http://www.krb.co.kr

WORLD 3000

- WORLD 3000-16DNS
- WORLD 3000-20DNS
- WORLD 3000-25DNS
- WORLD 3000-30DNS

Inside you will find many helpful hints on how to use and maintain your boiler properly. Just a little preventive care on your part can save you time and money over the life of your boiler. You'll find many answers to common problems in the 'Before you call for Service' section. If you review our chart of 'Troubleshooting Tips' first, you may not need to call for service at all.

CERTIFIED ®

Advanced gas detection system

If a gas leak is detected, the main control system alerts and stops the boiler operation automatically to prevent accidents.

Self-diagnosis function

Boiler operation is continuously monitored. If a fault occurs, an error code is displayed on the control.

Freeze protection system

If the surrounding temperature falls suddenly in winter, the system operates the circulation pumpe to maintaion the suitable temperature by itself. To prevent freezing when you are away from home for a long period, do not turn off the power. Just set the temperature control mode on 'Going out' mode.

Automatic gas cut-off system

This system has a function which cuts off the gas supply automatically for the user's safety when electric power supply is interrupted or gas pressure is extremely low, or the heat exchanger is overheated The system also stops supplying the gas if the vent pipe is blocked or there is any problem with the ventilation of flue gas because of wind.

Advantages

⚠CAUTION

Gas detector is not a safety device but a monitoring device.

Low water level cut off function

The water level is always monitored by this function at all time. The boiler will shut down if a low water condition is detected.

CONTENTS

Read The Safety Information

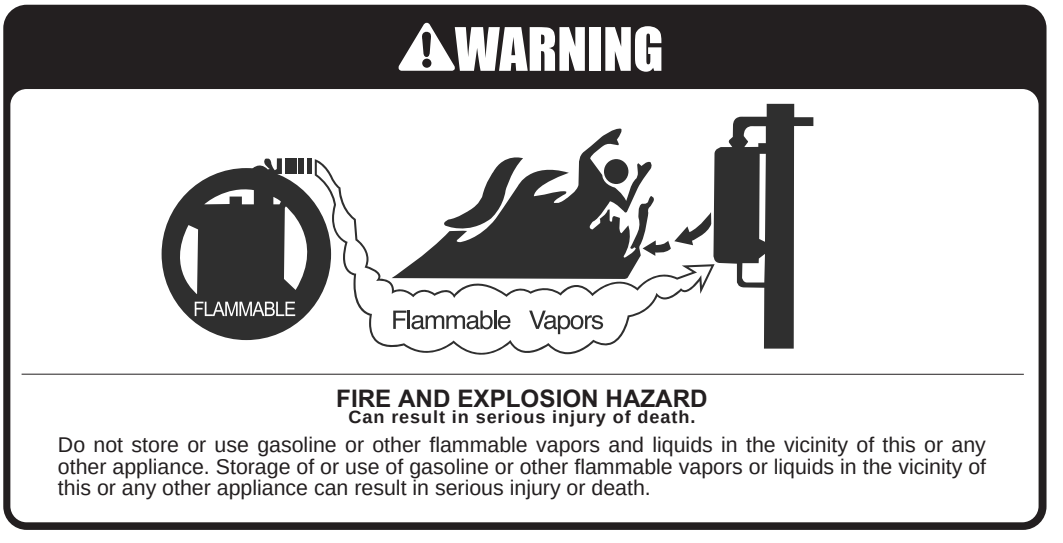
Your safety and the safety of others are very important. There are many important messages in this manual and on your appliance. **Always read and obey all safety messages.**

SAFETY INSTRUCTIONS

Be sure to read and understand the entire this manual before attempting to install or operate the boiler. It may save you time and money. Pay particular attention to the 'Safety instructions'. Failure to follow these warnings could result in serious bodily injury or death.

FOR YOUR SAFETY

Gasoline, as well as other flammable materials and liquids, and the vapors they produce are extremely dangerous. Do not handle, use or store gasoline or other flammable or combustible materials anywhere near or in the vicinity of a boiler or any other appliance. Be sure to read and follow the warning label pictured below, as well as the warnings printed in this manual. Failure to do so can result in property damage, bodily injury or death.



Do not store and use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

Installation and service must be performed by qualified installer, service agency or the gas supplier.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

⚠**WARNING** : IF THE INFORMATION IN THIS MANUAL IS NOT FOLLOWED EXACTLY, A FIRE OR EXPLOSION MAY RESULT CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR LOSS OF LIFE

SAFETY INSTRUCTIONS

If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life

WATER TEMPERATURE SETTING

Safety and energy conservation are factors to be considered when selecting the water temperature setting of a thermostat. Water temperatures above 125°F can cause serve burns or death from scalding. Be sure to read and follow the warnings pictured below.

⚠CAUTION

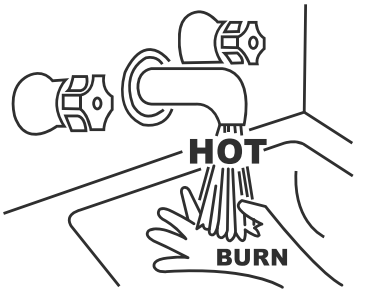
Households with small children, disabled, or elderly persons may require a 120°F(48.9℃) or lower gas control(thermostat) setting to prevent contact with hot water

The temperature at which injury occurs varies with the person's age and time of exposure.

The Slower response time of disabled persons increase the hazards to them. Never allow small children to use a hot water tap, or to draw their own bath water.

Never leave a child or disabled person unattended in a bathtub or shower.

⚠DANGER



Water temperature over 125°F can cause severe burns instantly or death from scalds.

Children, disabled and elderly are at highest risk of being scalded.

See instruction manual before setting temperature at boiler.

Feel water before bathing or showering.

Temperature limiting valves are available, see manual.

SCALDS? FIRST AID

1. Remove clothes: Quickly remove all wet clothing which can contain the heat.
2. Immediately submerge the burnt s area into cold water for 30 minutes to reduce the heat and to prevent more serious burning.
3. Keep the injured person warm.
4. Call a medical service, describe the situation and follow their advice.

⚠DANGER

Hotter water increases the Potential for **Hot Water SCALDS.**

Time/Temperature Relationship in Scalds

Water temperature	Time to produce a serious burn
120°F(48.9°C)	More than 5 minutes
125°F(51.7°C)	1 11/42 to 2 minutes
130°F(54.4°C)	About 30 seconds
135°F(57.2°C)	About 10 seconds
140°F(60.0°C)	Less than 5 seconds
145°F(62.8°C)	Less than 3 seconds
150°F(65.6°C)	About 1 11/42 seconds
155°F(68.3°C)	About 1 seconds

The chart shown above may be used as a guide in determining the proper water temperature for your home

GENERAL CAUTIONS FOR INSTALLATION

This boiler must be installed in accordance with these instructions, local codes, utility company requirements, and/or in the absence of local codes, use the latest edition of the American National Standard/National Fuel Gas Code. A copy can be purchased from either the American Gas Association, ANSI standard 1.34.16 or National Fire Protection Association.

NOTICE FOR INSTALLER

❶ Installation and service must be performed by a qualified installer, service agency or the gas supplier.

❷ This gas boiler must be installed in accordance with this manual. Kiturami is not responsible for improper installation, adjustment, alteration, service or maintenance that can cause property damage, personal injury or death.

❸ Make sure the boiler fits the electrical specification and the type of gas supplied.

❹ Make sure that the installation place is safe from fire.

❺ Improper installation of ventilation and vent pipe could cause gas related accidents and reduce the life span of the boiler.

❻ Kiturami is not responsible for use of the improper type of water such as well water in its heating boiler. If the improper water for heating has been used, flush the heating pipe as much as possible.

❼ Leave this copy of the manual with the end user after the installation

⚠CAUTION

This boiler is wall-mounted type. The rating plate is on the right side of boiler.

Piping for heating and hot water should be cleaned before connecting to the unit.

Install the boiler in accordance with this user's manual.

Install the boiler with minimum specified clearance distances to prevent fire.

Lime scale accumulation can reduce the life of the equipment, reduce efficiency and waste fuel. Boiler failure due to lime or scale buildup voids the warranty.

GENERAL CAUTIONS FOR INSTALLATION

REQUIREMENTS FOR INSTALLATION

The installation must conform to the requirements of the authority having jurisdiction or, in the absence of such requirements, to the ***National Fuel Gas Code, ANSI Z223.1/NFPA 54 and/or CAN/CSA B149.1, Natural Gas and Propane installation Code.***

Where required by the authority having jurisdiction, the installation must conform to the ***Standard for Controls and Safety Devices for Automatically Fried Boilers, ANSI/ASME CSD-1.***

This boiler has an integral low water cut off device that will terminate boiler operation in the case of low water level. An external low water cut off device is not required for installations where the radiation piping is located below the level of the boiler.

The boiler and its individual shutoff valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 1/2 psi (3.5kPa).

The boiler must be isolated from the gas supply piping system by closing its individual manual shutoff valve during any pressure testing of the gas supply piping system at test pressures equal to or less than 1/2 psi (3.5 kPa)

The boiler shall be installed such that the gas ignition system components are protected from water such as dripping, spraying, rain, etc.) during appliance operation and service.

After placing the boiler in operation, the ignition system safety shutoff device must be tested. Please refer to page 15 for details.

If an external electrical source is utilized, the boiler, when installed, must be electrically bonded to ground in accordance with the requirements of the authority having jurisdiction or, in the absence of such requirements, with the ***National Electrical Code, ANSI/NFPA 70 and/or the Canadian Electrical Code Part I, CSA C22.1, Electrical code.***

CORROSIVE ATMOSPHERES

The air in beauty shops, dry cleaning establishments, photo processing labs, and storage areas for liquid and powdered bleaches or swimming pool chemicals often contain such halogenated hydrocarbons.

An air supply containing halogenated hydrocarbons may be safe to breathe, but when it passes through a gas flame corrosive elements are released that will shorten the life of any gas burning appliance.

Propellant from common spray cans or gas leaks from A/C and refrigeration equipment are highly corrosive after passing through a flame.

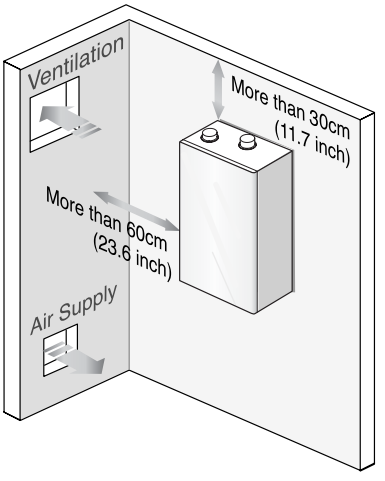
The boiler warranty is voided when failure of the boiler is due to operation in a corrosive atmosphere.

NOTICE: The boiler should not be installed near an air supply containing halogenated hydrocarbons

LOCATION FOR INSTALLATION

LOCATION

Install in a separate boiler room if possible to prevent infiltration of flue gas into the living space. This appliance is typically installed indoors to avoid freezing the boiler. If the boiler is to be installed outdoors, provisions must be made to keep the appliance and its associated piping from freezing.

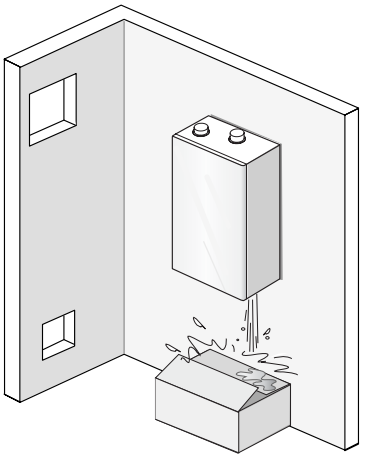


[SEPARATED BOILER ROOM]

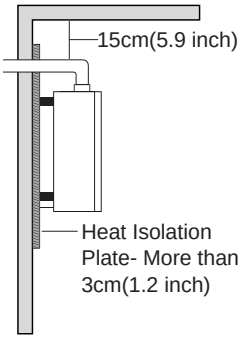
Do not install the boiler in bathrooms, bedrooms, any occupied rooms that are normally closed, or in unprotected outdoor areas. Avoid any airtight place which there is no ventilation to prevent gas relative accidents and malfunctions from a lack of air.

Have a space at least 60 cm(23.6 inch) from the wall and 30 cm(11.7 inch) from the ceiling for safety inspection and future access.

It is highly recommended to have air supply and ventilation grilles when the appliance is installed in an enclosed space to prevent gas related accidents.



Make sure the pressure relief valve in the boiler is properly provided with a means of drainage. Please check the connections between drain pipe and boiler for your safety and to avoid water damage.
Provide the minimum clearance to combustible construction for installation in an alcove or closet.



Top.....10 in.
Front.....10 in.
Flue or vent connector.....0 in. Around Flue pipe
Back.....0 in.
Left Side.....10 in.
Right Side.....10 in.

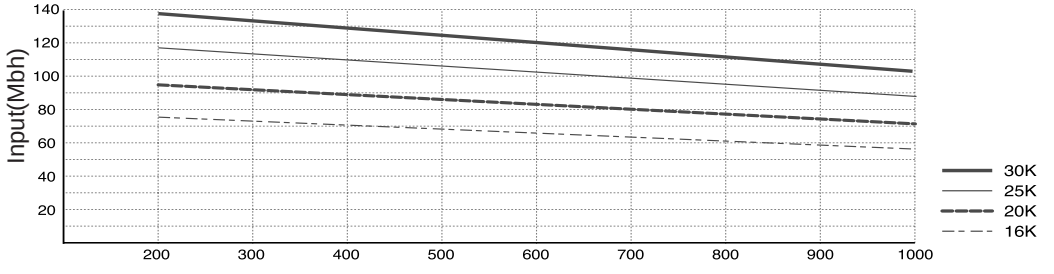
⚠WARNING

A gas fired boiler or any other appliance should not be installed in a space where liquids which give off flammable vapors are to be used or stored. Such liquids include gasoline, LP gas (butane and propane), paint or adhesives and their thinners, solvents or removers.

The boiler and water lines should be protected from exposure to freezing temperatures.
The boiler should be installed as close as practical to the gas vent or vent pipe.
Make sure there is at least 1m distance between the boiler and other gas related appliances.
Make certain the wall is strong enough to sufficiency support the weight of the boiler once it is filled with water.
Install the boiler using anchor bolts that are strong enough to support the boiler's weight approximately 35 ~ 45 kg(77.1~99.2 lbs).

HIGH ALTITUDE

The boiler is designed to operate to capacity in installations with 2000 feet off elevation or less. As elevations higher than 2000 feet have less dense air, the unit is not capable of providing its specified capacity. The affect of elevation will de-rate the input by approximately 3.5% per 1000 foot of elevation. At elevation greater than 2000 feet, the combustion of the boiler must be checked with a calibrated combustion tester to ensure safe and reliable operation.



GAS INSTALLATION

Consult with qualified gas technician for construction of gas piping.
Use certified gas pipes in connection with the boiler.
Use only the gas type that is indicated on the rating plate of the boiler and install the manual gas shut-off valve where you can reach it easily.

GAS SUPPLY

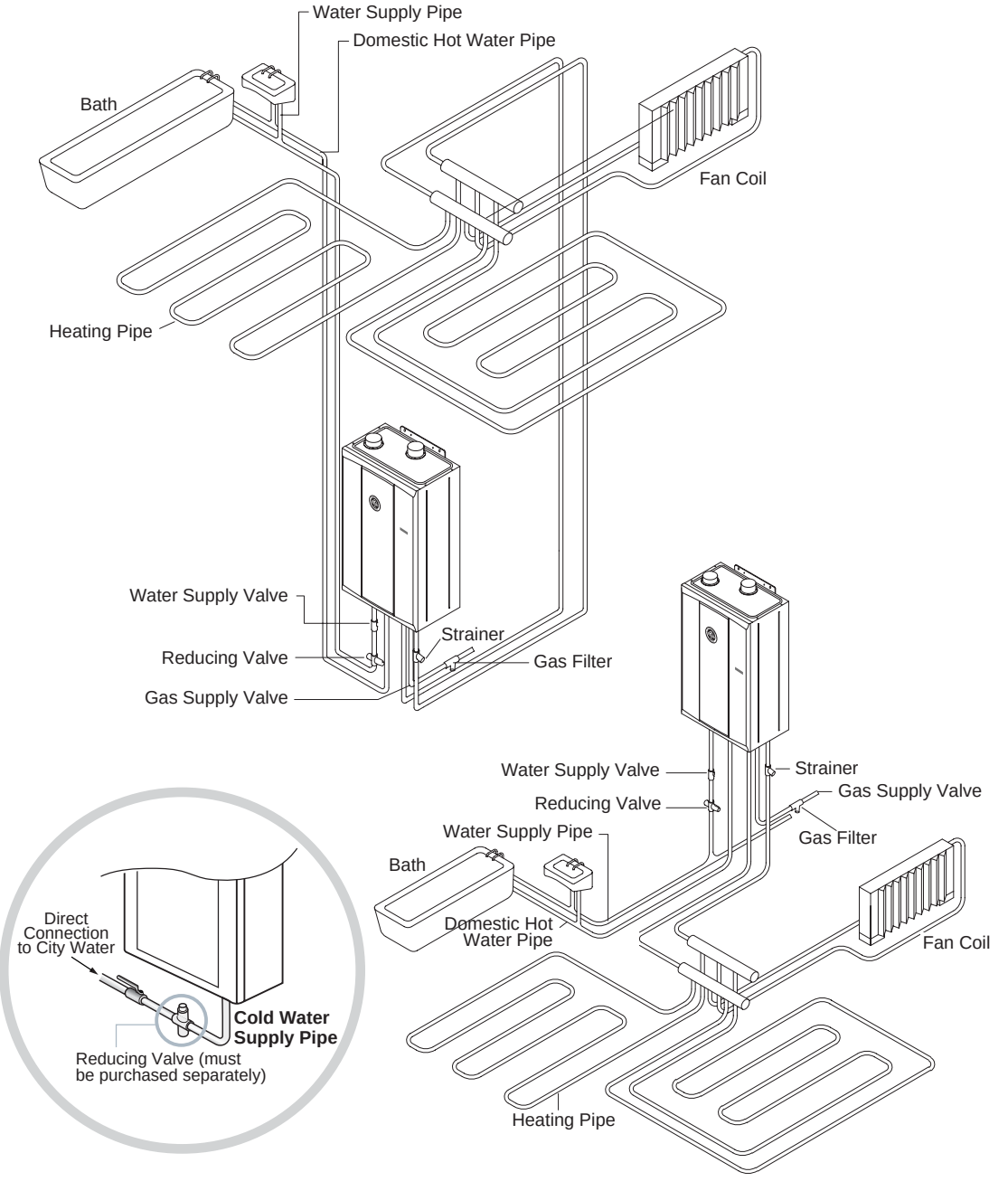
A ground joint union or ANSI design certified semi-rigid or flexible gas appliance connector should be installed in the gas line close to the boiler. A manual gas shut-off valve should be at least 5 ft. above the floor and readily accessible.
Compound used on the threaded joints of the gas piping must be of the type resistant to the action of LP gas. Use compound sparingly on male threads only.
A sediment trap should be installed at the bottom of the gas line.
Do not use excessive force (over 31.5 ft lbs.) in tightening the pipe joint at the gas control (thermostat) inlet, particularly if teflon pipe compound is used, as the valve body may be damaged.

LEAK TEST

The boiler and its gas connections must be leak tested at normal operation pressures before is placed in operation.

1. **Turn on the manual gas shut-off valve near the boiler.**
2. **Use a soapy water solution to test for leaks at all connections and fittings. Bubbles indicate gas leak that must be corrected.**

UP/DOWNWARD TYPE PIPING SYSTEMS



⚠WARNING

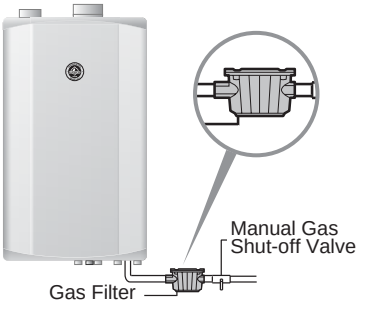
Do not attempt to convert this boiler for use with a different type of gas other than the type shown on the rating plate. Such conversion could result in hazardous operating conditions.

⚠WARNING

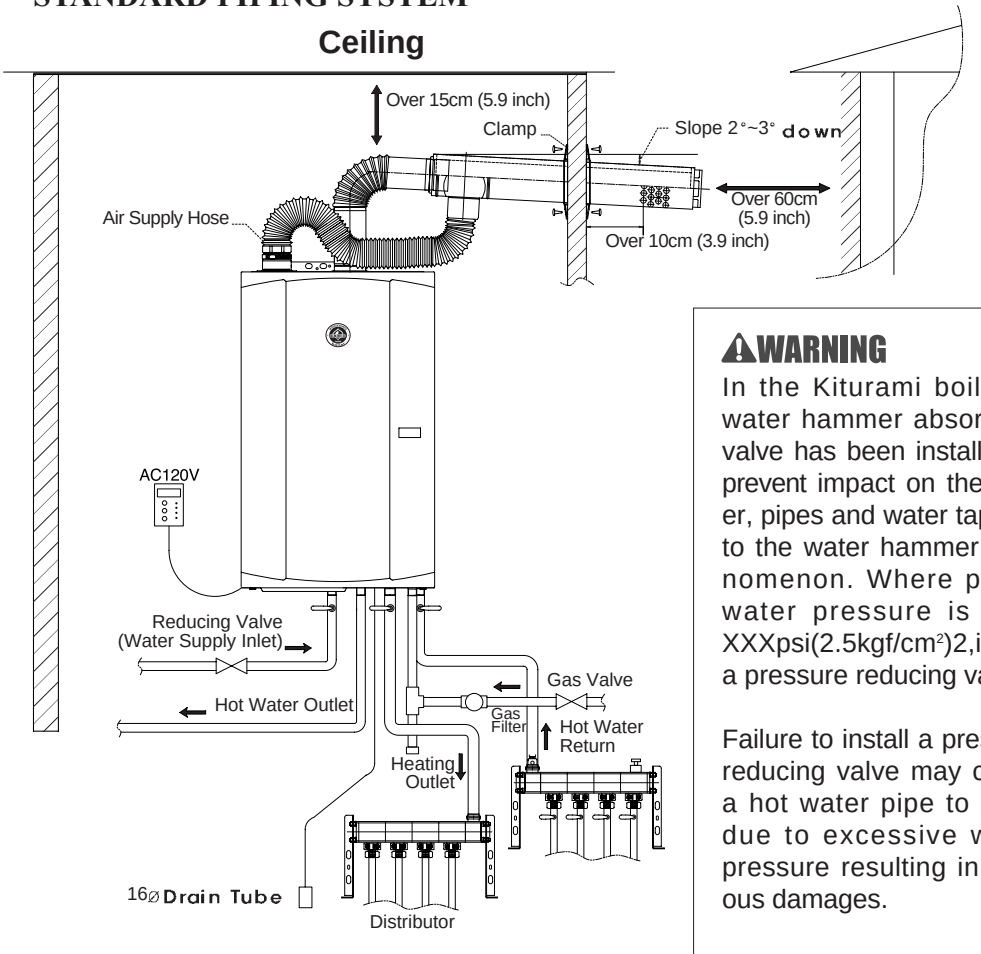
Never use an open flame to test for gas leak, as property damage, personal injury or death could result.

CONNECTING PIPES AND GAS FILTER

Use suitable materials with adequate strength to support gas piping. Install all components securely. The main gas supply pipe must be larger in diameter than the internal gas connections. When connecting LNG piping the gas valve is sometimes blocked by dust and other substances from LNG. Installing a gas filter near the boiler will prevent the blockage.



STANDARD PIPING SYSTEM



⚠WARNING

In the Kiturami boiler, a water hammer absorption valve has been installed to prevent impact on the boiler, pipes and water tap due to the water hammer phenomenon. Where public water pressure is over XXXpsi(2.5kgf/cm^2)2,install a pressure reducing valve.

Failure to install a pressure reducing valve may cause a hot water pipe to burst due to excessive water pressure resulting in serious damages.

VENT PIPE INSTALLATION

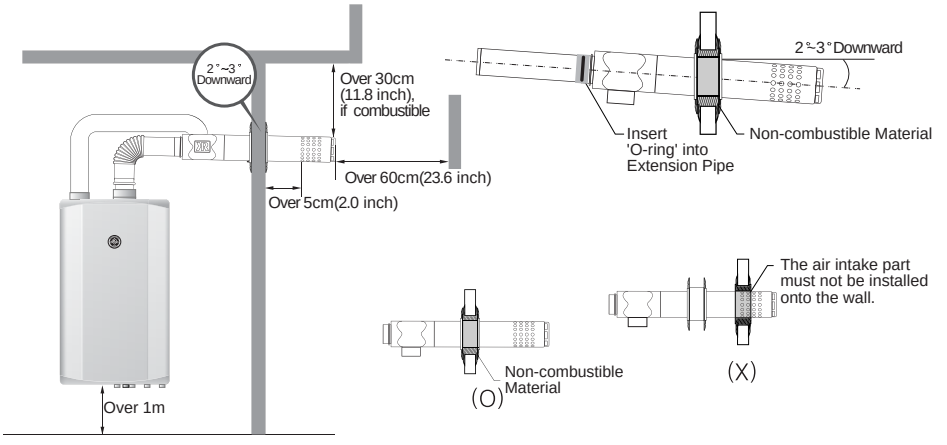
PRECAUTION

To protect from flue gas leaks, the connection between the vent pipe and the boiler must be connected by the stainless band and O-ring provided.

The vent pipe materal must be stainless steel.

The connection of vent pipe to the vent terminal must be sealed by the wire clamp provided or aluminum tape to prevent any leaks. In the connection of the flue duct and the flue elbow, the O-ring provided with the elbow must be inserted to prevent leakage.

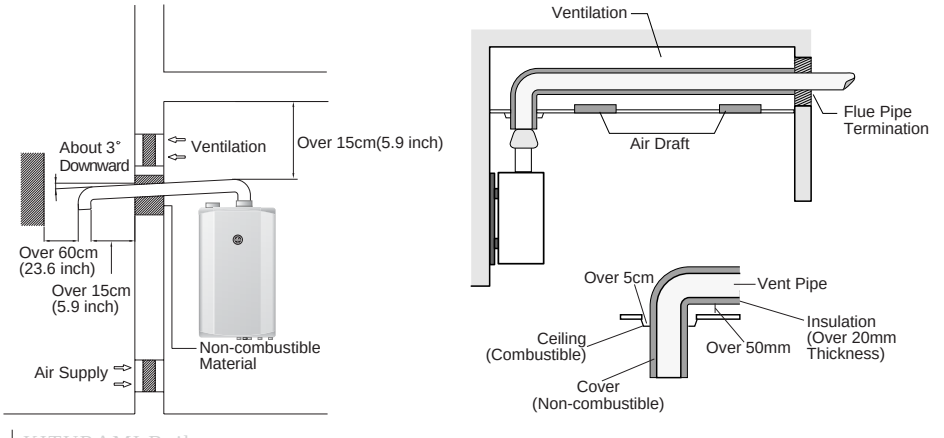
FF VENT PIPE INSTALLATION



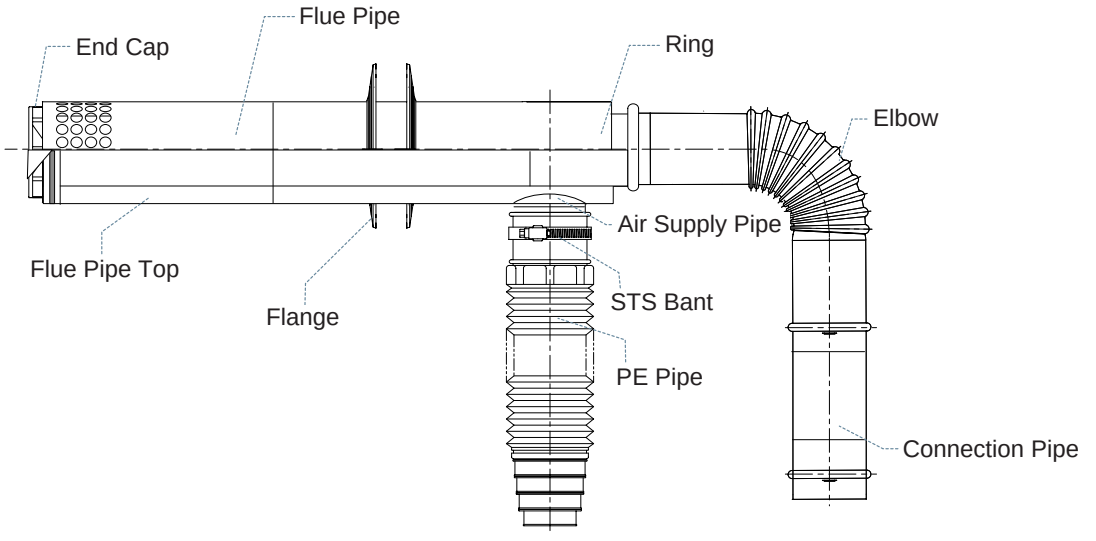
1. Maintain 3° slant away from the boiler to the outside to ensure that all condensate and rain water is drained to the outside.
2. Install the flue in a place where there are no obstacles within 60 cm(23.6 inch) from the flue end.
3. The total length of the flue duct should be 3m(10feet) or less and with 2 or less elbows.
4. If the total length of flue duct exceed 10 feet and two elbow a combustion analyzer must be used to verify correct combustion. If required, the fan motor speed can be adjusted as shown on page 35.

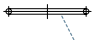
co		
co2		
o2		

FE VENT PIPE INSTALLATION

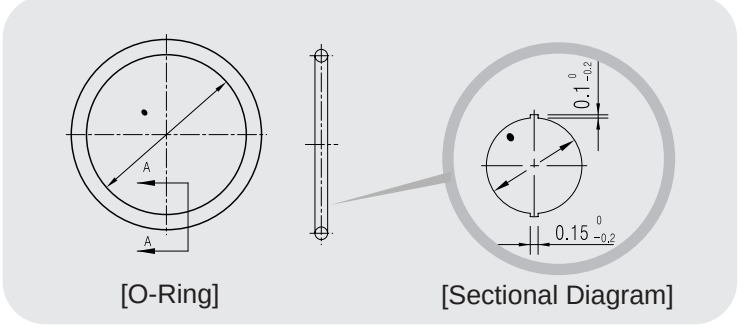


MEASUREMENT OF VENT PIPE

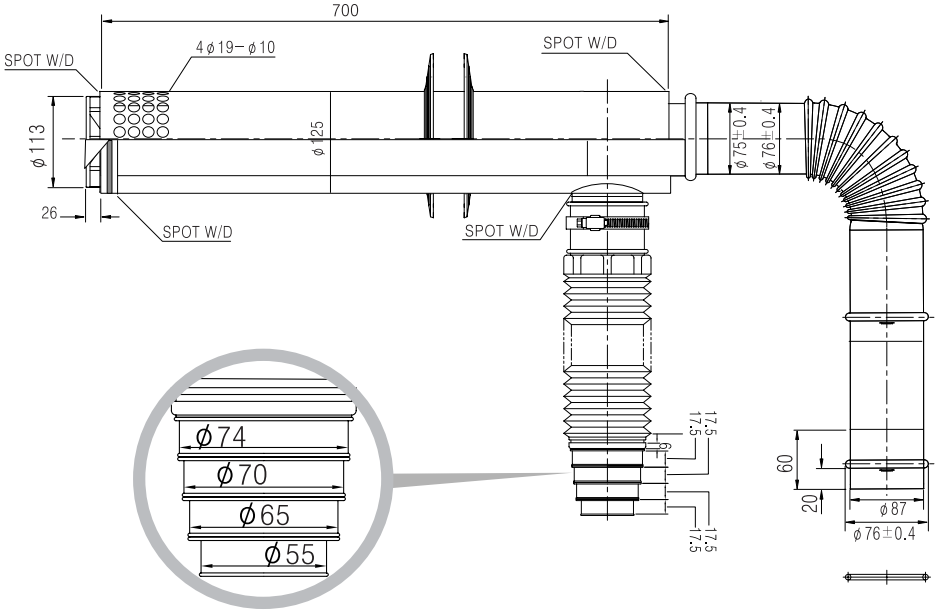




O-Ring



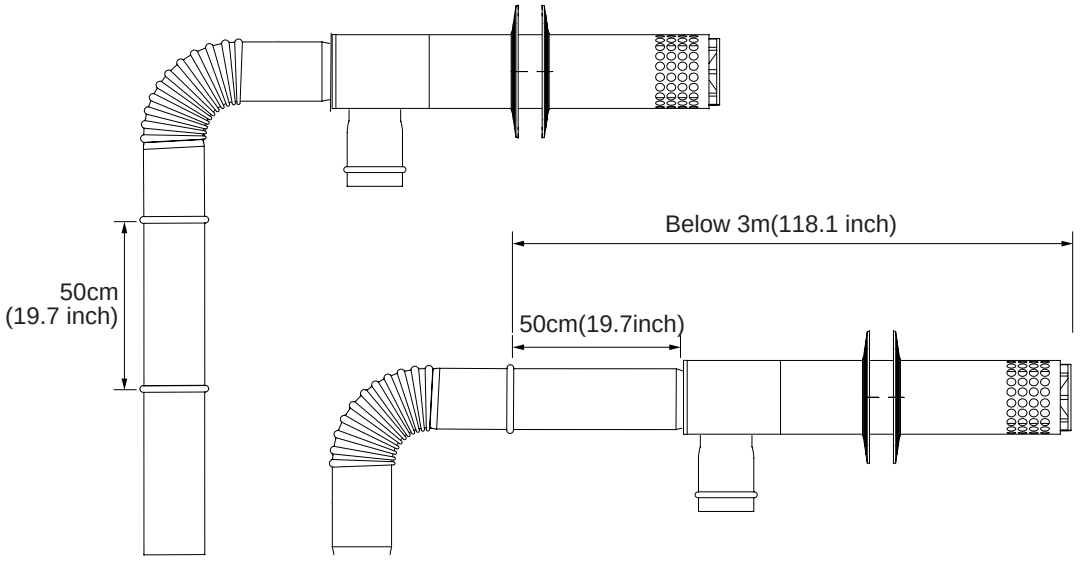
[O-Ring] [Sectional Diagram]



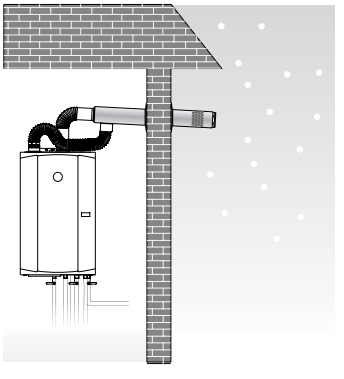
VENT PIPE EXTENSION

VENT PIPE EXTENSION

The Kiturami genuine vent pipe including extension can be extended if necessary as following pictures.

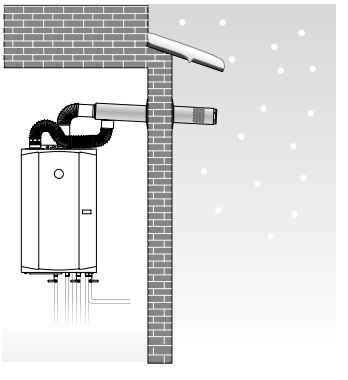


CAUTION IN SNOW

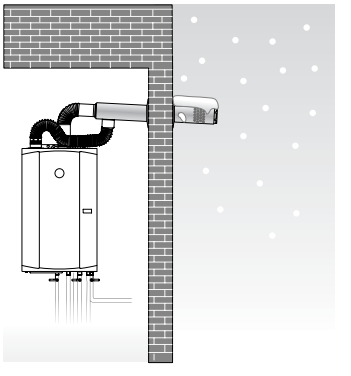


The vent pipe termination is designed to minimize the affects from fallen snow during operation. However, we recommend the vent pipe be installed under the roof line to prevent blockage by snow where possible.

The air intake part of the terminal should not be blocked.



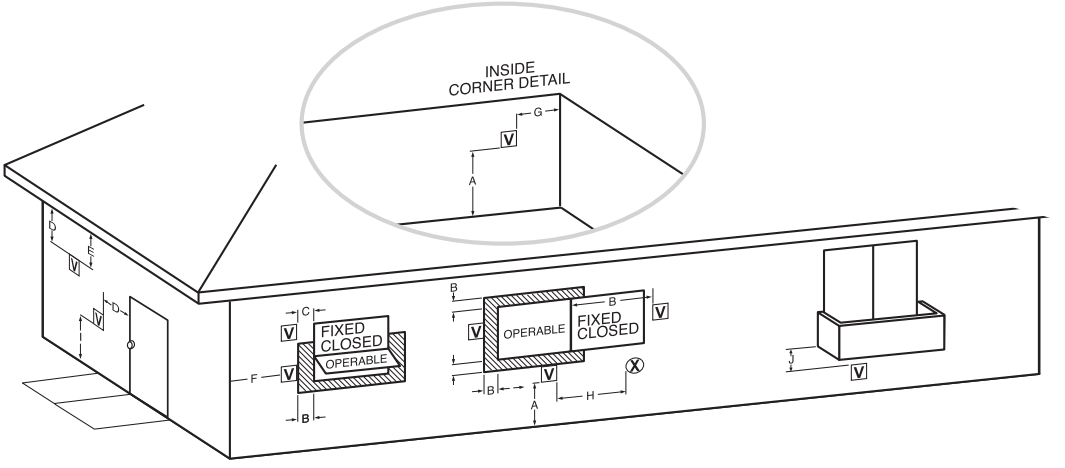
Install a protection panel above the vent pipe on exposed walls to avoid blockage by snow.



If the vent pipe is blocked by snow before operating, please remove snow on the vent pipe before starting the boiler.

VENT TERMINAL CLEARANCES

VENT PIPE EXTENSION



V VENT TERMINAL X AIR SUPPLY INLET AREA WHERE TERMINAL IS NOT PERMITTED

A= Clearance above grade,veranda, porch, deck, or balcony	30 cm (11.8 inch)
B= Clearance to window or door that may be opened	15 cm (6 inches) for appliances ≤ 10,000 Btu (3kW), 30 cm (12 inches) for appliances >10,000Btu (3kW) and ≤d100,000 Btu (30 kW), 36 inches (91 cm) for appliances >100,000Btu (30kW)
C= Clearance to permanently closed window	•
D= Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 feet (61 cm) from the center line of the terminal	•
E= Clearance to unventilated soffit	•
F= Clearance to outside corner	•
G= Clearance to inside corner	•
H= Clearance to non-mechanical air supply inlet to building or the combustion air inlet to any other appliance	15 cm (6 inches) for appliances ≤ 10,000 Btu (3kW), 30 cm (12 inches) for appliances > 10,000Btu (3kW) and ≤d100,000 Btu (30 kW), 36 inches (91 cm) for appliances >100,000Btu (30kW)
I = Clearance above paved sidewalk or paved driveway located on public property	2.13 m (7 feet)†
J= Clearance under veranda, porch deck, or balcony	30 cm (12 inches)‡

[1] In accordance with the current CSA *B149.1*, *Natural Gas and Propane Installation Code*

[2] In accordance with the current *ANSI Z223.1/NFPA 54, National Fuel Gas Code*

† A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single family dwellings and serves both dwellings.

‡ Permitted only it veranda, porch, deck, or balcony is fully open on a minimum of two sides beneath the floor.

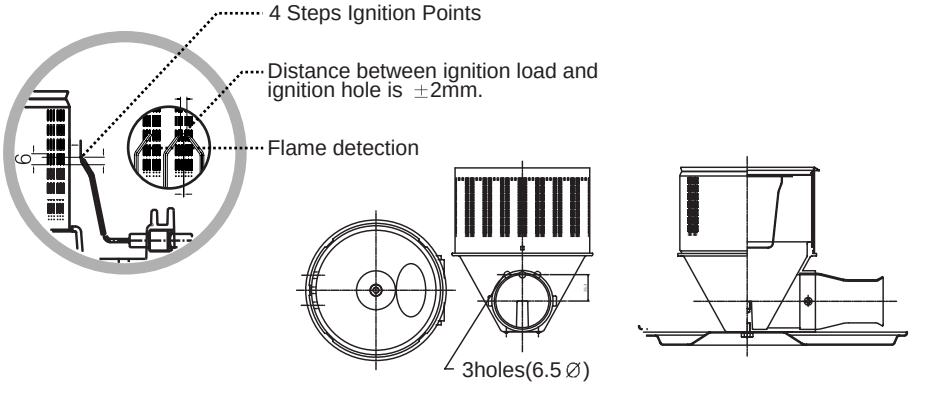
• For clearances not specified in *ANSI Z223.1/NFPA 54* or *CSA B149.1* one of the following shall be indicated:

a) A minimum clearance value determined by testing in accordance with section 2.19.6, or:

b) A reference to the following footnote:

"Clearance in accordance with local installation codes and requirements of the gas supplier."

CRITICAL IGNITION POINT MANAGEMENT



If the distance between the burner and igniter is outside of its allowable range, ignition can fail resulting in an explosion.
Over time with regular use the distance between the burner and the igniter can widen which can lead to ignition failure. To prevent this, regular maintenance is highly recommended.

IGNITION SAFETY SHUT OFF DEVICE TEST

Test description	ERROR code
Remove the flame rod(Red) from the high voltage cable part of boiler body's output and operate the boiler.	01
Ground flame rod after inserting a diode at grounding wire which goes to back part of gas valve from ignition controller. Operate the boiler.	02
Disconnect the flame rod after 10 seconds of normal operation. (Repeat 5 times)	03
Disconnect the blue wire from the temperature sensor.	04
Disconnect the red wire from the temperature sensor.	05
Disconnect the blower vent connector	06
Block the vent pipe. Check if the blower reaches hi speed using a tachometer.(Repeat two times)	07
Disconnect R3 of main controller or take out the wire of thermostat.	08
Take out the lower water level wire(RED) from the body of the boiler.	95
Take out the water temperature sensor and put it in boiling water. (Has to be more than 98 to simulate.)	96
Expose the gas sensor to gas using a lighter.	97

Please note that you may experience difficulty in performing some parts of the ignition shut off device test.

WATER SUPPLY CONNECTIONS

PRECAUTION

Use unions and flanges for pipe connections to make it easy for maintenance and service as well as re-arrangement.

Use adequate materials for piping and connections or fittings

Before connecting heating pipe, the domestic water pipe and the others to the gas boiler, remove all debris Clean the pipes completely.

Do not use ground water for heating. It will narrow the pipe by deposition of lime which will cause problems in operating the gas boiler.

Install exposed pipe outside nicely and neatly. Wrap pipes with insulation blankets to protect pipes from freezing. Fix vertically installed pipes, securely.

Do not use a pipe that had been used previously with an oil boiler. It can shorten the boiler's possible years of use. If it is unavoidable, clean the pipe thoroughly.

Ground water in the pipe system can decrease the heat efficiency and cause malfunctions.

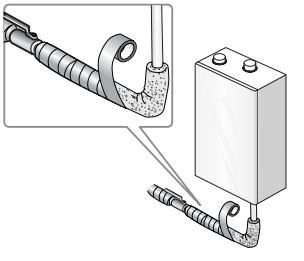
Purge air from piping system thoroughly.

INSTALLATION OF PIPES

Wrap the heating pipe, domestic water pipe with insulation blankets with a thickness of more than 25mm(2.0 inch). It is highly recommended to install the pipes with heat tracing for further protection.

The heating supply, domestic water pipe, heater, check valve need to be insulated to protect the gas boiler from freezing during winter.

Do not use insulation blankets for drain valve, filter and air elimination valve.



PREVENTION FROM FREEZING

WATER SUPPLY PIPELINE

Install the water supply valve at water supply inlet.

If the water pressure is too high, install a reducing valve.

Before connecting water supply to the gas boiler, purge all debris such as sand by opening water supply valve. Fill water in the gas boiler after the water leakage test.

HEATING PIPELINE

When connecting pipes, use the same diameter of heating water supply and return pipe.

The diameter of the heating water supply pipe is 20A (3/4inch). Install the drain valve at the lowest point of the piping and install pipes so all water can be drained when it is needed.

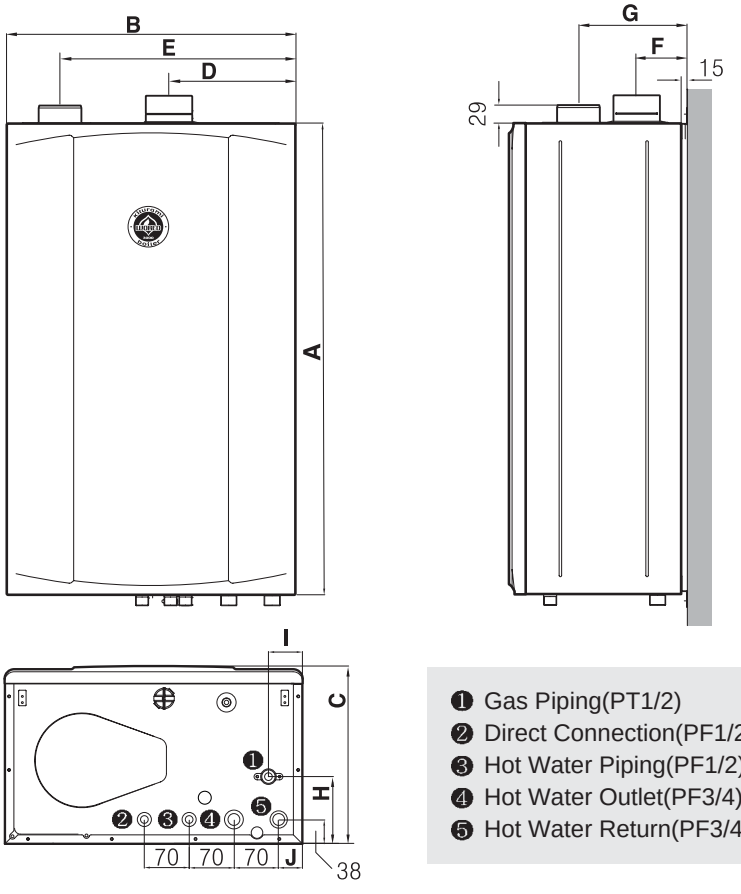
Install pipes as short as possible with as few bends as possible

When radiators are used, install an automatic or manual air vent at the top of each radiator and purge air frequently.

Use a minimum 36mm(1-1/2inch) diameter header for 5 branches or less and more than 44mm (2 inch) diameter header for 6 branches or greater.

A hose must be connected from the pressure relief valve to discharge above a floor drain

GAS BOILER INSTALLATION



SIZE DETAILS

	A	B	C	D	E	F	G	H	I	J
16H	721 mm (28.4 ")	465 mm (18.3 ")	278 mm (10.9 ")	203.5 mm (8.0 ")	379.5 mm (14.9 ")	86.8 mm (3.4 ")	180.8 mm (7.1 ")	110 mm (4.3 ")	53 mm (2.1 ")	37 mm (1.5 ")
20H	761 mm (30.0 ")	465 mm (18.3 ")	278 mm (10.9 ")	203.5 mm (8.0 ")	379.5 mm (14.9 ")	86.8 mm (3.4 ")	180.8 mm (7.1 ")	110 mm (4.3 ")	53 mm (2.1 ")	37 mm (1.5 ")
25H 30H	788 mm (31.0 ")	507 mm (20.0 ")	310 mm (12.2 ")	198.4 mm (7.8 ")	413.4 mm (16.3 ")	103.3 mm (4.1 ")	193.3 mm (7.6 ")	126.5 mm (5.0 ")	53 mm (2.1 ")	42 mm (1.7 ")

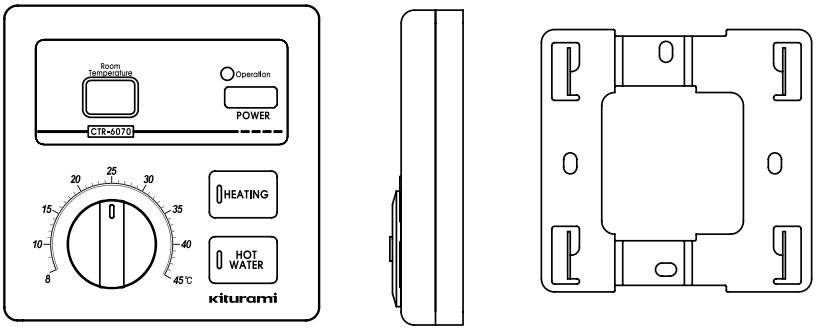
INSTALLATION

The gas boiler needs to be installed vertically and have to have minimum space for maintenance and service.

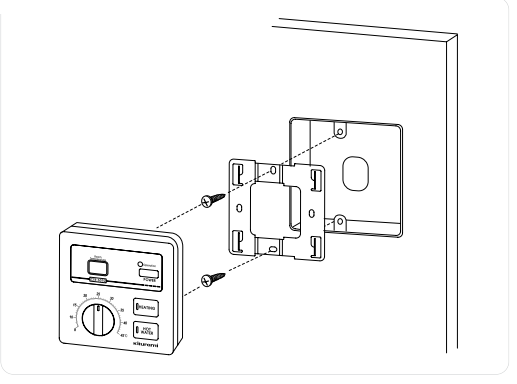
The wall where the gas boiler is going to be installed must have enough strength to hold the weight of the appliance which is about 35-40kg(77.2~88.2 lbs).

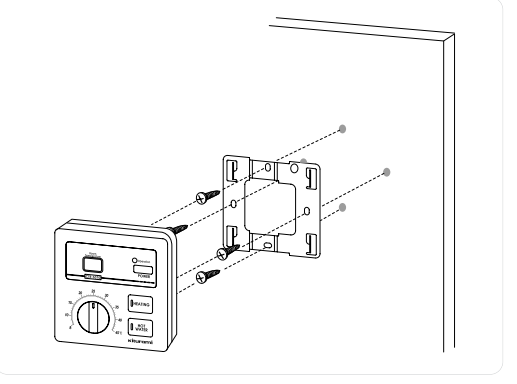
Install the gas boiler securely with anchor bolts to hold the weight of appliance and not to have any vibration. To prevent vibration, use a vibration absorbing material such as rubber.

THERMOSTAT INSTALLATION



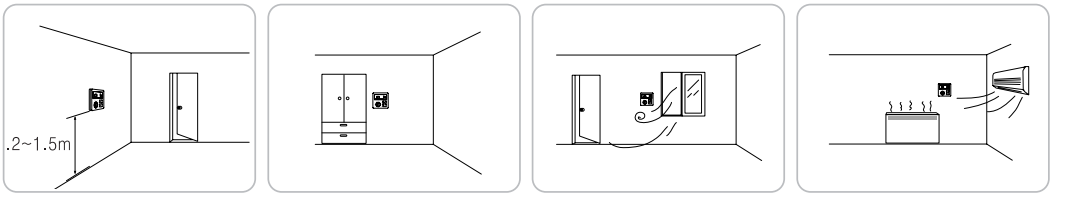
1. Do not bury the signal wire under the ground or put in the same pipe with electric wire It can cause miscommunication between room thermostat and main controller.
2. Do not install where exposed to sunlight and high moisture.
3. Do not install where children can reach easily.
4. Do not install on the stairway and entrance





1. Install the clamp plate on the wall 1.2 ~1.5m(3.9~4.9feet) above the floor at a place where room temperature is relatively stable.
2. Connect the wire at the backside terminal of room thermostat.
3. Adjust room thermostat hook and clamp plate attach loops and press down while pressing to the wall.

RECOMMENDED INSTALLATION PLACE



(O) **(X)** **(X)** **(X)**

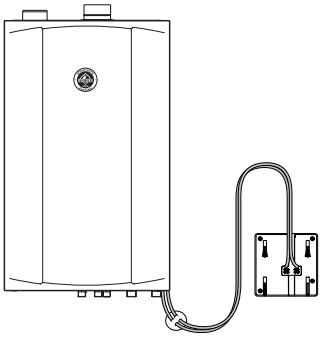
THERMOSTAT INSTALLATION

Install the thermostat in room where heating is most necessary.

The recommended installation position is 1.2-1.5m(3.9~4.9 feet) from floor where air circulation is good.

Do not install thermostat where it will be exposed to direct sunlight, moisture, etc.

CONNECTION TO ELECTRIC POWER



Connect two lines from the boiler to the +/- of back side of thermostat.

Fix thermostat at desirable position using bracket and bolts.

The + and - of thermostat has polarity. The red line has to be connected to + and the white line goes to.

Do not band the two lines with power lines.

If the two lines are banded with the AC 120V line, there is a possibility of electrical noise or communication error.

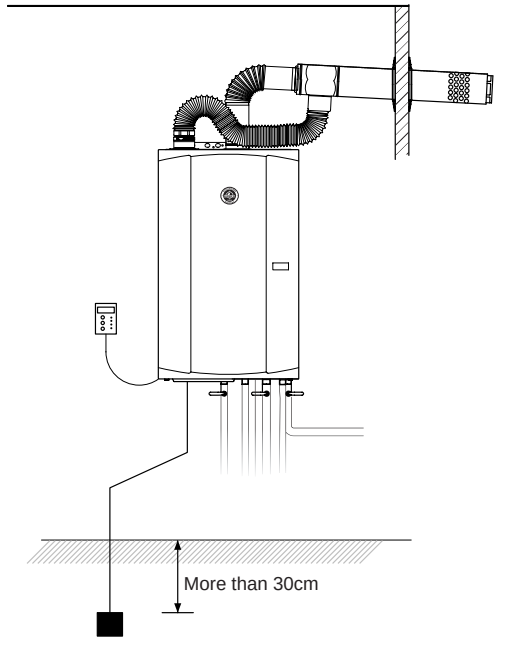
The thermostat can be easily fixed to the bracket by pushing downward.

GROUNDING

⚠CAUTION

Supplying power is AC 120V / 60Hz. Be sure to check voltage before use. Consult with qualified electrician for grounding.

1. To prevent electric related accident such as electric shock by electric leakage, grounding is necessary.
2. Works or construction for power supply, grounding and cable must comply with local codes.
3. If power outlet is not grounded grounding work has to be done by qualified electrician.
4. Do not ground at gas pipe, telephone line or lighting rod.
5. The power outlet has to have at least the minimum clearance of 30mm(1.2 inch) from the gas boiler.
6. The grounding point needs to be buried at least 30cm(11.8 inch).



INSTALLATION CHECK LIST

⚠CAUTION

Please Check the followings after complete all processes of boiler installation.
(Please tick)

LOCATION

- ☐ Close to area of vent.
- ☐ Boiler is installed horizontally.
- ☐ The boiler is installed indoors and protected from freezing temperature.
- ☐ Combustible materials are clear around the boiler.

WATER SUPPLY

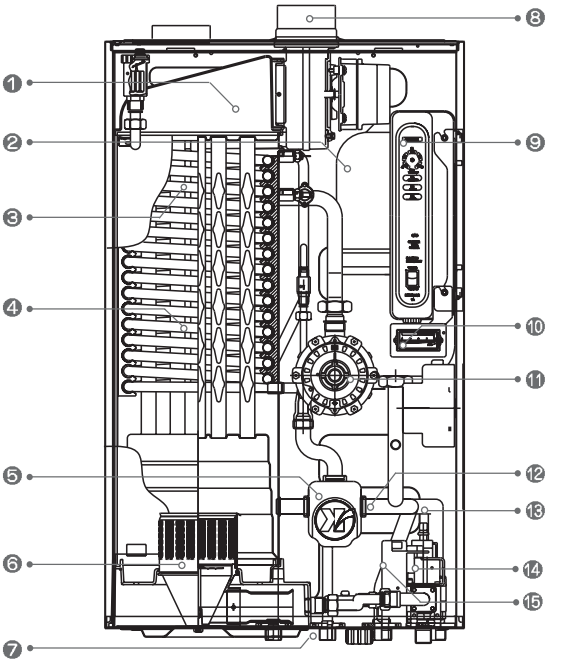
- ☐ Air purged from boiler and piping.
- ☐ Water connections tight and free of leaks.

GAS SUPPLY

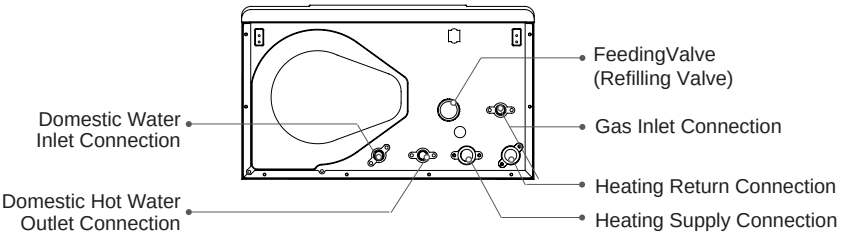
- ☐ Gas line equipped with shut-off valve, union and sediment trap.
- ☐ Soap and water solution used to check all connections and fittings for possible gas leak.
- ☐ The manual gas cut-off valve installed on gas supply pipe.
- ☐ The type of supplying gas is same as on the rating plate.
- ☐ Gas Company inspected installation (if required).
- ☐ Sufficient fresh air supply for proper operation of boiler.
- ☐ Air supply free of corrosive elements and flammable vapors.

IDENTIFYING THE COMPONENTS

16, 20, 25, 30DNS



❶ Vent Hood
❷ Nitrogen Tank (Expansion Tank)
❸ Heat Exchanger
❹ Hot Water Coil
❺ Three Way Valve
❻ Burner
❼ Feeding Valve(Refilling Valve)
❽ Exhaust Pipe
❾ Main Controller
❿ Gas Pressure indicator
⓫ Circulation Pump
⓬ Heating Supply Connection
⓭ Heating Return Connection
⓮ Gas Valve
⓯ Ignition Controller



PIPE CONNECTIONS

GENERAL CAUTIONS FOR OPERATION

FOR YOUR SAFETY READ BEFORE OPERATING

⚠WARNING : IF YOU DO NOT FOLLOW THESE INSTRUCIONS, EXACTLY, A FIRE OR EXPLOSION MAY RESULT CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR LOSS OF LIFE.

A. This appliance does not have a pilot. It is equipped with an automatic ignition device which automatically light the burner. Do not try to light by hand. It may cause personal injury or death.

B. Before lighting : Smell all around the appliance area for gas. Be sure to smell next to the floor because some types of gas are heavier than normal air.

C. Use only your hand to push in or turn the gas shut off valve. Never use tools. If the gas control valve will not push in or turned by hand, do not try to repair it. Call a qualified service technician. Force or attempted repair may result in a fire and explosion.

D. Do not use the appliance which any part has been under water. Immediately call a qualified technician to inspect the appliance and replace the parts of the control system which has been under water.

E. Do not operate unless the unit is filled with water or water pipe lines are fully open.

F. Should overheating occur or the gas supply fail to shut off, do not turn off or disconnect the electrical supply to the pump. Instead, shut off the gas supply at a location external to the appliance.

OPERATION INSTRUCTION

1. Stop! read the safety information above on this label.
2. Set the system controller to the lowest setting.
3. Turn off all electric power to appliance.
4. This appliance is equipped with an ignition device which automatically light the burner by hand.
5. Turn knob of gas valve close to "OFF" position.
6. Wait few minutes to clear out any gas.
7. Including near the floor. If you do not smell gas go to the next step.
8. Turn knob of gas valve close to "ON" position.
9. Turn power switch to "ON" position.
10. Set the system controller to desired setting.
11. If the appliance will not operate, follow the instructions "TO TURN OFF GAS TO THE APPLIANCE" and call your service technician or gas supplier.
12. Verify proper operation after servicing.

TO TURN OFF GAS TO APPLIANCE

1. Set the system controller to the lowest setting.
2. Press the power switch on room controller (if so equipped) to "OFF" position. (Light turns off)
3. Turn knob on gas valve (connected to the appliance) to "OFF" position.

FEATURES OF KITURAMI GAS BOILER

Plenty of water supply: If the water pressure maintains between 30 and 150 psi, hot water can be supplied stably.

Room thermostat: User can adjust the room temperature and water temperature through the use of room thermostat CTR6070

Indicating operation conditions: Digital thermostat (CTR 6070) indicates operating conditions such as room temperature and water temperature on LED.

Safe combustion function: If failure to attempt the ignition or the flame fails due to low gas pressure during boiler operatinon, the operation will be automatically stopped by detecting the flame condition.

Safe ventilation system: If the unit encounters heavy wind through the vent pipe or the pipe is blocked in normal combusting condition, the system detects it and stops the boiler operation.

Re-ignition function: In case of failure to detect the flame, the BLDC blower and the gas valve is immediately stopped and the boiler tries to ignite again. If it fails a second time the system will stop operating the boiler completely.

Safety device in interruption of electric power: If the electric power supply is interrupted, this device will activate to close gas valve to protect the safety of the boiler automatically.

Manual reset function: If there are any problems in operating such as overheating, activated gas alarm, etc., please press reset button to cancel these errors.

Pump failure prevention system: Seizing of the circulation pump may occur if the boiler is not used for a long period. The circulation pump activates for 30 seconds to prevent this problem when the water temperature is below 104˚F (40˚C) on the shower mode.

If the first ignition fails for a few moments, the gas supply will be cut off for the user's safety.

Automatic conversion system for heating water: Whether the room thermostat is activated or not, if the water temperature sensor detects that the water temperature is below 86˚F (30˚C), the system will be automatically converted to hot water mode. (If the water temperature is over 86˚F (30˚C), the hot water mode is automatically cancelled.)

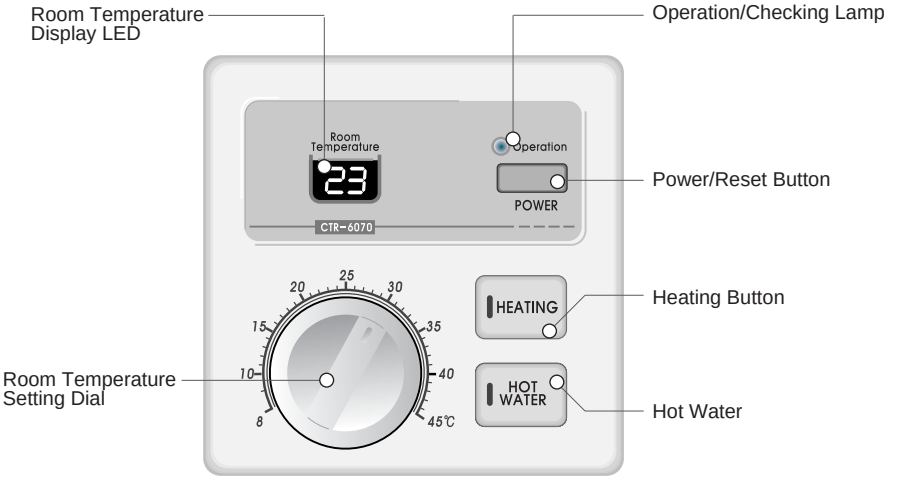
⚠WARNING

The heating function may not be operated if the automatic converting function activates in abnormal conditions such as leaking water pipes.

Open the water pipes to prevent freezing of the boiler. It may be very helpful to operate boiler.

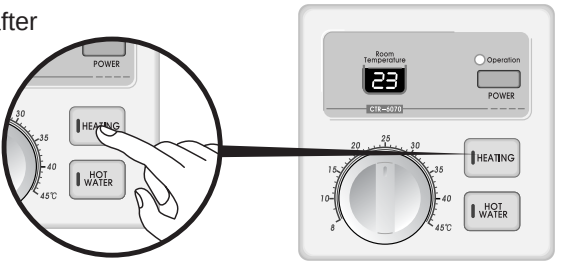
THERMOSTAT OPERATION (CTR-6070)

CTR-6070 is installed indoors and this room thermostat maintains the conditions of indoors by communicating with and controlling the MAIN CONTROLLER.

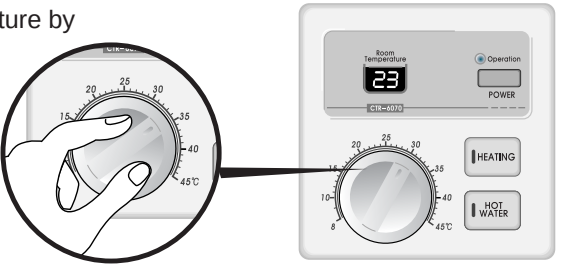


TO SELECT THE HEATING MODE

1 Push the "HEATING" button after the power is on.



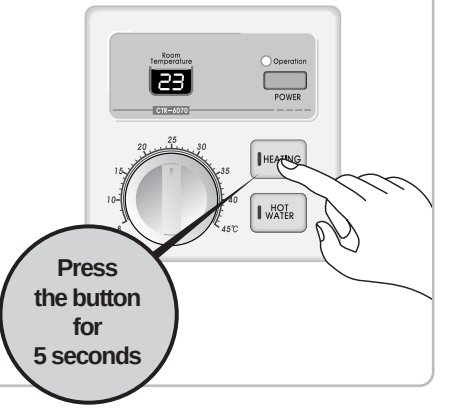
2 Choose the desirable temperature by setting the temperature dial on the front of the thermostat. The boiler will operate only when the current temperature is lower than the setting temperature.



THERMOSTAT OPERATION (CTR-6070)

HEATING TEMPERATURE SETTING

1. The room temperature can be regulated setting the temperature dial on the thermostat. Whenever press the "Heating" button for 5 seconds, the temperature will be changed by 5°C (86°F). Ex.) 70°C (158°F) < 75°C (167°F) < 80°C (176°F) < 85°C (185°F) > 45°C (113°F) > 5°C (122°F). The initial temperature was set to 70℃ in factory. If there is no input for 5 seconds, it will save the change and return to current room temperature display automatically.

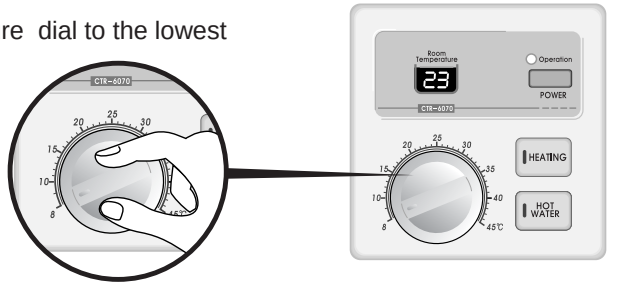


2. If the displayed temperature is not correct, press "Heating" button for 5 seconds under the condition of power off first and adjust a desirable temperature. The adjustable range of temperature is 1°C (33.8°F). Ex.)0°C (32°F) < +1°C (33.8°F) < +2°C (35.6°F) < +3°C (37.4°F) > -1°C (30.2°F) > -2°C (28.4°F) > -3°C (26.6°F) > 0°C (32°F).

   If there is no input for 5 seconds, the adjusted temperature will be automatically saved.

WHEN GOING AWAY FROM HOME FOR A LONG TIME

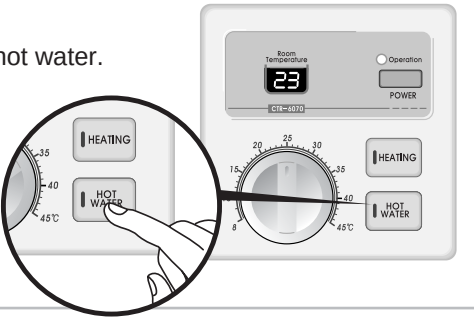
1. Set the room temperature dial to the lowest level.



THERMOSTAT OPERATION (CTR-6070)

TO SELECT 'HOT WATER' MODE

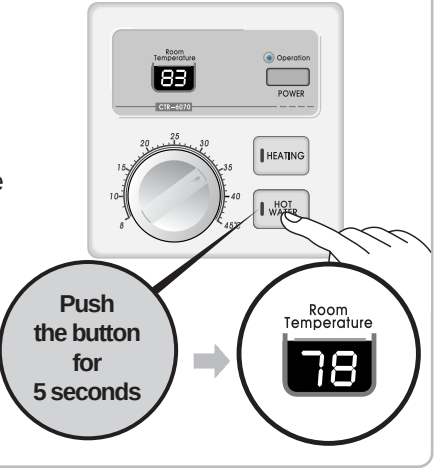
1. Press "HOT WATER" button to use hot water.
2. The mode will return to "HEATING" mode automatically after 2 and 1/2 hours.



HOT WATER TEMPERATURE SETTING

1. Press 'HOT WATER' button for 10 seconds. The setting temperature '78' will be displayed on LED.
2. Whenever press the "HOT WATER" button, the setting temperature will change as following.

83˚C(181.4˚F) < 85˚C(185˚F) > 70˚C(158˚F) < 72˚C(161.6˚F) < 75˚C(167˚F) < 78˚C(172.4˚F) < 80˚C(176˚F) < 83˚C(181.4˚F) < 85˚C(185˚F)



⚠CAUTION

Be cautious of scalding when using hot water.

Feel water before bathing or showering. Water temperature over 50℃ can cause severe burns instantly or death from scalding

Children, disabled and elderly are at highest risk of being scaled.

This unit is not designed for heating potable water.

If the temperature dial has fallen off the thermostat, do not touch the circuit board. Contact a local service center.

THERMOSTAT OPERATION (CTR-6070)

FUNCTIONS

NAME	PART	FUNCTION DETAILS	REMARK
Room Temperature	LED DISPLAY	Display room temperature	Flashing for self diagnosis. Display Option (if applicable)
Operation/Check	LED	Power ON in ROOM CONTROLLER in operation	Flashing when the boiler is malfunction. (Display EROR)
Room temperature setting volume	VOLUME	Room temperature setting volume	
Room	S/W+LED	Set ROOM function and display	Operated as set temperature OPTION: Available to set heating water temperature
Shower	S/W+LED	Set SHOWER function and display	Water Temp. : MAX 85℃ Return to ROOM mode after 2 1/2 hours later. OPTION: Available to set speedy hot water temperature
Power/Reset Button	SWITCH	The ON/OFF switch of boiler main power. Pushing the button will reset the boiler manully.	Reset is available up to three times.

FUNCTION DETAILS

(ROOM operation condition (Display operation LED)

Condition	ROOM	SHOWER
Yes	Set temperature under -1℃(30.2℉)	Yes
NO	Above a set temperature	N/A

THERMOSTAT OPERATION (CTR-6070)

OPTIONAL LED DISPLAY

A. WATER TEMPERATURE DISPLAY (Flashing water temperature) : Press Room button for 5 seconds ➡ Automatically return in Power OFF/ON

B. PRESENT TEMPERATURE REVISION (Flashing present temperature) : Press Power/Reset button for 5 seconds. [Room button (UP), Shower button (DOWN)] ➡ If no input by button for 5 seconds, automatically return to previous function.

C. HEATING WATER TEMPERATURE SETTING (LED displays a flashing current/desirable temperature) : As pressing Room button the display, it will change to desirable setting temperature after pressing shower button for 5 seconds ➡ If no input for 5 seconds and more, it will be returned to previous function automatically.

70℃(158℉) < 75℃(167℉) < 80℃(176℉) < 85℃(185℉) > 45℃(113℉)< 50℃(122℉) < 55℃(131℉) < 60℃(140℉) < 65℃(149℉)

Initial Temperature : 70°C(158℉)

D. HOT WATER TEMPERATURE SETTING (LED displays a flashing setting temperature) : As pressing the shower button, it will change the setting temperature after pressing 10 seconds. If no input for 5 seconds or more, it will return to previous function automatically.

83°C (181.4℉) < 85°C (185℉) > 70°C (158℉) < 72°C (161.6℉) < 75°C (167℉) < 78°C (172.4℉) < 80°C(176℉) < 83°C(181.4℉) < 85°C(185℉)

E. SELF DIAGNOSIS FUNCTION (Display 10 self diagnosis per seconds) : Press shower button for 5 seconds ➡ repeat 2 times and return to the previous function automatically.

F. RETURN TO DEFAULT MODE AFTER DELETING ALL ERROR : Press Heating button in power OFF condition for 10 seconds.

Initial modes : Heating mode, Water temperature setting 70°…, and Speedy hot water setting 83°.

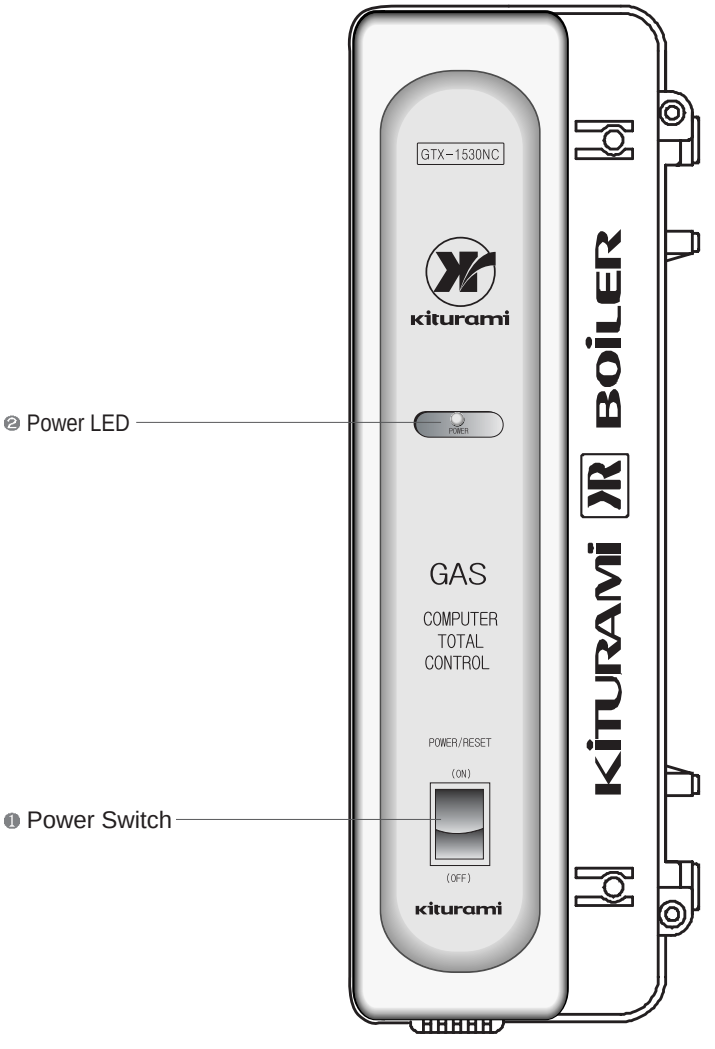
SELF DIAGNOSIS

1) Malfunction or safety cut-off alarm (low water level, overheat, safety cut-off, gas leakage alarm)

2) Boiler operation stops.

3) Self diagnosis number is displayed on Room Temperature Display panel and flashing operation/checking lamp. (Alarm sound - which is optional - is operated after 5 seconds of alarm condition.)

MAIN CONTROLLER (GTX – 1530NC)



FUNCTIONS

NO	NAME	FUNCTION DETAILS	NOTE
❶	Power switch	Main light is on	Gas leakage detection and anti-freezing working in Off position
❷	Power LED	Main power ON/OFF function	Communication failure blinking

DESCRIPTION OF OPERATION

Initial Operation: ❶ The gas detection function does not work for 30 sec. due to its preparation.

❷ P/T stops for initial 30 sec.

Functions in Power OFF

Main Power OFF

NO	Function	Sensing Method	Display Method	Reaction	Cancell
❶	GAS Detection	GAS Sensor	Power LED flashing	Exhaust Fan ON	Power S/W ON/OFF
❷	Anti-Frozen	Water Temperature Sensor (About blow 8℃)	N/A	Circulation Pump ON	Automatically Cancel above 10℃

Power OFF means that the SWITCH on the main controller (GTX) is OFF but the plug of boiler is in.

It will supply water by lower water level detection sensor when the main power is off and freezing is detected. (The circulation pump will be on)

ROOM THERMOTAT POWER OFF

NO	Function	Sensing Method	Display Method	Reaction	Cancellation
❶	GAS Detection	GAS Sensor	Power LED flashing	Exhaust Fan ON	Power S/W ON/OFF
❷	Freeze Protection	Detect by water sensor (About blow 8℃)	N/A	Circulation Pump ON	Automatically Cancel above 10℃
		Detect by water sensor (About blow 5℃)	N/A	Circulation Pump ON/ P/T Activation	Automatically Cancel above 15℃ (Stop circulation pump after 5 mins.)

Water supply is automatically operated when the lower level water is detected during room power is off. (However, the circulation pump is on while the freezing is detected)

THERMOSTAT OPERATION

FUNCTION WITH CONNECTION ROOM THERMOSTAT

Room Thermostat CTR-6070			GTX-1530NC				Detail
Condition	Room Thermostat operating (Opetation Lamp ON)		BURNER		CIRCULATION PUMP		
			↓Set temp.	↑Set temp.	↓Circulation Temp.	↑Circulation Temp.	
Room	YES	NO	NO		OFF	NO	Set Temp. means Water Temp. setting (Set on CTR-1500)
	NO	OFF	OFF		OFF	OFF	
Shower	YES	ON	OFF		When Shower Mode is detected	When Shower Mode is not detected	Control change according to detected shower mode
					ON	OFF	

The maxinum hot water temperature can be adjusted up to 85℃ in the hot water mode.

FUNCTIONS WITHOUT CONNECTION ROOM CONTROLLER (CTR-6070)

During the operation, the boiler system will recognize the Room Temperature function of controller automatically.

It will set the water temperature to 78℃(172.4℉) automatically.

Water Temp. Settong	BURNER		CIRCULATION PUMP		Note
	ON	OFF	ON	OFF	
78℃ (172.4° F)	66 ℃(150.8° F)	78 ℃(172.4° F)	70 ℃(158° F)	56 ℃(132.8° F)	

RE-IGNITE FUNCTION: WHEN THE FLAME DETECTION IS FAILED IN ITS NORMAL OPERATION, THE P/T STOPS

Fan and Gas Valve off and try again.(5 times repeat for 60 seconds when the flame detection is failed)

Failed after 5 times re-ignition, safety cut-off proceeds.

Temperature Measurement Range : Controller measurement according to thermostat criteria value.

Temperature Tolerance : Temperature tolerance without any mentioned is ±3℃.

OPERATE TEMPERATURE OF BURNER AND CIRCULATION PUMP BY WATER TEMPERATURE SETTINGS

Water Temp. Setting	BURNER				CIRCULATION PUMP				Note
	ROOM		SLEEPING		ROOM		SLEEPING		
CTR-6070	ON	OFF	ON	OFF	ON	OFF	ON	OFF	
45℃(LowTemp)	40℃ (172.4℉)	45℃ (133℉)	36℃ (96.8℉)	41℃ (105.8℉)	42℃ (107.6℉)	35℃ (95℉)	38℃ (100.4℉)	33℃ (91.4℉)	
55℃	48℃ (118.4℉)	55℃ (131℉)	44℃ (111.2℉)	50℃ (122℉)	50℃ (122℉)	40℃ (104℉)	46℃ (114.8℉)	38℃ (100.4℉)	
65℃(Midium Temp)	56℃ (132.8℉)	65℃ (149℉)	52℃ (125.6℉)	59℃ (138.2℉)	58℃ (136.4℉)	46℃ (114.8℉)	54℃ (129.2℉)	43℃ (109.4℉)	
75℃	64℃ (147.2℉)	75℃ (167℉)	58℃ (136.4℉)	67℃ (152.6℉)	67℃ (152.6℉)	53℃ (127.4℉)	60℃ (140℉)	48℃ (118.4℉)	
85℃(High Temp)	72℃ (161.6℉)	85℃ (185℉)	65℃ (144℉)	77℃ (170.6℉)	75℃ (167℉)	60℃ (140℉)	67℃ (152.6℉)	53℃ (127.4℉)	

Whenever, the operation LED on room thermostat is on and the water temperature is lower than burner off temperature, the burner is operated.

THE OPERATION CONDITION OF CIRCULATION PUMP IN SHOWER MODE

Shower Mode	When Shower Mode is detected	Circulation Pump ON
	When Shower Mode is not detected	Circulation Pump OFF

3 WAY VALVE OPERATION

Speedy Hot water Mode(Including Shower Mode) : Operate to 'Hot Water' function

Heating Function: Operate to Heating Function. However, the circulation pump will be stopped for 15 seconds in the operation condition of 3 way valve. It will switch over to heating function if there is a warning.

MANUAL RETURN. (OPERATED AT ROOM THERMOSTAT)

1. If there is a safety cut off for any safety reasons, the error can be cancelled by pushing the restart button.

2. The P/T will be stopped the operation during this period.

3. To reset the main controller, turn power switch off and on.

THERMOSTAT OPERATION

SAFETY DEVICE: STOP P/T OPERATION AND PROCEDURE EACH SAFETY FUNCTION

1. Safety Function List : Safety Cut-off, GAS Leakage Alarm, Overheat, Low Water Level, Freeze Protection, etc.

2. Procedures

Name	Situation		Operation	Indication	Detection	Return	Self Diag-nosis
Safety cut-off	No Flame is detected after the ignition transformer operation time.		P/T Stop	Power LED Flashing	Power LED Flashing Immediately after repeat 2 times	Manual	01
	Flame is detected before the ignition transformer is operation		P/T Stop FAN ON	None	When Continuing for 2 seconds	Automatic	02
	Flame detection time is less than 1 Min. after its ignition and repeat 5 times		P/T Stop	None	Immediately after 5 times repeat	Manual	03
	Wire of overheat sensor is cut.		P/T Stop	None	About 5 seconds later	Automatic	04
	"		P/T Stop	"	Immediately	Manual	05
	"		"	"	"	"	"
	No detecion for RPM of exhaust fan.		"	"	Immediately after 5 times repeat	"	06
	RPM of exhaust fan is out of its allowance range		"	"	"	"	07
Communi-cation Error	Communication Error	Sending Error	Normal Operation	None	Continue for 2 seconds	Automatic	2
		Receiving Error	Operation GTX-1530N only	Power LED Flashing			
Low Water Level	Low Water Level		P/T Sotp Circulation Pump OFF	None	About 9 seconds later	Automatic	95
Over heat	Temperature sensor is detected more than 98℃ (208.4°F)		P/T Sotp Circulation Pump ON	None	About 5 seconds later	Manual	96
Gas Detec-tion	Gas Lekage Detected		P/T ON Blower ON	Power LED Flashing	Immediately	"	97
Freeze Protec-tion	Water Temperature sensor is detected under 8℃ (46.4°F)		Circulation Pump ON	None	Immediately	Water temp sensor is more than 10℃(50°F)	None
	Water sensor is more than 5℃(41℉)		Circulation Pump ON P/T ON	None	Immediately	Water temp sensor is more than 15℃(59℉)	None

AUTOMATIC FUNCTIONS AND SENSORS

When lower water level and over heating are detected at the same time, the circulation pump will be stopped.

When safety cut-off and freezing are detected at the same time, the burner will be stopped, but the circulation pump will be operating. However, The circulation pump will be off in case of freezing of 8℃(46.4° F).

The system will not detect gas for 15 seconds after extinguishing.

Ignition Failure Cut-Off : During fuel supply, there is no ignition within set time, fuel supply will be cut-off for safety. (Safety Cut-off after 2 times repeat)

Initial Cut-off : Before ignition, the FLAME LOAD is recognized flame, ignition is not performed.

Low Water Level Sensing:

(1) The low water level alarm is performed when the sensor detecting low water level for 9 seconds.(P/T stop, Circulation Pump Off)

(2) Cancel the lower water level immediately

(3) After cancellation of lower water level, the circulation pump will work about 2 min. (Apply delay time. However, this condition is not applied in Speedy Hot water and Shower Mode)

Auto Reset : Automatically initialize the MICOM for safety when the MICOM make an error.

Automatic Hot Water Supply :

(1) Regardless with function on Room Thermostat, the operation LED is OFF and the hot water sensor perceive lower than 30℃, automatically turn to SHOWER function. (When hot water sensor perceive more than 30℃ Bath function is cancelled.)

(2) Maximum temperature of hot water is 83℃ when speedy hot water is set to 83℃ at CTR-6070.

⚠CAUTION

Abnormal automatic conversion function can cause serious problems such as water leakage.

THERMOSTAT OPERATION

FAN MOTOR SPECIFICATION

a) Normal RPM and LOW - HIGH LIMIT

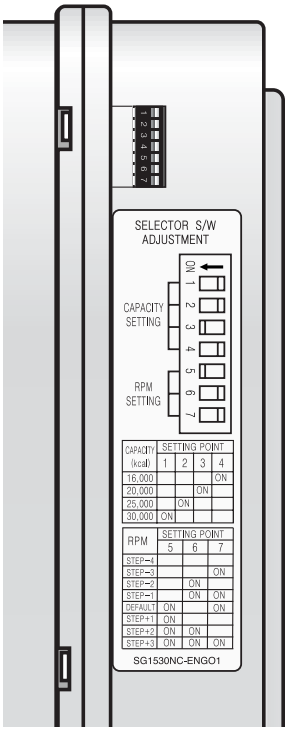
MODEL	16000Kcal 63,500 Btu	20000Kcal 79,400 Btu	25000Kcal 99,200 Btu	30000Kcal 119,100 Btu	Note
1st Rated RPM	2400 ±100	2800 ±100	2700 ±100	2800 ±100	Measured during ignition.
2nd Rated RPM	2850 ±100	3250 ±100	3150 ±100	3300 ±100	Measured after combution is detected
LOW LIMITE (RPM)	500 ±50	500 ±50	500 ±50	500 ±50	
HIGH LIMITE (RPM)	3100 ±50	3100 ±50	3500 ±50	3500 ±50	

The first rated rotation speed has to be at least 2000 RPM in winter time when the temperature around the boiler is blow 0℃

The check signal is indicated when the RPM is out of high or low limit.

Second step of RPM is turned on 4 seconds after flame detection.

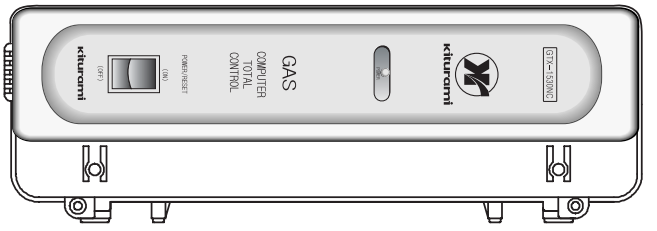
b) DIP SWITCH & MODEL & RPM setting.

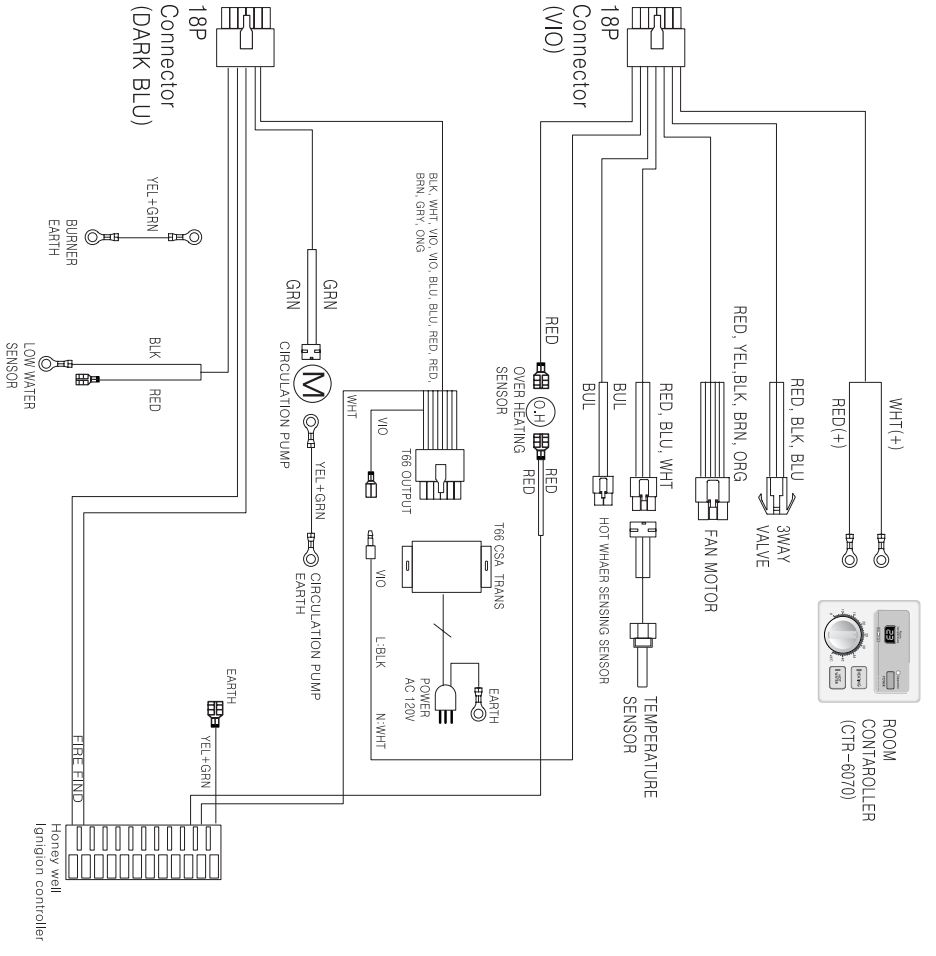


Model	Switch Position(ON)
30000Kcal 119,100 Btu	1
25000Kcal 99,200 Btu	2
20000Kcal 79,400 Btu	3
16000Kcal 63,500 Btu	4

RPM	Switch Position			Note
	4	5	6	
-4	ON	OFF	OFF	
-3	OFF	OFF	ON	
-2	OFF	ON	ON	
-1	OFF	ON	ON	
0	ON	OFF	OFF	
+1	ON	OFF	ON	
+2	ON	ON	OFF	
+3	ON	ON	ON	

ELECTRIC WIRING

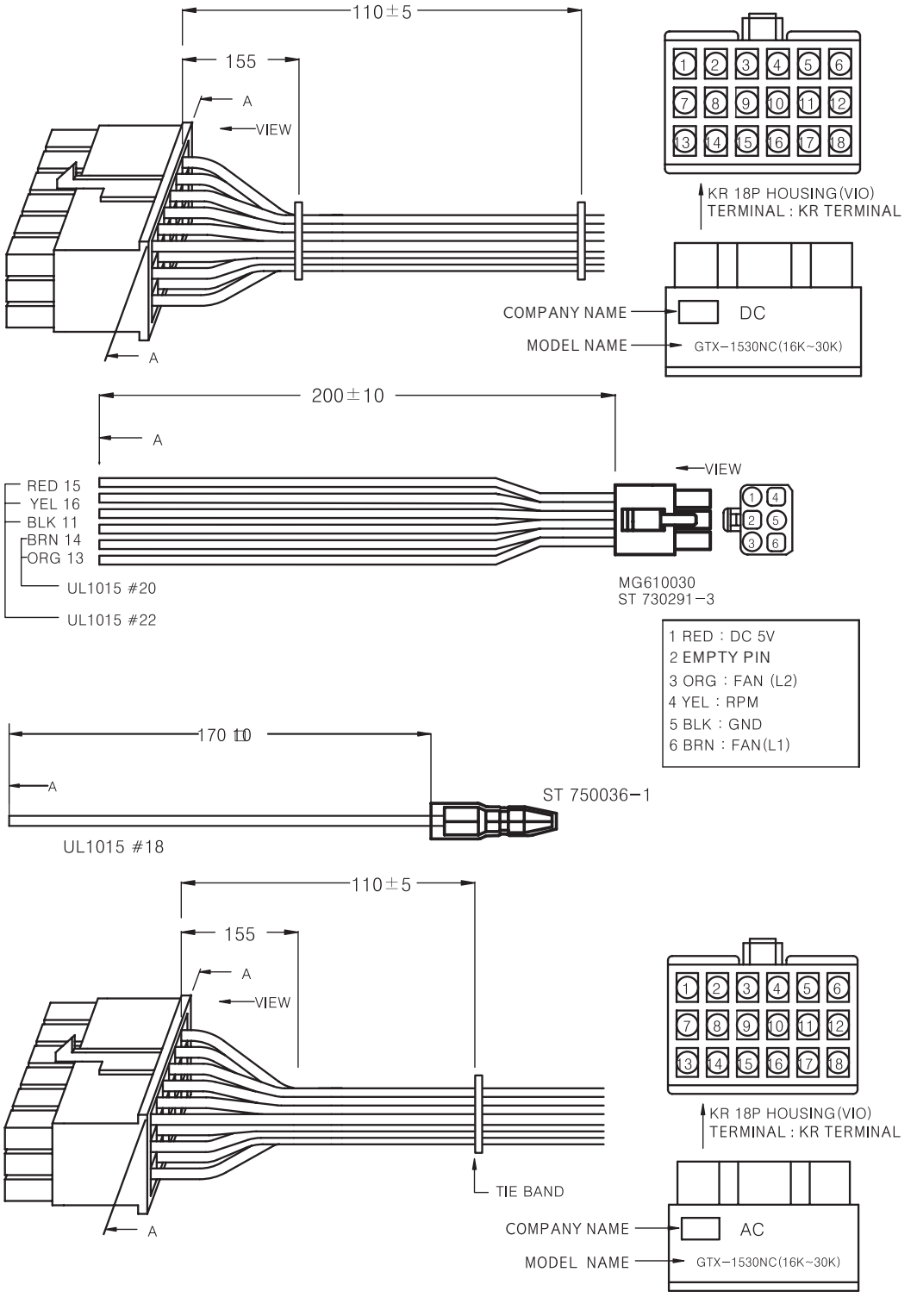


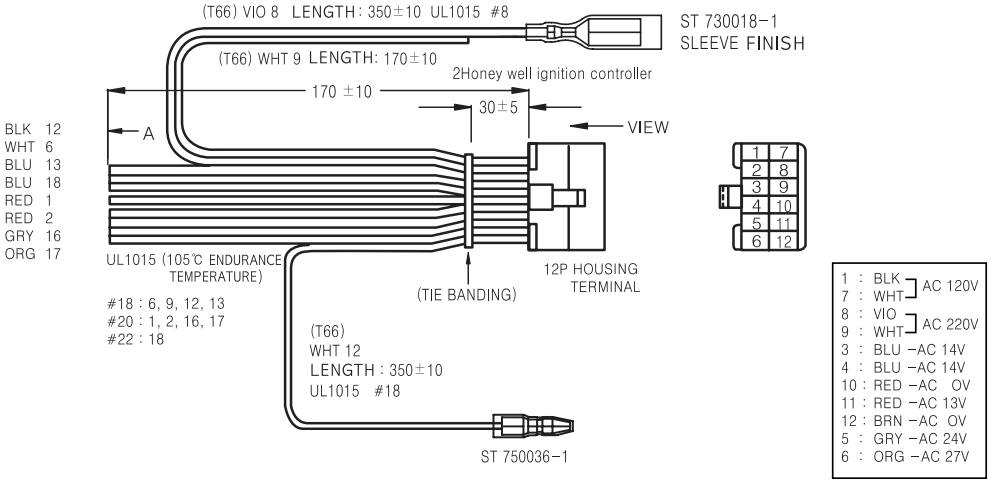


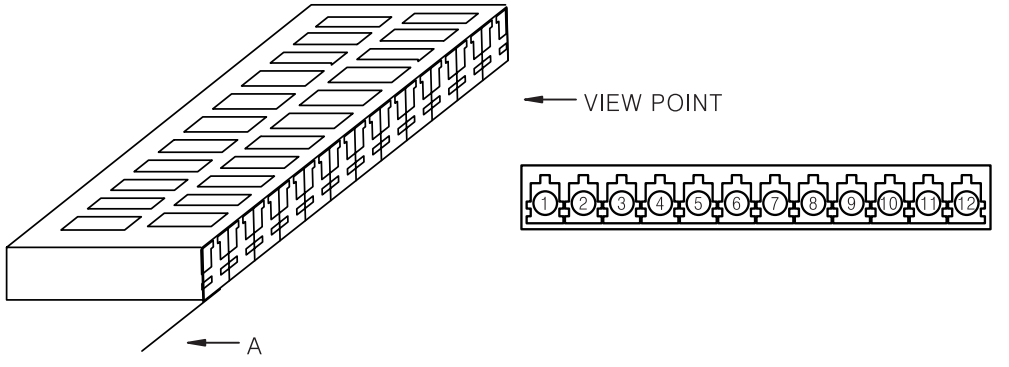
⚠CAUTION

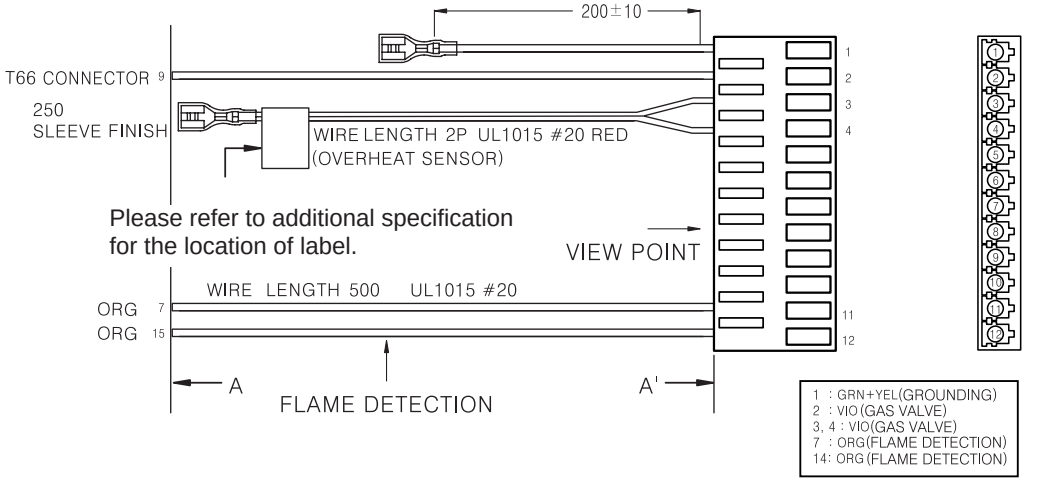
Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.

ELECTRIC WIRING




(T66) VIO 8 LENGTH: 350±10 UL1015 #8
ST 730018-1
SLEEVE FINISH
(T66) WHT 9 LENGTH: 170±10
2Honey well ignition controller
170 ±10
30±5
VIEW
BLK 12
WHT 6
BLU 13
BLU 18
RED 1
RED 2
GRY 16
ORG 17
A
UL1015 (105℃ ENDURANCE TEMPERATURE)
#18 : 6, 9, 12, 13
#20 : 1, 2, 16, 17
#22 : 18
(TIE BANDING)
12P HOUSING TERMINAL
(T66)
WHT 12
LENGTH : 350±10
UL1015 #18
ST 750036-1
1 : BLK
7 : WHT
AC 120V
8 : VIO
9 : WHT
AC 220V
3 : BLU -AC 14V
4 : BLU -AC 14V
10 : RED -AC OV
11 : RED -AC 13V
12 : BRN -AC OV
5 : GRY -AC 24V
6 : ORG -AC 27V


VIEW POINT
1 2 3 4 5 6 7 8 9 10 11 12
A


200±10
T66 CONNECTOR 9
250
SLEEVE FINISH
WIRE LENGTH 2P UL1015 #20 RED
(OVERHEAT SENSOR)
Please refer to additional specification
for the location of label.
VIEW POINT
WIRE LENGTH 500 UL1015 #20
ORG 7
ORG 15
A
A'
FLAME DETECTION
1 2 3 4 11 12
1 : GRN+YEL(GROUNDING)
2 : VIO(GAS VALVE)
3, 4 : VIO(GAS VALVE)
7 : ORG(FLAME DETECTION)
14: ORG(FLAME DETECTION)

OPERATION CHECK LIST

⚠WARNING

Do not use or store flammable products such as methane, acetylene, gasoline, actone, etc. which have a burning point lower than 30 ℃ in same room or area near the gas boiler.

01 Confirm type of fuel gas supplied

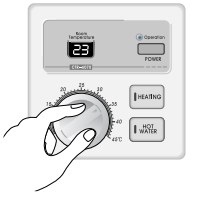
A natural gas boiler will not function safely on LP gas and vice versa.

02 Check the power source

Ensure that the electric power source is AC 120V/60Hz

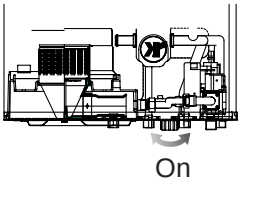
03 Turn on the main power

04 Set a desirable temperature using room temperature setting dial.



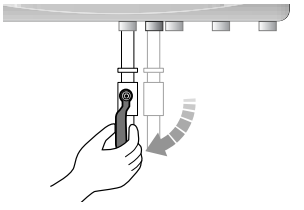
05 Turn the refilling valve on to left side to feed water into the boiler and pipes.

(left : Open, Right : Shut off)

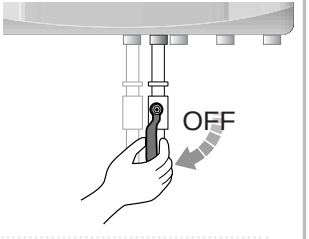


OPERATION CHECK LIST

06 Supply Water by opening the manual water supply valve

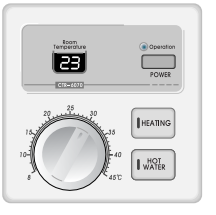


07 Supply gas by opening the manual gas shut-off valve



08 Supply water by opening the manual water supply valve at under the boiler

The completion of refilling water will cancel the low water level error



09 The boiler will operate with ignition after the temperature setting

⚠CAUTION

Be sure that the boiler is installed completely according to installation guide.

Be sure there is no gas and water or electric leakage.

Clean the domestic water and heating pipe before operation.

Open the valves of all room and heating pipe.

CARE & CLEANING

MAINTENANCE FOR SUMMER

The maintenance of boiler could be negligent during summer becuase it is not being used as much as winter period. However, you could not enjoy the pleasant heating environment and hot water during winter period without proper maintenance for summer. The following is the guide for summer maintenance.

Pull out the power plug

The boiler and its circuits can be damaged by lightning.
If the boiler is not being used for a long time, pull out the power plug

Operate periodically

The boiler needs to be operated at least once or twice a month. If the boiler is not being used for a long time, the performance of its components can deteriorate.The circulation pump might need to be replaced due to seizing

Check the vent pipe

Be sure that there is no influx of water into the vent pipe. Water flows into the boiler will cause boiler malfunction, incomplete combustion, and create deleterious gas. Check pipe connections and fittings frequently to prevent unsafe conditions.

Schedule maintenance when the boiler is not being used

Have maintenance services from an authorized service center or a qualified technician when the boiler is not being used very much. This simple and easy maintenance can improve the boiler performance, and prevent unsafe combustion. The maintenance of boiler could be neglected during summer because it is not being used as much as winter period. However, you could not enjoy the pleasant heating environmont and hot water during winter period without proper maintenance for summer. The following is the guide for summer maintenance

MAINTENANCE FOR WINTER

There are explosions, fires, freezing and other gas relative accidents caused by ignoring safety check during winter. To prevent those accidents, comply with following instructions before using the boiler in the early winter.

Before operating the boiler, ensure that there are no flammable vapors, liquids or other combustible materials in the vicinity of boiler or any other appliance.

- Ensure that the air supply pipe and ventilation pipe are properly installed.
- Ensure that the boiler is firmly attached to the wall.
- Be sure that the vent pipe does not have any dent or other damages.
- Ensure that there is no condensed water in vent pipe and chimney connections are fixed firmly.
- Ensure that exposed pipes are well insulated to prevent freezing.

TEST OPERATION

- Plug the power cord into the outlet and then turn on the manual gas shut-off valve near the gas boiler. Use a soapy water solution to test for leaks at all connections and fittings before turning on the main power.
- After turning on the main power of boiler, check the operation lamp whether it is on or not after pushing power button of room thermostat.
- If the lamp is not turned on, check the setting temperature whether it is lower than current temperature. The boiler will be operated only when the setting temperature is lower than the current temperature.
- If the boiler does not work although the operation lamp is on, it can be caused by excess air in piping system. Press the reset button repeatedly.
- Once it is ignited, check every single function.
- Adjust the desired temperature by turning the temperature dial according to seasonal condition and your preference.

PREVENTION OF FREEZING

Do not pull out the power plug. The freeze protection function will not work without the power.

The best way to protect the boiler from freezing is to drain all water from pipes when it is not being used for a long time.

Wrap the exposed pipes with insulation blankets. If the boiler has been subjected to freezing, do not operate the gas boiler again until it has been checked by qualified person.

SAFETY INSTRUCTION

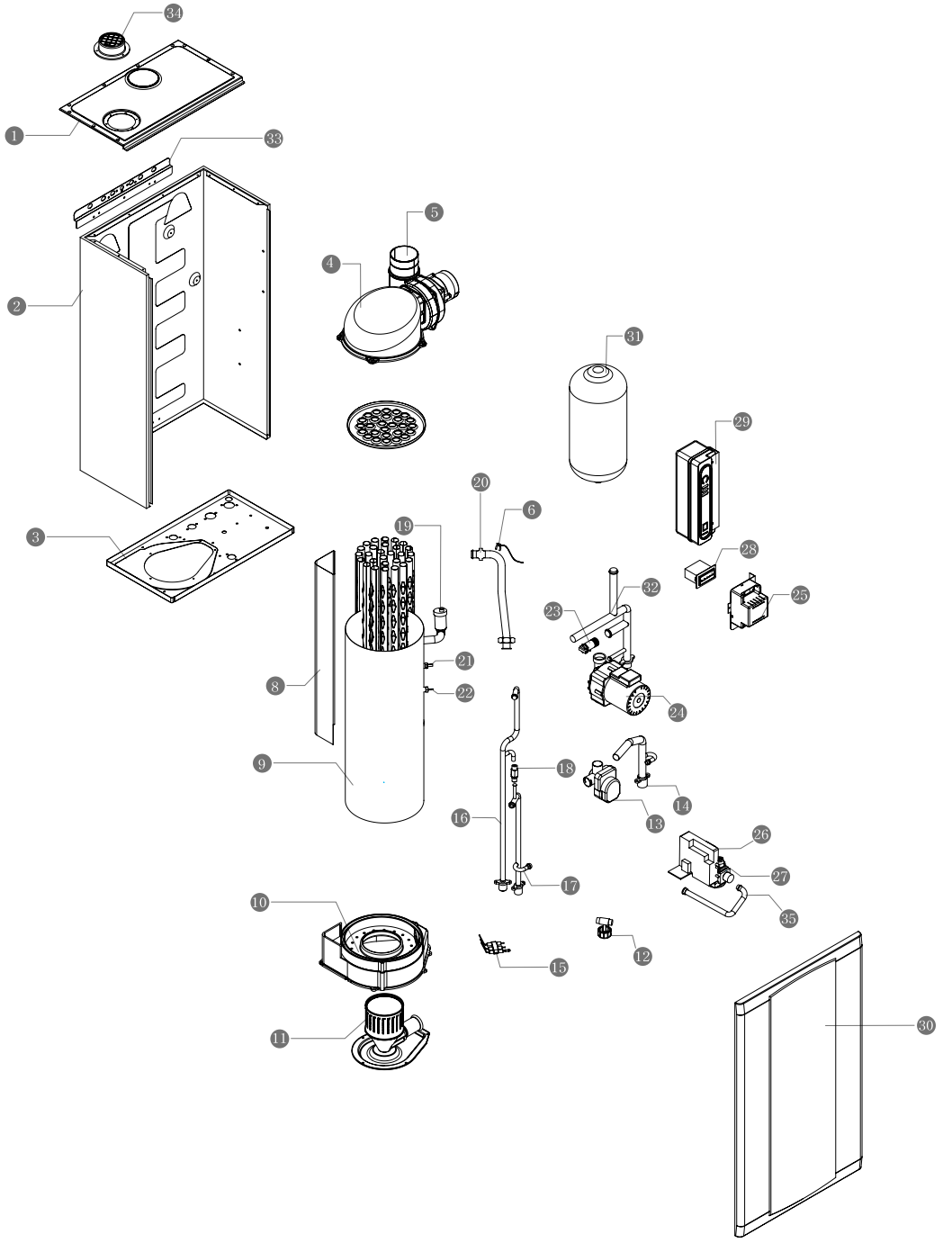
A periodic inspection done by qualified service personnel is recommended at least once a year.

Perform routine inspections, maintenance or cleaning after closing the manual gas shut-off valve, pulling out the power cord and cool down.

Inspect gas leaks frequently by using a soapy water solution at all connections and fittings.

Check the vent pipe and its connection and fittings for air supply and ventilation. Inspect the vent pipe for blockage or holes on its surface.
Ensure that there is no flue gas leakage from connections and fittings of vent pipe.

PARTS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PARTS LIST

NO	PART	CODE			
		16K	20K	25K	30K
01	Upper case	2014026		2014027	
02	Casing	2011036	2011037	2011038	2011039
03	Bottom case	2017912		2017913	
04	Hood	2382039		2382041	
05	Exhaust fan	2386045			
06	Hot Water Sensor	2351001			
07	Air supply Pipe	2019259		2019262	
08	Heat Exchanger	2015215	2015216	2015217	2015218
09	Air supply	2383024		2383025	
10	Burner	2105079	2105081	2105082	2105083
11	Manual water Supply valve	2363037			
12	Three way Valve	2363036			
13	Heating supply connection	2461124-1		2461125-1	
14	Ignitor	2373039		2373041	
15	Domestic Water Inlet Connection	2461124-2		2461125-2	
16	Domestic Hot Water Outlet Connection	2461124-3		2461125-3	
17	Water Hammer Absorption Balancer	2361003			
18	Air Vent	2362012			
19	Overheating Sensor	2351501			
20	Low Water Sensor	2352002			
21	Temperature Sensor	2351001			
22	Safety Valve	2361007			
23	Circulation Pump	2130072			
24	Power Transformer	2344003			
25	Gas Valve Controller	2119011			
26	Gas Valve	2190021			
27	Pressure Gauge	2369003			
28	Control	2113027			
29	Front Open Door	2013018	2013019	2013022	2013023
30	Nitrogen Tank	2141003		2141002	
31	Heating Return Connection	2461124-4		2461125-4	
32	Fixing Bracket	2019722			
33	Air Supply Cap	2392055			
34	Gas Pipe	2461124-5		2461125-5	

BEFORE YOU CALL FOR SERVICE

For your safety DO NOT attempt repair on your own discretion, but act according to the instruction below. Any error code on room temperature display LED will flash depending on the nature of malfunction when something is wrong with the boiler. When abnormal behavior continues for a while, contact a service center or a qualified service technician.

There is no power

Check to see if the power cord is plugged.

Check the power outlet with another electric appliance such as an iron. If this other electric appliance does not also operate, the problem is likely to be with electricity. If the testing electric appliance operates, contact any local service center for help.

When room does not heat up even though the power of boiler is on

Check the boiler whether it is normally operating or not.

Check the setting temperature. If the setting temperature is lower than the current temperature, the boiler will not operate.

Contact an authorized service center if abnormal behavior continues.

When error code is flashing at room temperature display LED.

01, 02, 03	Ignition failure due to flaws in fire sensor or safety cut off immediately after ignition. It may be caused by external factors. Try to restart the boiler by push Power/Restart button. Check the manual gas shut-off valve whether it is closed or not. Contact an authorized service center if abnormal behavior continues.
04	This is caused by problems in the water temperature sensor. Use causeof product and contact an authorized service center.
05	This is caused by disconnection of overheating sensor. If it is not canceled, contact an authorized service center.
06	This occurs when boiler cannot detect the RPM of exhaust fan. Contact an authorized service center.

07	This occurs due to alien substances gathered which makes a result of low RPM in the exhaust fan as a result of low RPM. The blower may rotate too fast if the vent pipe is installed in a place with strong wind zone. Contact the installer to change the location of vent pipe. Condensed water at the bent part in vent pipe has to be removed. Contact an authorized service center.
08	This error is caused by too long wiring of room thermostat (more than 10m) or electric noise from high voltage wire such as telephone line, etc Be careful not to be peeled and do not bury with the wires for hosehold electric appliances and 120V wires. In some special case, it needs to be rewired with special wire. Contact an authorized service center.
95	This is caused by lack of water in the boiler. Open the feeding valve(Refilling valve) to supply water in boiler. The boiler will be operated as normal automatically after sufficient water is refilled.If the error is not cancelled and the water is not being replenished, contact a nearest authorized service center.
96	The overheating protection device is triggered and the boiler operation is stopped for safety purposed because of excessive high temperature of heating water. In this case, the circulation pump is activated and make the temperature of heating water decrease. If the error is not cancelled, contact an authorized service center.
97	There is a gas leakage in somewhere. In this case, be sure not to use any of electric appliances such as gas range, stove, etc. and specially no fires with lighter, match for smoking. Also, to ventilate the leaked gas, open the door or window and refresh the indoor air. ※These can cause an explosion. Please call and ask to the gas company to check gas leakage in gas supply pipeline. After checking, there is still some suspicion, call to any authorized service center. Check the gas leakage periodically with soapy water solution.

if you need service...

Should you have any questions about your new boiler, or if it requires adjustment, repair, routine maintenance, it is suggested that you first contact your installer, plumbing contractor or previously agreed upon service agency. In the event the firm has moved, or is unavailable, refer to the telephone directory, commercial listings or local utility for qualified service assistance.

- Model and serial number of the boiler as shown on the rating plate attached to the boiler.
- Address where the boiler is located and physical location.
- Name and address of installer and any service agency who performed service on the boiler.
- Date of original installation and dates any service work was performed.
- Details of the problems as you can best describe them.
- List of people, with dates, who have been contacted regarding your problem.

CONSUMER PRODUCT OWNERSHIP REGISTRATION

Follow these three steps to protect your new appliance investment.

1 Complete and mail this consumer product ownership registration.

2 After mailing the registration below, store this document in a safe place. It contains information you will need should you require service.

3 Read your Use and Care Manual carefully. It will help you operate your new appliance property.

Model Number **Serial Number**

Cut here

CONSUMER PRODUCT OWNERSHIP REGISTRATION

Cut here

Model Number **Serial Number**

First Name

Last Name

Street Address

Apt.#

City

State **Zip Code**

Month **Day** **Year**

Street Address – –

Notice: Failure to complete and return this card does not diminish your limited warranty right.

MEMO

MEMO