goes below -5°C , it is desirable to use kerosene.

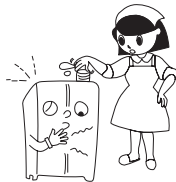


Fuel storage

- The fuel shall be kept in a place without direct sunlight, free from the impact of oil, fire, rain, or dust.



Attentions



Be sure to close the oil tank lid.

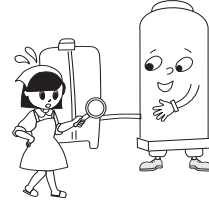
- Any foreign object in the oil tank may cause the deteriorated combustion, boiler malfunction, or the shortened life of the boiler.



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Check oil leak on the fuel pipe

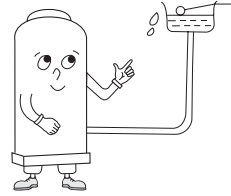
- Check if there is any oil leak on the connection points on the oil pipe.



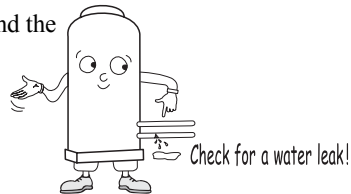
Check the boiler and its pipeline

- ! Be sure to comply with the following instructions before use.

- Check if water is in the makeup water tank. When the water is insufficient to operate the boiler, the makeup water lamp (red) on the controller will light.

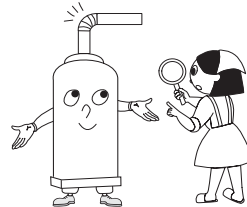


- Check if there is any water leak in the heating and the hot water pipes of the boiler.



Check the chimney pipe (chimney)

- Before operation of the boiler, check if the chimney pipe (chimney) is incorrectly connected or pulled out from the boiler.



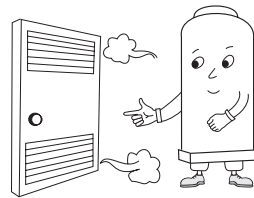
6 Correct method of use

Precautions for use

- ! Do not use the boiler for the purposes other than supplying hot water and heating.
- ! After repair or exchange of the oil pipes, you shall have the boiler checked by the installation personnel before use of the boiler.

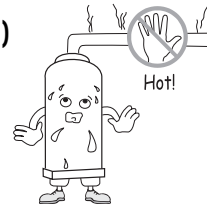
1 Precautions for ventilation (⚠ Warning)

- Care shall be taken for air intake and ventilation during use.
- Improper air intake and ventilation causes deteriorated boiler combustion, as well as shortened life of the boiler. In addition, the flow of exhaust gas into the indoors may result in carbon oxide poisoning.



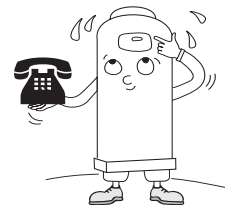
2 Precautions against a burn (⚠ Caution)

- Care shall be taken against a burn, possibly caused by touching the hot chimney pipe (chimney) or pipes during operation.



3 Consultation with the installation personnel

- With any abnormality in the boiler, the checkup lamp on the controller will light, and the check lamp on the room temperature controller will be blinking. Then, press the restart button 2 to 3 times for reoperation. If any abnormality still exists consult with a selling agency where near your town, or where you purchased from.



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The method to use the temperature controller

Correct method to use the temperature controller

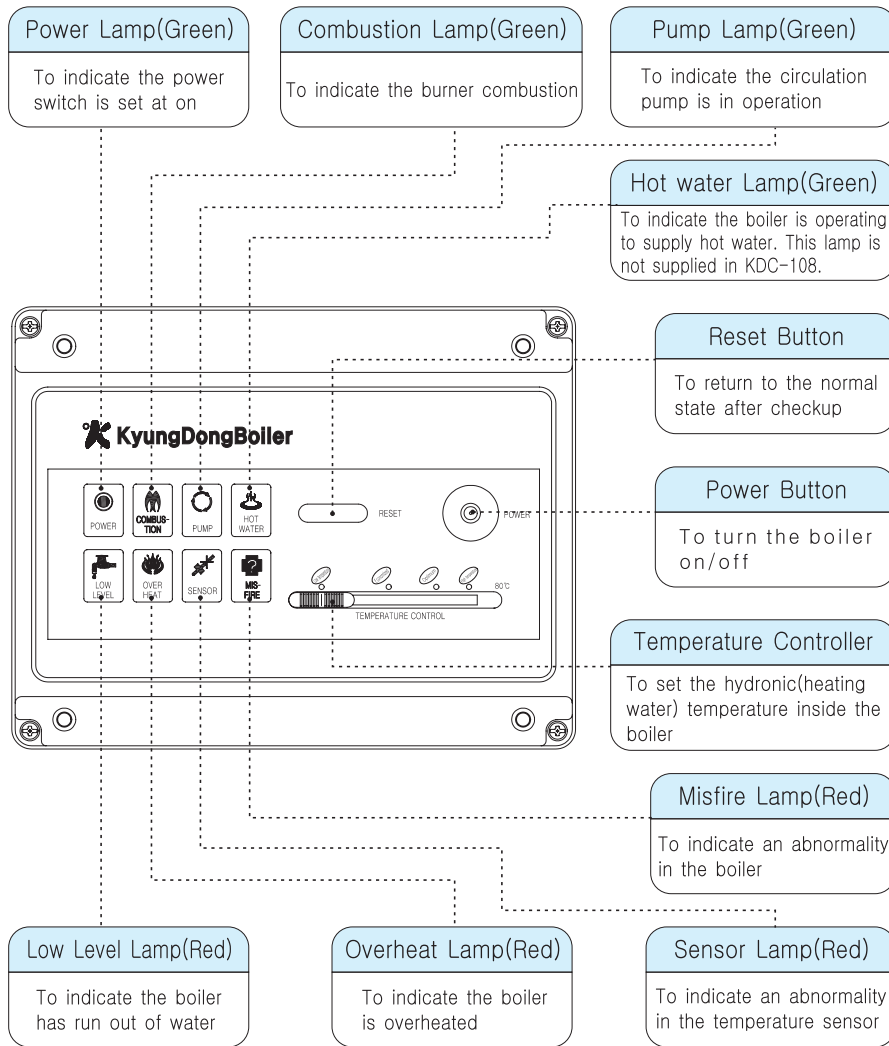
1. The heating method is classified into the hydronic heating system, the heating system operating by detection of the designated room temperature, and the heating system operating at designated intervals. The heating system operating at a designated interval helps you to reduce the heating cost.
2. The hydronic heating system is operating through detection of the temperature of hot water circulating through the floor for heating. When using the hydronic heating system, it is desirable to set the hydronic (hot water) temperature at 60 to 70°C in the spring and fall and at 70 to 80°C in the winter.
3. When using the heating system operating by detection of the designated room temperature, it is desirable to set the room temperature at 10 to 40°C, as desired.
4. When using the heating system to operate at a designated interval for reduction in heating cost, you may set the time for stopping the boiler operation at 0 to 4 hours, as desired.
5. If there is a considerable difference in the temperature between the floor and the room temperature due to the inferior heat insulation, it is desirable to use the hydronic heating system rather than the heating system operating by detection of the designated room temperature.



Controller

■ Model No. : KDC-107 (for both heating and supplying hot water)

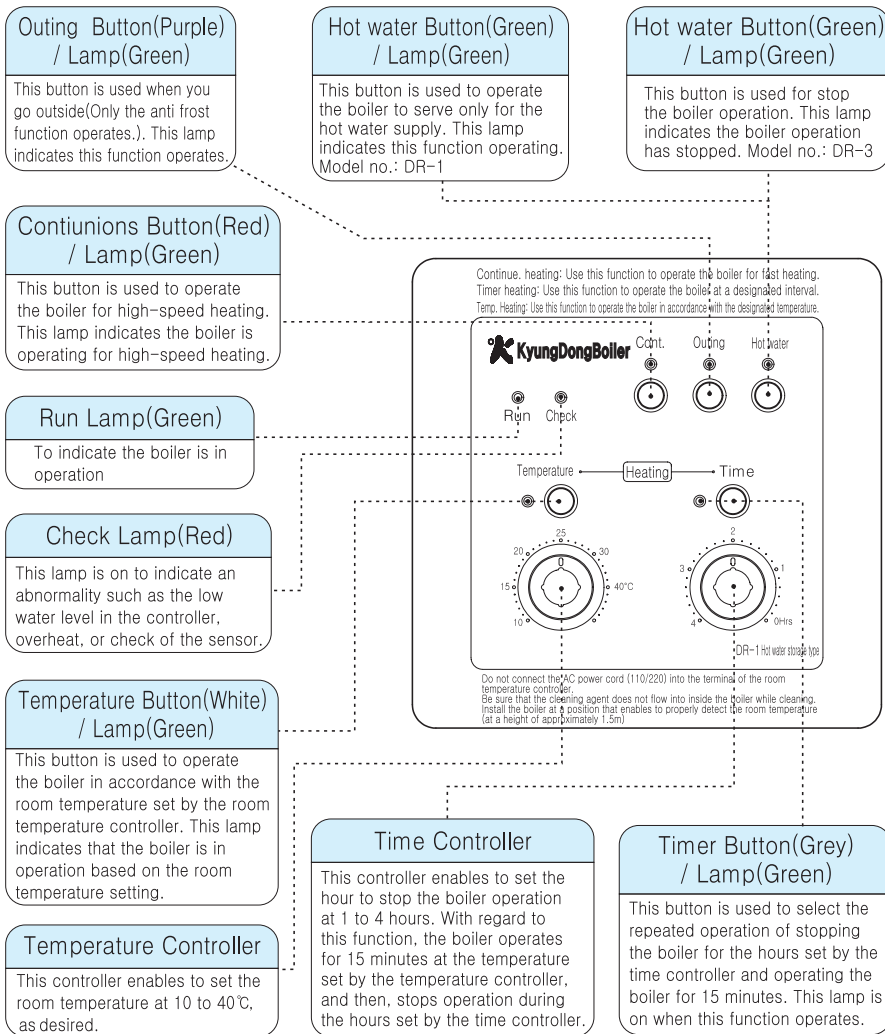
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Kyung Dong Oil Boiler

Room Thermostat

■ Model No.: DR-1 (for both heating and supplying hot water)



User's Manual

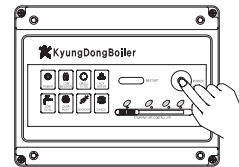
Kyung Dong Oil Boiler

The method to operate the room thermostat (Model No.: DR-1)

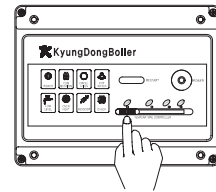
- If the lamps on the controller and the room temperature controller are on or blinking, check the description of the functions of the controller and the room temperature controller.

Operation of the heating system for the room temperature setting

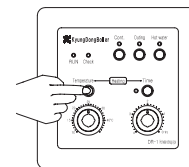
- 1** Check if the 'Power' button on the controller is set at ON. All the operations on the room temperature controller are available only when the 'power' on the controller is on.



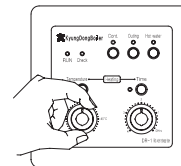
- 2** Adjust the temperature controller to the left or right to set the temperature of the boiler water.
- Low temperature : 20°C, Economized : 40°C, Optimum : 60°C, High temperature : 85°C
 - The boiler stops operation at the designated temperature.



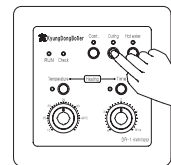
- 3** Press the 'Temperature' button on the room temperature controller.



- 4** Turn the 'Temperature controller' to the left or the right to set the desired room temperature. The temperature shall be set higher than the room temperature in order to operate the boiler. The temperature controller may be adjusted to 10 to 40°C for setting the room temperature.



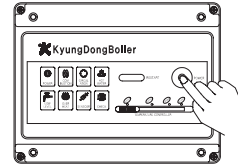
- 5** Press the 'Outing' button to stop the heating operation for the designated temperature. Then, the boiler will stop operation, and only the anti frost function will work.



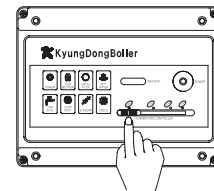
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Operation of the heating system at designated intervals

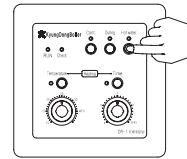
- 1** Check if the 'Power' button on the controller is set at ON. All the operations from the room thermostat are available only when the 'power' of the controller is on.



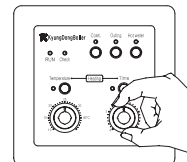
- 2** Adjust the temperature controller to the left or right to set the temperature of the boiler water.
- Low temperature : 20°C, Economized : 40°C, Optimum : 60°C, High temperature : 85°C
 - The boiler stops operation at the designated temperature.



- 3** Press the 'Timer' button on the room temperature controller. The boiler operation proceeds for 15 minutes, and 1, 2, 3, and 4 on the time controller refer to the hours to stop boiler operation.



- 4** Turn the 'Time controller' to the left or the right, in order to set the desired time to stop operation.

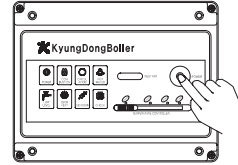


- 5** The boiler repeatedly operates for 15 minutes and stops operation in accordance with the designated time for stopping. (For example, if you set the temperature controller at 3, the boiler will operate for 15 minutes, and stop operation for 3 hours, which is repeatedly performed.)

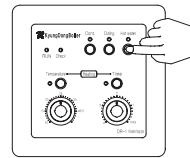
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To use hot water (DR-1: both for heating and supplying hot water)

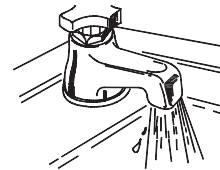
- 1** Check if the 'Power' button on the controller is set at ON. All the operations from the room temperature controller are available only when the 'power' of the controller is on.



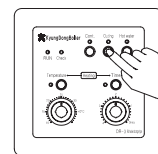
- 2**
- Press the 'Hot water' button in order to use the hot water during heating.
 - Select 'High speed', 'Temperature', or 'Time' as desired, in order to perform the heating operation after using the hot water.



- 3** When the boiler is used only for supplying hot water, the water temperature is automatically set at 80 °C.






- 4** When the heating system is not used in the summer, press the 'Outing' button on the room temperature controller if you desire to cancel the operation for supplying hot water.



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Other considerations

1 If it is impossible to operate the boiler due to a malfunction of the room temperature controller, call the selling agency first. Then, for temporary use of the boiler, tighten 2 wires connected to the rear side of the room temperature controller. The boiler will operate for heating in accordance with the temperature set by the room temperature controller. (To stop the boiler operation, loosen the wires connected to the room temperature controller.)

-  Call the selling agency for consultation.
-  Tightening or loosening the room temperature controller wires shall be performed after disconnecting the power cord.
-  Do not connect the room temperature controller wires directly to the power supply.

Indication of abnormalities in the controller

Conditions	Cause
Makeup water lamp (Red)	To indicate the lack of hot water (hydronics) in the pipes of the boiler
Overheat lamp (Red)	To indicate overheated pipes
Sensor lamp (Red)	To indicate the short or open circuit on the temperature sensor
Check lamp (Red)	To indicate the failure of boiler ignition or abnormalities

 If there is any abnormality as mentioned above, consult with your nearby selling agency.

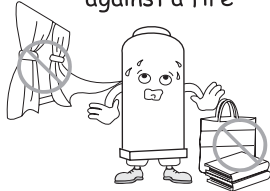
7 Daily checkup / Cleaning method

Daily checkup

- ! Check if there is any combustible object nearby the boiler or the chimney pipe (chimney).

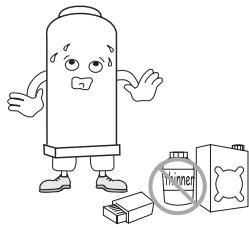
Warnings

Precautions against a fire



Never place any combustible objects near the boiler.

- Any combustible objects such as vinyl nearby the boiler may cause expansion of a fire.



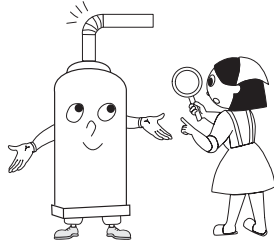
Never place any inflammable objects near the boiler.

- Highly inflammable materials, such as volatile oil or alcohol, may cause a fire during ignition of the boiler.

- ! Check if the chimney pipe (chimney) is crushed, filled with water, clogged or burst and if the end of the chimney pipe (chimney) is in a place and a direction not to have damage on other houses and people owing to the wind or other impacts.
- ! Check if the connection points on the intake and exhaust pipes (exhaust pipe, chimney pipe) are secured, if the chimney pipe (chimney) is clogged, and if there is any leak due to rusty portions
- ! If there any abnormality still exists, call the agency where you purchased from, and consult with a installation personnel.

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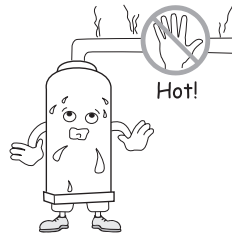
Warnings



Check if the chimney pipe (chimney) is incorrectly connected or pulled out.

- If the chimney pipe (chimney) is missing from the boiler, exhaust gas may flow into the indoors during operation, which may cause a carbon oxide poisoning.

Cautions



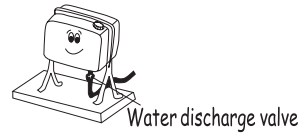
When the boiler is operating or right after the boiler is turned off, do not touch the portions near the vent or the chimney pipe (chimney).

- Touching the hot temperature on the chimney pipe (chimney) or nearby the vent may result in a burn.

- ! Always keep the boiler clean.
- ! Check if there is any oil leak in the oil tank, the oil pipe, or the boiler.
- ! Check if there is any water leak inside the boiler (inside or outside) or the pipe.

Water discharge from the oil tank

- Open the water discharge valve on the oil tank to remove water periodically.



- ! It is dangerous to fully open the water discharge valve, as a large amount of oil may flow out of the oil tank. You do not have to fully open the valve, as there is only a small amount of water to remove.

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Cleaning the boiler

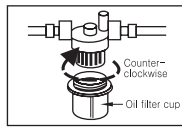
Cleaning the oil filter

- ❗ Fume deposits or foreign objects inside the boiler may cause deterioration of the efficiency of boiler operation and shortened life of the boiler, as well as a fire.
- ❗ Call the distributor, if it is necessary for checkup and cleaning of the boiler.

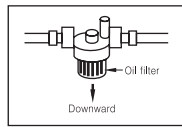
Cleaning the oil filter

If the oil filter is dirty, stop operation of the boiler, close the oil valve, and remove dust and rust below the oil filter cup.

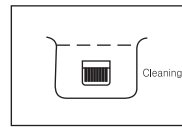
- Sequence ① Turn off the boiler.
- Sequence ② Separate the oil filter cup connected to the flexible hose nearby the inlet of the gear pump, by turning the cup counter-clockwise.
- Sequence ③ Separate the strainer screen by pulling it out downward.
- Sequence ④ Clean the strainer screen and inside the oil filter cup using the clean boiler oil or the light oil.



<Figure 1>



<Figure 2>



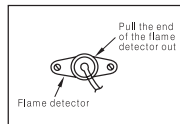
<Figure 3>

- ❗ Do not forget to wear gloves while cleaning.

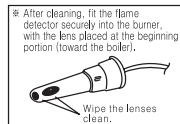
Cleaning the flame detector

- Dirt and fume deposits on the photoelectric tube causes deteriorated sensitivity of the tube, and the photoelectric tube may fail to detect the flame, which eventually leads to failure of combustion.

- ① Pull out the flame detector (Black) attached to below the burner.
- ② Wipe the glass surface of the flame detector with clean cloth.
- ③ Fit the flame detector into the burner until you hear a snap sound, after cleaning.



<Figure 1>





<Figure 2>





- ❗ Be sure to turn the power on, while cleaning the flame detector.
- ❗ Never wipe the flame detector with wet cloth or oil.
- ❗ Do not pull the wire out while separating the flame detector.


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8 Checkpoints before consulting with the installation personnel

- If there is any abnormality in the product, check the following before consulting with the installation personnel.
- If the check lamp light is on to indicate an abnormality, take proper actions by symptoms as presented in the following, and restart the boiler. (Re-insert the power plug or set the restart switch at ON to re-operate the boiler.)
- If the boiler does not operate, call the nearby any distributors.

 Actions to be taken by the user.
 Consult with the installation personnel.

Symptoms		Causes	Actions	Remark
The boiler does not operate.	▶ The Power lamp does not light. (No indication of power supply)	▶ The fuse is burnt out.	▶ Replace the fuse.	
		▶ Power failure	▶ Wait for the power recovery.	
		▶ The plug contact failure	▶ Consult with the installation personnel.	
		▶ The power plug is not connected.	▶ Connect the power plug.	
	▶ The Power lamp is on, but the boiler does not work	▶ The room temperature is higher than the designated temperature.	▶ Increase the temperature on the room temperature controller supplied in the room.	
		▶ The temperate set by the boiler temperature controller is too low.	▶ Increase the temperature on the boiler temperature controller.	
	Makeup water	▶ The heating pipe has run out of water, or the makeup water valve is closed.	▶ Fill the makeup water	
		▶ The low water level connection wire (Yellow) on the controller is incorrectly connected or short-circuited.	▶ Consult with the installation personnel.	
		▶ The earth wire on the controller (Red) is incorrectly connected.	▶ Consult with the installation personnel.	
	Check	▶ Flame is not detected.	▶ Consult with the installation personnel.	
		▶ The ignition spark is not generated.	▶ Consult with the installation personnel.	
	Sensor	▶ The sensor wire on the controller is incorrectly connected or short-circuited.	▶ Consult with the installation personnel.	
	Overheat	▶ The heat exchanger is overheated.	▶ Consult with the installation personnel.	
		▶ The heating pipe is clogged.	▶ Consult with the installation personnel.	
▶ The boiler operates normally, but the heating does not work.	▶ The valve on the heating pipe is closed, or the pipe is clogged.	▶ Consult with the installation personnel.		
	▶ The heating pipe is filled with air or has a water leak.	▶ Consult with the installation personnel.		
	▶ The circulation pump does not operate.	▶ Consult with the installation personnel.		
▶ The boiler operates normally, but hot water is not supplied.	▶ The valve on the hot water supply pipe is closed, or the pipe is clogged.	▶ Consult with the installation personnel.		
▶ Too much noise is generated during ignition and combustion	▶ The duct on the chimney is incorrectly installed.	▶ Consult with the installation personnel.		
	▶ The chimney is clogged.	▶ Consult with the installation personnel.		

 If there is a symptom, which is not specified above, call your nearby any distributors.

