KITURAMI WORLD PLUS-13D TECHNICAL INFORMATION AND INSTALLATION INSTRUCTIONS

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WORLD PLUS Gas boiler.....

Model

WORLD PLUS - 13D (15.1 kW)

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WORLD PLUS - 20D (23.2 kW)

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WORLD PLUS - 30D (34.9 kW)

Gas fired wall hung combination coilers

CONTENTS

1. overall view

1-1 General Information

These instructions are suitable for **WORLD PLUS** Series boiler;
Do not forget this instruction.
To ensure the correct installation, commissioning and servicing of domestic central heating system.

To the householder,

Make sure you have a completed this book for your boiler. This book provides a record of the commissioning of your boiler. It contains very important information about your particular installation that may be required by service engineer.
This book will also provides contact details for the installer should you need guidance in the use of this unit or if there are any problems. As with your car, your boiler will work more reliably and efficiently if it regularly is serviced. We recommend an annual service check. The service history of the unit will be recorded on this book.
In the unlikely event of any problems with your boiler or system you should first contact your installer. If your installer cannot resolve the problem he should calling to our service center.

You statutory rights are not affected.

To The Installer

As part of the commissioning of this unit it is vital that this book is completed and given to the householder.
Please ensure that your customer is aware of the importance of keeping this book safe as a record of the installation and the unit service history
Please ensure that your customer is aware of the correct operation of the system, boiler and controls. **KITURAMI** recommend the use of protective clothing, when installing and working on the unit i.e. gloves.

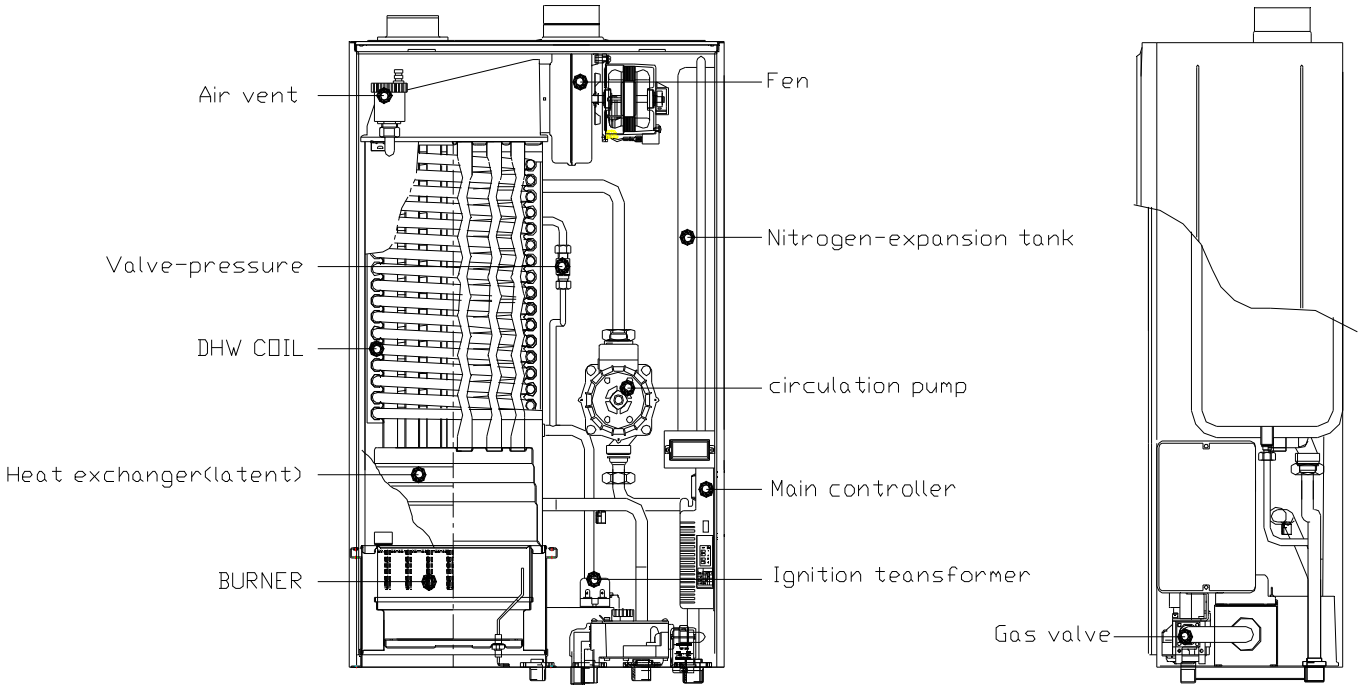
GUARANTEE

The manufacturer's guarantee is for 2 years from the date of installed. The guarantee is invalidated if the unit is not installed in accordance with the recommendations made herein or in a manner not approved by the manufacturer. To assist us in providing you with an efficient after sales service, please return the guarantee registration card enclosed with the boiler without delay.

1. Product description

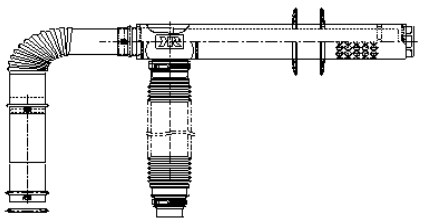
1-2 Speafication

Model : WORLD PLUS



MODEL	WORLD PLUS-13	WORLD PLUS-16	WORLD PLUS-20	WORLD PLUS-25	WORLD PLUS-30
POWER SOURCE	220 - 240 V, 50Hz				
DIMENSION (Wx Dx H)	430 x 250 x 721	465 x 278 x 761		507 x 310 x 788	
WEIGHT (kg/lb)	35 (77.1)	36 (79.3)	36 (79.3)	39 (85.9)	39 (85.9)
INSTALLATION TYPE	B33-C13-C33-C43-C53-C63-C83				
FUEL TYPE	LNG, 13A, G20, G30				
HETING AREA (㎡)	85	106	133	166	199

Room Control



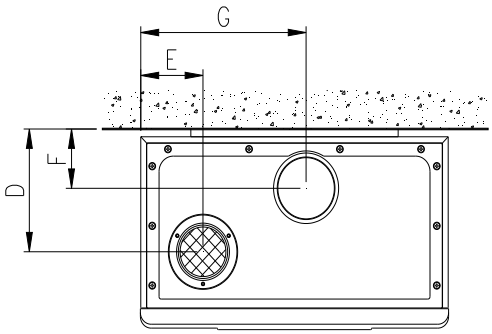
CHIMNEY

FIXATION BOLT

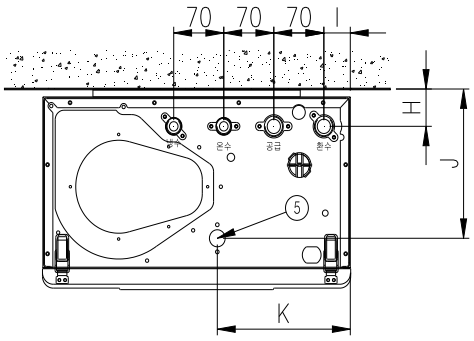
STAINLESS STEEL BEND

2. Installation

2-1 Standard installation



FRONT <TOP>



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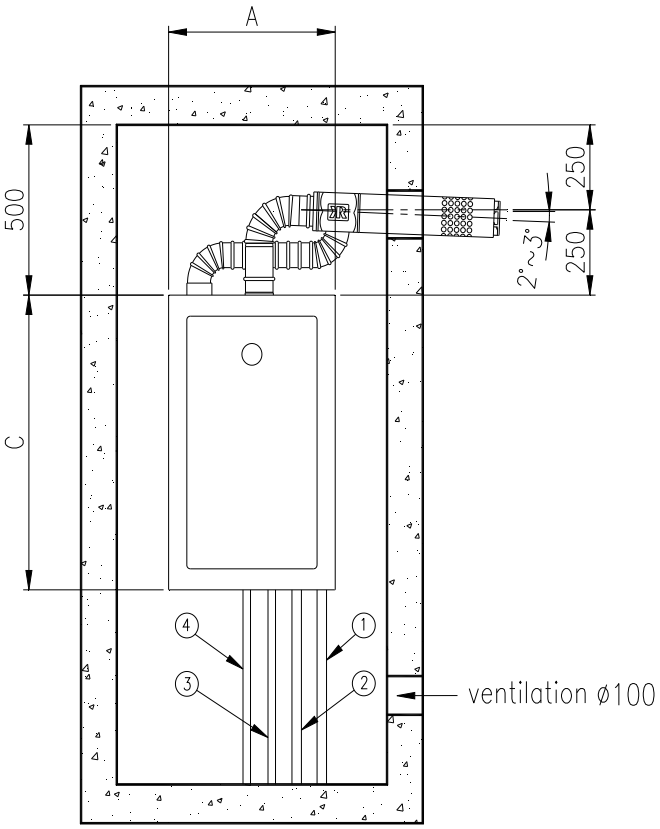
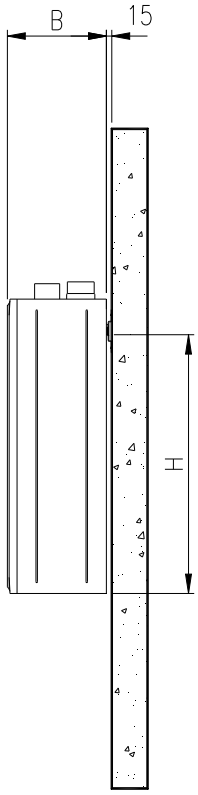
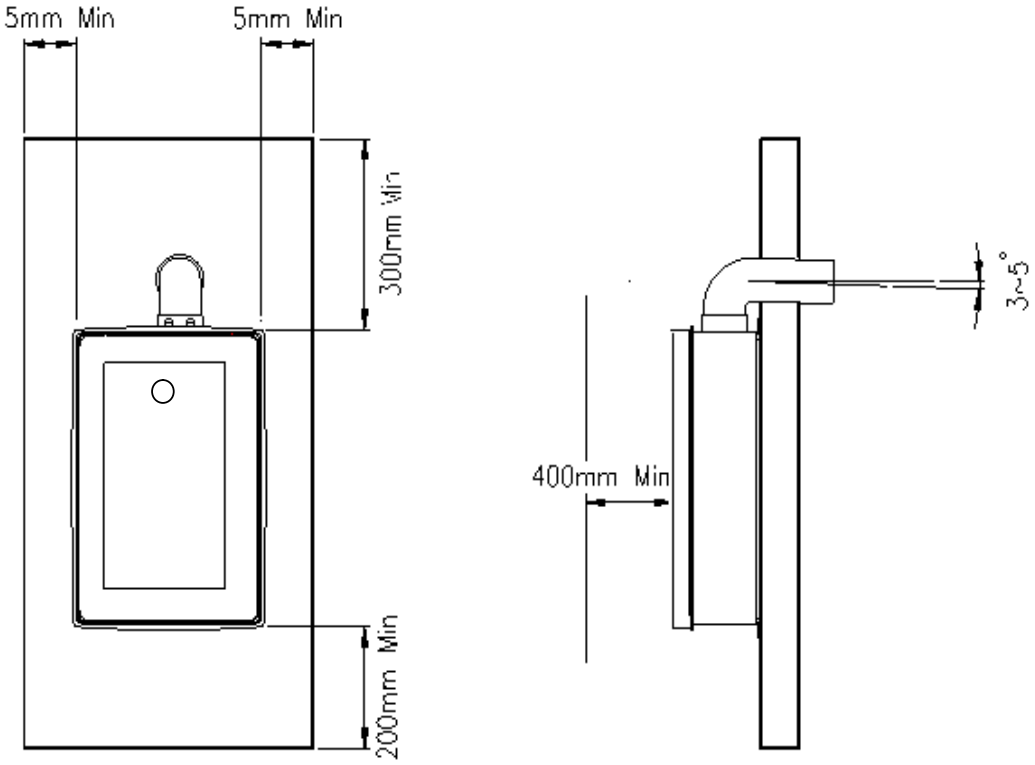




capacity(kW)	A	B	C	D	E	F	G	H	I	J	K
15.1	430	250	721	164	87	77	231	634	37	198	186
18.6	465	278	721	181	86	82	262	628	37	125	53
23.3	465	278	761	181	86	82	262	668	37	125	53
29.0~34.9	507	310	788	193	92	98	302	696	42	142	54

No	PIPE NAME	SPEC
①	Heating return	20A
②	Heating supply	20A
③	Hot water out	15A
④	Cool water in	15A
⑤	Gas in	15A

2-2 Boiler Installation



| Installing Boiler |

1. **The boiler has to be fixed horizontally to the wall with some space for cleaning and maintenance.**
2. **The wall should support enough to hang 35 ~ 45kg of Boiler and be incombustible surface**
3. **Before installing the boiler, check the pipes and valves for central heating water in & out-let, domestic hot water in & out-let, and gas.**

| Selecting Location |

1. **Please select the location and position, considering some space for cleaning and maintenance.**
2. **The wall should support enough to hang the boiler of 35 ~45kg. If need, reinforce the wall before installing.**
3. **Corrosive gas [ex. Ammonia gas, Chloric gas, Sulfur, Acids, etc] can destroy or rust the boiler, flues, and pipes by a chemical reaction. And it may reduce the efficiency of heater or igniter. Please avoid this location or clean up the place before installing Boiler.**
4. **he boiler should be installed onto the incombustible surface.**
5. **Please avoid the wet place and hermetically sealed location.**

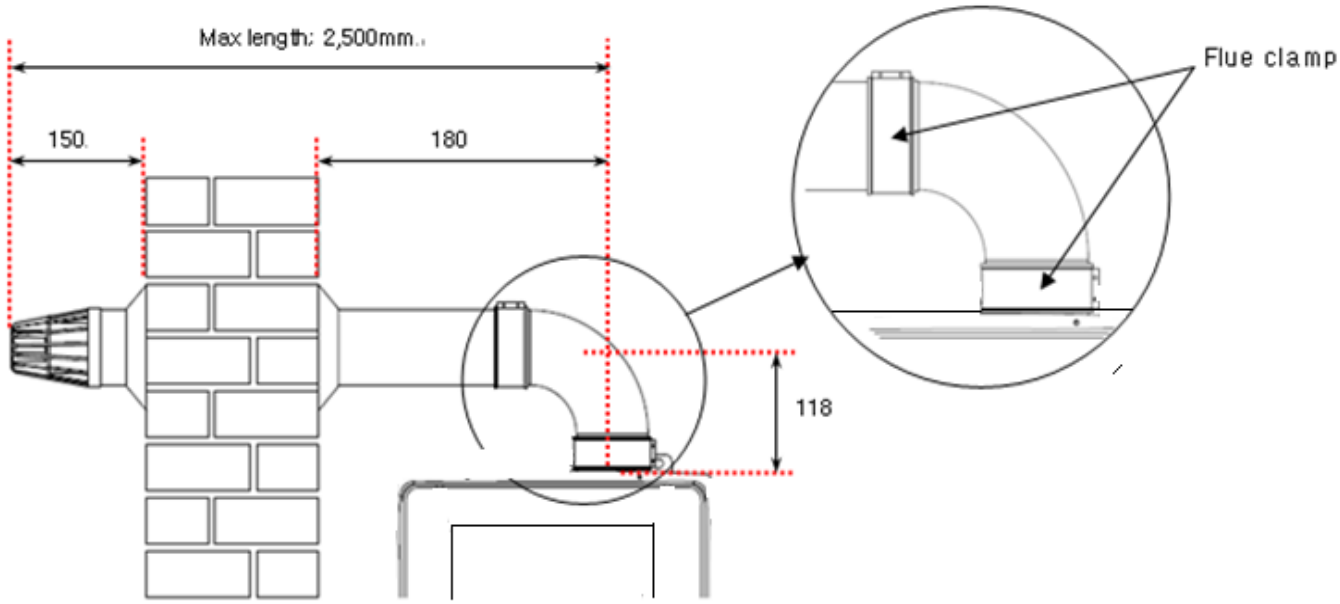
The boiler can be installed on any suitable internal wall (suitable sound proofing may be required when installing onto a stud partition wall). Provision must be made to allow for the correct routing of the flue and setting of the terminal to allow the safe and efficient removal of the flueproducts.

Where a room sealed appliance is installed in a room containing a bath or shower, the appliance and any electrical switch or appliance control, utilizing mains electricity should be situated specifically in accordance with current IEE Wiring Regulation.

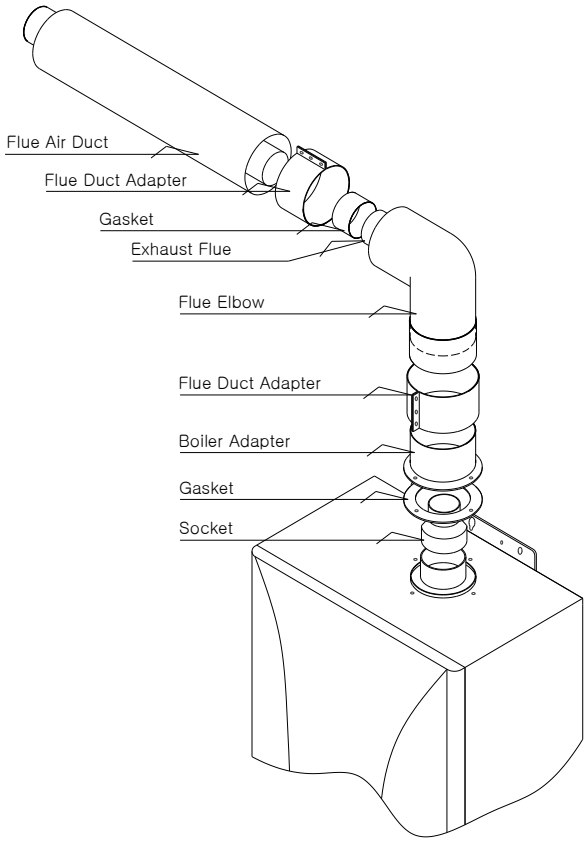
[Installing Boiler]

1. The boiler has to be installed horizontally to the wall with some space for cleaning and maintenance.
2. The boiler has to be fixed firmly with special bolt for its weight and tightly against any vibration.
   It is recommended to stick the rubber against vibration.

2-3 Installing flue (Dimensions and Fixings)



2-3-2 Installing flue (Connecting)



COXAIL FLUE Connecting

ASSEMBLING the socket of inlet and outlet flue.

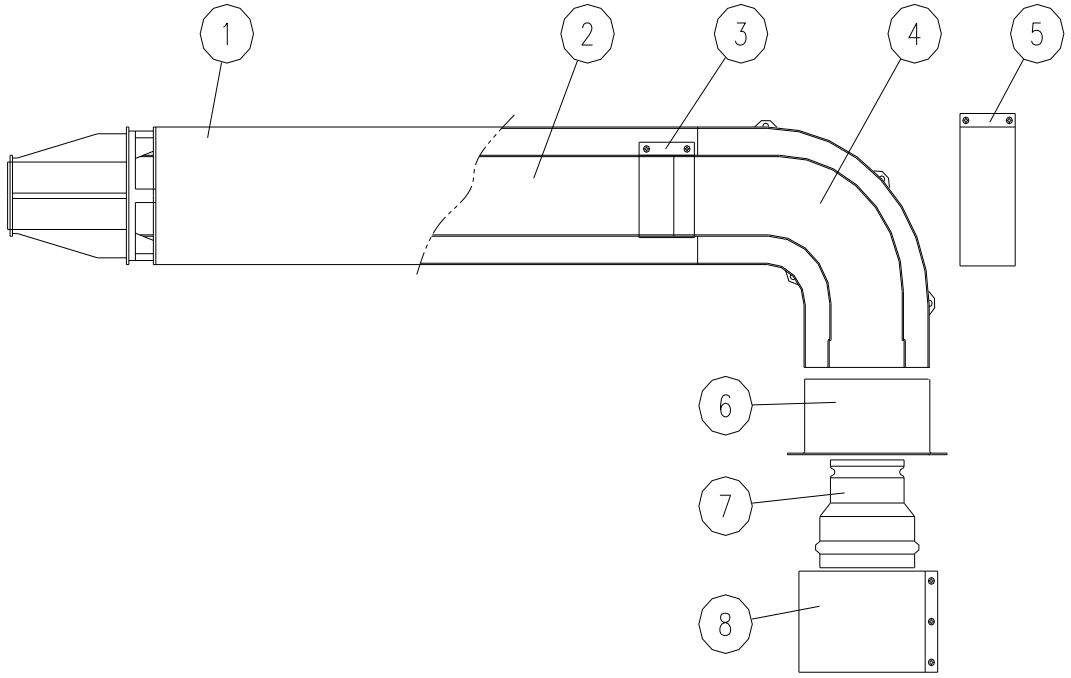
1. Join the flue socket on flue outlet.
2. After sealing the top of boiler and socket with gasket, fix the socket to the boiler body with screw.

JOINING FLUE WITH BOILER

1. Fix the socket, boiler adapter and flue elbow with sealing tape after adjusting all.
2. After sealing well, join and screw the flue duct adapter.
3. Join and fix the flue elbow to main flue with careful check of exhaust flue and inlet flue.
4. Seal the joint completely with tape and screw the Flue duct adapter.
5. Slope down the flue outlet by 3 ~ 5˚ in order to drop the condensation down.

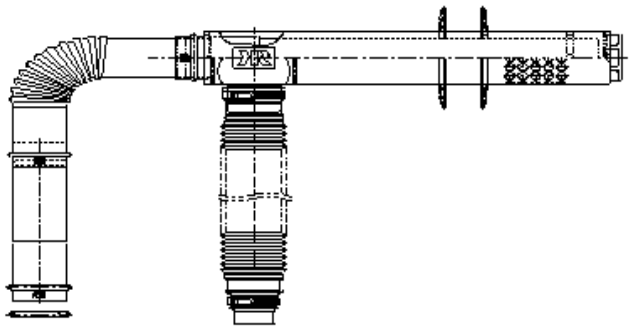
2-3-1 FLUE

COXAIL FLUE

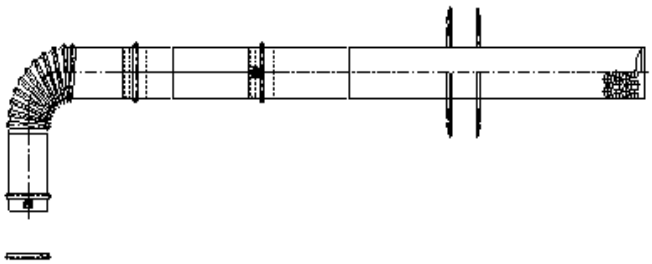


	1	2	3	4	5	6	7
name	air suction pipe	exhaust pipe	exhaust bend	exhaust elbow	air suction soket	exhaust soket	air suction bend
material	SUS	AL	AL	AL	SUS	SUS	AL
remarks							

⇒ **Forcible air inlet, outlet type (FF)**



⇒ **Forcible air outlet type (FE)**



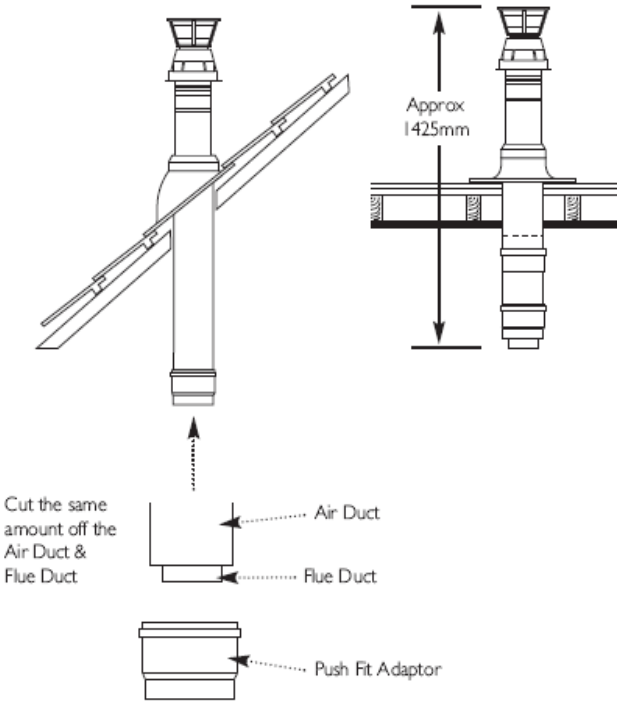
2-3-1 CHIMNEY

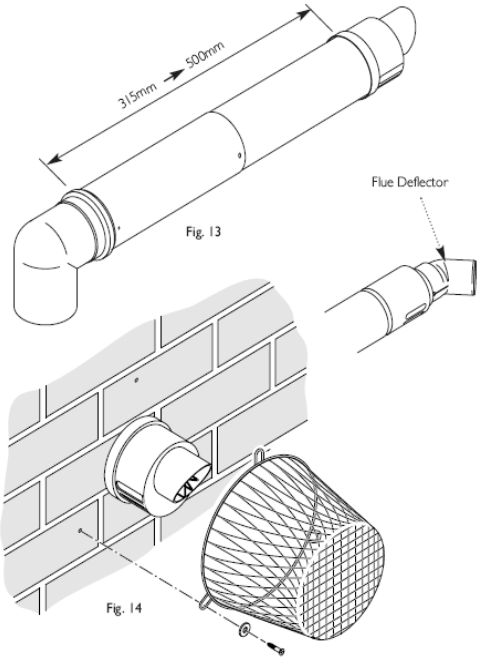
The provision for satisfactory flue termination must be installed in accordance with local regulations.
The appliance must be installed so that the flue terminal is exposed to outdoor air.
The terminal must not discharge into another room or space such as an outhouse or lean-to. It is important that the position of the terminal allows a free passage of air across it at all times. The terminal should be located with due regard for the damage or discoloration that might occur on buildings in the vicinity,
it must also be located in a place not likely to cause nuisance. In cold or humidity weather water vapor may condense on leaving the flue terminal The effect of such "steaming" must be considered. If the terminal is less than 1 meter above a balcony, above ground or above a flat roof to which people has access, then a suitable stainless steel terminal guard must be fitted. The minimum acceptable spacing from the terminal to obstructions and ventilation openings are specified in Fig. X.

Warning

The exhaust gas duct must not be contact with or close to inflammable material and must not pass through building structures or walls made of inflammable material. When replacing an old appliance, the flue system must be changed.

2-3-3 Installing flue (For Roof Terminals)





① For Roof Terminals

1. In the case of a pitched roof 25-50 degrees, position the lest tile to replace/flash over existing roof tilling. Make an aperture in the roof suitable for the lower tube of the roof terminal and ensure the integrity of the roof cover is maintained. The adjustable plastic collar can either be positioned. on the lead tile or the lower tube of the roof terminal prior to the final positioning of the vertical flue through the tile Check the collar is correctly located to suit required roof pitch (either 25˚ to 38˚ or 37˚ to 50˚) From inside the roof adjust the to vertical position and secure to the roof structure with the clamp supplied.
2. For flat roof installations the aluminum flashing must be incorporated into the roof covering and the appropriate aperture aperture made in the roof decking. The vertical flue is lowered onto the flashing.(A mastic seal may be necessary). From inside the roof, structure with the clamp supplied

IMPORTANT : If the boiler is not fitted immediately after the flue System, temporary precautions must be taken to prevent rain entry into the room of installation, Any precautionary measures must be removed prior to commissioning the boiler.

② Flue Dimensions

The standard horizontal telescopic flue kit allows for lengths between 315mm and 500mm from elbow to terminal (Fig 13)

③ Flue Trim

1. The rubber flue trim supplied may be fitted to either the outside wall or on the inner wall of installation.

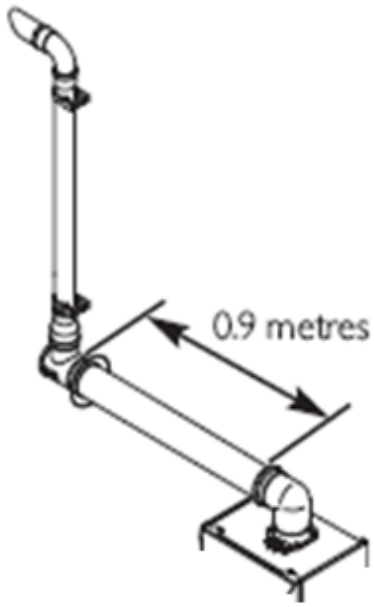
④ Terminal Guard (Fig. 14)

1. When codes of practice dictate the use of terminal guards, they can be obtained from most Plumber' and Builders' Merchants.
2. There must be a clearance of at least 50mm between and part of the terminal and the guide.
3. When ordering a terminal guide quote the appliance name and model number.
4. The flue terminal guide should be positioned centrally over the terminal and fixed as illustrated.

⑤ Flue Deflector

1. If required push the flue deflector over the terminal end and rotate to the optimum angle for deflecting plume. Secure the deflecton to the terminal with screws provided

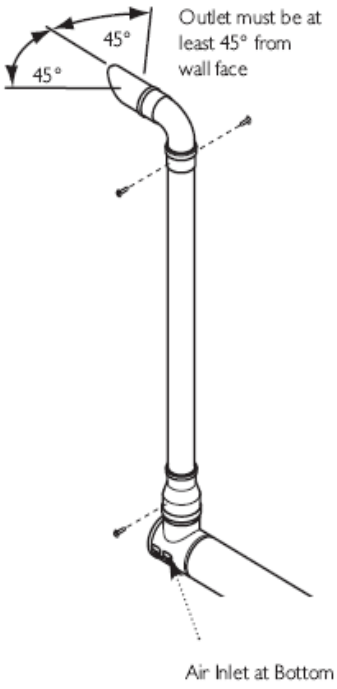
2-3-4 Installing flue (Plume Displacement)



Content of kit

1 0.9m 60/100 Concentric Flue
1 1m 60 Dia-meter Exhaust Flue Pipe
1 Adaptor
2 60Dia Support Brackets
1 93˚ Elbow/Plume Outlet Assembly
1 Flexible Flue Time
3 "O" Rings
1 Jubilee Clip
1 Elbow

1. This kit is recommended for installations where the condensate plume emitted from the flue may cause a nuisance or affect the surroundings.
2. The terminal must be positioned outside the building with the air inlet facing downward and outlet connection upwards.
3. The plume outlet must always be at least 45˚ to the wall with the '' uppermost to prevent rain entry (Fig. 15 & 16) and be at least 2 meters above ground level. It must be at least 500mm from the air inlet in any direction (Fig. 16)



NOTE : The outlet must be positioned so that any condensate plume is directed away from adjacent surfaces. There must be a constant fall along the entire of the flue system from the back to boiler

4. It is possible to reduce or increase (with the addition of extensions) the length of either or both 60/100 concentric and 60Φ exhaust.
5. Standard concentric flue extension kits may be added between the boiler elbow the terminal assembly
6. The minimum length of the concentric flue is 100mm when measured from the edge of the flue elbow

IMPORTANT : The maximum equivalent length of concentric flue is : **8 meters**
Additional bends may be fitted in the concentric flue, but the equivalent length must be reduced I meter (93˚ elbow) or 0.5 metric (45˚ elbow)

7. 60Φ I meter extensions (including support bracket), and additional 93˚ & 45˚ elbows are available. Any additional 93˚ & 45˚ elbows must be accounted for when calculating flue lengths

2-3-5 Installing flue (Fitting The Flue)

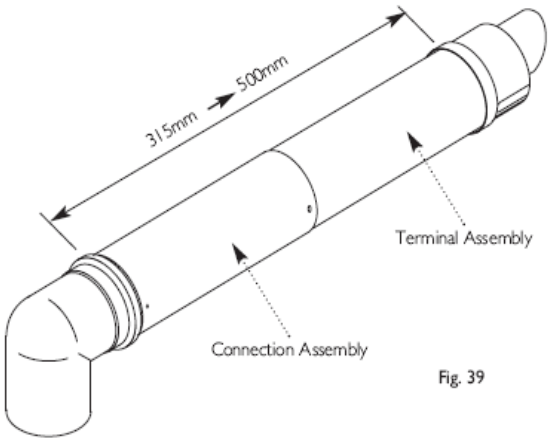
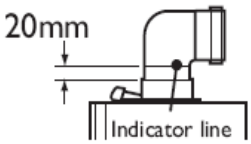
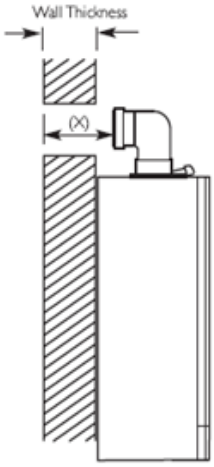
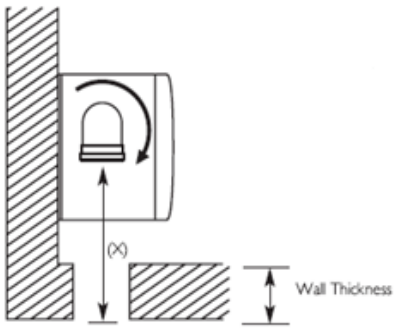


Fig. 39







Fitting The Flue

HORIZONTAL TELESCOPIC FLUE

1. There are tow telescopic sections. The Terminal Assembly and the Connection Assembly, a roll of sealing tape and two tapping screws . A 93˚ elbow is also supplied. The outer duct of the Connection Assembly is painted white On the Terminal Assembly The outer duct is unpainted.

2. The two sections can be adjusted to provide a length between 315mm and 500mm (Fig. 39) when measured from the flue elbow (there is 50mm engagement into the elbow)

3. Locate the flue elbow on the adaptor at the top of the boiler Set the elbow to required orientation (Fig. 41)

NOTE : The flue elbow is angled at 93 degrees to ensure a fall back the boiler

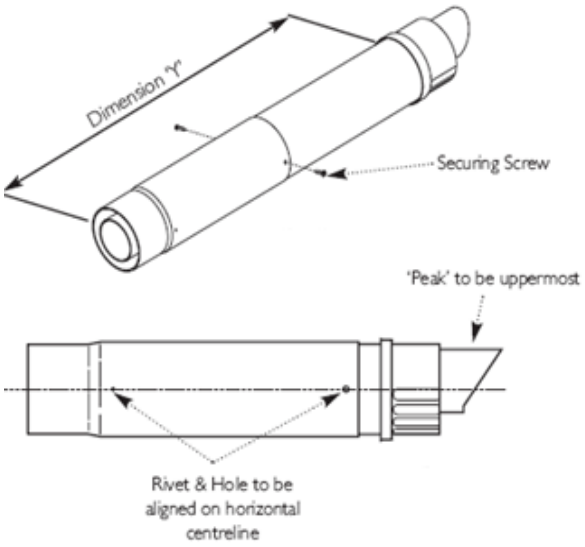
4. Measure the distance from the outside wall face to the elbow. This dimension will be known as 'X'

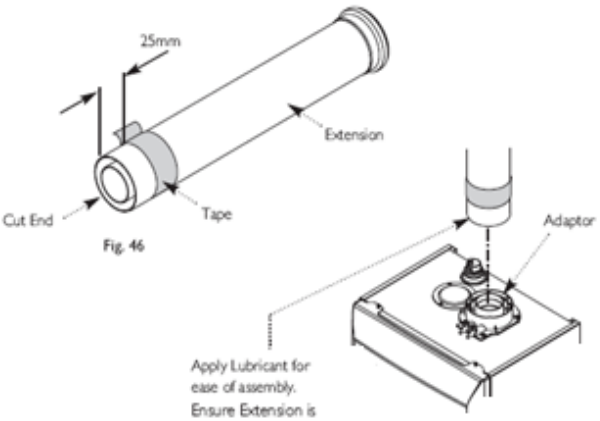
5. If the distance from the flue elbow to the outside face of the wall ('X' in) is less than 250mm the Connection Assembly can discarded and the Terminal Assembly fitted directly into the elbow.

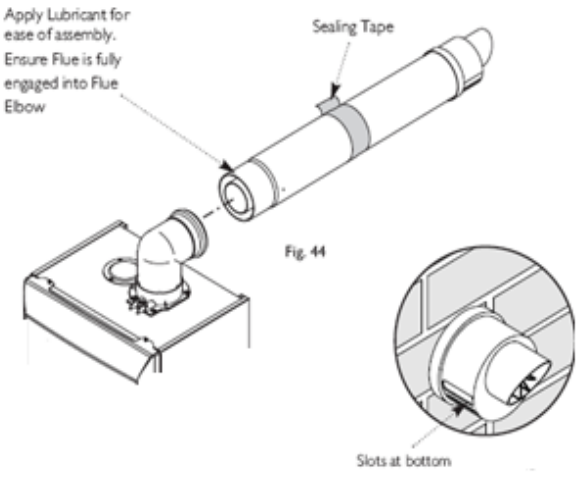
6. In instances where the dimension ' X' is between 250mm and 315mm it will be necessary to shorten the Terminal Assembly by careful cutting to accommodate wills of these thickness.

7. To dimension 'X' add 50mm. This dimension to be known as 'Y'.

2-3-6 Installing flue (Fitting The Flue (Cont))







Fitting The Flue (Cont)

8. Adjust the tow telescopic sections to dimension 'Y'
   Ensure that the rivets and holes in the Connection Assembly are aligned horizontally
9. Using a 2mm bit, drill through the holes at the end of the Connection Assembly into the Terminal Assembly and secure together using he screws supplied
   Seal the joint with the tape provided
10. Remove the flue elbow and insert the flue through the hole in the wall. Refit the elbow to the boiler adaptor, ensuring that it is pushed fully in
11. Draw the flue back through the wall and engage it in the elbow
    It may be necessary to use soap solution or similar to ease assembly of the elbow adaptor and flue
12. Ensure that the terminal is positioned with the slots to the bottom

IMPORTANT : It is essential that the flue terminal is fitted as shown to ensure correct boiler operation and prevent water entering the flue

13. Make good between the wall and air duct outside the building
14. Fit the flue trim inquired, and if necessary fit a terminal guard (see Section 8.8 ~ 8.9)

CONCENTRIC VERTICAL FLUE

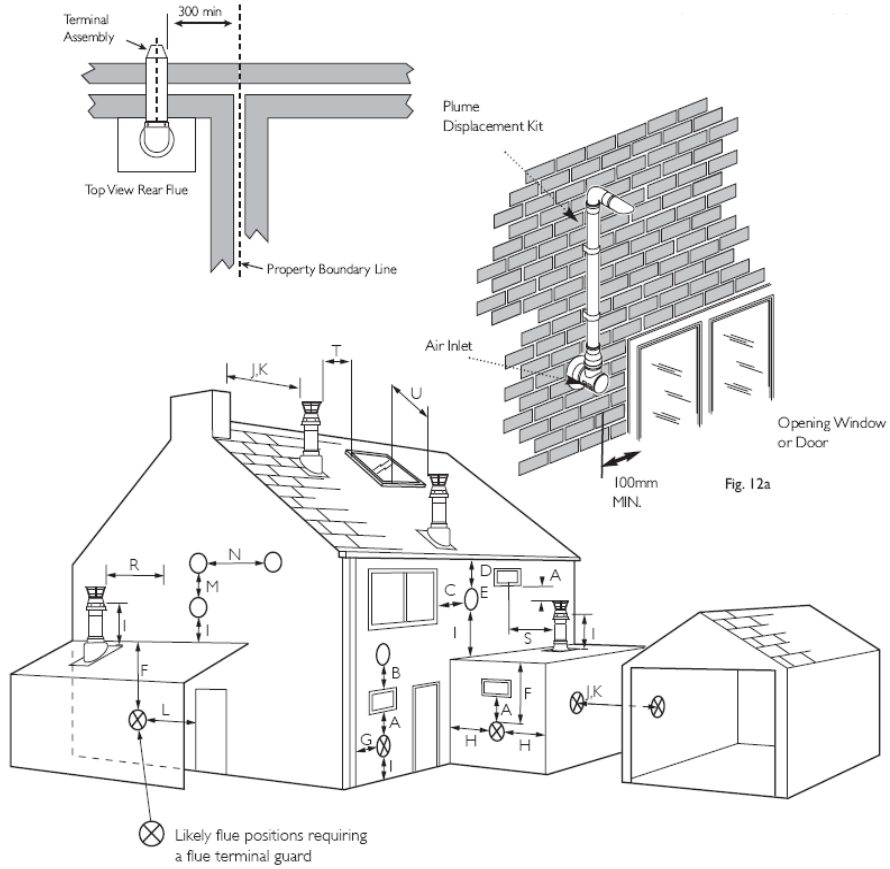
15. Once the length of the vertical concentric extension has been determined mark and carefully cut off the excess material. The cut end MUST be square and free of burrs to ensure correct insertion into the boiler adaptor.

16. Measure 25mm from the end of the flue extension and apply a length of tape around the boiler duct

17. Engage the extension into the adaptor up to this position
    Once the installation of the flue is complete and all support brackets securely in place remove the tape

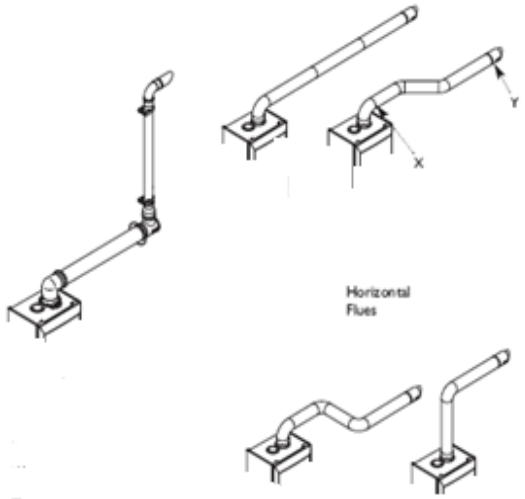
2-3-7 Installing flue (Fitting The Flue (Cont))

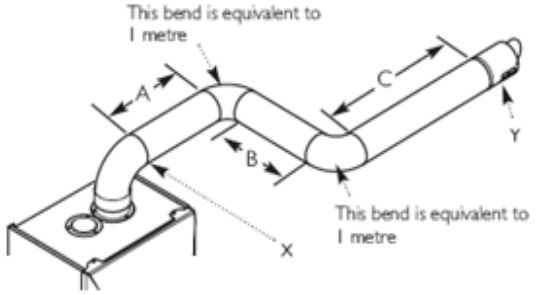
A	Directly below an opening, air brick, opening widow, etc.	300mm
B	Above an opening, air brick, opening window etc	300mm
C	Horizontally to an opening, air brick, opening window etc	300mm
D	Below gutters, soil pipes or drain pipes	25mm
E	Below eaves	25mm
F	Below balconies or car port roof	25mm
G	From a vertical drain pipe or soil pipe	25mm
H	From an internal or external corner	25mm
I	Above ground, roof or balcony level	300mm
J	From a surface or boundary line facing a terminal	600mm
K	From a terminal facing a terminal (Horizontal flue). From a terminal facing a terminal (Vertical flue).	1200mm
L	From an opening in carport (e.g. door, window) into the dwelling	1200mm
M	Vertically from a terminal on the same wall	1500mm
N	Horizontally from a terminal on the same wall	300mm
R	From adjacent wall to flue (vertical only).	300mm
S	From an adjacent opening window (vertical only).	1000mm
T	Adjacent to windows or openings on pitched and flat roofs	600mm
U	Below windows or openings on pitched roofs	2000mm



NOTE; the flue must not be installed in a place likely to cause a nuisance and positioned to ensure that Nproducts of combustion do not discharge across a boundary.

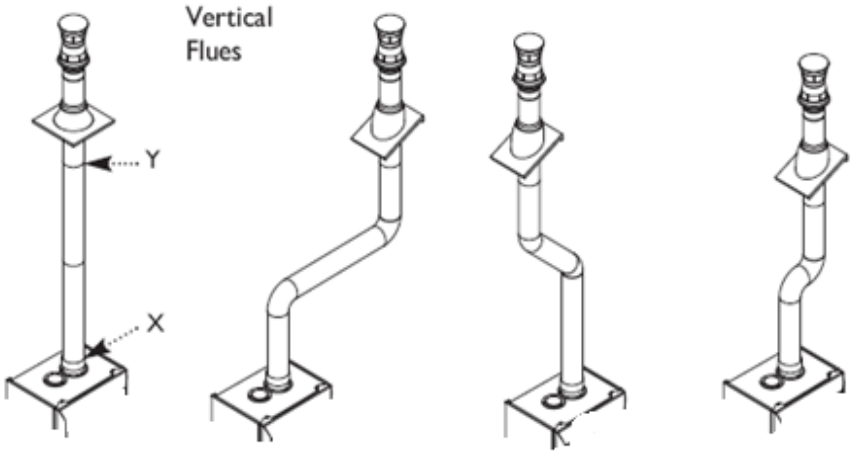
2-3-8 Installing flue (Flue Options - Horizontal Flue Systems)





Total equivalent length =

A+B+C+2x90°Bends



Twin & Vertical Flue Systems

1. Maximum permissible equivalent flue lengths are:-

Vertical Concentric	**10 metres**	**20 metres**
Vertical Twin Pipe	**15 metres**	

2. Any additional " in lin" bends in the flue system must be taken into consideration

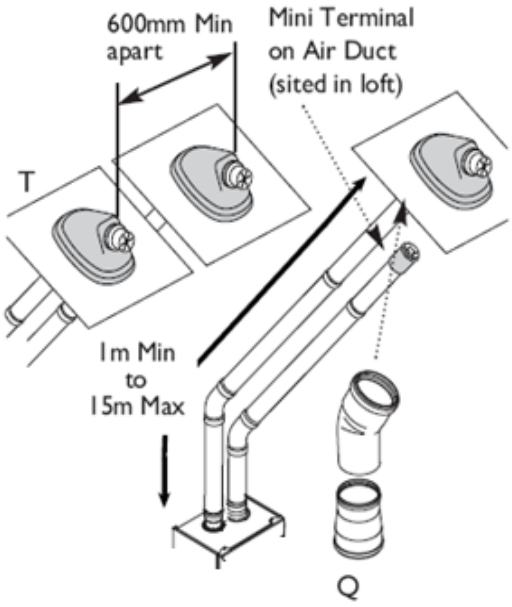
Their equivalent lengths are:-

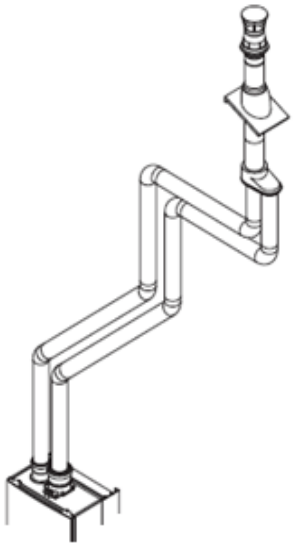
Concentric Pipes:			**Twin Flue Pipe**	
130	**bend**	**0.5 metres**	**135 bend**	**0.25 metres**
93	**bend**	**1.0 metres**	**91.5 bend**	**0.50 metres**

The elbow supplied with the standard horizintal telescopic flue kit is not included any equivalent length calculations

NOTE : Flue length is measured from point X to as shown

2-3-9 Flue options





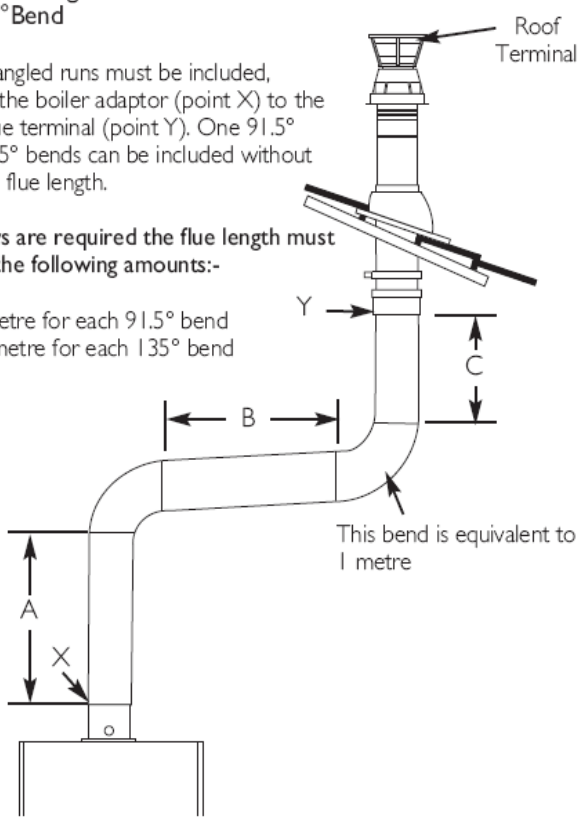
The total equivalent length for this example is = 6.5 meters

Total Equivalent Length =
A+B+C+1x90°Bend

All vertical and angled runs must be included, measured from the boiler adaptor (point X) to the joint with the flue terminal (point Y). One 91.5° bend or two 135° bends can be included without reduction of the flue length.

If further elbows are required the flue length must be reduced by the following amounts:-

1 metre for each 91.5° bend
0.5 metre for each 135° bend

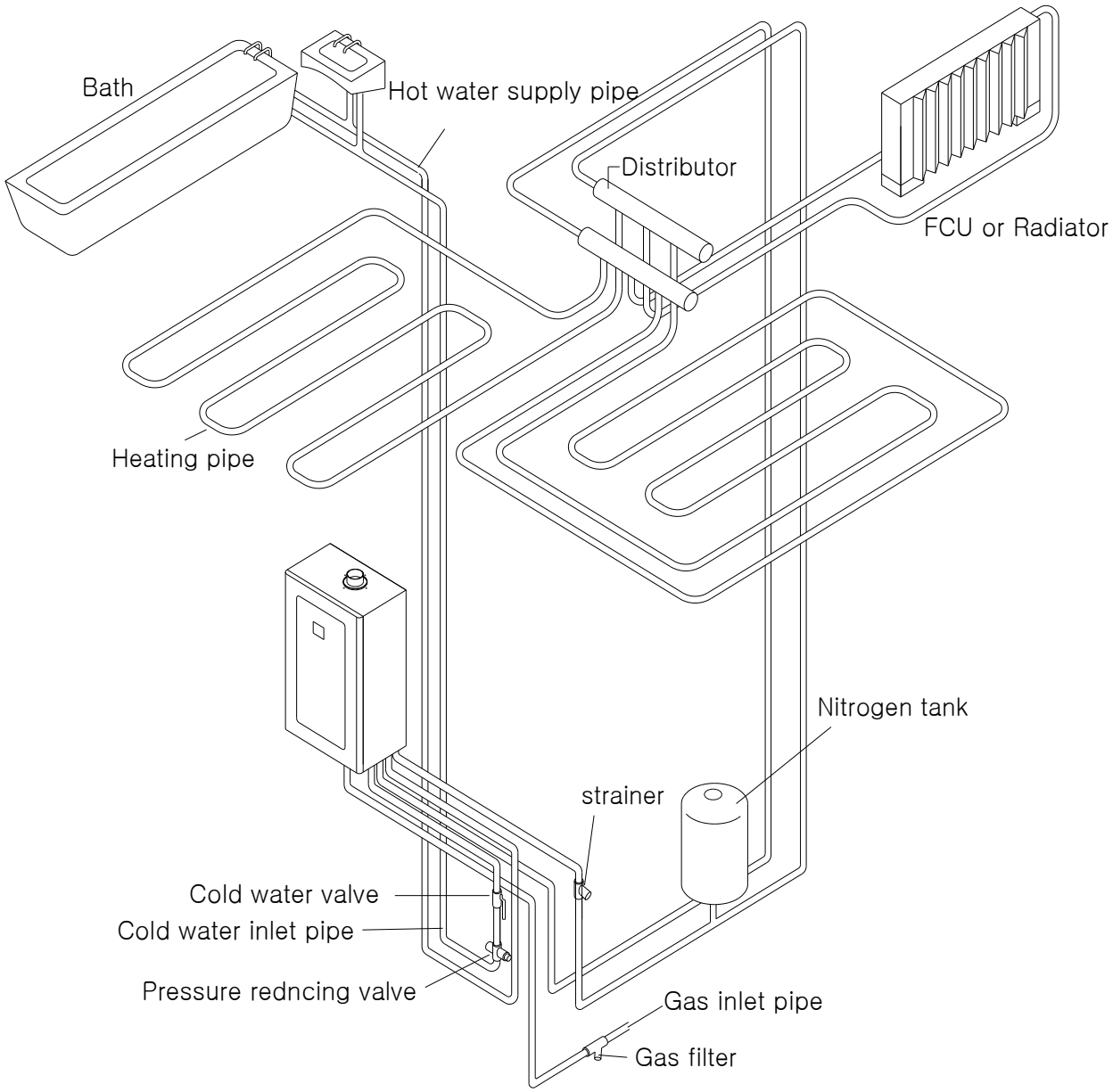


AIR DUCT		
Equivalent Length Value	N of fittings/pipes	sub total
1 m	5	5.0 m
0.25 m	2	0.5 m
0.5 m	2	1.0 m
Equivalent Length Air Duct = 6.5 m		

FLUE DUCT		
Equivalent Length Value	N of fittings/pipes	sub total
1 m	5	5.0 m
0.25 m	2	0.5 m
0.5 m	2	1.0 m
Equivalent Length Air Duct = 6.5 m		

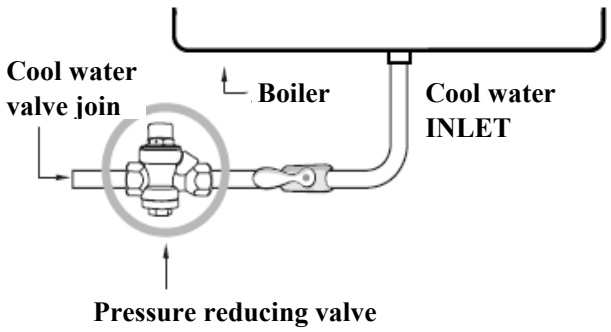
2-4 pipework

2-4-1 Standard pipework

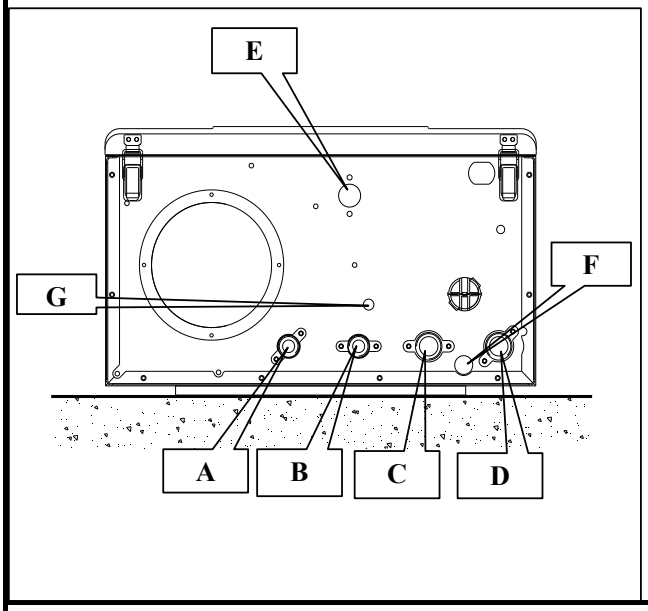


※ Caution on piping

This boiler is equipped with the pressure controller of water-inlet to protect the body and each valves from the instantaneous high-water-pressure when or closing the water valves.
This pressure controller of water-inlet works under 2.5kgf/㎠ of inlet water pipe pressure. Therefore, if over it, should install the pressure reducing valve for inlet water pipe additionally.
If over pressure of inlet water, it may cause bursting pipes of house or boiler inside and stopping hot water from boiler.



2-4-2 Gas / Water connection



mark	Name
A	Domestic Hot Water Inlet
B	Domestic Hot Water Outlet
C	Central Heating Return
D	Central Heating Supply
E	Gas Inlet
F	Safety Valve Discharge & Drain Valve
G	Water Refill Valve
others	

1. Gas connection

1). Make sure, using the labels on the packaging and the data plate on the appliance itself, that the boiler is in the correct country and that the gas category for which the boiler was designed corresponds to one of the categories available in the country where it will be used.

2). The gas supply piping must be created and measured out in compliance with specific legal requirements and in accordance with the maximum power of the boiler; you should also make sure that the shut-off valve is the right size and that it is connected correctly.

3). Check that the supplied gas corresponds to the type of gas for which the boiler was designed (see the data plate located on the appliance itself).

It is also important to check that the pressure of the gas (methane or LPG) you will be using to feed the boiler is suitable, because if it is insufficient the power may be reduced, causing inconvenience for the user.

2. Water connection

1). The illustration shows the connections for the water and gas attachments of the boiler. See valves configuration

2). Check that the maximum water mains pressure does not exceed 3bar; if it does, a pressure reducing valve must be installed.

3). For measuring of the pipes and of the heating bodies in the heating system, the residual head value should be calculated as a function of the requested flow rate, in accordance with the valves shown in the circulation pump graph

3. Drain connection

1). Extend the hose from the safety valve and connect the drain hole.

※ Caution ; Do not store any wettable things under the boiler or near the drain hole.

2-5 Connecting Electricity

2-5-1 Connecting Wires

※ This appliance is designed on **AC 230V/ 50Hz**.
This work of connecting wires is required by a qualified electrician.

1. Make sure that the earth connection is required for safety uses from any electric leakage or short-circuit.

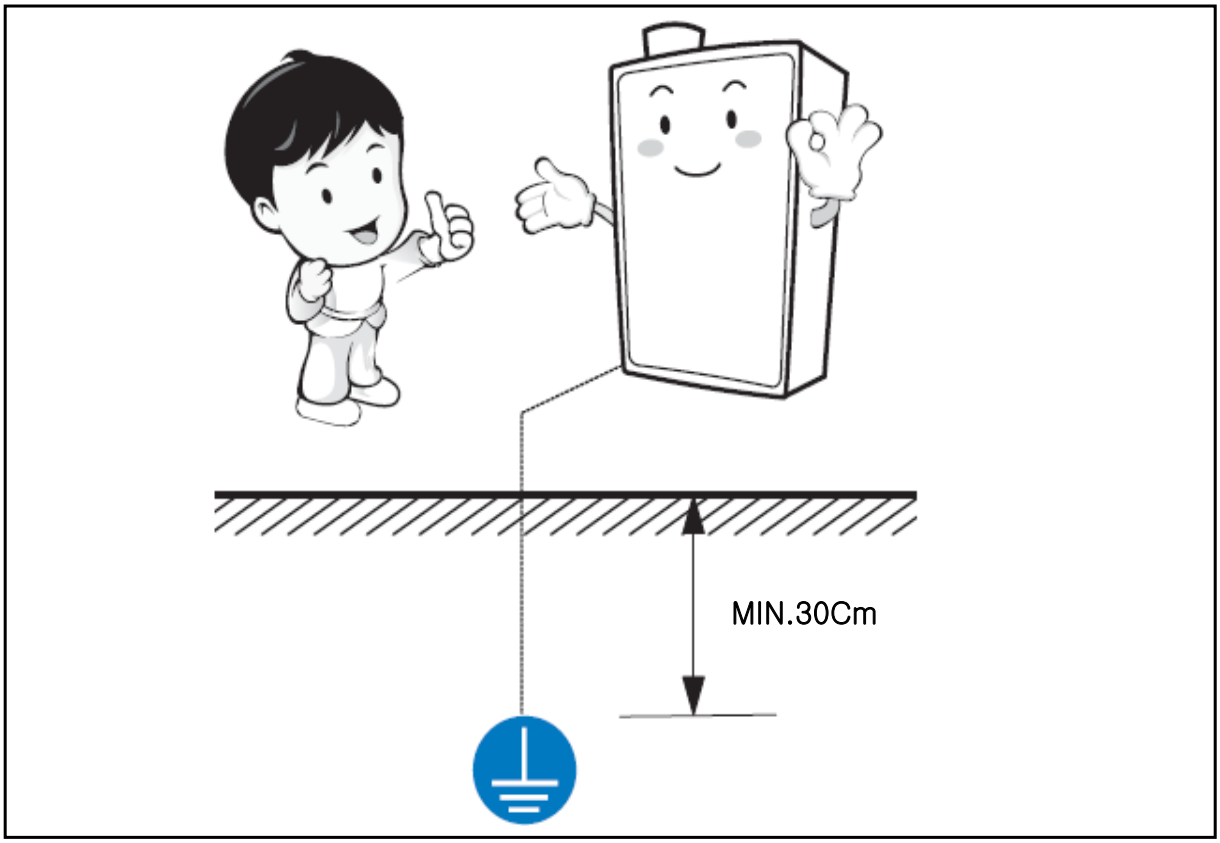
2. Make sure that the connecting electricity - for example, connecting power and cable, wiring, earthing, etc - should comply with the regulation.

3. If this appliance is not earthed by power plug, ensure to earth separately, by minimum 30cm inserted in the ground. Note not to connect gas pipe, telephone wire and lightning conductor(rod) in order to avoid any accident from lightning, surge, or the gas accident.

4. Make sure that the socket outlet is apart by over 30 cm from the appliance.

5. The power outlet has to have at least the minimum clearance of 30mm from the gas boiler

6. The grounding point need to be buried at least 30cm



3. TEST WORKING

3-1 Check list before switching-on

1). Before switching-on, please check the followings after finishing the installation of boiler, flue, pipes, and electricity.

① ☐ Is the boiler installed horizontally on the wall?

② ☐ Does the installer work on the installation manual?

③ ☐ Are not there any inflammable material near the boiler, for example, gasoline, gas can and bottle, thinner, etc ?

④ ☐ Is the on-off valve installed between gas pipe and boiler?

⑤ ☐ Does check the gas leakage of each connecting points?

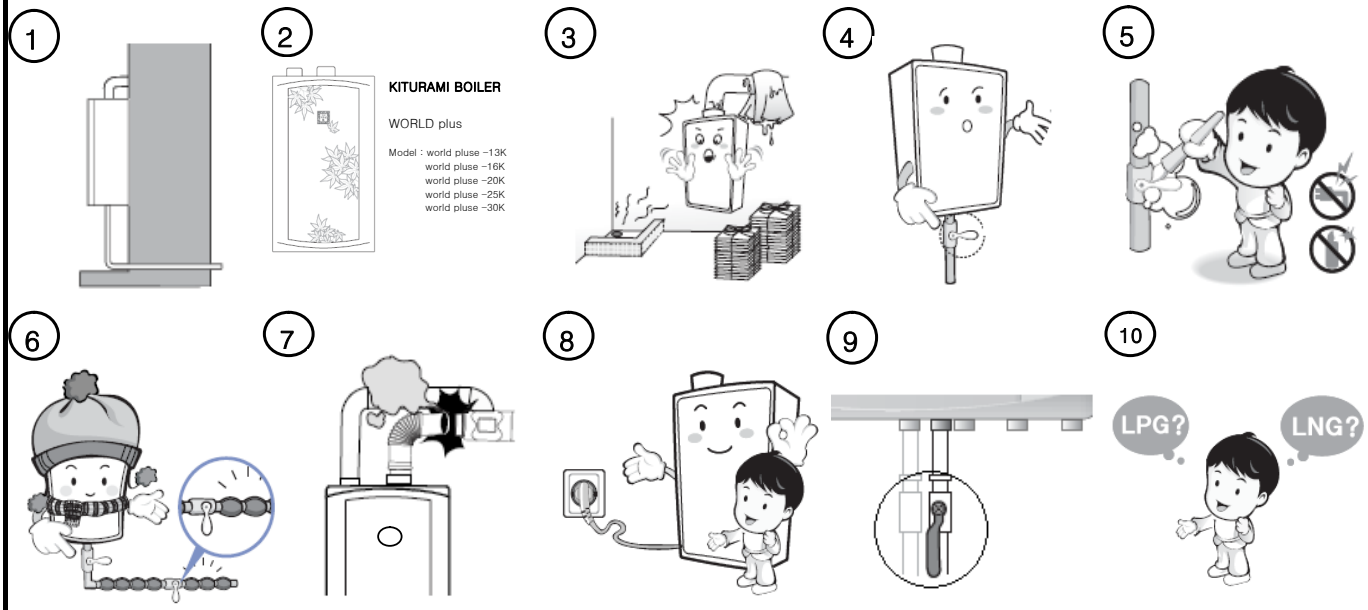
⑥ ☐ Does insulate each pipes properly to protect in winter season?

⑦ ☐ Does check the leakage of the exhaust gag from the flue ?

⑧ ☐ Does check the voltage and hertz - AC 230V 50Hz, before of plugging-on ?

⑨ ☐ Does locate the middle on-off valve for water inlet pipe?

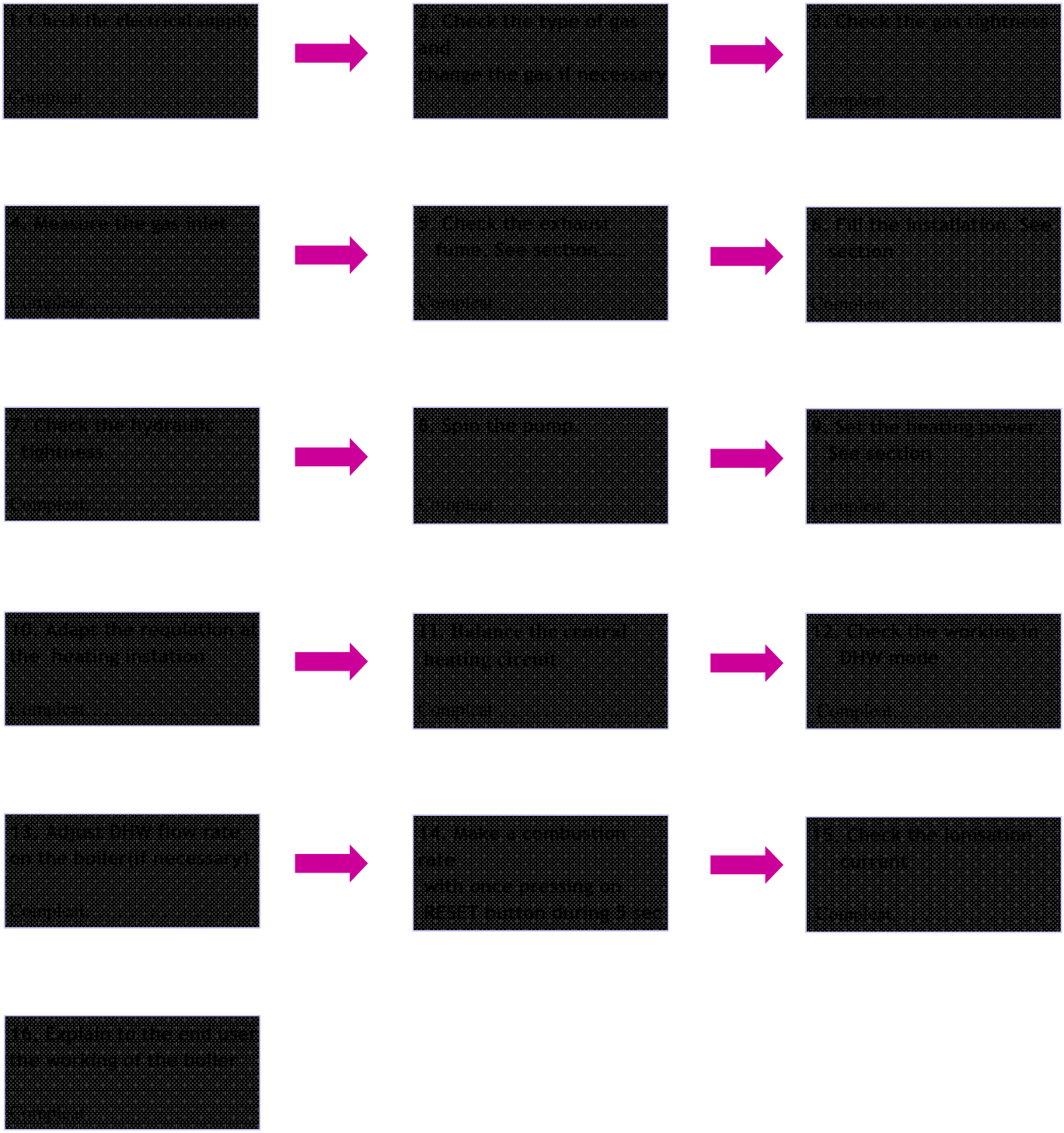
⑩ ☐ Does check the classification of the supplied gas to the instruction of gas on the specification label in boiler?



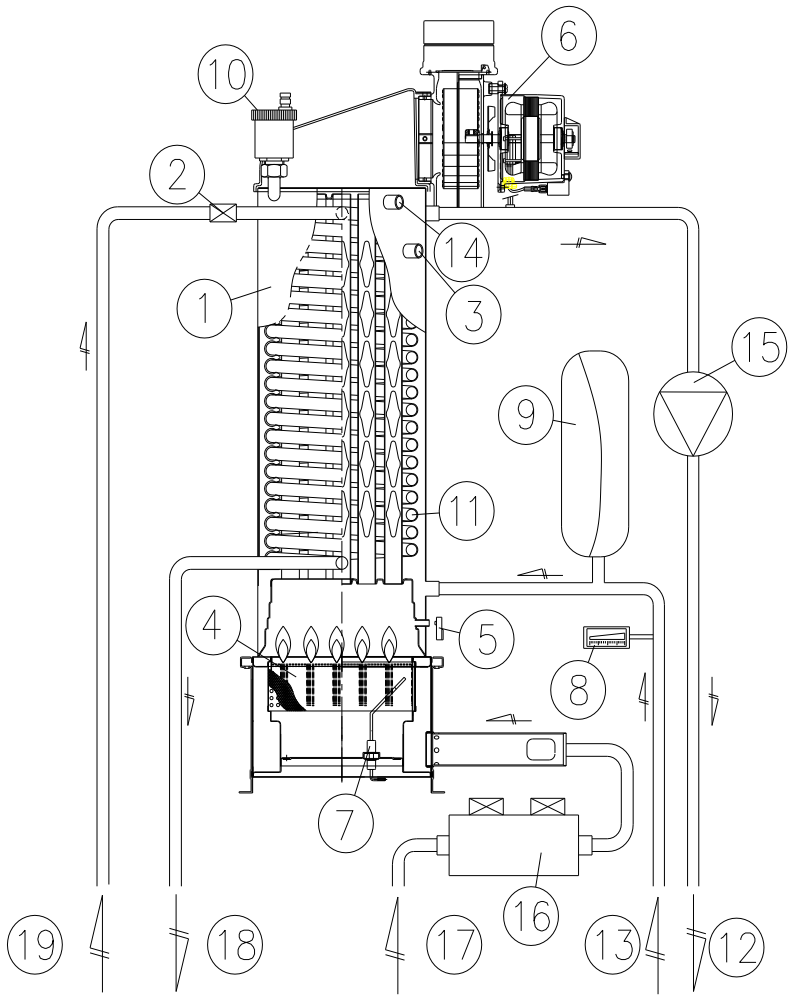
3-2 FIRST IGNITION OPERATION

Date : .....

Installer : .....

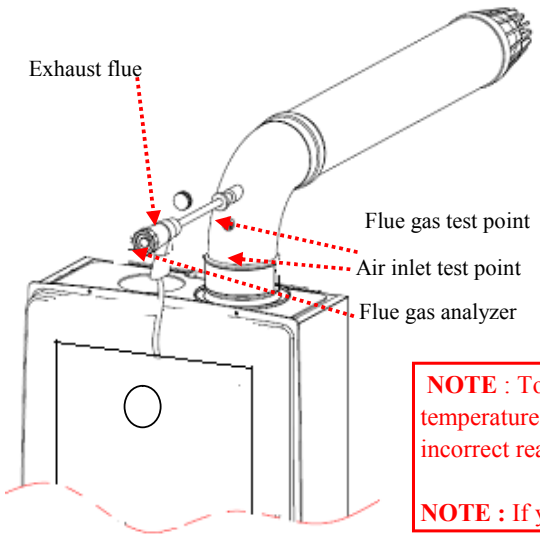


3-3 Water Circuit Diagram



1. Main Heat Exchanger
2. Hot water Limit Switch
3. Heating Temperature Probe
4. Blade Burner
5. Flame Detector(Photo Sensor)
6. Fan
7. Igniter
8. Pressure Gauge
9. Expansion Tank
10. Auto Air-vent
11. DHW Heat Exchanger Coil
12. Heating supply Connection
13. Heating return Connection
14. Heating Water Level Sensor
15. Circulation Pump
16. Gas valve
17. Gas Inlet Connection
18. Hot water Outlet Connection
19. Hot water Inlet Connection

3-4 Checking the CO2



① The combustion may be checked after running the boiler for several minutes. To do this it is necessary to set the boiler to Calibration Mode.
② Ensure that all external controls are calling for heating with maximum output.
③ The appliance should be check visually for obvious defects.
④ There are two test points in the flue, one for flue gas and the other for air.
⑤ Open the air and flue gas test points.
⑥ Insert the flue gas analyzer probe as far as the retainer.
⑦ Allow the boiler to reach thermal equilibrium (around 5~10min)
⑧ The CO and CO2 values should be check each below 200ppm and 5%.

NOTE : To ensure correct readings the boiler must have reached maximum operating temperature. . Testing the boiler before thermal equilibrium has been attained will give incorrect readings.

NOTE : If you have only 1 probe, measure separately air and flue gas, close the test point not

3-5 Adjustment and gas Conversion

1) Adjusting the pressure and gas flow rate to the main burner

This boiler operates on the flame modulation principle. It has two fixed pressure values which are minimum and maximum and must be shown in the following table, whichever type of gas is used.

Note – Because correct minimum and maximum pressure are critical to the efficient operation of the boiler it is essential that the following adjustments are carried out by qualified personnel only.

2) Adjusting minimum and maximum pressure gas valve (VK4105C)

① Undo the screw "A".

② Connect suitable pressure gauge (Analogue – Water columns, Digital – Digital manometer) to burner test point with silicone tube "B" downstream of the gas valve.

③ Operate boiler for central heating

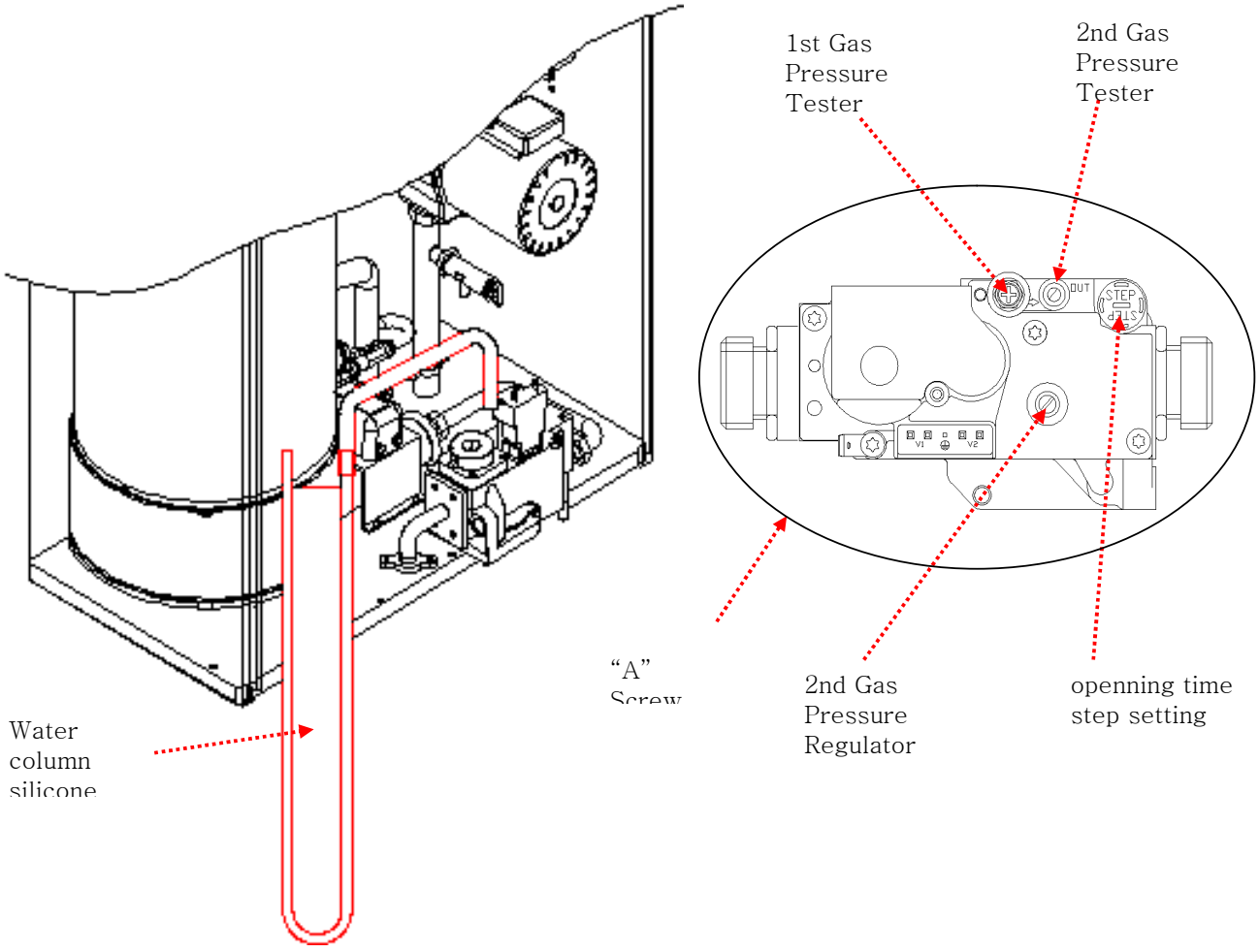
④ After setting DIP S/W Nr 8 to the "ON" position, adjust potentiometer "C" on the main board at the minimum.

⑤ Adjust minimum pressure by rotating screw "D" clockwise to reduce pressure and anticlockwise to increase pressure.

⑥ After adjusting the minimum pressure, turn OFF position the DIP S/W Nr 8.

⑦ And then, After setting DIP S/W Nr 9 to the "ON" position, adjust potentiometer "D" on the main board at the maximum.

⑧ Adjust maximum pressure by rotating screw "E" clockwise to reduce pressure and anticlockwise to increase pressure.



3-6 Adjustment and gas Conversion

The following adjustment and conversion operations must be carried out by qualified personnel. KITURAMI Limited accepts no liability for damage to property or personal injury resulting from tampering with the boiler by unauthorized persons.

To convert the boiler from **Natural Gas** to **LPG** and vice versa, the main burner injectors must be replaced. Minimum and maximum pressure must then be adjusted on the gas valve.

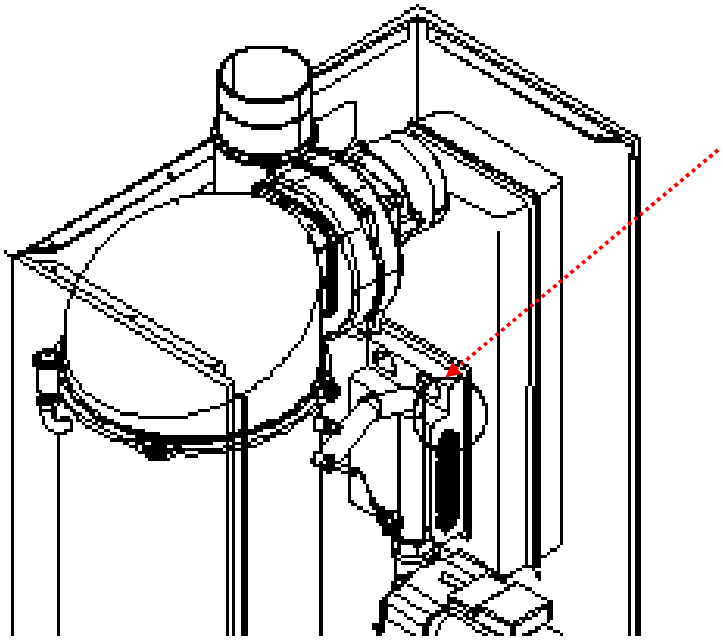
Table1, Gas valve 2nd pressure each Model

Unit mmAq

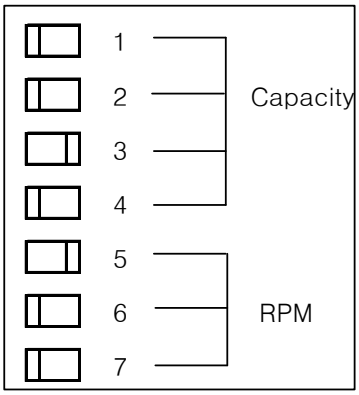
Model	13D		16D		20D		25D		30D	
GAS	MAX	STEP	MAX	STEP	MAX	STEP	MAX	STEP	MAX	STEP
LPG (mbar)	7.5	fast	8.5	fast	9.5	fast	8.5	fast	7.5	fast
LNG (mbar)	10	slow	11	slow	10.5	slow	10	slow	8.5	slow

Table2, Nozzle diameter each model and gas Unit mm

Model	13D	16D	20D	25D	30D
LPG	Ø2.4 X 3 hole	Ø3.0 X 3 hole	Ø3.0 X 3 hole	Ø3.2 X 3 hole	Ø3.4 X 3 hole
LNG	Ø1.8 X 3 hole	Ø2.3 X 3 hole	Ø2.3 X 3 hole	Ø2.5 X 3 hole	Ø2.8 X 3 hole



DIP S/W

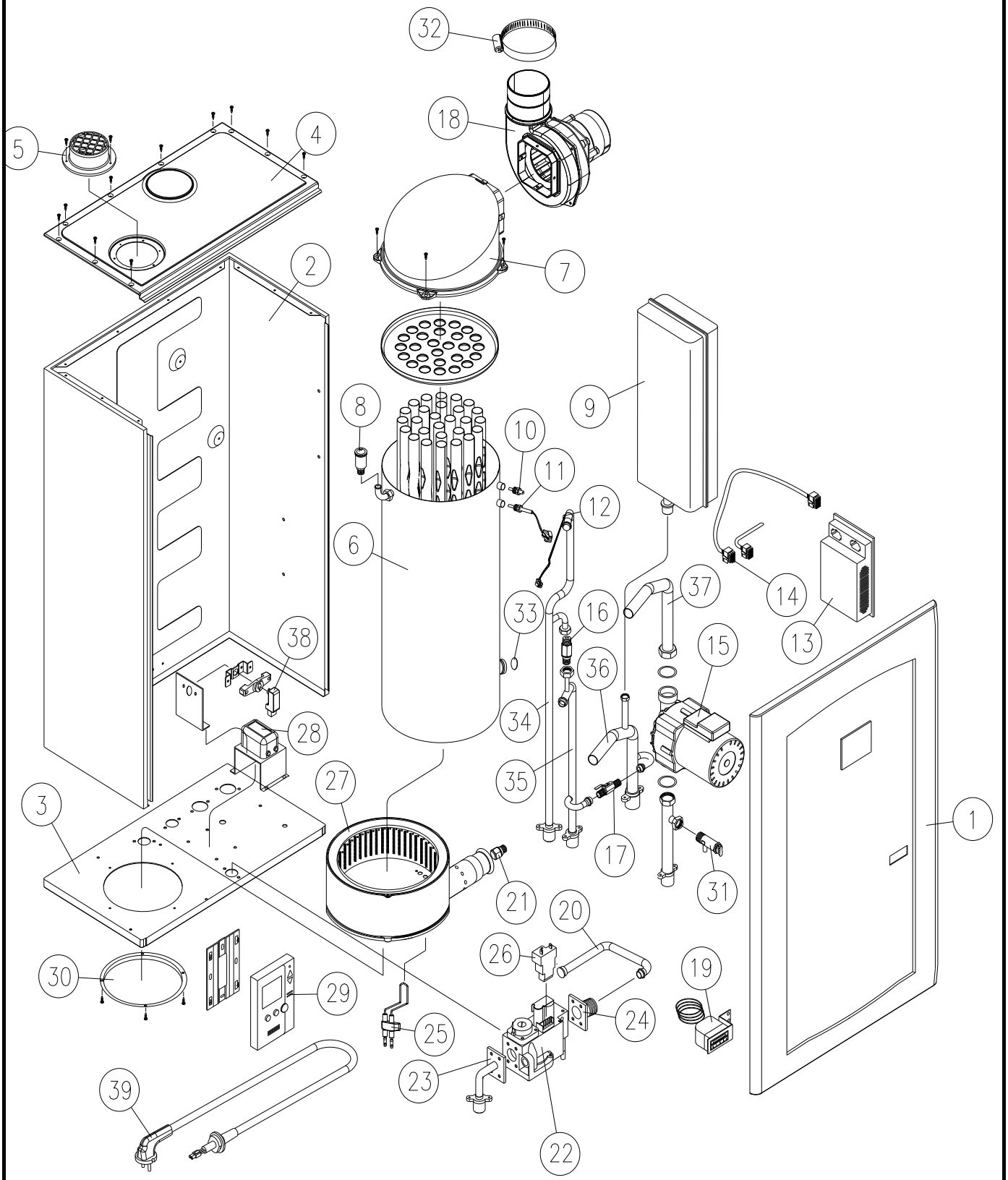


Capacity (kcal/h)	Switch 1	2	3	4
10,000				ON
13,000				
16,000			ON	
20,000				
25,000		ON		
30,000				
35,000	ON			

RPM	Switch 5	6	7
− 4			
− 3			ON
− 2		ON	
− 1		ON	ON
standard	ON		
+ 1	ON		ON
+ 2	ON	ON	
+ 3	ON	ON	ON

4. Direction for assembly

4-1 Part exploded view



4-1-1 Part name

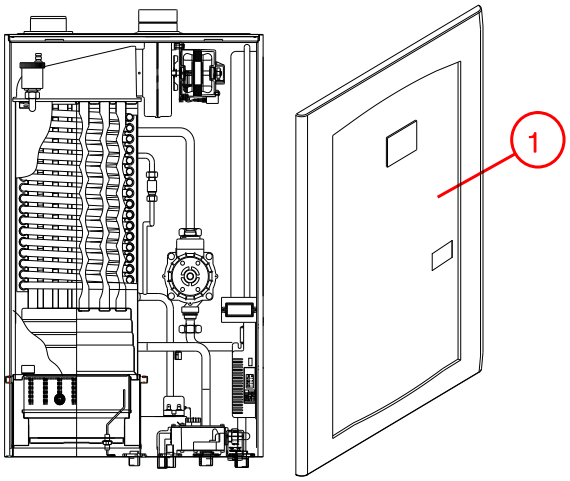
No	Part Name(English)	Korean	ERP Code	Model				
				13K	16K	20K	25K	30K
1	Front Door	전면문짝		●				
2	Side case	케 이 싱		●				
3	Connector	바닥판넬		●				
4	Top plate	상부판넬		●				
5	Air suction INLET	급 기 구		●	●	●	●	●
6	Heat exchanger Ass'y	열교환기		●				
7	Exhaust-hood	배기후드		●				
8	Ait vent	에어벤트		●	●	●	●	●
9	Nitrogen-expansion tank	질소탱크		●				
10	Low water sensor	저수위센서		●	●	●	●	●
11	Temperature sensor	온도센서		●	●	●	●	●
12	DHW Outlet Temp. Sensor	급탕센서		●	●	●	●	●
13	Main controller	콘트롤		●				
14	Connector	콘넥타		●				
15	Circulation pump	순환펌프		●				
16	Valve-pressure	수압방지장치		●	●	●	●	●
17	Ball valve	보충수 밸브		●	●	●	●	●
18	Fan	배풍기		●	●	●	●	●
19	Pressure gauge	압력계		●	●	●	●	●
20	Gas pipe	가스배관		●				
21	Nozzle	노즐		●				
22	Gas Valve	가스밸브		●	●	●	●	●
23	Gas Valve Inlet Connection	가스밸브 입구니쁠		●	●	●	●	●
24	Gas Valve Outlet Connection	가스밸브 출구니쁠		●	●	●	●	●
25	Ignition rod	점화봉		●				
26	Gas valve plug	가버너 플러그		●	●	●	●	●
27	Burner	버너		●				
28	Ignition tranformer	점화트랜스		●	●	●	●	●
29	Room controller	실내온도 조절기		●	●	●	●	●
30	Burner bottom cover	버너 바닥카바		●	●	●	●	●
31	Safety valve	안전밸브		●	●	●	●	●
32	Stainless bend	스텐밴드		●	●	●	●	●
33	Mica	운모		●	●	●	●	●
34	DHW Inlet Pipe	급수배관		●				
35	DHW Outlet Pipe	온수배관		●				
36	Heating rrturn pipe	난방 환수 배관		●				
37	Heating supply pipe	난방 공급 배관		●				
38	Photo sensor	포토센서		●	●	●	●	●
39	Power cord	파워코드		●	●	●	●	●

5. MAINTENCE GUIDE

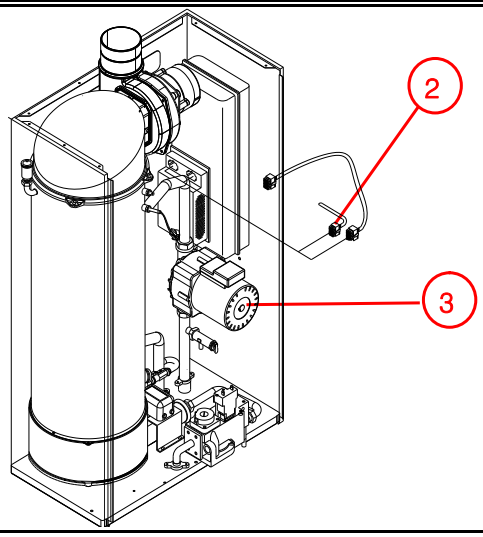
5-1 Main heat exchangeur

Tool

1

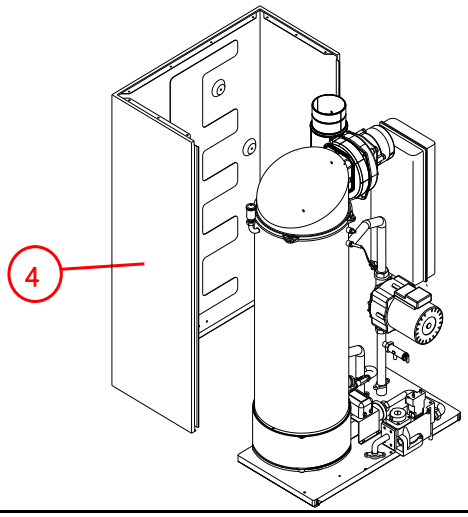


1. Unplug
2. Lock the gas valve
3. Loose the clamp under the body and open the front cover.①

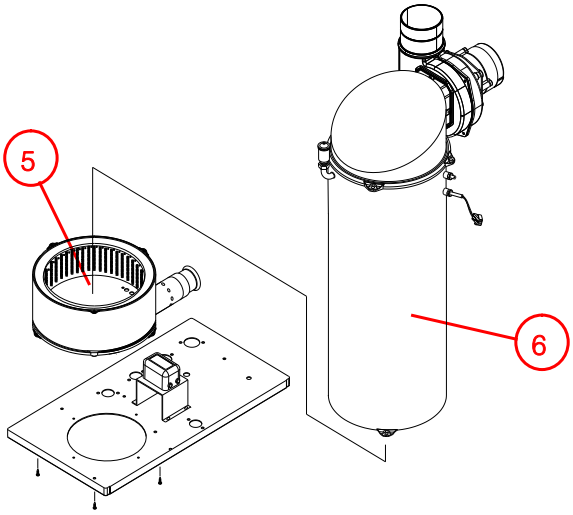


1. Disassemble connector,main controller, circulation pump.
2. With + driver, unscrew the screws under the body and on the pipes.
3. Loose the nuts between pipes and heat exchanger and separate the heat exchanger.

2



1. Separate the base plate from body after unscrewing.



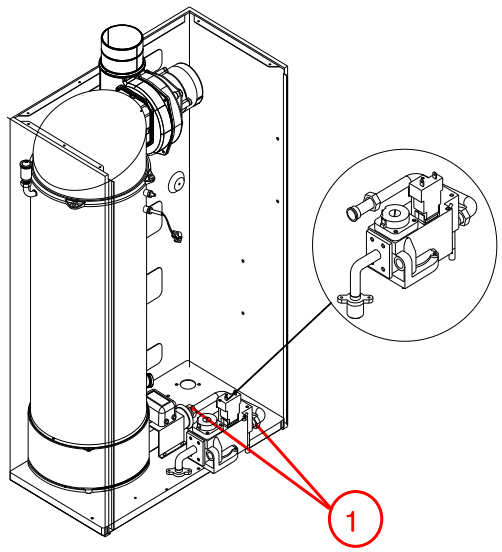
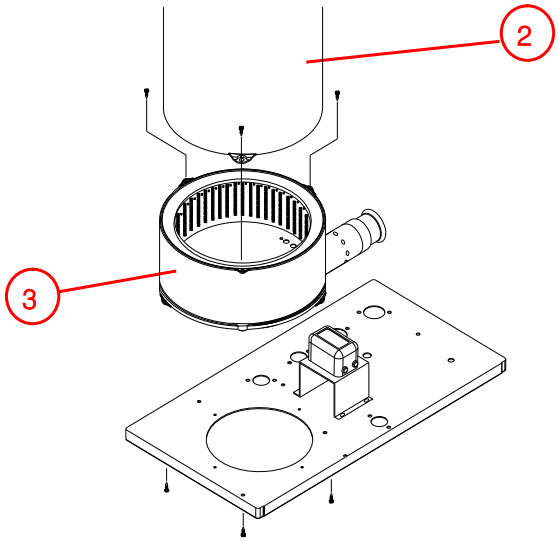
1. With + driver, dismentle the screw fixing the burner.
2. Separate the heat exchanger.

※ On reverse order, assemble the parts and boiler.

Warning ! : Carefully assemble the cover and nut to seal the parts. If fail to seal, there may occur the accident of gas leakage.

5-2 Burner unit

Tool

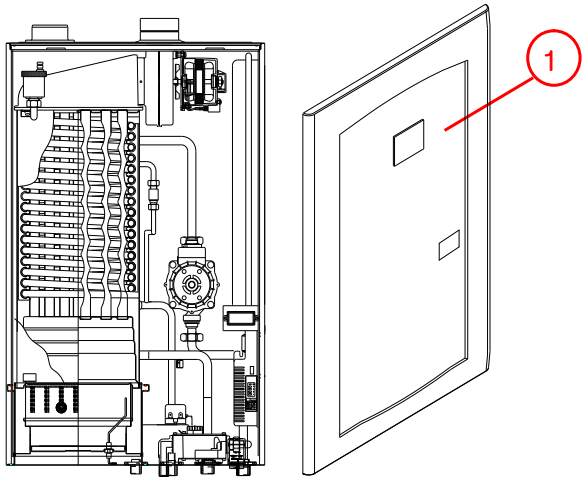
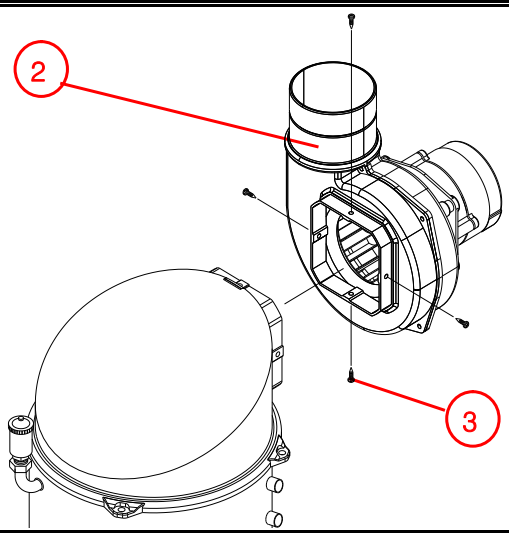
1		
	1. With spanner, loose the nuts of gas valve and pipes. **2.** By unscrewing the screws of gas valve in the base plate, separate the gas valve.	**1.** Separate the heat exchanger from the burner after unscrewing. **2.** Unscrew in the base plate and take off the burner from the base plate.

※ ※ On reverse order, assemble the burner and heat exchanger.

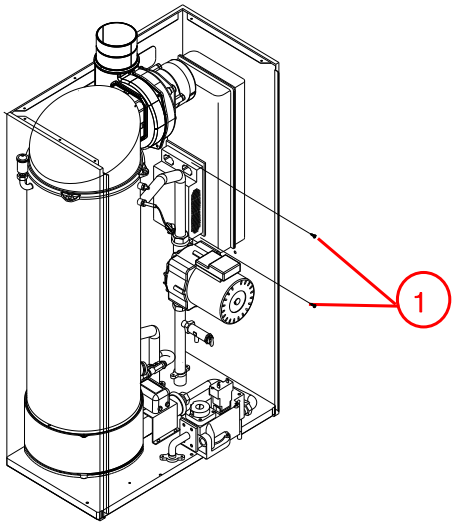
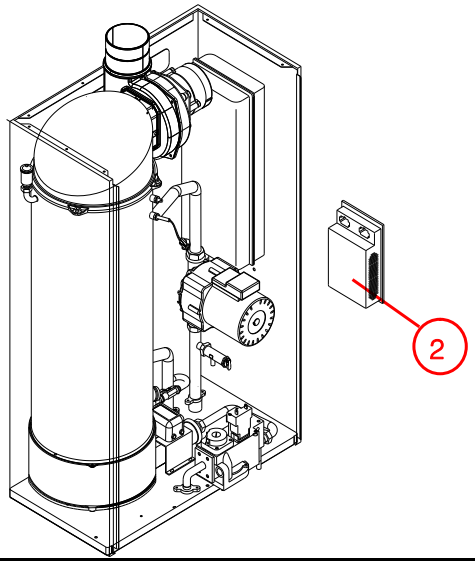
Warning ! : Carefully assemble the burner and heat exchanger with silicons to seal. If fail to seal, it may cause the imperfect combustion.

5-3 Fan unit

Tool 

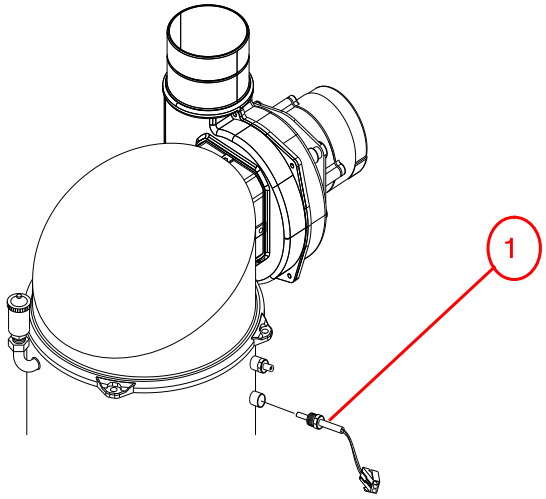
1		
	1. Unplug **2.** Lock the gas valve **3.** +Loose the clamp under the body and open the front cover.	**1.** Unscrew the fan with + screw driver. **2.** Pull the fan right and separate.

5-4 Controller unit

1		
	1. Unplug **3.** +With + screw driver, dismentle 2 screws in the top and bottom of main controller.	**1.** Pull and separate the controller forward. **2.** Separate the connectors from controller.

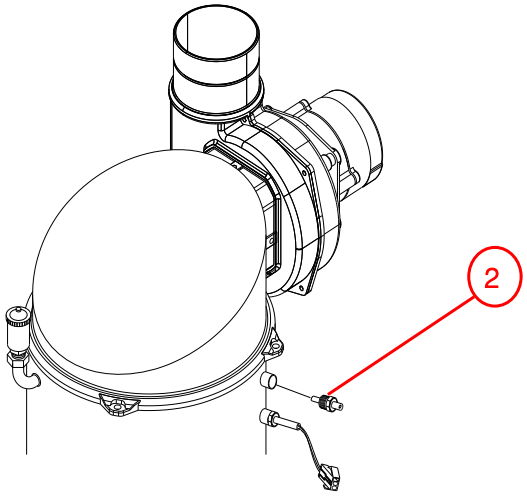
5-5 Temperature sensor

1



1. Lock all valves of pipes under the boiler.
2. Remove the connector of temperature sensor housing from the controller.
3. By turning left, pull out the temperature sensor from the heat exchanger.

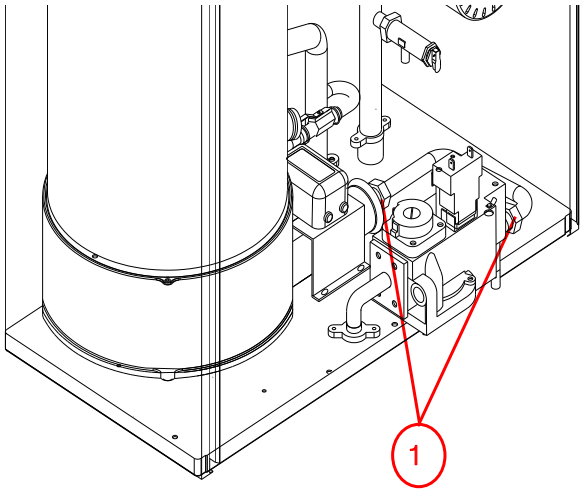
5-6 Heating Water Level Sensor



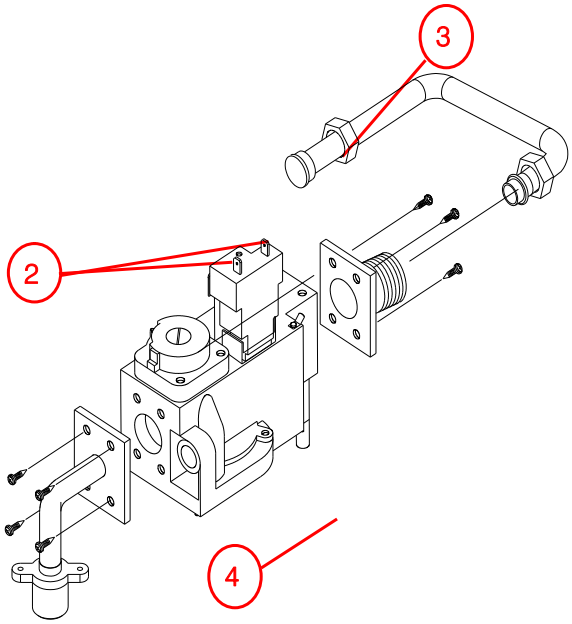
1. Lock all valves of pipes under the boiler
2. By turning left, separate the Heating water level sensor from the top of heat exchanger.

5-7 Gas valve

1

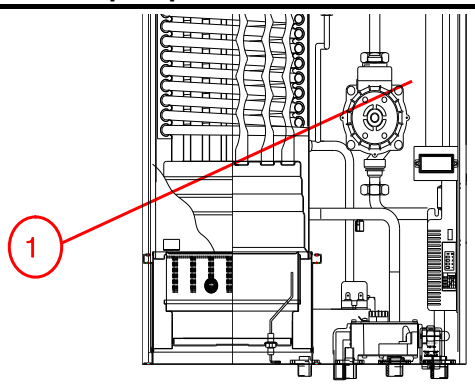
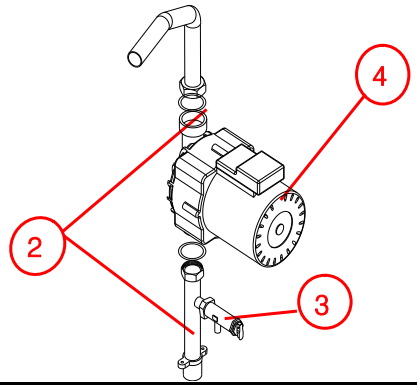


1. Remove the nuts of gas pipe with spanner.



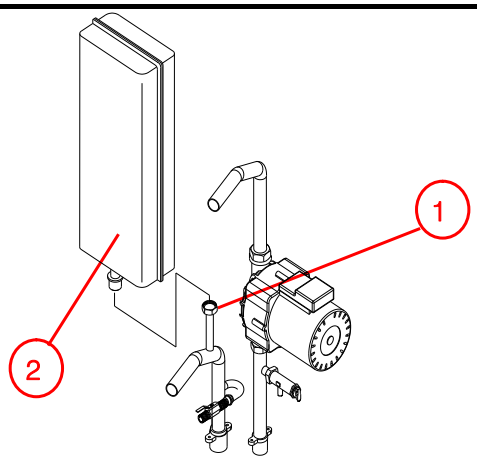
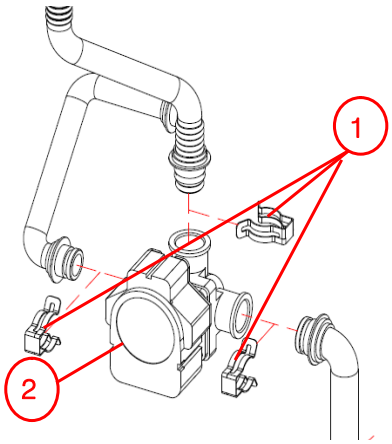
1. Pull out the connectors from the gas valve.
2. With spanner, dismentle the gas valve and gas pipe.
3. With + driver, separate the gas valve from left and right nipple after unscrewing.

5-8 Circulation pump

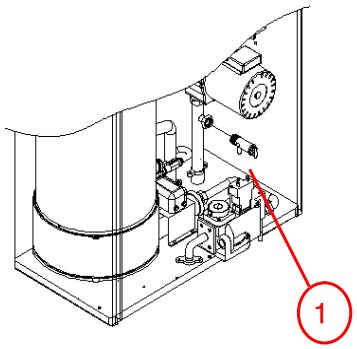
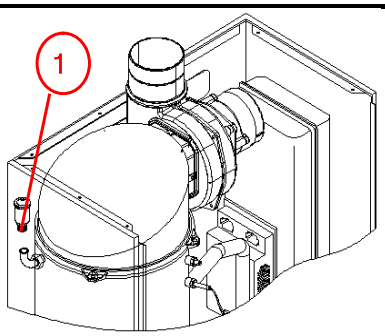
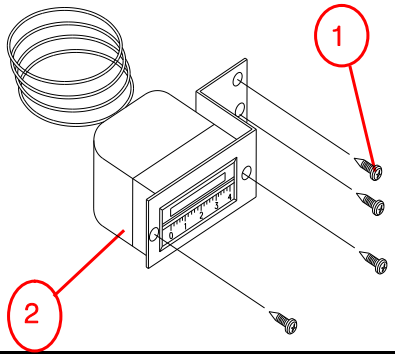
1		
	1. Open the front cover and separate the connector housing connected on circulation pump.	**1.** Unwind the nut joining circulation pump and heat water pipe. **2.** Unscrew the screw combined on casing. **3.** Separate heat water pipe and circulation pump.

5-9 Expansion Tank

5-9 3way valve

1		
	1. With spanner, unwind the nut. **2.** Pull forward and separate the extension tank.	1. Disjoin the clip of heat water pipe and 3 way valve. 2. Pull and separate 3 way valve.

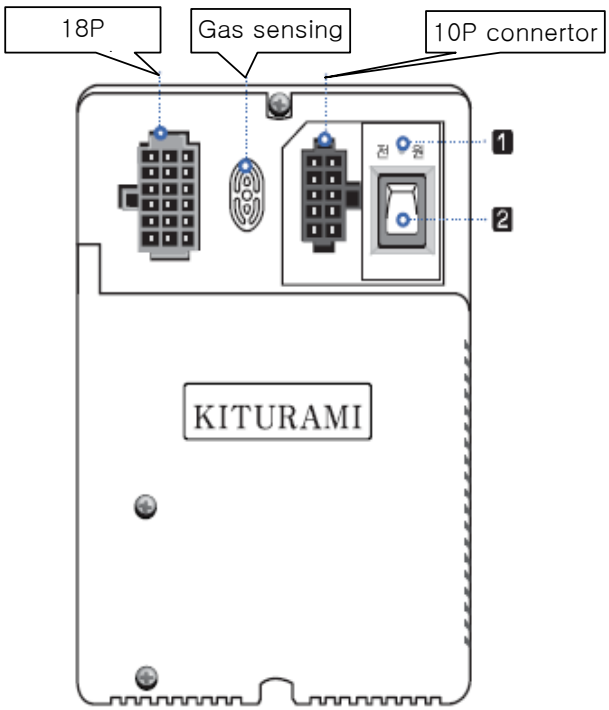
5-10 others

1			
	1. Disassembling the safety valve and drain hose	**1.** Disassembling air vent	**2.** Separate the pressure gage after unscrewing.

6. Functions of the controller

6.1 Main Controller part name

Model : GTX-5050N



1. Power supply / Alarm Lamp

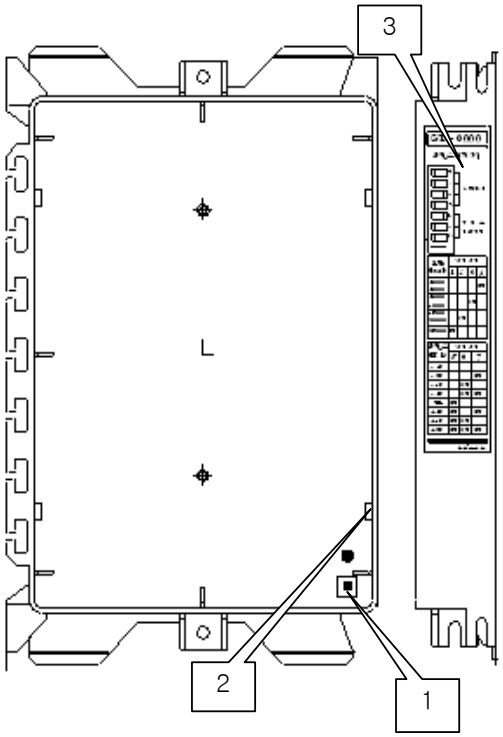
-. Lights when the boiler's power turned on and flickers when the boiler in abnormal condition.

2. Power switch

-. Boiler power on/off switch

※ Gas sensing and Protection from cold winter function work, even if the power is off.

Model : GTX-6000



1. RESET SWITCH

Switch to reset the main power

2. Power / Alarm LED

Lights when Main Power is on, flickers at the alarm

3. SWITCH for selecting boiler capacity and fan RPM

6-2 Function

6-2-1 Controller applied by Model

◎ GTX - 6000 : 13,000Kcal ~ 30,000Kcal (condensing / normal , open type/close type , FF/FE, LNG/LPG)

◎ GTX - 5050 : 13,000Kcal ~ 30,000Kcal (condensing / normal , open type/close type , FF/FE, LNG/LPG)

6-2-2 Feature Description

◎ Operation start when plug-on

① During first 60 seconds, the controller will not sense the gas due to requirement of preheating time for gas sensor heater.

② And then for 5 seconds, in order to initialize the system, the controller will not operate P/T.

1) Function while the Room Power is off

NO	FUNCTION	SENSING METHOD	DISPLAY	OPERATION	FORCED CLEAR
1	Gas leakage detect	Sensing by Gas sensor	Power LED flickers	Fan starts work	Room Power Switch
2	Protection from cold winter	Sensing by water temperature and thermal storage sensor (below 8℃)	none	Circulation pump starts work (Repeat 10minutes on 30seconds off)	Automatically return to the normal condition after over 10℃
		Sensing by water temperature and thermal storage sensor (below 5℃)	none	Circulation pump starts work P/T starts work	Automatically return to the normal condition after over 10℃ of temperature sensor (Circulation Pump stops after about 5 minutes operation)

2) Function while the Room Power is on

-. only with Room controller model no. CTR-5550

Room controller

		GTX - 7000 , GTX - 7030				REMARKS
	Function LAMP	Water Temp. Senso	Burner (Water Temp. Sensor) below setting TEM	Burner (Water Temp. Sensor) over setting TEM	Circulation Pump	
Room (Reservation)	YES		ON	OFF	ON	Setting TEMP. means targeted Water TEMP. (Water TEMP. can be seton Room Controller CTR-5550)
	NO		OFF	OFF	OFF	
Sleep	YES Room Temperature -1℃ Sleep Set Temperature		ON Set Temperature x 90% Sleep Set Temperature	OFF		
	NO					
Out of House	YES (If Room temp. below 8℃)	If below 30℃, ON for 5 minutes	ON (63℃ ± 2℃)	OFF (85℃ ± 2℃)	ON	Operates by Thermal Storage Heating function.
	NO	(If over 30℃)	OFF	OFF	OFF	
			OFF	OFF	OFF	
Bath	YES		ON (If below 84℃)	OFF (If below 84℃)	ON	

-. Function when the Room controller is not connected with

* Recognized automatically as the operation of "ROOM" function on the Room controller

* Season-Select (Water Temperature Setting) is set at 78℃ automatically.

WATER TEMPERATURE SETTING	BURNER		CIRCULATION PUMP		REMARK
	ON	OFF	ON	OFF	
78℃	73℃	78℃	70℃	56℃	

(3). Burner and Circulation Pump operating Temperature by each water temperature setting (It can be set on CTR-5500)

WATER TEMPERATURE SETTING	BURNER				CIRCULATION PUMP				REMARK
	ROOM		Sleep		ROOM		Sleep		
CTR-5500	ON	OFF	ON	OFF	ON	OFF	ON	OFF	
45℃(Low Temp.)	40	45	36	41	42	35	38	33	
55℃	50	55	45	50	50	40	46	38	
65℃(Average Temp.)	60	65	54	59	58	46	54	43	
75℃	70	75	62	67	67	53	60	48	
85℃(High Temp.)	80	85	72	77	75	60	67	53	

* Burner always operates if water temperature is below burner OFF temperature at the moment LED becomes ON during Room Temp. controller's operation.

(4). BURNER OFF POINT

* ROOM : 85℃±2℃ (When the water temperature setting is 85℃)

* BATH : 87℃±2℃ (Burner is OFF when the water temperature reaches 85℃, in the case that Burner starts where the water temperature is below 85℃)

(5). TEMPERATURE DIFFERENCE BETWEEN BURNER ON AND OFF

* ROOM : 5℃±1℃ (When the water temperature setting is 85℃)

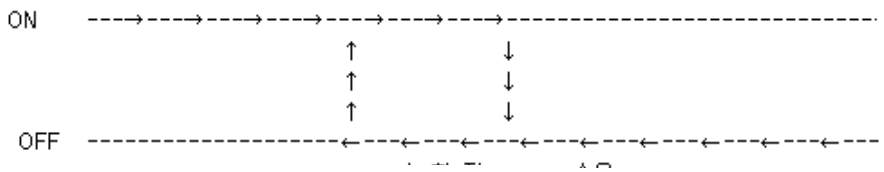
* SLEEP : 5℃±1℃ (When the water temperature setting is 85℃)

* OUT OF HOUSE : 5℃±1℃

* BATH : 1℃±1℃

(6). TEMPERATURE DIFFERENCE BETWEEN CIRCULATION PUMP ON AND OFF

◎ Circulation Pump operating conditions



Water Temperature ≤ circulation point ≥ Water Temperature

3). COMBUSTION CONTROL TIME CHART

① PRE-PURGE TIME : for 11sec ± 2sec

→ In order to operate safely, fan emit the exhaust gas from burner before starting ignition transformer.

※ In using Fast Water Heating function, PRE PURGE TIME is 3 seconds in the case that Burner ignites again within 2 minutes after Burner stops.

② PRE IGNITION TIME : 1 sec

→ To burn well, start the ignition before supplying gas.

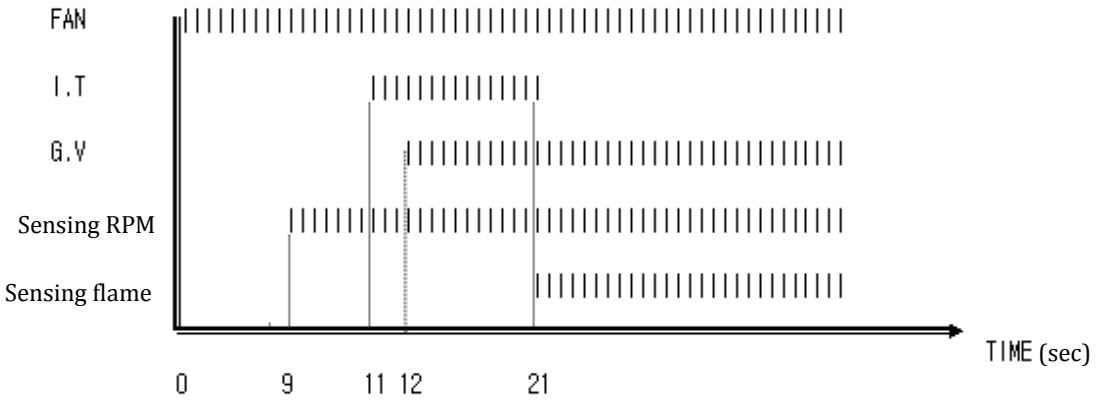
③ POST IGNITION TIME : 9 sec ± 1sec

→ After the initial burning, the igniter will operate for 8 ~ 10 seconds in order to protect the burn from the initial failure due to incomplete combustion.

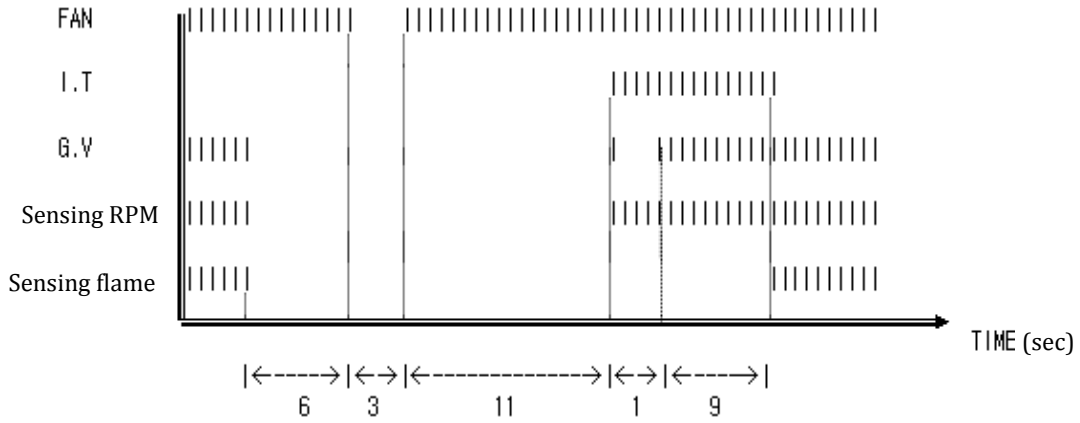
④ POST PURGE TIME : 6 sec ± 1sec

→ After the burner stops, the fan will operate for 5 ~ 7 seconds to emit the exhausted gas from boiler.

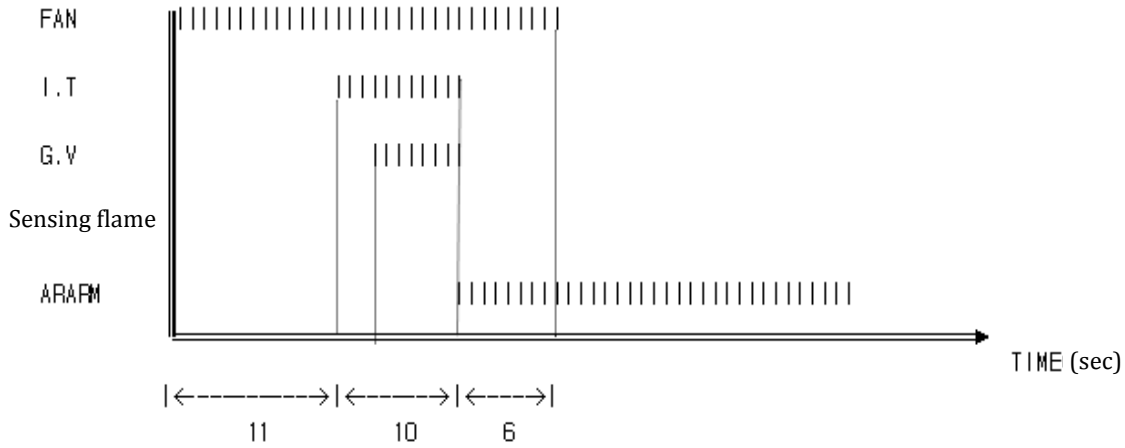
Ⅰ. Normal operation time chart



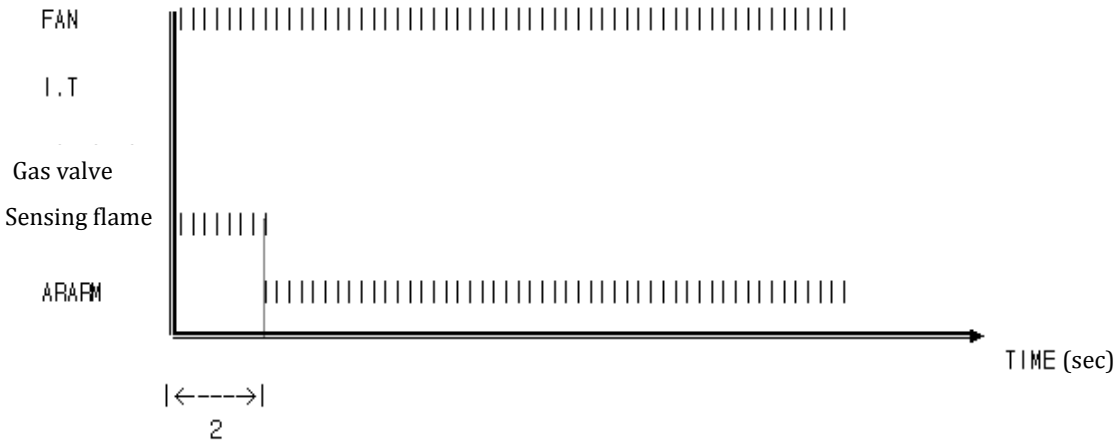
Ⅱ . Re-ignition after failure of burning during operation



Ⅲ. Failure of initial ignition (Alarm after 2 times failure)



Ⅳ. Initial Block



4). FAN MOTOR SPEC

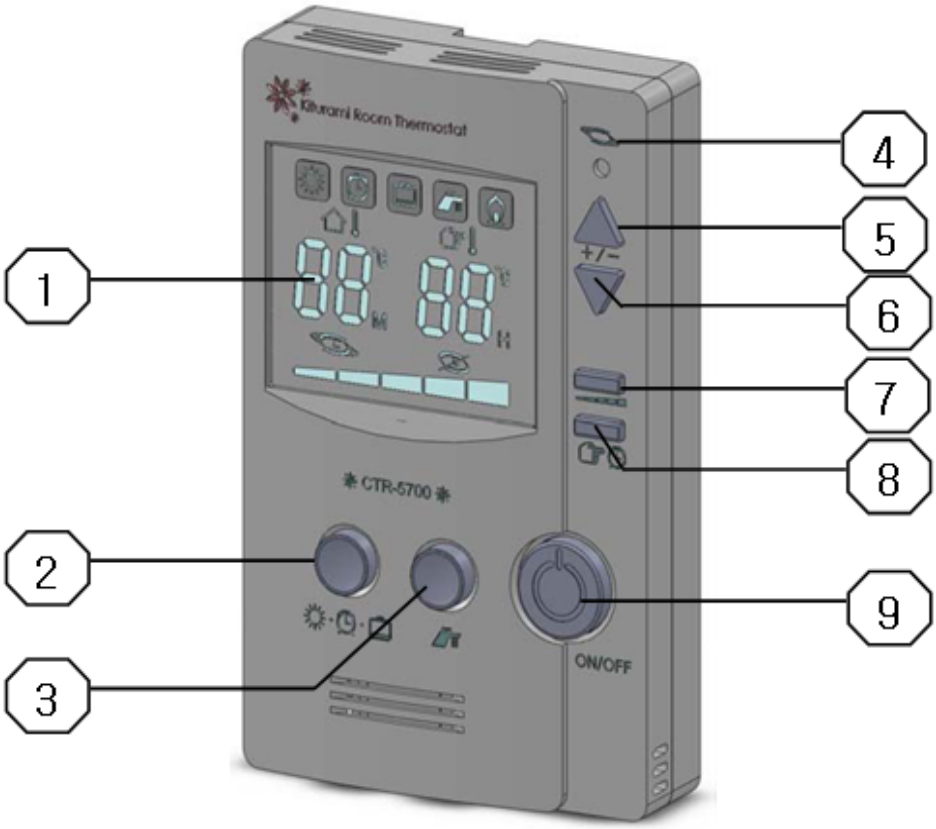
* Rated RPM and Low, High LIMIT

MODEL	10,000 kcal/h 13,000 kcal/h	16,000 kcal/h 20,000 kcal/h	25,000 kcal/h 30,000 kcal/h	remark
First-stage Rated (RPM)	2200±100	2200±100	2200±100	Measure after 30 minutes operation
Second-stage Rated (RPM)	2900±100	3050±100	3100±100	
LOW LIMITE (RPM)	1000±50	1000±50	1000±50	
HIGH LIMITE (RPM)	3200±500	3400±500	3300±50	

◎ Ignites at ignite-RPM slowed down after high-speed rotating for about 1 second.
◎ Alarms for checking if RPM escapes Low or High Limit.
◎ Converted to Second-stage RPM after 30 seconds from sensing flame.

7. Functions of the Room controller

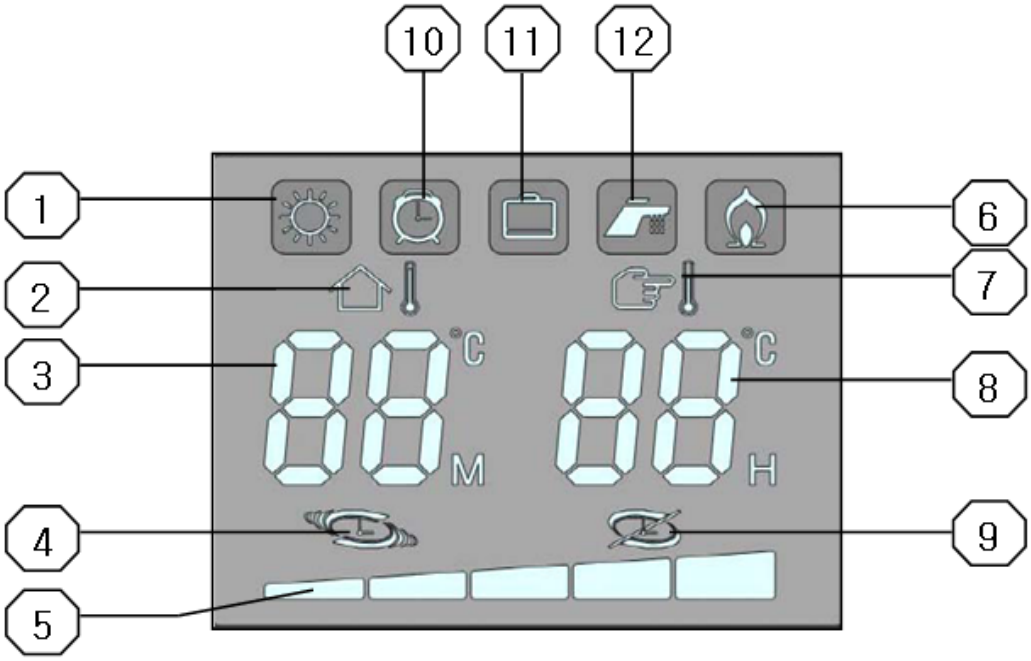
7-1 Room Control panel (CTR-5700)



◎ **LEGEND**

1. **LED panel**
2. **BOILER HEATING OPERATING CONDITION SELECT BUTTON (RPPM TEMPERATURE HEATING, TIMER HEATING, OUT GOING)**
3. **DOMESTIC HOT WATER, ONLY**
4. **GREEN INDICATOR - POWER SUPPLY**
5. **ADJUSTMENT NUMERIC INCREASING BUTTON EACH EUNCTION**
6. **ADJUSTMENT NUMERIC DECREASING BUTTON WITH EACH FUNCTION**
7. **CH TEMPERAYURE ADJUSTMENT BUTTON.**
8. **TIMER ADJUSTEMENT BUTTON**
9. **ON/OFF BUTTON**

7-2 Rooom control LED panel



◎ **LEGEND**

1. **When the boiler operates with room temperature heating mode, this symbol display**
2. **When the boiler operates with room temperature heating mode, this symbol display.**
3. **Current's room temperature display in accordance with each heating modes**
4. **When the boiler operates with timer mode, this symbol display.**
5. **When the boiler operates with heating temperature mode, adjusted heating temperature display. More the BAR's numbers, the heating temperature is higher**
6. **When the boiler is operating in each setting mode, this symbol display**
7. **When set the room temperature will changing, this symbol display.**
8. **When the room temperature will be changing, this symbol display**
9. **When the boiler doesn't operate with timer mode, this symbol display**
10. **When the boiler operates with timer heating mode, this symbol display**
11. **When the boiler operates with outgoing mode, this symbol display.**
12. **When the boiler operates with DHW mode, this symbol display**

8. Troubleshooting guide (error code)

8-1 Finding fault

Error code
The error codes display when errors occur
The last ten errors are saved in the appliance error memory
→ Press the "Timer" button for 5 seconds
→ Automatically the last errors history display 2 times by step on LCD panel.
You can exit the error memory display as follow;
→ Do not press any button return to the former times display

Code	Meaning	Cause
E 01	Appliance does not start Attempts to ignite during start failed	Faults in the gas supply such as Gas meter or gas pressure detector defective Air in gas Gas flow pressure too low Faults in the gas fitting, wrong gas setting, igniter (ignition transformer, ignition cable, ignition plug) defective, photo r sensor defective (cable, electrode), faulty earth in appliance, electronics defective.
E 02	Flame detect before supplied gas	Electronics defective, Photo sensor defective
E 03	Flame goes off during the appliance operating until less than 1 minute for 5 times repeat	Gas supply pressure too low, flame detect device defective, PCB defective
E 04	Interruption in heating temperature sensor	Sensor connection defective, sensor faulty
E 14	Interruption in DHW outlet temperature sensor	Sensor connection defective, sensor faulty
E 34	Interruption in DHW inlet temperature sensor	Sensor connection defective, sensor faulty
E 05	Interruption safety high limit sensor wire	PCB defective, faulty connection on the electronics
E 06	Fan RPM signal doesn't detect	Fan detective, RPM signal connection faulty, PCB defective, plug not inserted correctly on fan, hall sensor defective
E 07	Fan RPM signal in the wrong range	Check the flue condition, PCB defective, electronic defective
E 08	No communication with the PCB	Communication faulty between the room controller and the PCB. PCB faulty, Room controller faulty
E 95	Not enough water in the heating system	Filling the water into the heating system
E 96	High temperature limiter actuated	Flow probe not connected thermally correct of defective, appliance does not shut down
E 97	Gas leakage detect	Change of air in boiler installing site, electronics defective

9. Technical Data Tadle

Technical Specification \ Model			WORLD pluse -13D		WORLD pluse -16D		WORLD pluse -20D		WORLD pluse -25D		WORLD pluse -30D	
Heating Output (Max-Min) (Flow/Return 80/60℃)		kW (kcal/h)	15.1 (13,000)		18.6 (16,000)		23.2 (20,000)		29.1 (25,000)		34.9 (30,000)	
Heating Input (Max-Min)		kW (kcal/h)	18.1 (15,600)		22.0 (19,000)		27.7 (23,800)		34.6 (29,800)		41.4 - 12.2 (35,600- 10,500)	
Useful Efficiency at Max-Min Heating Output (Flow/Return 80/60℃)		%	92.5		91.6		92.2		92.1		92.0	
Useful Efficiency at Max-Min Heating Output (Flow/Return 50/30℃)		%	94.2		93.3		94.5		94.1		94.2	
Energy Perfomance		star	★ ★		★ ★		★ ★		★ ★		★ ★	
Purpose			Heating and Domestic Hot Water Production									
Heating Water Circulation Method			Air Closed Type									
Max Heating Water Pressure		bar(psi)	3.0 (43.5)									
Max Heating Temperature		℃(°F)	85 (185)									
Adjustable Temperature Heating		℃(°F)	45 - 80 (113 ~ 176)									
Total Volume Expansion Tank		ℓ(gal)	7.0 (1.84)									
Expansion Tank Pre Charge		bar(psi)	1.0 (14.5)									
Domestic Hot Water Output		kW (kcal/h)	15.1 (13,000)		18.6 (16,000)		23.2 (20,000)		29.1 (25,000)		34.9 (30,000)	
Min working Pressure for DHW		bar(psi)	0.2 (2.9)									
Min working Flow Rate for DHW		ℓ/min(gpm)	1.60 (0.42)									
Max Domestic Hot Water Pressure		bar(psi)	17.5 (253.8)									
Adjustable Domestic Hot Water Temperature		℃(°F)	35 - 60 (113~140)									
Specific Domestic	△t=25℃	ℓ/min(gpm)	8.7		10.7		13.3		16.7		20	
Other Comestic Hot Water Rate	△t=30℃	ℓ/min(gpm)	7.2		8.9		11.1		13.9		16.7	
Other Comestic Hot Water Rate	△t=40℃	ℓ/min(gpm)	5.4		6.7		8.3		10.4		12.5	
Electrical Supply		V/Hz	230V / 50Hz									
Nominal Absorption		A	0.6									
Power consumption		W	115									
Electrical Protection			IPX4D									
Installation Type			Wall Mounting Type									
Intake/Exhaust Flue System Type		mm	B33-C13-C33-C43-C53-C63-C83									
Intake/Exhaust Flue Diameter		mm	75×100									
Connecting Diameter	Heating water Connection	mm(A)	3/4 (20)									
	Domestic Hot Water Connection	mm(A)	1/2 (15)									
	Gas Connection	mm(A)	1/2 (15)									
Physical dimensions		WxDxH (mm)	430 x 250 x 721		465 x 278 x 721				507 x 310 x 788			
Weight		kg(lbs)	33 (72.7)		34 (74.9)		34 (74.9)		39 (85.9)		39 (85.9)	
Nox		class	3		3		3		3		3	
Gas Type			LNG	LPG	LNG	LPG	LNG	LPG	LNG	LPG	LNG	LPG
Nozzle Diameter		mm	Φ2.4x3	Φ1.8 x3	Φ3.0x3	Φ2.3 x3	Φ3.0x3EA	Φ2.3 x3	Φ3.2x3	Φ2.5 x 3	Φ3.4x13	Φ2.8 x3
Natural Gas supply (gas control valve)		mbar	7.5	10.0	8.5	11.0	9.5	10.5	8.5	10.0	7.5	8.5
Gas Supply Pressure		mbar (mmH2O)	19.6 (200)	2.75 (280)	19.6 (200)	2.75 (280)	19.6 (200)	2.75 (280)	19.6 (200)	2.75 (280)	19.6 (200)	2.75 (280)
Gas Type			LNG		LNG		LNG		LNG		LNG	
Exhaust Mass Flow rate at Max Heating Output		kg/h	10.8		13.3		16.6		20.8		25.0	
CO2 at Max Output		%	7		7.1		7		7.5		8.1	
CO(0%O2) at Max Output		ppm	32		36		42		56		55	
NOx (0%O2) at Max Output		ppm	28		26		31		28		27	
Exhaust Temperature at Max Output		℃(°F)	120.3		120.6		121.1		123.6		123.4	
Exhaust Temperature at Min Output		℃(°F)	118.5		118.3		118.8		121.6		121.8	

*** Specifications are subject to change without prior notice to improve design and performance**

10. Memo

11. Warranty

Model name		Mamufacturing number	

Period of guarantee	2 years		Agent signature
Date of sale	※		※You have to have a record here to receive servece tree of change.
Customer	Address		
	Tel. No		
	Name		

Terms and Conditions

◎ This product is insured for an amount of up to 200min won
It a consumer or a 3rd party suffers physical of material damage due to product default compensation is paid in an amount of up to two hundred million won.

◎ Free repair service is available for two years after installation given normal exploitation of product

※ Free service is available only during guaranteed period. Repair will be charged if damage was caused by user's negtigence or in the following cases.
- Service was not received in any of Kiturami's service centers or damage is done as a result of discretionary interterence by the user or installer.
- Damage is caused by a natural disaster, fire, tlooding, moisture, or negligent maintenance
- Boiler is damager because of water condensation due to straight chirnney
- Damage is caused by continuous use of boiler disregarding collection of waste gas inside the product due to bad funneting.
- Damage is causde by excessive water extension pressure due to improper installation of pipes, valves or other parts.
- Customer does not have the guarantee of quality or the guarantee is not fillde in required areas.
- Damage is caused by use of water with salts or timestone or subterianean water.
- Damage is caused by user's carelessness as a result of winter sowing.

Warranty cannot be reissued so keep it safety.

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