Technical information and Installation Servicing Instructions

eco-condensing Gas Boiler.....

CE PC M K ISO9001 ISO14001

Model

eco condensing - 16D (18.6 kW)

eco condensing - 20D (23.2 kW)

eco condensing - 25D (29.1 kW)

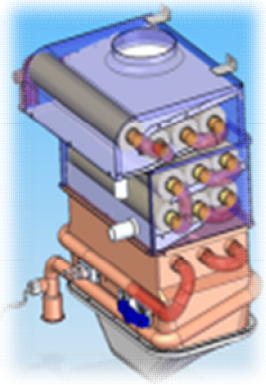
eco condensing - 30D (34.9 kW)

Gas fired wall hung combination boilers

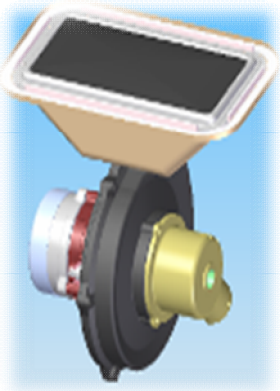
CONTENTS

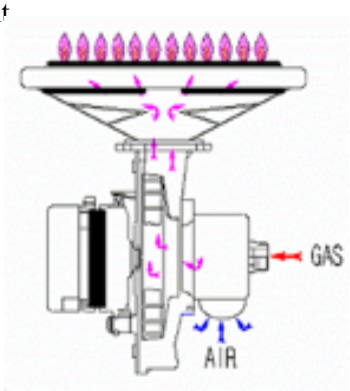
* eco-condensing gas boiler Features of Product

1. World-best level of thermal efficiency at over 90.8% of domestic heating and over 92% of hot water supply, equipped with 4 pass main heat exchanger in world-first.



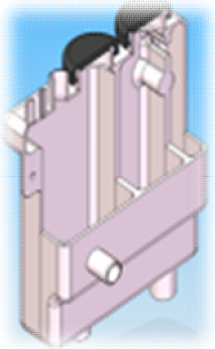
2. Consideration on Eco-Environment





(Low Nox burner controls the Nox emissions under 20ppm.)

3. Equipped with condensate neutralization device
(Durable condensate neutralization device works the strong acidity(PH3~4) of condensate down the normal water(PH6).



4. Safety low voltage and powerful TURBO-FAN
(Powerful turbo fan offer the steady combustion system without interruption from the changeable wind.)

4. Durable condensing heat exchanger
- Aluminum and Stainless steel material of main heat exchanger extends its life cycle.
- And double collecting condensate design makes to work longer than others

7. Lasting Stainless steel heat exchanger for hot water
-. Stainless steel of heat exchanger provide the hot water without rust and block, with the constant efficiency of hot water exchange.

8. Quick and abundant hot water
- Precise hot water control

※ Hot water can be controlled by 1℃ in the range from 35 to 50℃.

9. Double protection against instantaneous high pressure of water
-. It is designed to protect appliance against water hammer and thermal expansion with water hammer protection device and water pressure releaser of inlet pipe

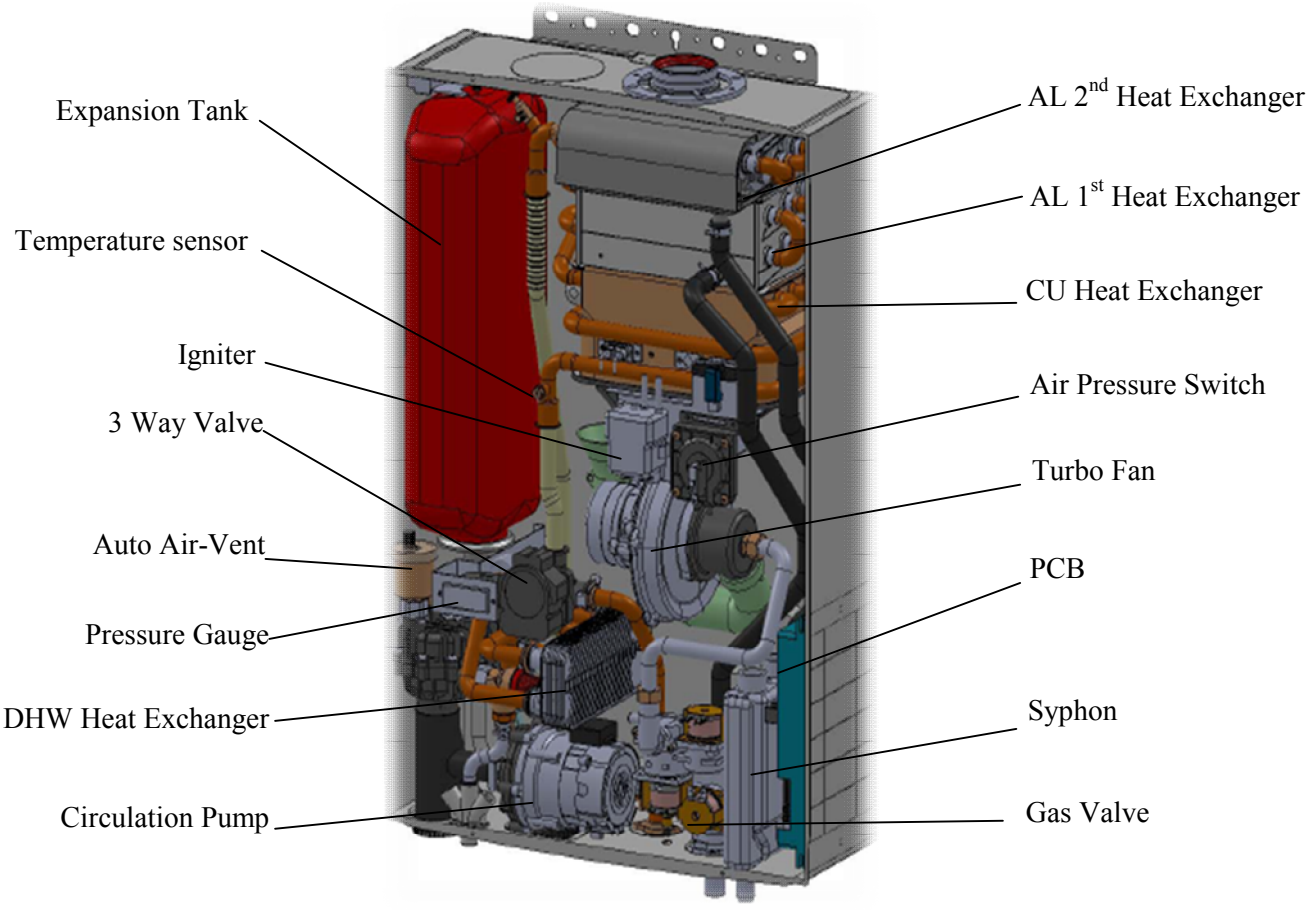
10. Interruption Free operation from any condition of outside
-. With powerful turbo fan and wide proportional control on combustion, it operates efficiently and silently even on the low pressured gas supply.

11. Thoughtful consideration on safety and convenience.
- It is equipped with gas leakage detector, water hammer protector, and water over-pressure reducer as special safety devices.
- Additionally there are test operation function, precise water temperature setting function and reservation function as useful and convenient features.

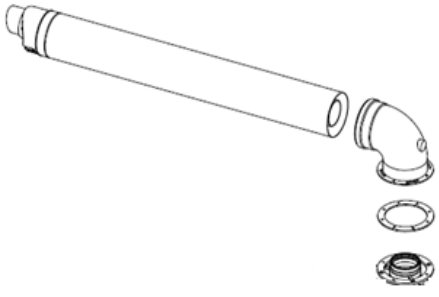
1. Product description

1-1 Specification

Model : WORLD5000

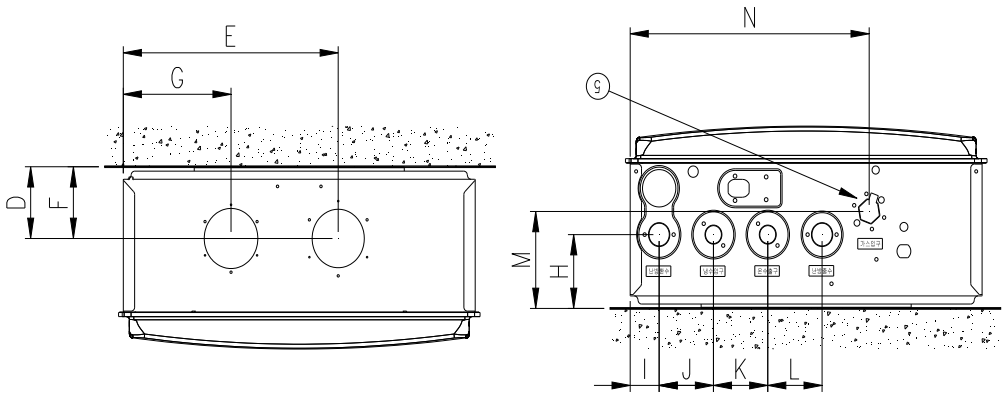


MODEL	eco condensing-16D	eco condensing-20D	eco condensing-25D	eco condensing-30D
POWER SOURCE	220 - 240 V, 50Hz			
DIMENSION (Wx Dx H)	507 x 310 x 788			
WEIGHT (kg)	34 (74.9)	34 (74.9)	39 (85.9)	39 (85.9)
INSTALLATION TYPE	B33-C13-C33-C43-C53-C63-C83			
FUEL TYPE	LNG, 13A, G20, G30			
HEATING AREA (㎡)	106	133	166	199

			
Room Control	**Flue**	**Fixing bolt**	**BEND**

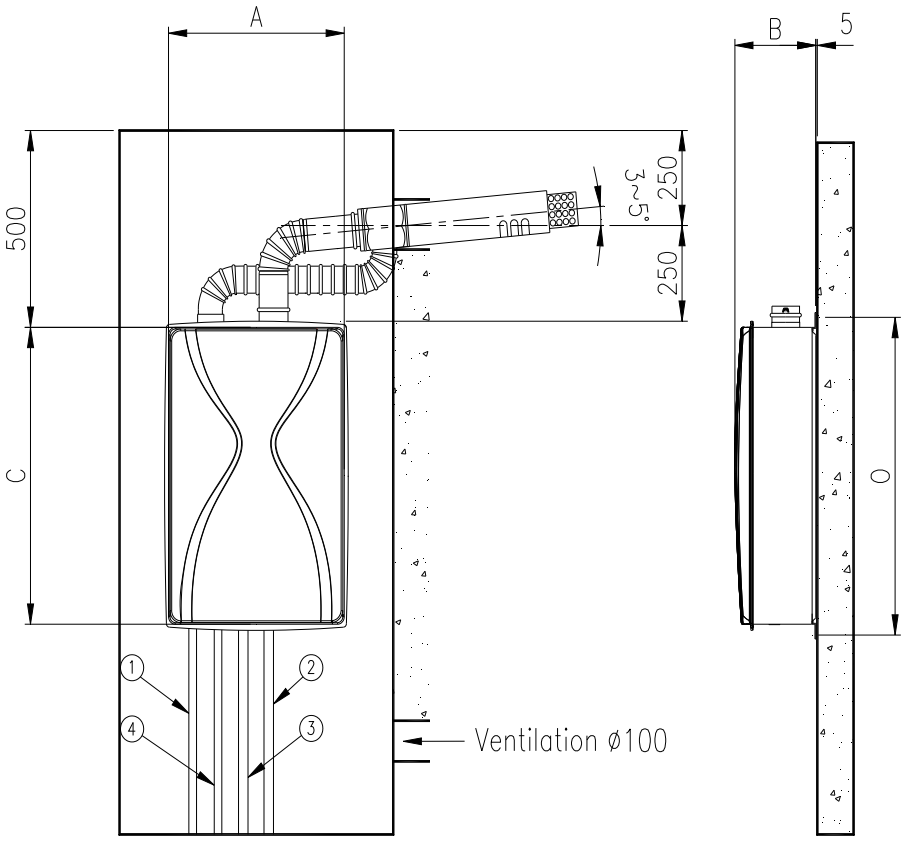
2. Installation

2-1 Appliance dimension and required specification



FRONT <TOP>

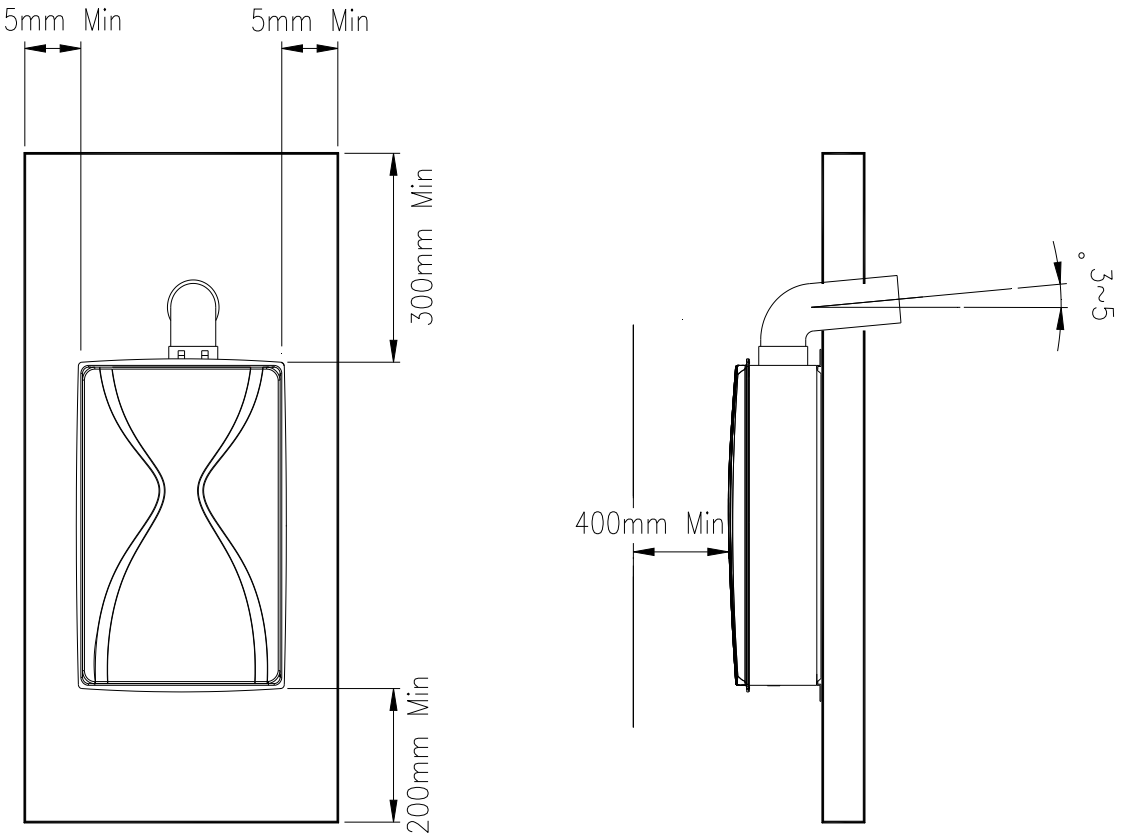
FRONT<BOTTOM>



capacipy(kcal/h)	A	B	C	D	E	F	G	H
16,000~35,000	486	220	730	83	297	83	149	90
	I	J	K	L	M	N	O	
	40	75	75	75	120	330	768	

No	PIPE NAME	SPEC
①	Heating return	20A
②	Heating supply	20A
③	Hot water OUTLET	15A
④	Cool water INLET	15A
⑤	Gas inlet	15A

2-2 Body 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.**

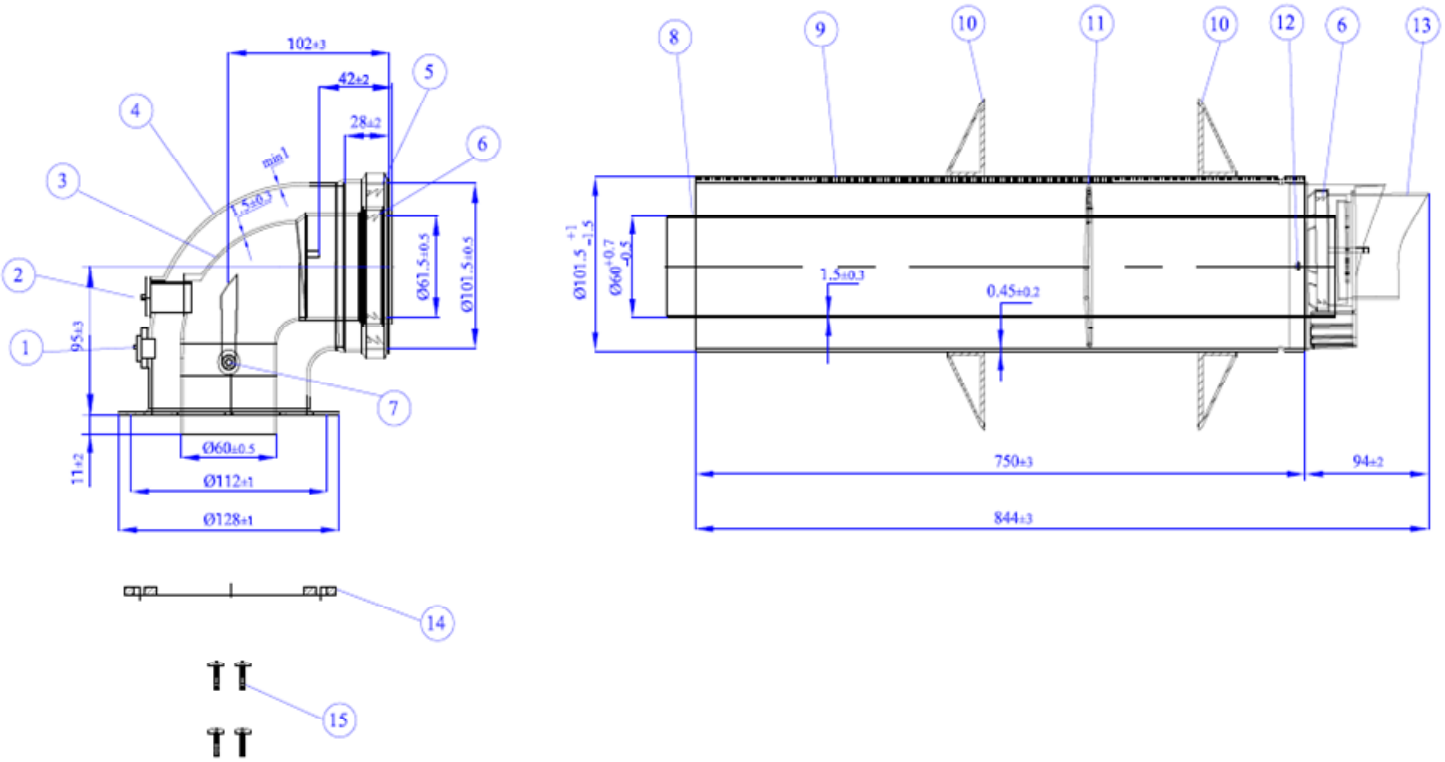
The boiler can be installed on any suitable internal wall (suitable sound proofing may be required when installing onto a stud partition wall). Provision must be made to allow for the correct routing of the flue and setting of the terminal to allow the safe and efficient removal of the flue products.

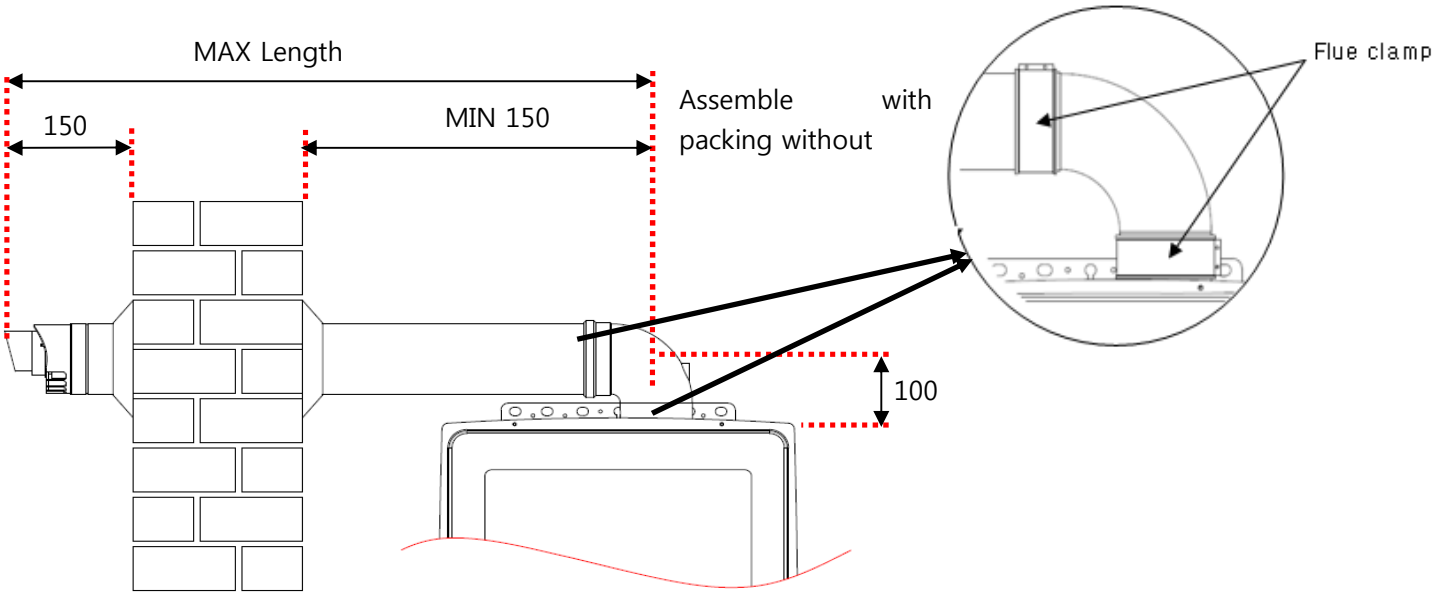
Where a room sealed appliance is installed in a room containing a bath or shower, the appliance and any electrical switch or appliance control, utilizing mains electricity should be situated specifically in accordance with current IEE Wiring Regulation.

[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.





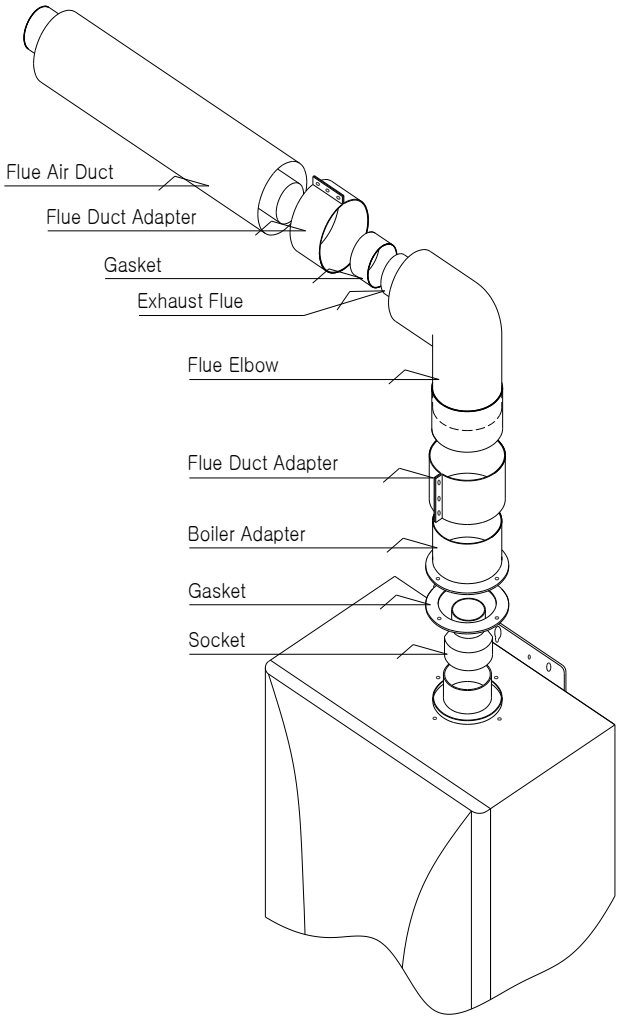
Warning

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.

2-3-1 FLUE

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.

2-3-2 Installing flue (Connecting)



COAXIAL 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.

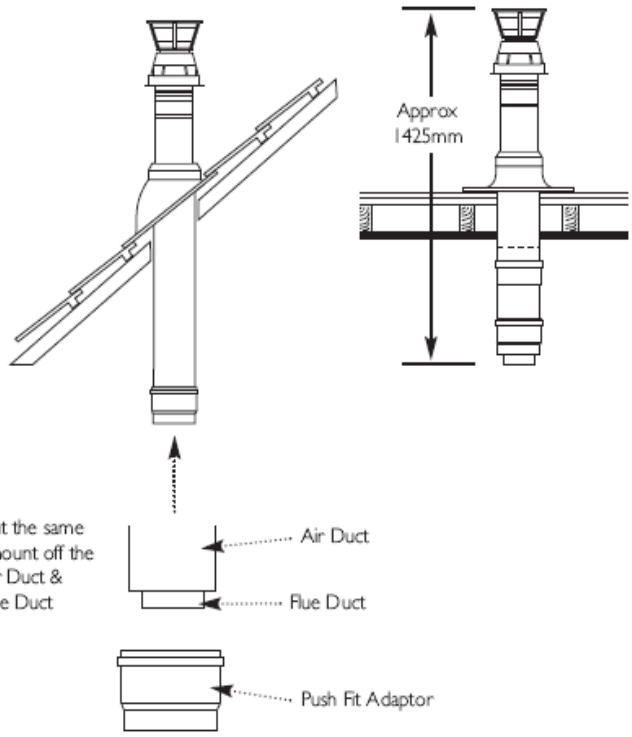
2. After sealing well, join and screw the flue duct adapter.

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.

2-3-3 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.

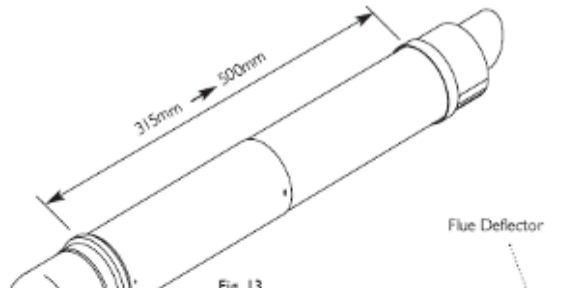


Fig. 13

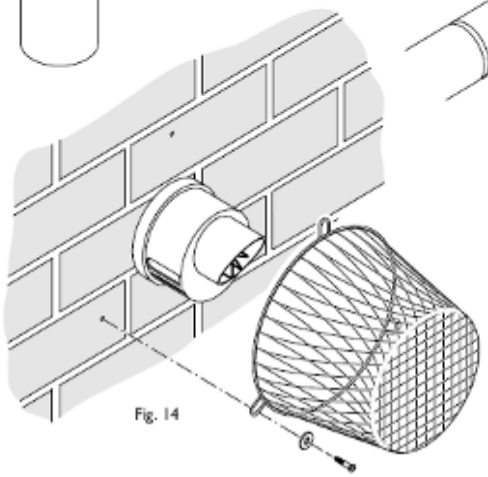


Fig. 14

② Flue Dimensions

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

The maximum permissible equivalent flue length is :

10 meters (60/100 system)

20 meters (80/125 system)

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 deflection to the terminal with screws provided

2-3-4 Installing flue (Plume Displacement)

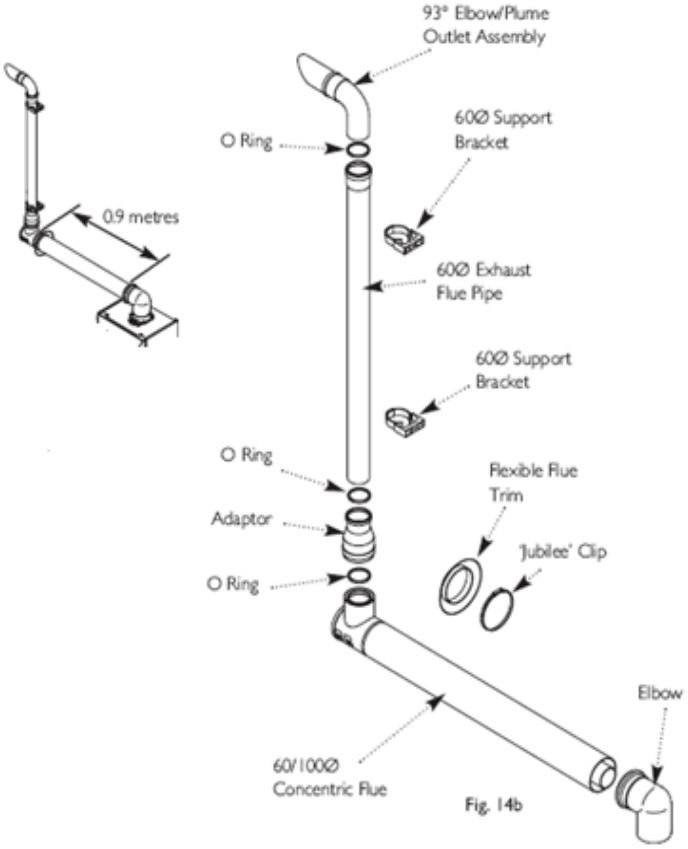


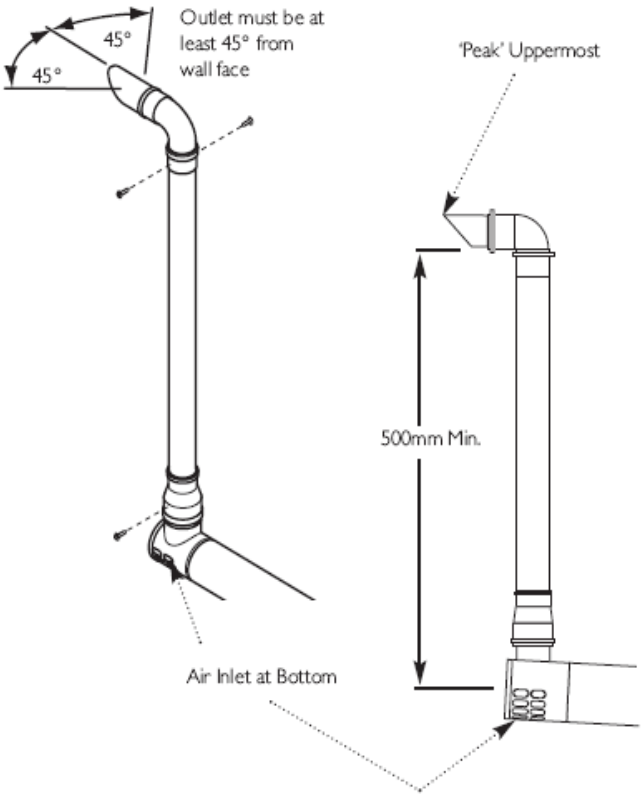
Fig. 14b

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

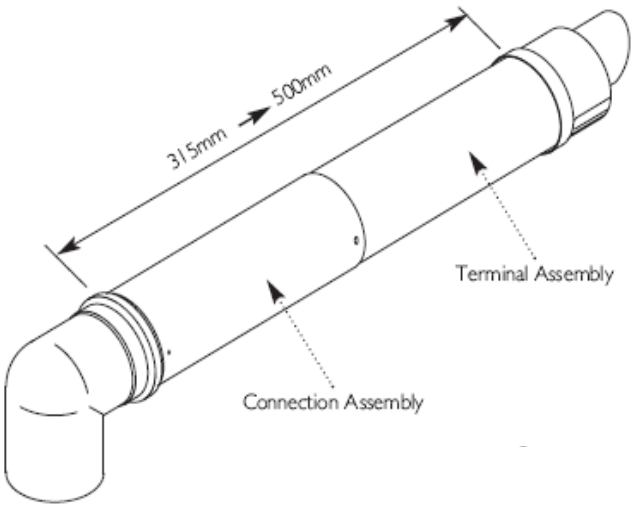


4. It is possible to reduce or increase (with the addition of extensions) the length of either or both 60/100 concentric and 60Φ exhaust.
5. Standard concentric flue extension kits may be added between the boiler elbow the terminal assembly
6. The minimum length of the concentric flue is 100mm when measured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

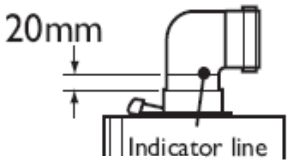


Fitting The Flue

HORIZONTAL TELESCOPIC FLUE

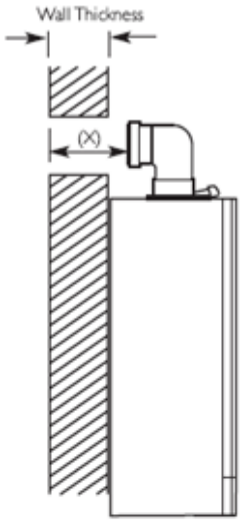
1. There are tow telescopic sections. The Terminal Assembly and the Connection Assembly, a roll of sealing tape and two tapping screws . A 93˚ elbow is also supplied. The outer duct of the Connection Assembly is painted white On the Terminal Assembly The outer duct is unpainted.

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)

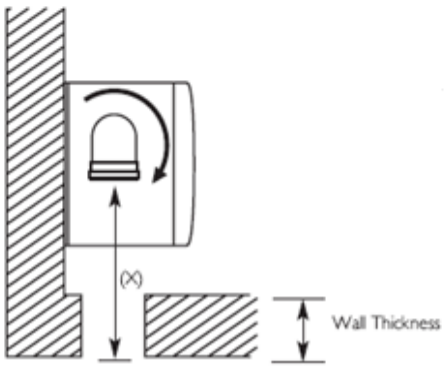
NOTE : The flue elbow is angled at 93 degrees to ensure a fall back the boiler



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)

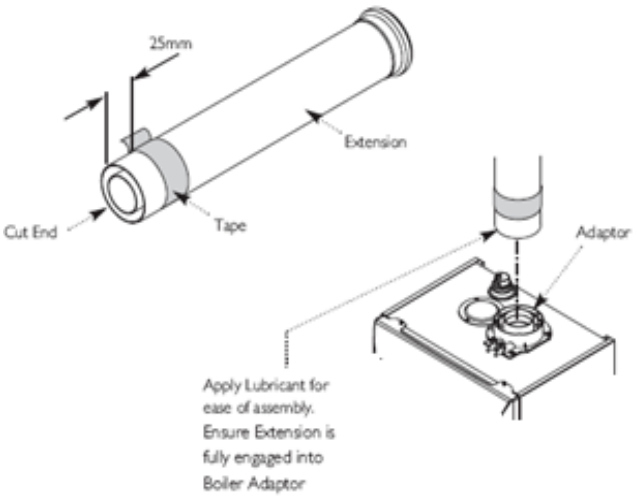
8. Adjust the tow telescopic sections to dimension 'Y'
Ensure that the rivets and holes in the Connection Assembly are aligned horizontally

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

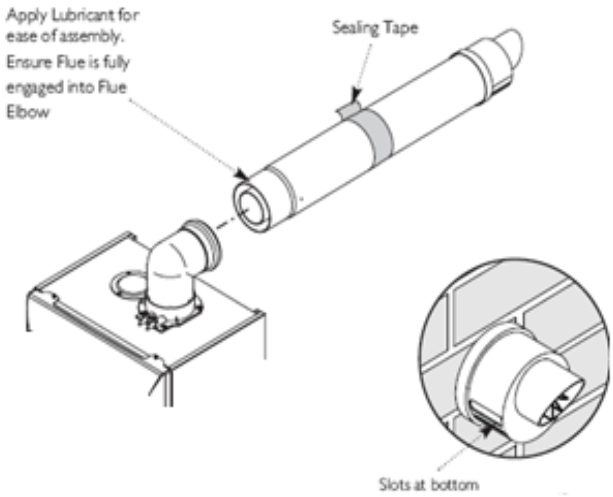
13. Make good between the wall and air duct outside the building

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.

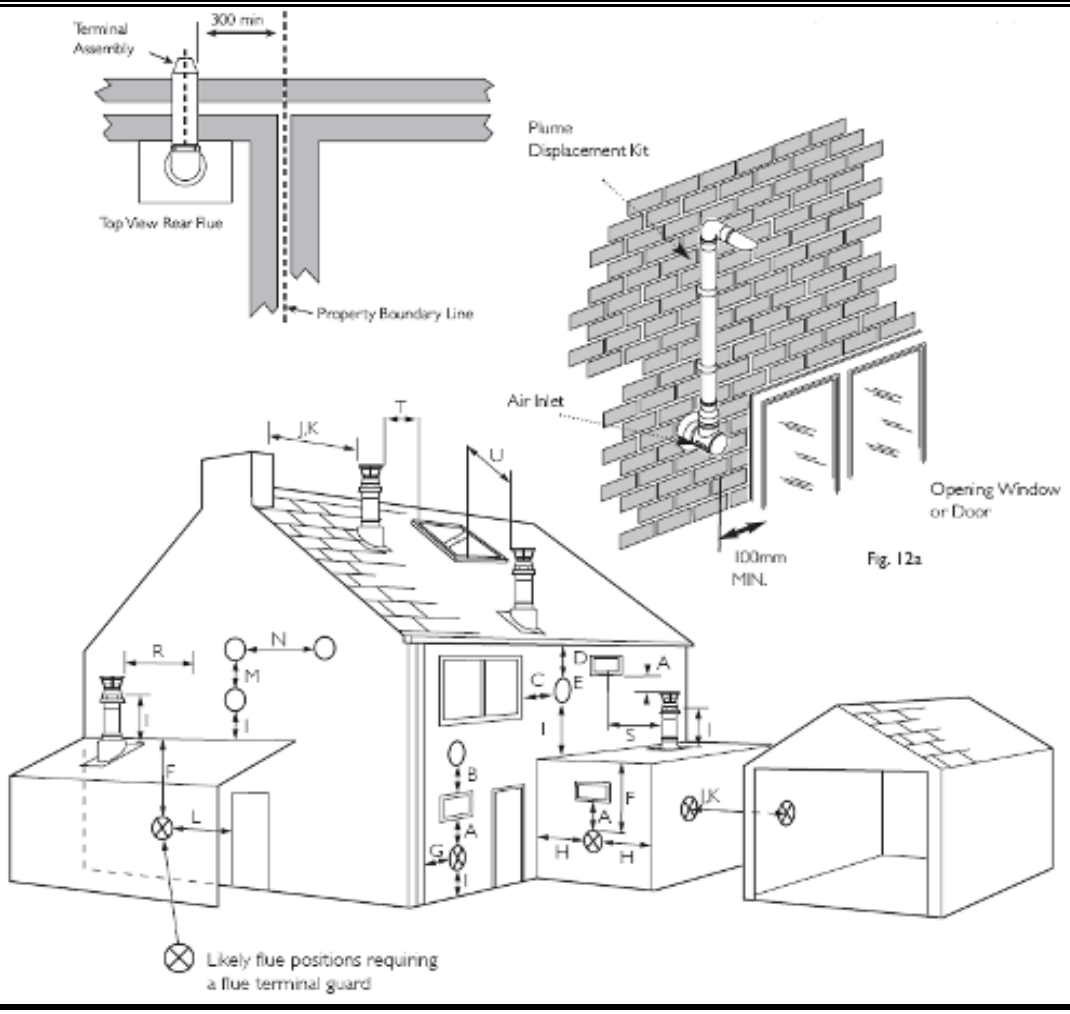
16. Measure 25mm from the end of the flue extension and apply a length of tape around the boiler duct



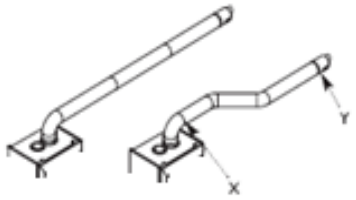
17. Engage the extension into the adaptor up to this position
Once the installation of the flue is complete and all support brackets securely in place remove the tape

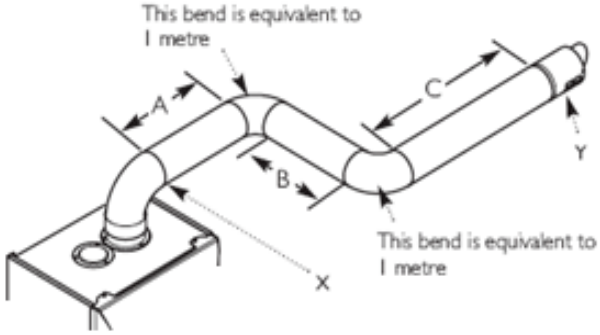
2-3-7 Installing flue (Fitting The Flue (Cont))

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

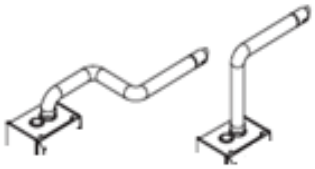


2-3-8 Installing flue (Flue Options - Horizontal Flue Systems)





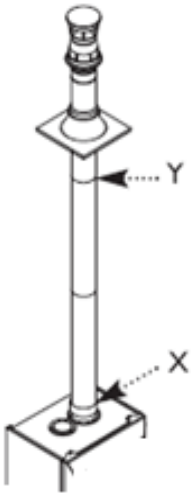
Horizontal
Flues

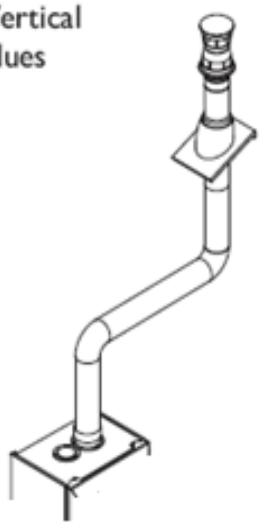


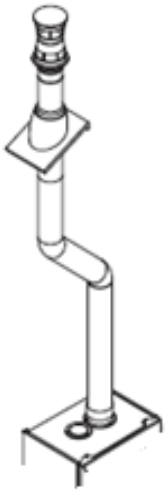
Total equivalent length =

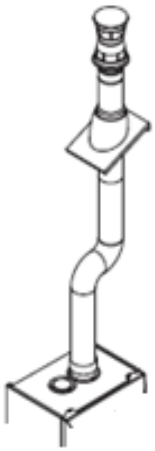
A+B+C+2x90°Bends

Vertical
Flues









Twin & Vertical Flue Systems

1. Maximum permissible equivalent flue lengths are:-

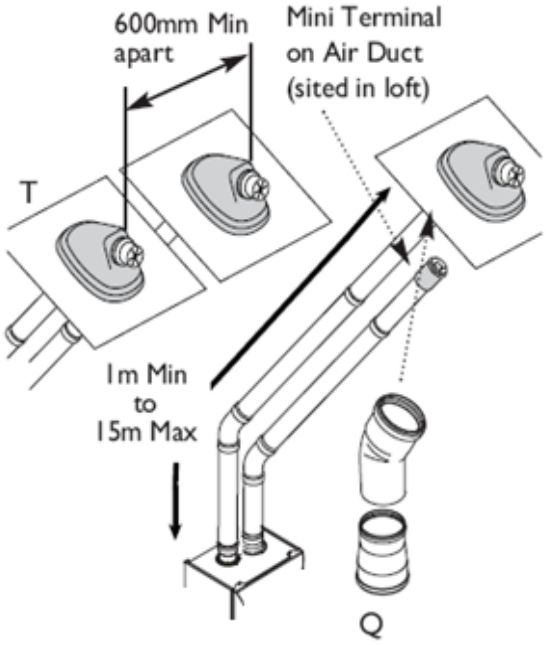
Vertical Concentric	**10 meters**	**20 meters**
Vertical Twin Pipe	**15 meters**	

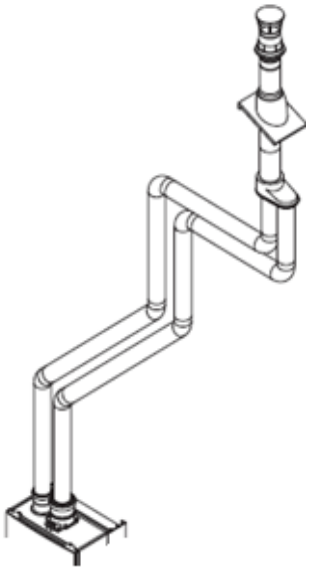
2. Any additional " in line" bends in the flue system must be taken into consideration
Their equivalent lengths are:-

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

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

2-3-9 Flue options





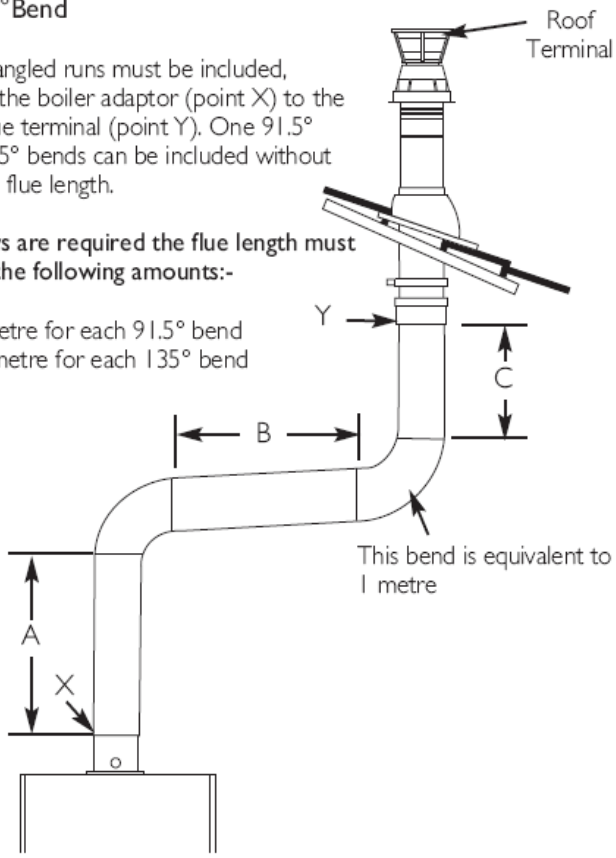
The total equivalent length for this example is = 6.5 meters

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:-

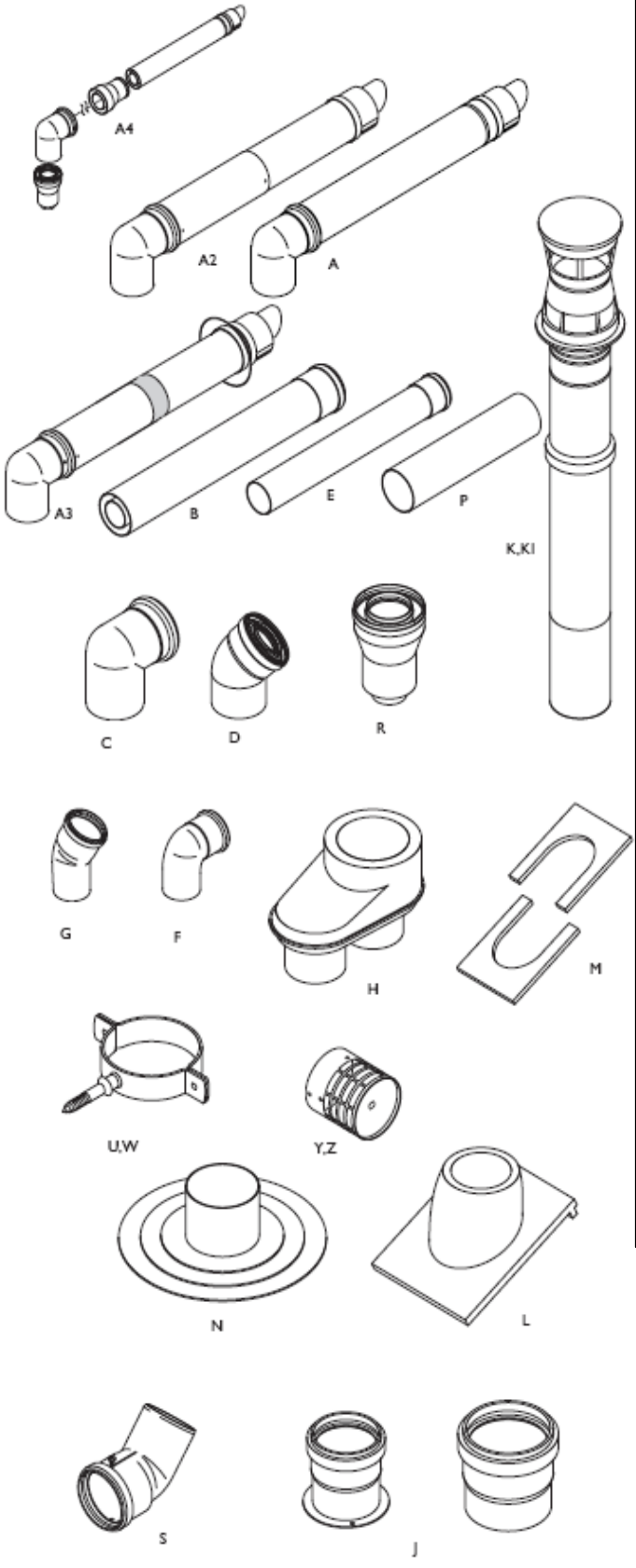
1 metre for each 91.5° bend
0.5 metre for each 135° bend



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		

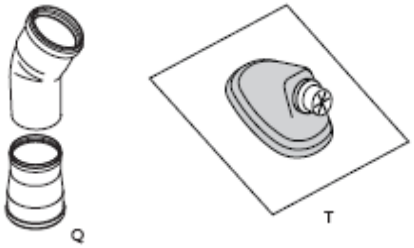
FLUE DUCT		
Equivalent Length Value	**N of fittings/pipes**	**sub total**
1 m	**5**	**5.0 m**
0.25 m	**2**	**0.5 m**
0.5 m	**2**	**1.0 m**
Equivalent Length Air Duct = 6.5 m		

2-3-10 Flue Options



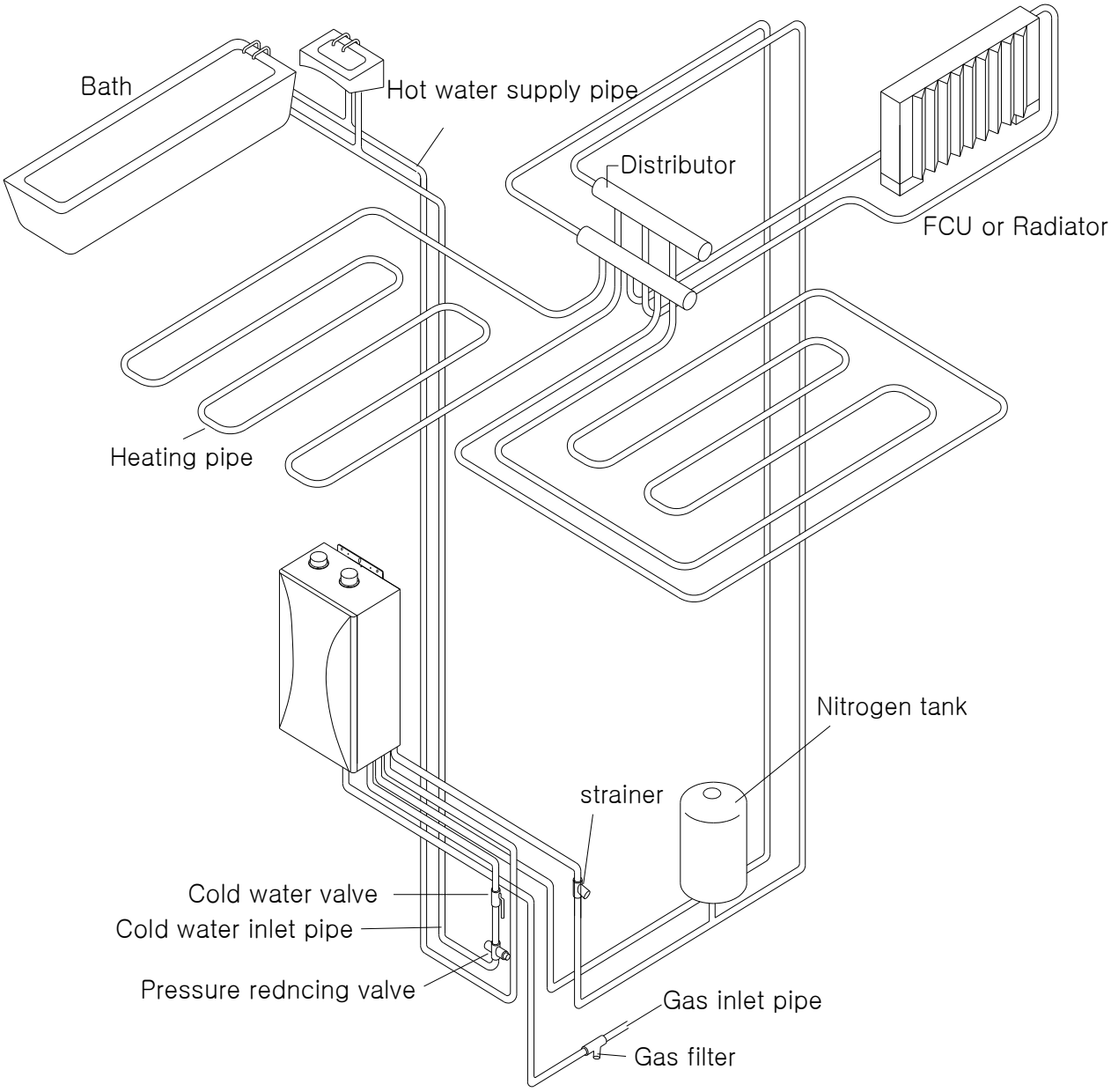
Flue Accessories

Key	Accessory	Size	code No
FLUE GROUP A			
Concentric Flue System 100mm diamter			
A3	Telescopic intermal Fuel Kit	315~500mm	5119654
A2	Telescopic Flue (incl elbow)		5118069
A	Horizontal Fule Terminal (incl elbow)		5118489
B	Flue Extension	1000mm	5111074
C	Flue Bend	93˚	5111075
D	Flue Bend (pair)	135˚	5111085
U	Pipe Support (Painted)	100mmΦ	5111080
R	Vertrical Flue Adaptor		5111070
P	Wall Liner		5111067
S	Flue Terminal Deflector		5111068
FLUE GROUP N			
Twin Flue System 100mm diamter			
E	Flue Extension (pair)	1000mm	5111087
F	Flue Bend (pair)	90˚	5111072
G	Flue Bend (2 pair)	135˚	5111086
J	Vertrical Flue Boiler Adaptor Kit		5111079
H	Vertrical Flue Adaptor		5111084
W	Pipe Support (pair)	80mm	5111081
Y	Flue TERMINATION Kit (horixontal termination)	80mm	5130172
Z	Single Terminal	80mm	5131791
Q	Adaptor	60/80	5121792
T	Pitched Roof Terminal	25˚/45˚	5106164
FLUE GROUP G			
Flue System 80/125mm diamter			
A4	Horizontal Flue Kit		5118580
B	Straight Extension Kit	1000mm	5118584
D	Bend Kit (pair)	135˚	5118597
C	Bend Kit (pair)	91.5˚	5118588
FLUE GROUP A,N,G			
Vertical Flue Kits			
K	VERTICAL Flue Terminal (use with 5111070)		5111078
KI	VERTICAL Flue Terminal		5118576
L	Pitch Roof FLASHING	25˚/50˚	5122151
M	Roof Cover Plate		246143
N	Flat Roof Flashing		246144



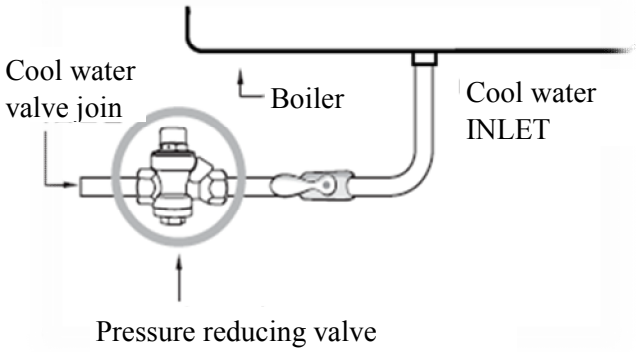
2-4 Piping

2-4-1 Standard piping

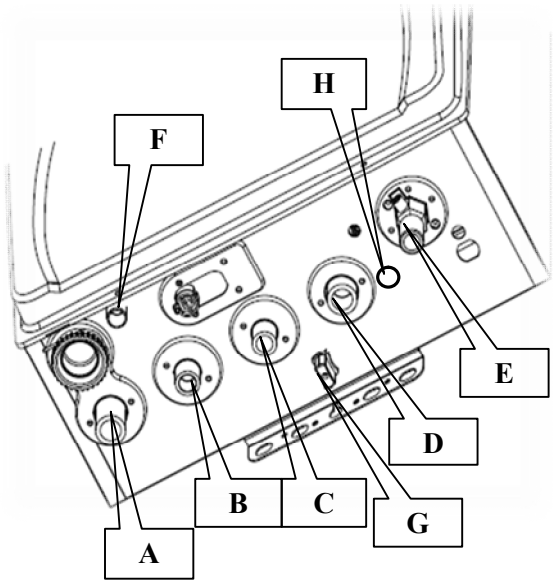


※ Caution on piping

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	Central Heating Return
B	Domestic Hot Water Inlet
C	Domestic Hot Water Outlet
D	Central Heating Flow
E	Gas Inlet
F	Safety Valve Discharge & Drain Valve
G	Water Refill Valve
H	condensed water outlet
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.

4. Installing neutralization device of condensate

1) 1Check the connection of the neutralization box and the hose from main heat exchanger.

2) Check the connection of the Air pressure s/w and make-up water hose.

3) Check the level of neutralizer whether it is enough or not. If need, fill it in the tank.

4) Connect the drain hose to the drain hole on the bottom of neutralization tank.

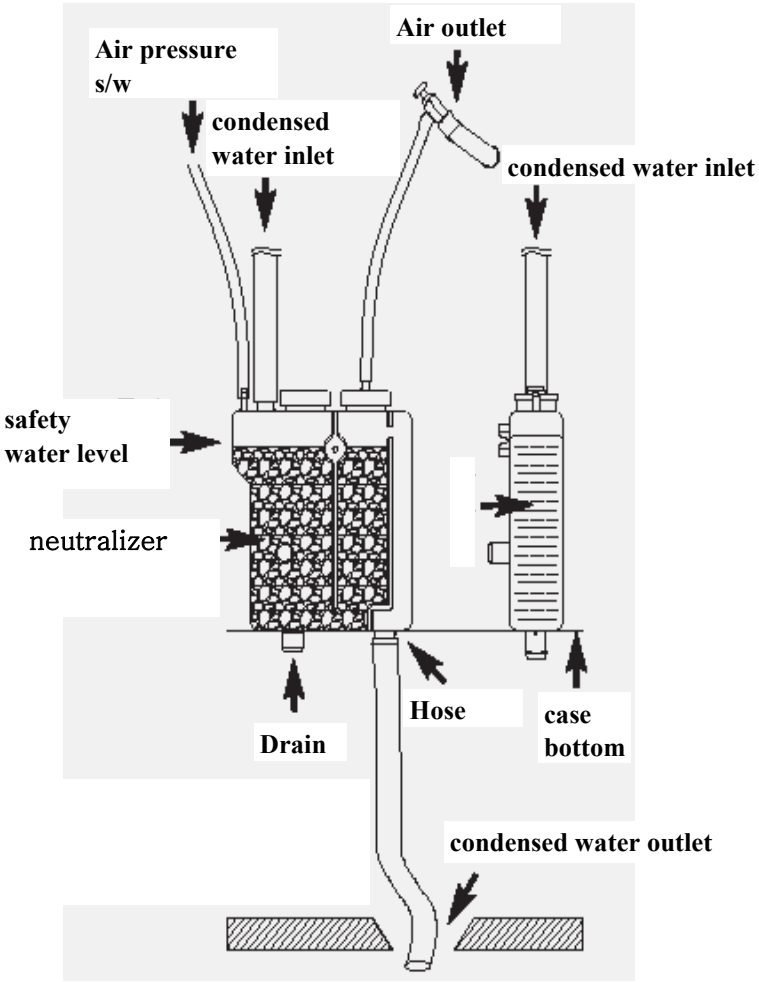
-. Caution!: Link the drain hose to the sewer of house which is made up with PVC or Stainless steel.

4) Check the water level and fill the water to safety level of neutralization tank by opening make-up water valve.

-. Caution !: Before the start of operation after installation or long stop, open and close the air pulling valve on the top of main heat exchanger and keep the safety water level of the neutralization tank.

※ Warning! : When shortage of water in tank, it may cause the danger due to the return of the exhaust gas.

-. Keep and install the appliance horizontally in order to drain well the condensate.



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.

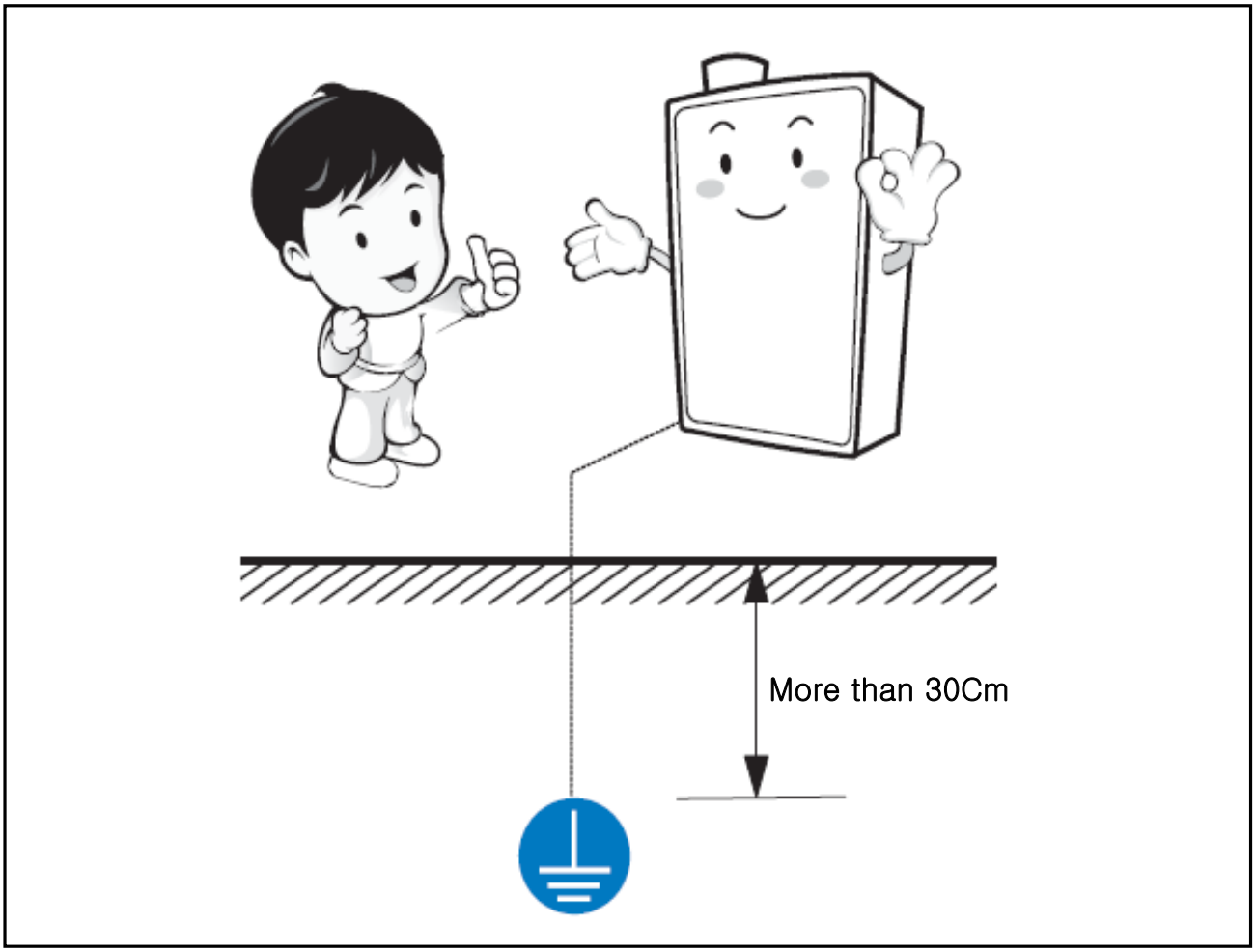
2. Make sure that the connecting electricity - for example, connecting power and cable, wiring, earthing, etc - should comply with the regulation.

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?

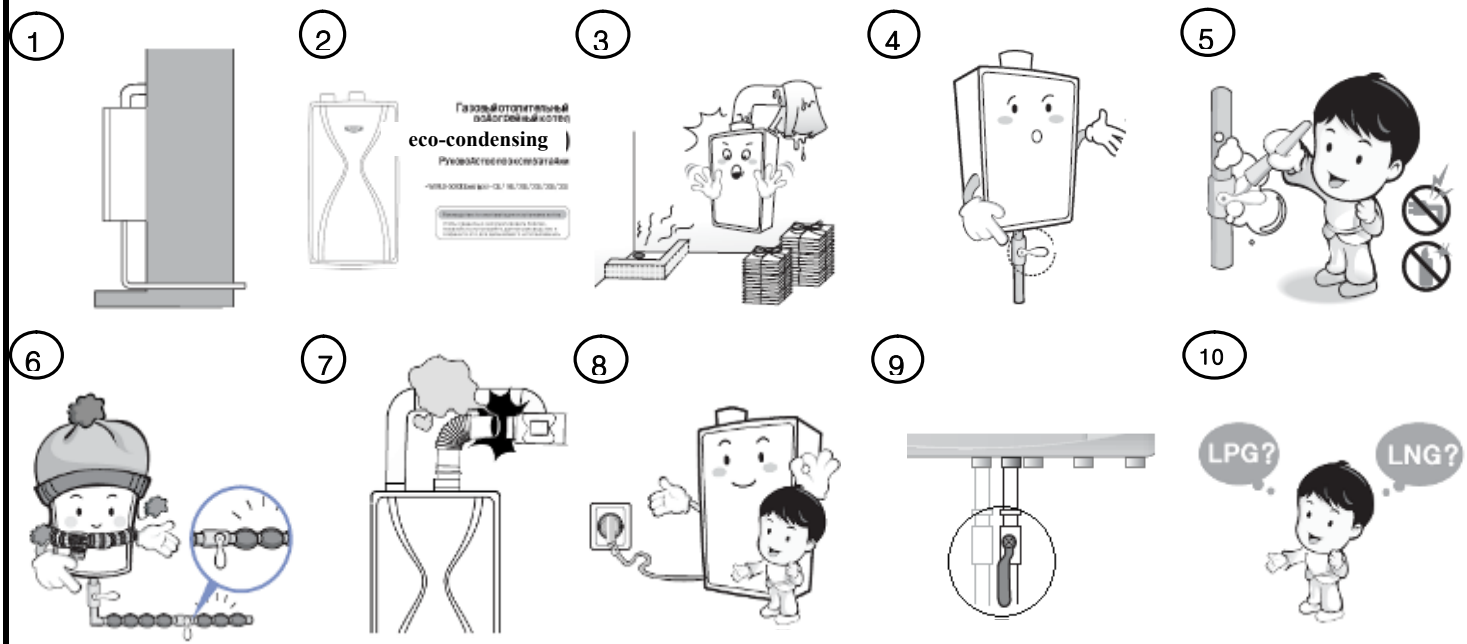
⑥ ☐ Does insulate each pipes properly to protect in winter season?

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

⑧ ☐ Does check the voltage and hertz - AC 220 ~ 230V 50Hz, before of plugging-on ?

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

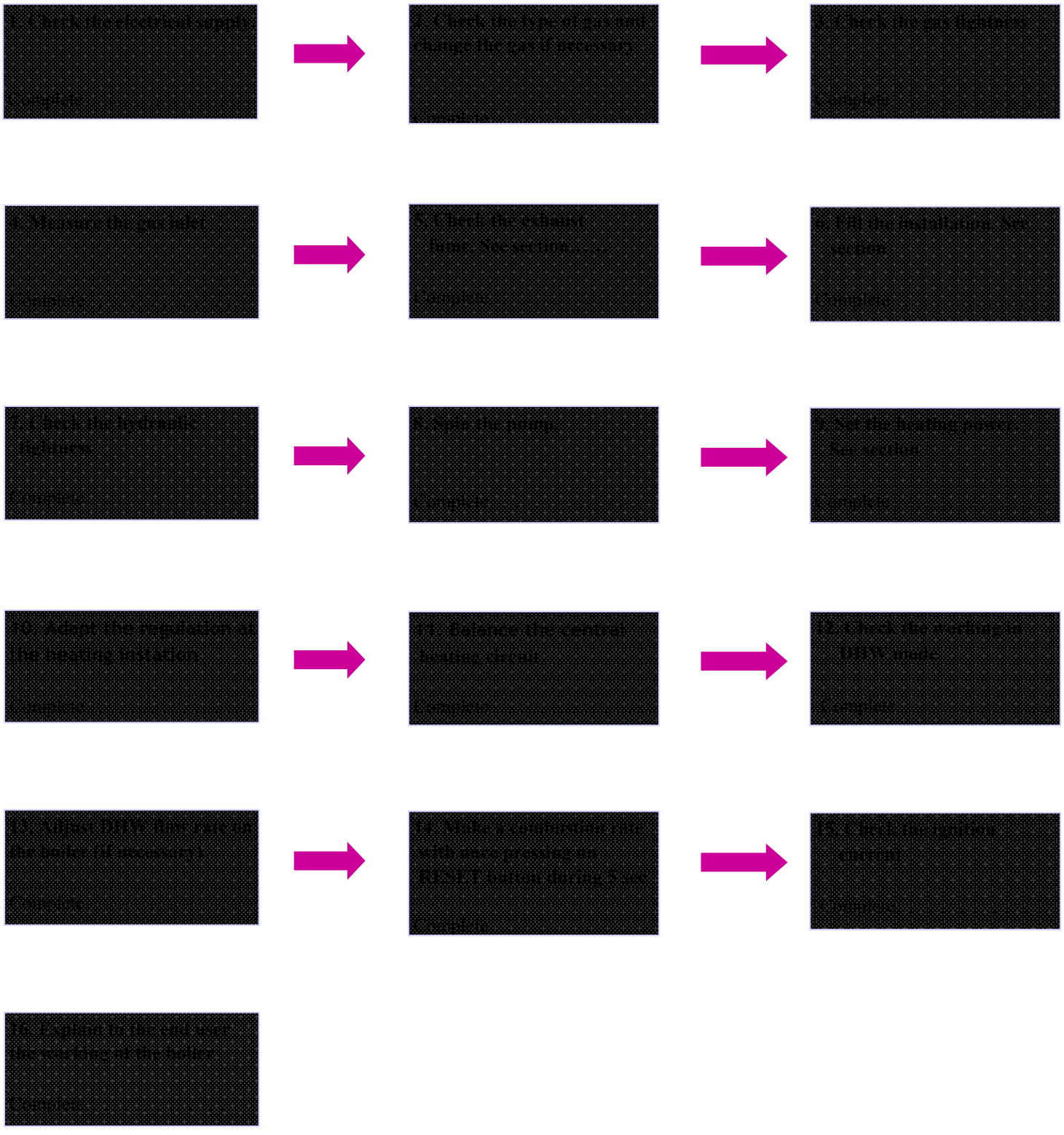
⑩ ☐ Does check the classification of the supplied gas to the instruction of gas on the specification label in boiler?



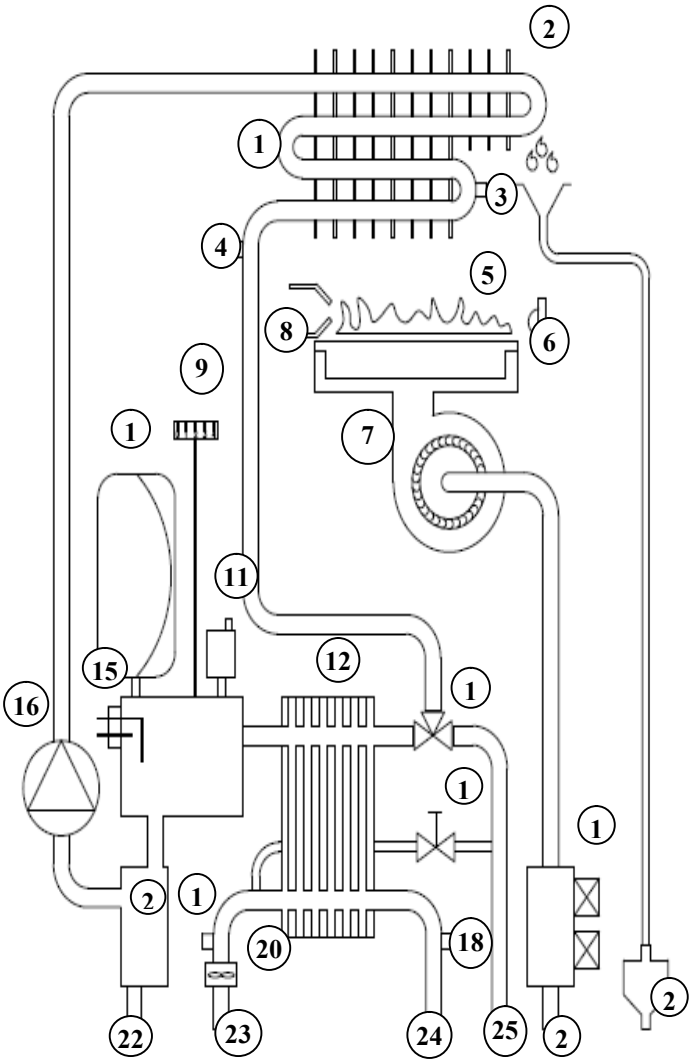
3-2 FIRST IGNITION OPERATION

Date : .....

Installer : .....

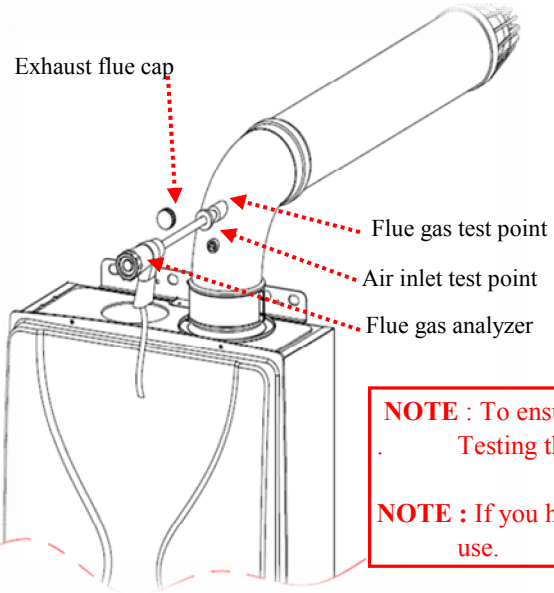


3-3 Water Circuit Diagram



1. AL Heat Exchanger
2. CU Heat Exchanger
3. Limit Switch
4. Heating Temperature Probe
5. MFB (Metal Fiber Burner)
6. Flame Detector (Photo Sensor)
7. Fan
8. Igniter
9. Pressure Gauge
10. Expansion Tank
11. Auto Air-vent
12. DHW Heat Exchanger
13. Three Way Valve
14. Heating Filling Valve
15. Heating Water Level Sensor
16. Circulation Pump
17. DHW Inlet Temperature Probe
18. DHW Outlet temperature Probe
19. Gas Valve
20. DHW Flow Sensor
21. Heating Filter
22. Heating Return Connection
23. Tap Water Inlet Connection
24. Hot Water Outlet Connection
25. Heating Supply 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 in use.

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 (TIME, UP33-06)

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

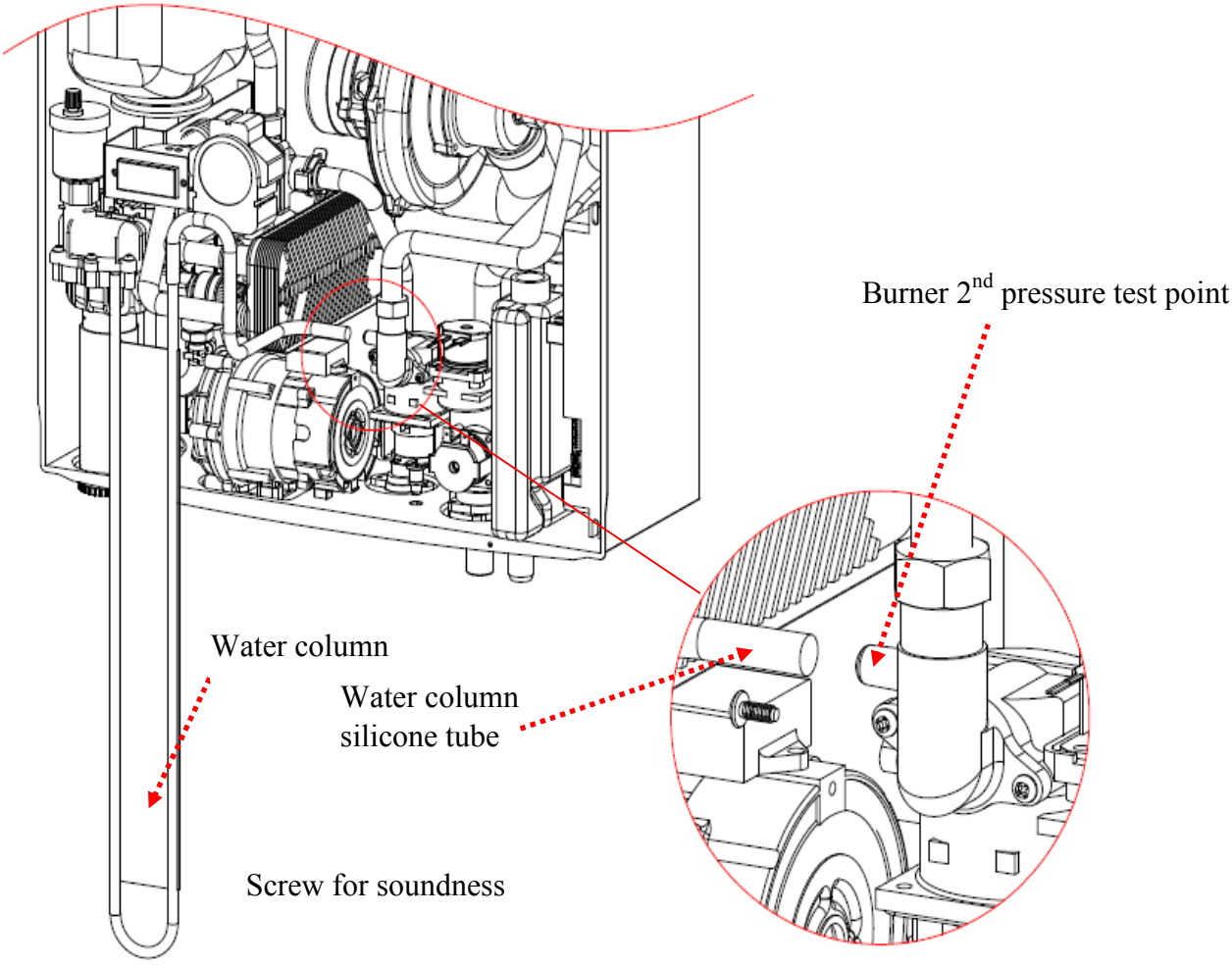
④ After setting DIP S/W Nr 8 to the “ON” position, adjust potentiometer “C” on the main board at the minimum.

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

2) 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.

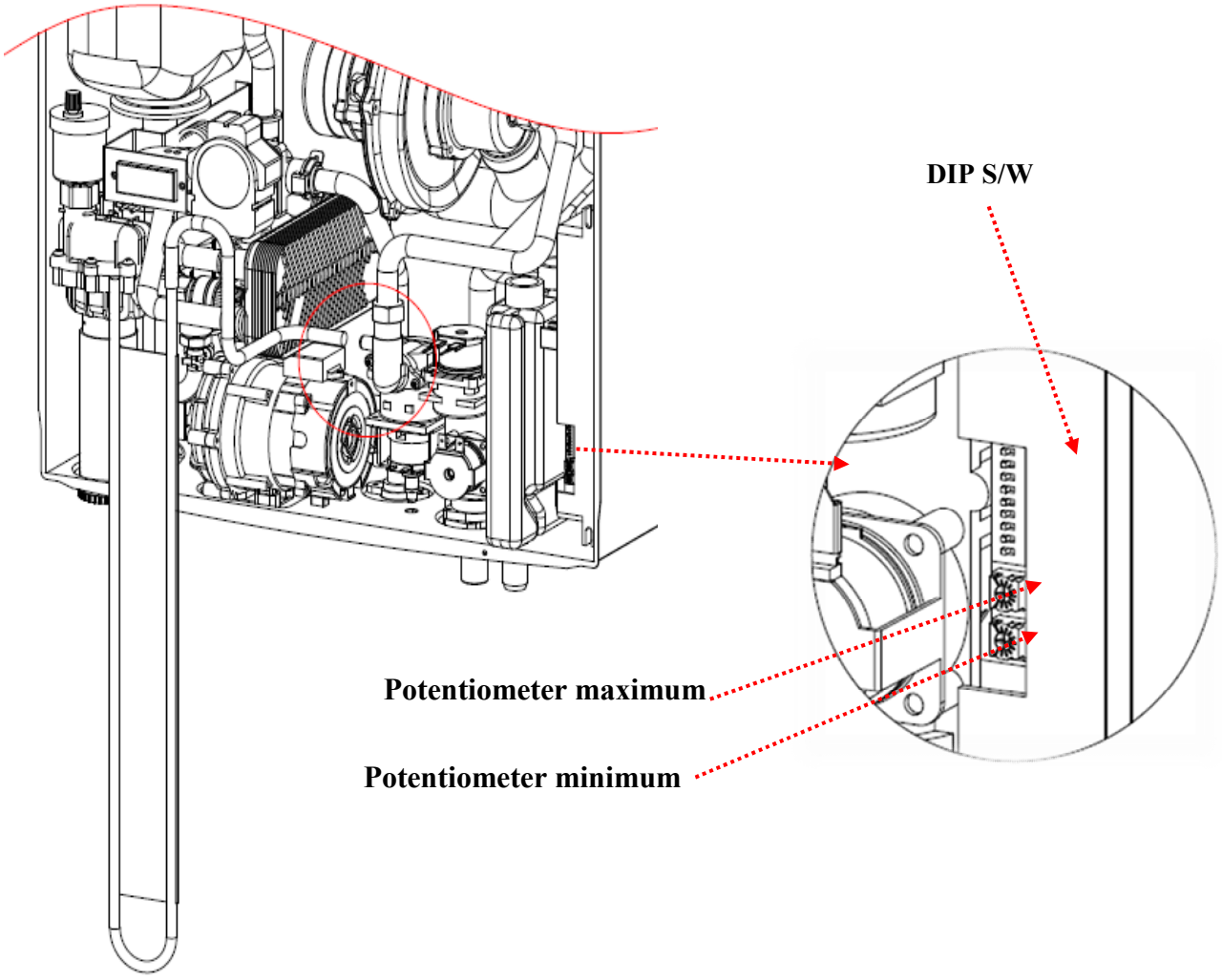
Table1, Gas valve 2nd pressure each Model

Unit mmAq

Model	16D		20D		25D		30D	
GAS	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
LPG								
LNG								

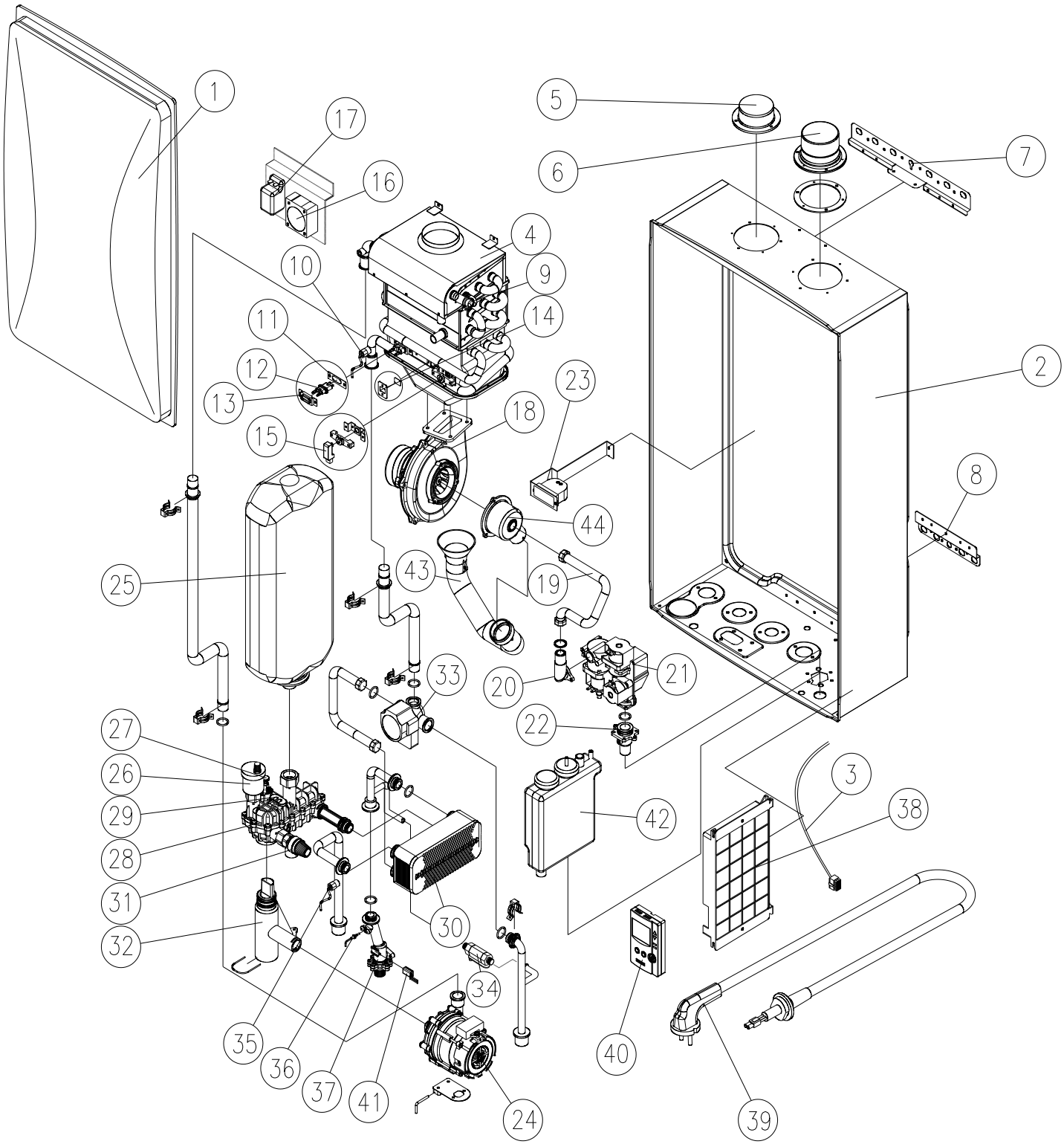
Table2, Nozzle diameter each model and gas Unit mm

Model	16D	20D	25D	30D
LPG	Ø1.1X10EA	Ø1.1X13EA	Ø1.1X15EA	Ø1.1X17EA
LNG	Ø1.55X10EA	Ø1.55X13EA	Ø1.68X15EA	Ø1.68X17EA



4. Direction for assembly

4-1 Part exploded view



4-1-1 Part list

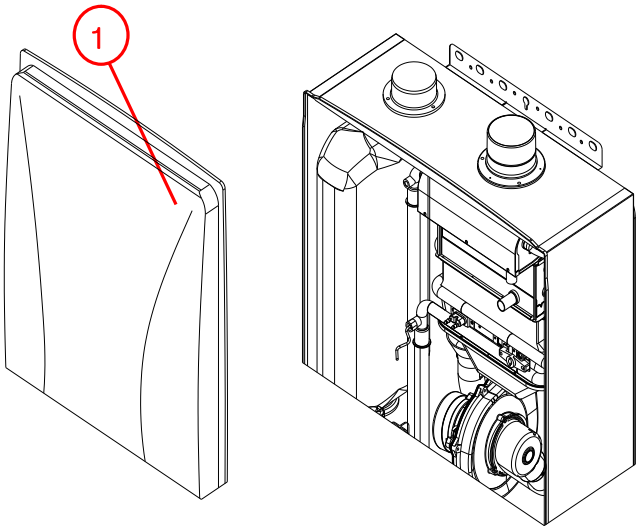
No	Part Name (English)	Korean	ERP Code	Model			
				16K	20K	25K	30K
1	Front Door	전면문짝		●	●	●	●
2	Side case	케 이 싱		●	●	●	●
3	Connector	콘 넥 터		●			
4	Heat exchanger Ass'y	열교환기 Ass'y		●			
5	Air suction INLET	급 기 구		●	●	●	●
6	Air OUTLET	배 기 구		●	●	●	●
7	Wall bracket (UP)	벽걸이브라켓 (상)	H140120011	●	●	●	●
8	Wall bracket (DOWN)	벽걸이브라켓 (하)	H140120006	●	●	●	●
9	Over heating sensor	과열센서	S311400002	●	●	●	●
10	Temperature sensor	온도센서		●	●	●	●
11	Ignition rod Gasket	점화봉 가스켓		●	●	●	●
12	Ignition rod	점 화 봉		●	●	●	●
13	Ignition rod bracket	점화봉 브라켓		●	●	●	●
14	Mica	운 모		●	●	●	●
15	Photo sensor	포토센서	S314200005	●	●	●	●
16	Nozzle adaptor	풍압스위치		●	●	●	●
17	Ignition transformer	점화트랜스	S223100005	●	●	●	●
18	Fan	송 풍 기	S242100010	●	●	●	●
19	Gas pipe	가스배관		●			
20	Gas Valve Outlet Connection	가버너 출구니쁠		●	●	●	●
21	Gas valve	가 버 너		●	●	●	●
22	Gas Valve Inlet Connection	가버너 입구니쁠		●	●	●	●
23	Pressure gauge	압 력 계	S325100009	●	●	●	●
24	Circulation pump	순환펌프	S132100036	●	●	●	●
25	Nitrogen-expansion tank	질소탱크		●	●	●	●
26	Air vent	에어벤트		●	●	●	●
27	Air valve	수동 에어밴트		●	●	●	●
28	Heating unification Block	통합블럭		●	●	●	●
29	Low water sensor	저수위센서		●	●	●	●
30	DHW Heat Exchanger	판형 열교환기		●			
31	Safety valve	안 전 변		●	●	●	●
32	Air Water Separator	난방필터		●	●	●	●
33	3Way valve	삼방향 밸브	S323100039	●	●	●	●
34	Ball valve	보충수밸브		●	●	●	●
35	DHW Outlet Temp. Sensor	출수센서	S311200015	●	●	●	●
36	DHW Inlet Temp. Sensor	급수센서		●	●	●	●
37	DHW Inlet Pipe	급수배관		●	●	●	●
38	Main Controller	콘 트 롤	S114100086	●	●	●	●
39	Power cord	전원코드	S261200006	●	●	●	●
40	Room Controller	실내온도조절기	S121100062	●	●	●	●
41	DHW Flow Sensor	유량센서		●	●	●	●
42	Neutralizing agent	중화장치		●	●	●	●
43	Silencer	소음기		●	●	●	●
44	Mixer blender	가스 혼합기		●	●	●	●

5. MAINTENANCE GUIDE

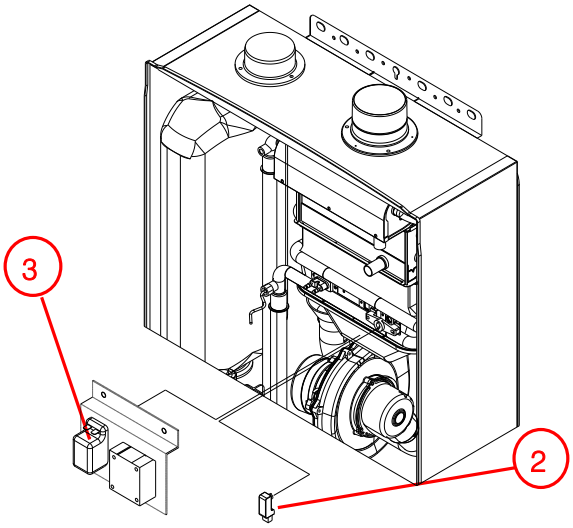
5-1 Main heat exchanger

Tool

1

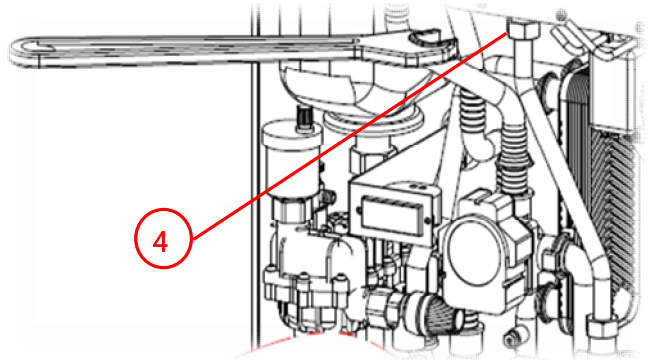


1. Plug off
2. Lock the gas valve
3. Open the front cover with +screw driver.
4. screws on top and bottom.

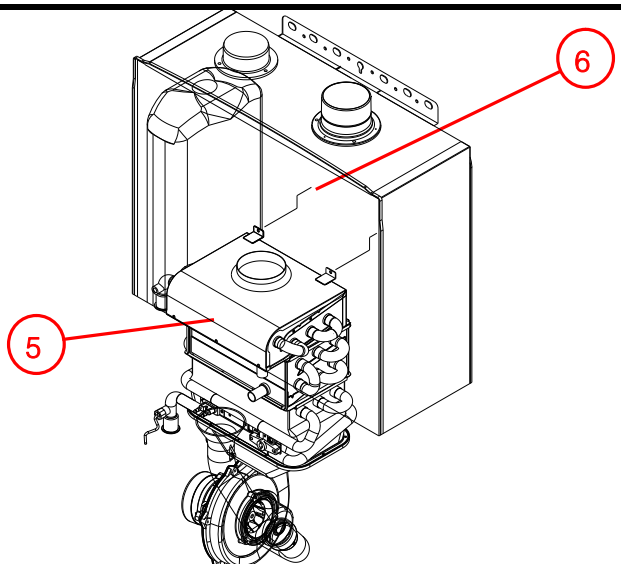


1. Disjoin the wire connectors of ignition transformer, ignition rod, and photo sensor.
2. Disassemble the parts around the main heat exchanger with +screw driver. Ignition transformer, Ignition rod, Photo sensor.

2



1. With spanner, unfasten the nut of the gas pipe.



1. Unscrew the cover of main heat exchanger.
2. Open it.

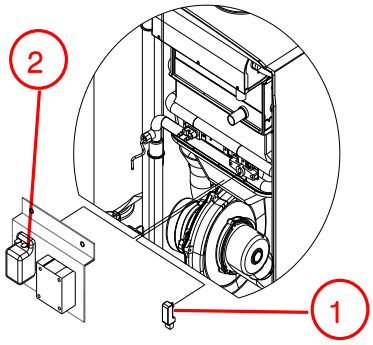
※ On reverse order, assemble the parts and boiler.

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

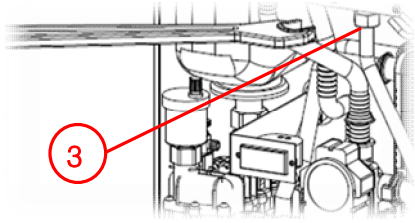
5-2 Burner unit

Tool

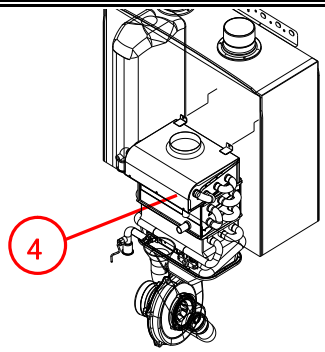
1



1. After plugging off, disconnect all the connectors.
2. Dismantle the ignition transformer and photo sensor from the heat exchanger.

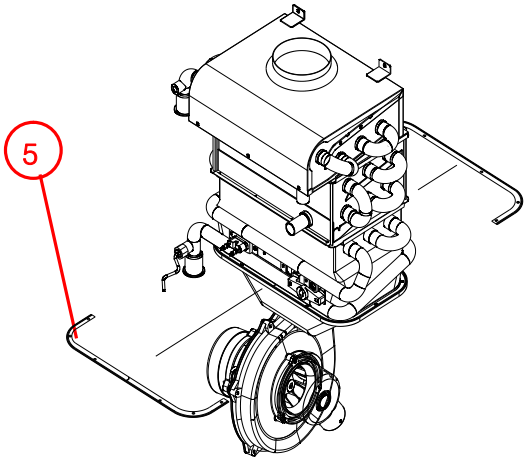


1. With spanner, disassemble the nut of gas pipe under the heat exchanger.

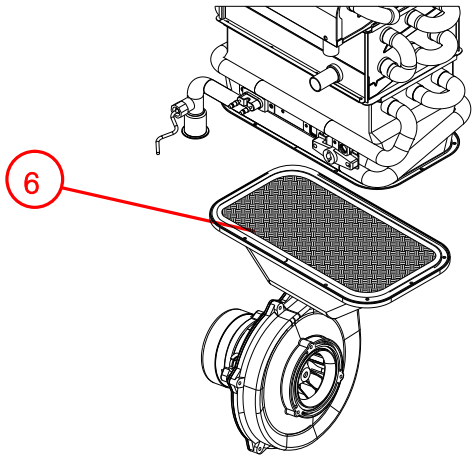


1. With + driver, remove the screw of main heat exchanger.
2. Pull and dismantle the main heat exchanger from the case.

2



1.Unscrew the burner from main heat exchanger, by + driver.
2.Remove the bracket from main heat exchanger.



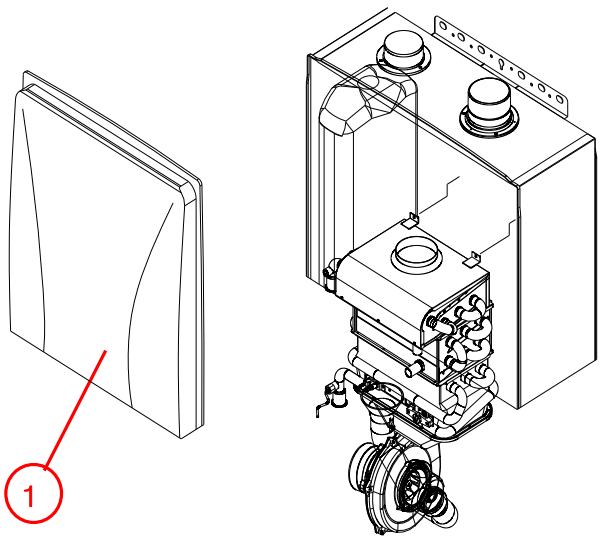
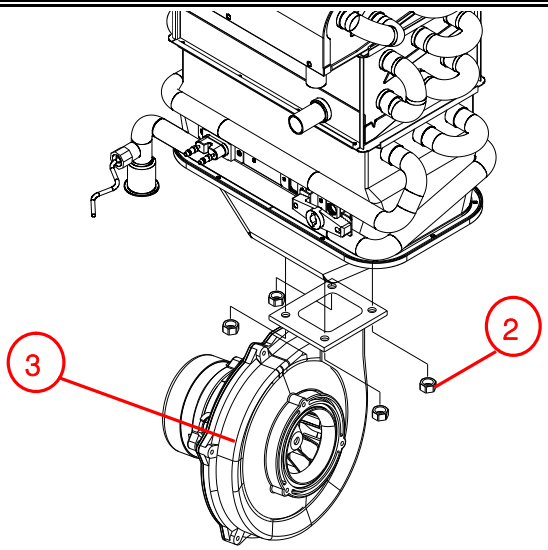
1. Dismantle the burner from main heat exchanger, downward.

※ To assemble burner, keep the above orders as reverse, and check the sealing, gasket, and bracket as firmly.

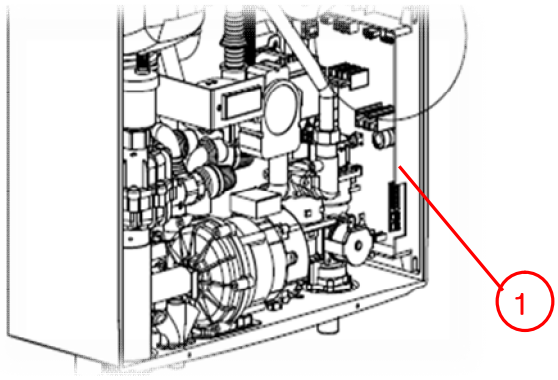
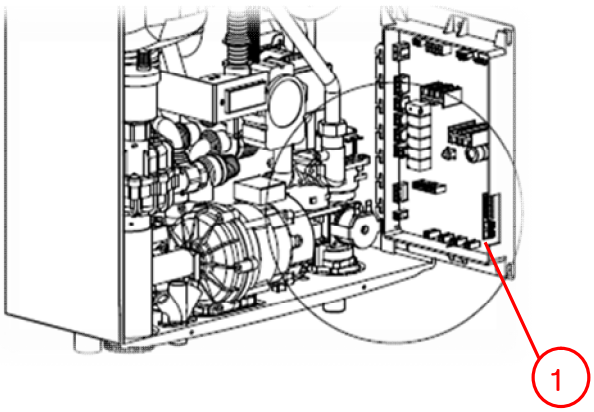
* Warning! If fail to seal them firmly, it may cause the failure of the correct combustion.

5-3 Fan unit

Tool 

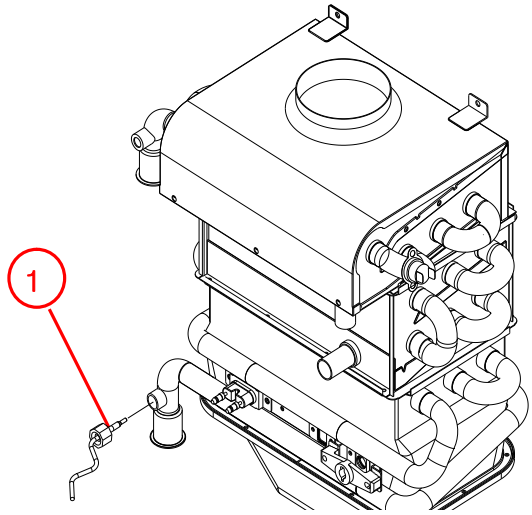
1		
	1. Plug off 2. Lock the gas valve 3. Open the front cover with +screw driver. 4. And then dismantle the main heat exchanger after unscrewing.	1. With spanner, remove the bolts 2. Separate the fan by pulling downward.

5-4 Controller unit

1		
	1. Plug off **3.** With +screw driver, unscrew 2 points on top and bottom sticking the controller unit to case.	1. Pull the controller unit. 2. Separate all connector carefully

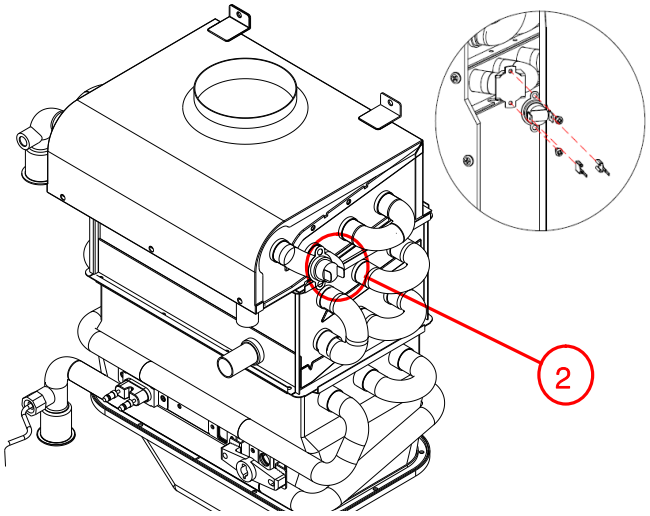
5-5 Temperature sensor

1



1. Close all valves on the bottom of boiler
2. Separate the sensor connector from controller unit.
3. Turn and pull out the temperature sensor from main heat exchanger, right top side.

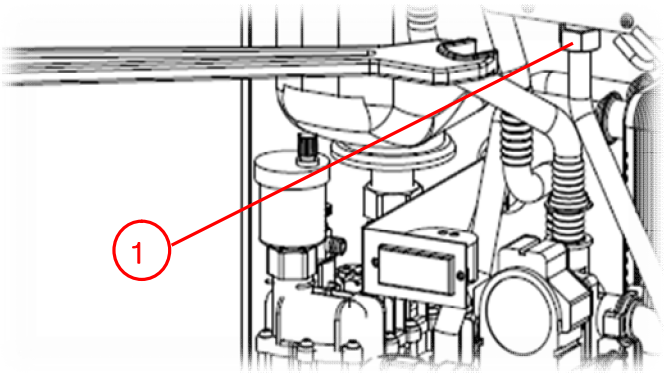
5-6 Overheating sensor



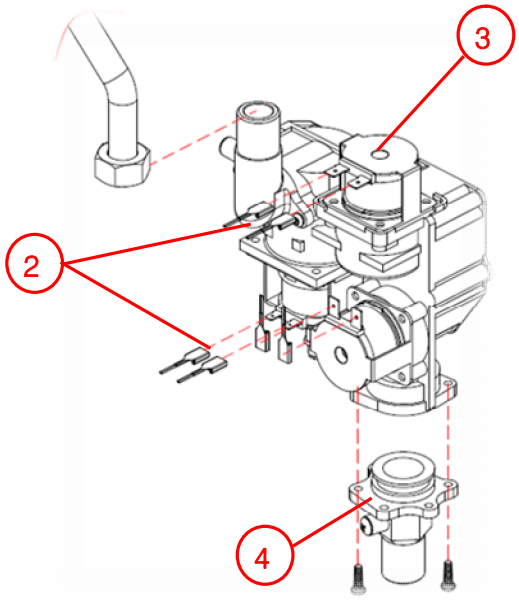
1. Separate the connector of overheating sensor located in left top side of main heat exchanger.

5-7 Gas valve

1

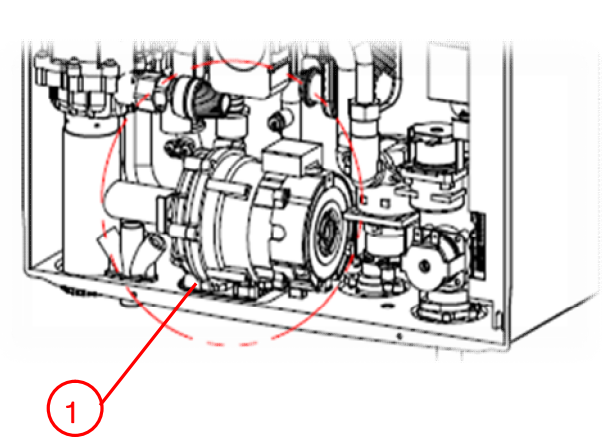
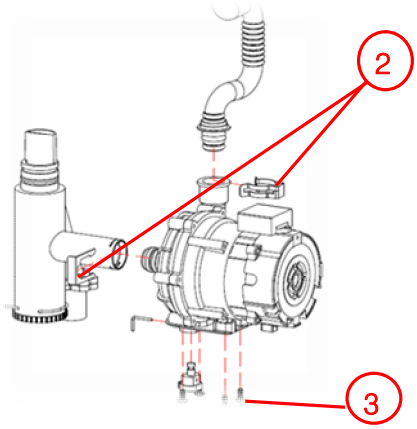


1. Close all valves on the bottom of boiler.
2. With spanner, unwind the nut of gas pipe between burner and gas valve.

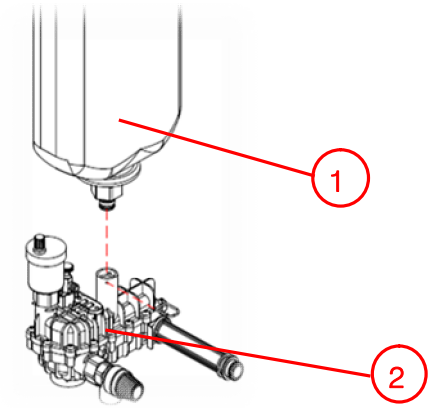
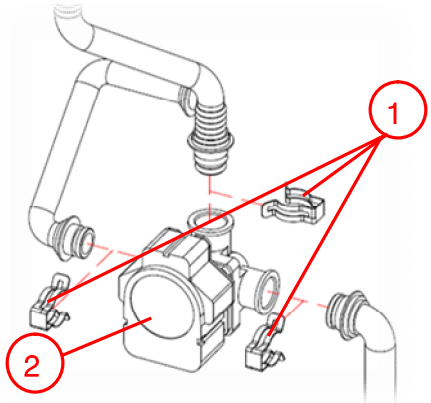


1. Pull out all the connectors from gas valve.
2. With +screw driver, remove the screws from the bottom of boiler and disassemble the adaptor from gas valve.
3. Separate the gas valve.

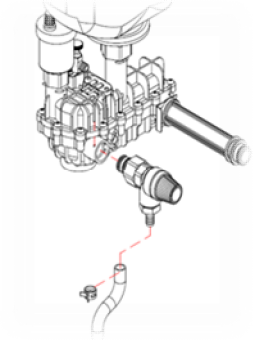
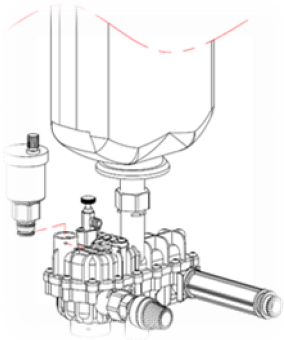
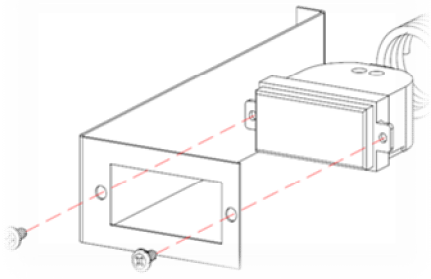
5-8 Circulation pump

1	 **1.** Open the front cover like 1 and separate the connector housing connected on circulation pump.	 **1.** Separate the clip joining circulation pump and central heat water pipe. **2.** Unscrew 2 points on the bottom. **3.** Separate water filter and circulation pump

5-9 3way valve

1	 **1.** With spanner, unwind the nut. **2.** Pull up and down, and separate the 3 way valve ass'y from the extension tank.	 **1.** Disjoin the clip of Central heat water pipe and 3 way valve. **2.** Pull and separate 3 way valve.

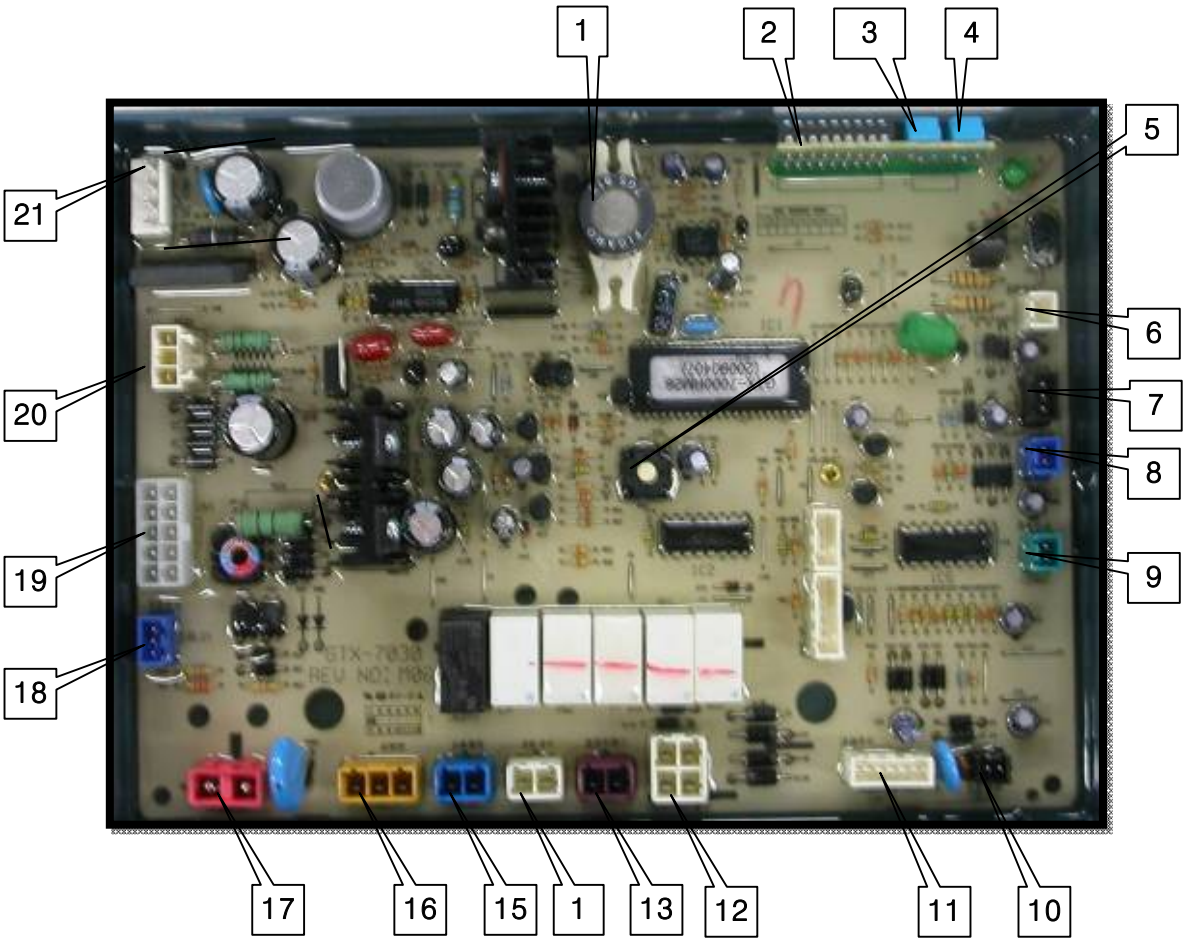
5-10 others

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

6. Functions of the controller

6.1 Controller part name

Model : GTX-7000eco (16K/ 20K/ 25K/ 30K)



No	Name
1.	Gas sensor
2.	Dip S/W (RPM control)
3.	Gas pressure controller (MAX)
4.	Gas pressure controller (MIN)
5.	Reset button
6.	Hot water outlet sensor
7.	DHW Flow Sensor
8.	Cold water inlet sensor
9.	Thermal sensor of extension tank
10.	Water temperature sensor
11.	Overheat / Burning (infrared rays) / Room temp

No	Name
12.	Gas valve
13.	Ignition transformer
14.	Auto water inlet valve
15.	Circulation Pump
16.	3way valve
17.	POWER
18.	Heating Water Level Sensor
19.	10P Connecter
20.	MOD
21.	DC FAN

6-2 Function

6-2-1 Controller model name

◎ GTX-7000ECO : 16,000Kcal ~ 30,000Kcal (condensing , open type/close type , FF/FE, LNG/LPG)

6-2-2 Function

◎ Operation start when plug-on
① During first 60 seconds, the controller will not sense the gas due to requirement of pre heating 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) Room controller start OFF function

NO	FUNCTION	SENSING	DISPLAY	OPERATION	FORCED CLEAR
1	Gas Sensing	by Gas Sensor	Power LED on-off	Fan starts on	ROOM controller power switch Off/On
2	Pretection from cold winter	Water temp. or Temperature sensor (about below 8℃)	none	Circulation pump starts on (Repeat 10minutes on 30 seconds off)	Automatically return normal operation after over 10℃
		Water temp. or Temperature sensor (about below 5℃)	none	Circulation pump starts on P/T operate	Automatically return normal operation after over 18℃ of temperature sensor and over 50℃ of water temp. sensor (Circulation pump stop after 5 minites operation)

2) Room controller start on function
-. only with Room controller model no.CTR-5550

Room controller CTR-5550		GTX - 7000 , GTX - 7030				REMARKS
	Function LAMP	Water Temp. Sensor	Burner (Water Temp. Sensor)		Circualtion PUMP	
			If below setting TEMP.	If over setting TEMP.		
room (RESER VATION)	YES		ON	OFF	ON	Setting TEMP. means the targeted WATER TEMP.. (WATER TEMP can be setted on Room Controller CTR-5550
	NO		OFF	OFF	OFF	
Out of House	YES (If Room temp. below 8℃)	(If below 30℃) ON for 5 min.	ON (63℃ ± 2℃)	OFF (85℃ ± 2℃)	ON	Out of house function is effected by controlling the extention tank.
	NO	(If over 30℃)	OFF	OFF	OFF	
			OFF	OFF	OFF	
Bath	YES		ON (If below 84℃)	OFF (If below 84℃)	ON	

3). Burner control time chart

① PRE-PURGE TIME : for 2 sec ± 1sec

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

② PRE IGNITION TIME : 1 sec

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

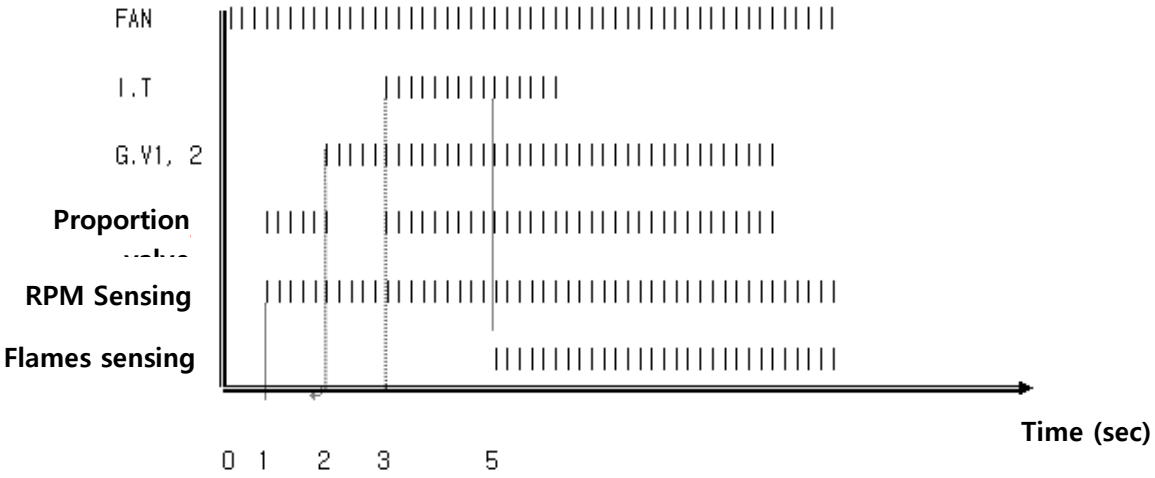
③ POST IGNITION TIME : 6 sec ± 1sec

→ After the initial burning, the igniter will operate for 1 or 2 seconds more in order to protect the burn from the initial failure.

④ POST PURGE TIME : 10 sec ± 1sec

→ After stopping the burn, the fan will operate for some seconds to emit the exhausted gas from boiler.

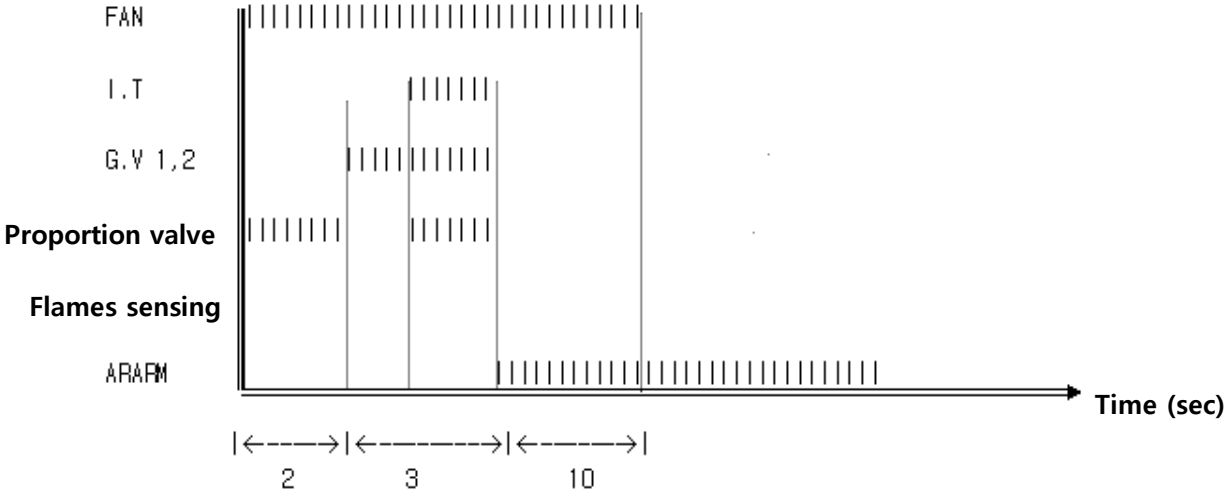
Ⅰ. Normal operation time chart



⑤ Safety cut-off time chart : 6sec ± 1sec

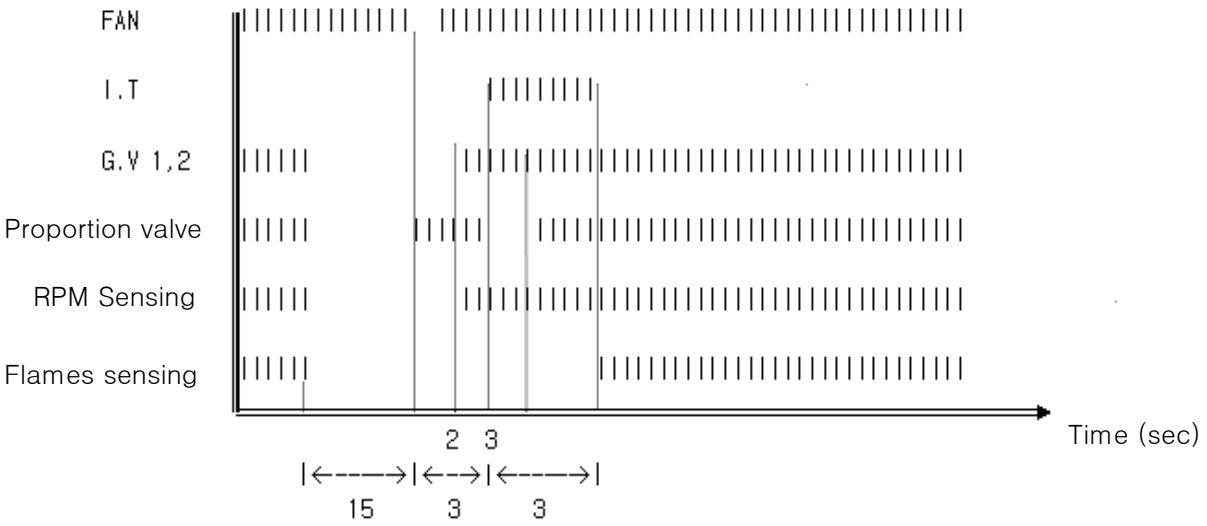
→ If the photo detector fails to sense the flame after steps of fan start - prepurge-preignition-fuel supply, it cut off the fuel supply for safety combustion.

→ If fail to make flame by 3 times, it alarms automatically.



⑥ **Re-ignition on losing flames : 15sec ± 1sec**

→ If photo sensor check the flame remains, it stops the gas supply for safety and then starts the ignition flows, PRE-PURGE / PRE-IGNITION / GAS SUPPLY / SENSING FLAMES.
It will repeat. If it fail to re-ignite, it will try to ignite again after POST PURGE for 15sec ± 1sec



⑦ Flames sensing

→ During prepurge step, if photo detector sense the flame remains, even though it finish the prepurge step, it will stop running the next step and check 3+-1 seconds more. And then, if the flames remain, it indicates "02 Error" on Room controller.

4). Combustion specification

Ⅰ. For AC fan, it will work on 220V within the allowable voltage ±10%.

Ⅱ. Proportional Control : On comparing the target water temp. with the current water temp., it control the pressure of gas inlet and fan speed for the effective combustion. (It means, if big difference, it burn on the high gas pressure..)

Model				Forced ignition			remark
				1set operation FAN	FAN	Gas valve	
LNG	FF	16K	output value	80	46	120	
			RPM/mm2O	2500 (2A)			
		20K	output value	90	53	125	
			RPM/mm2O	2800 (2F)			
		25K	output value	95	54	120	
			RPM/mm2O	2800 (2F)			
		30K	output value	95	50	88	
			RPM/mm2O	2600 (2C)			
LPG	FF	16K	output value	70	46	125	
			RPM/mm2O				
		20K	output value	70	53	125	
			RPM/mm2O				
		25K	output value	70	54	105	
			RPM/mm2O				
		30K	output value	95	50	95	
			RPM/mm2O				

※ CURRENT CONTROL : After gas valve on, it control the current as 0 mA for 0.5 seconds and then move as the table.
※ Burner fan control based on the targeted 80℃ water temp. during Central heating function
-. In Central heating water temp. below 60, it works by Max RPM+@; in case of 60 ~ 70, it run with proportional RPM controlled by 1; over 70, it operate with max RPM.

5). Air pressure specification

Model				Heating		Bath
				MIN	MAX	MAX
LNG	FF	16K	output value	basic rpm+540 rpm	basic rpm+660 rpm	basic rpm+660 rpm
			RPM/mm2O			
		20K	output value	basic rpm+540 rpm	basic rpm+660 rpm	basic rpm+660 rpm
			RPM/mm2O			
		25K	output value	basic rpm+540 rpm	basic rpm+660 rpm	basic rpm+660 rpm
			RPM/mm2O			
		30K	output value	basic rpm+540 rpm	basic rpm+660 rpm	basic rpm+660 rpm
			RPM/mm2O			
LPG	FF	16K	output value	basic rpm+540 rpm	basic rpm+660 rpm	basic rpm+660 rpm
			RPM/mm2O			
		20K	output value	basic rpm+540 rpm	basic rpm+660 rpm	basic rpm+660 rpm
			RPM/mm2O			
		25K	output value	basic rpm+540 rpm	basic rpm+660 rpm	basic rpm+660 rpm
			RPM/mm2O			
		30K	output value	basic rpm+540 rpm	basic rpm+660 rpm	basic rpm+660 rpm
			RPM/mm2O			

※ Proportional controlled fan RPM : basic RPM + 720 RPM
※ In order to control the gas valve proportionally, it works by max. and min. repeatedly before of starting the ignition transformer.
※ Max. RPM : 7200 rpm , Min. RPM : 960 rpm

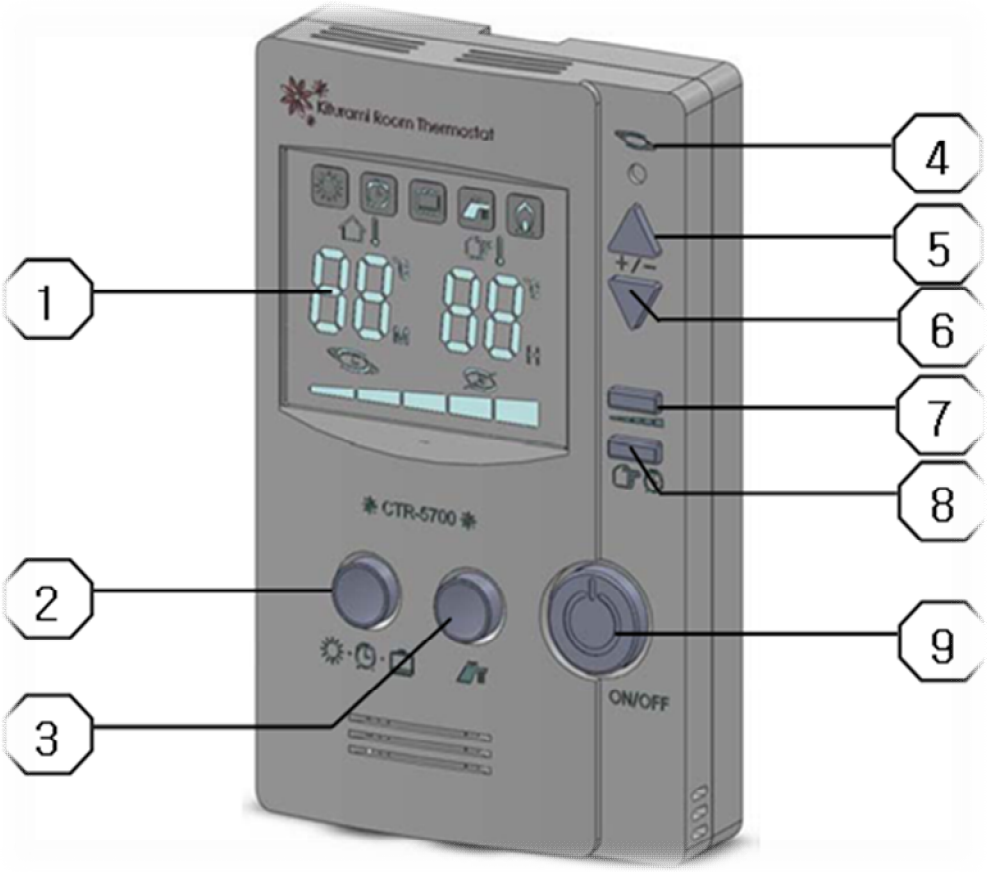
6). MODEL별 적용부품 및 일반기능

Type	capacity	DC FAN	cool /hot water, water flow sensor	condensed water sensing
Close type	16000K	◎	◎	◎
	20000K	◎	◎	◎
	25000K	◎	◎	◎
	30000K	◎	◎	◎

※ Fan Error
- If the fan works below minimum RPM, it indicates "06 Error".
- If the fan works over maximum RPM, it displays "07 Error".

7. Functions of the Room controller

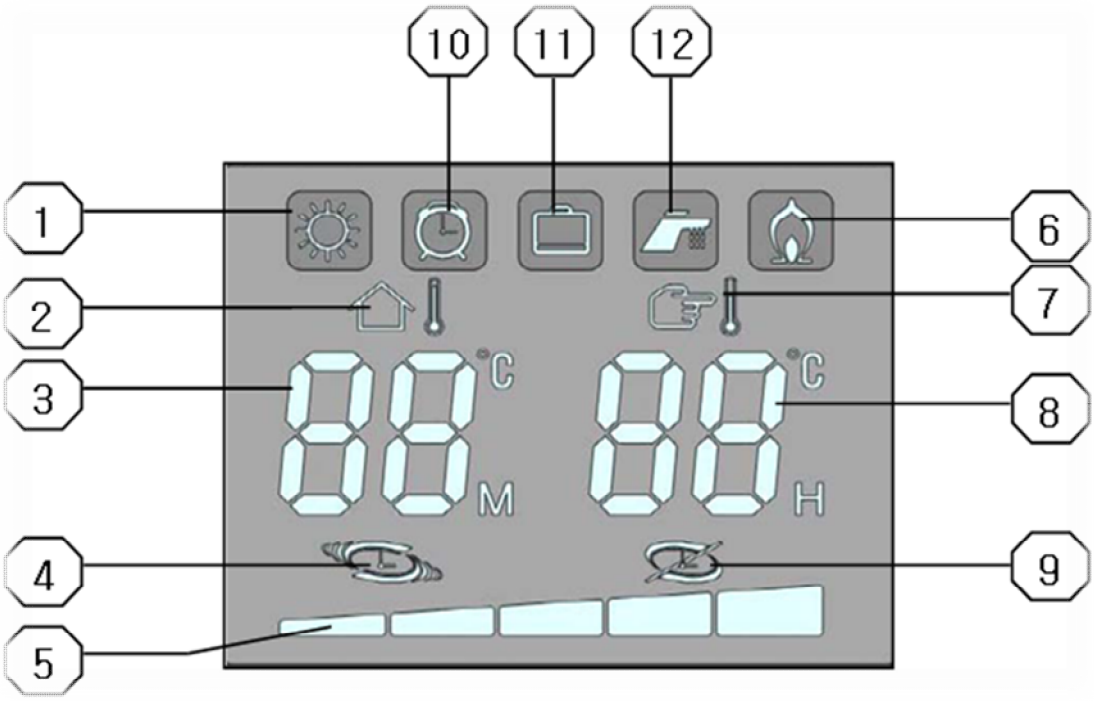
7-1 Room Control panel (CTR-5700)



◎ **LEGEND**

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

7-2 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 Table

Technical Specification \ Model			eco condensing -16D	eco condensing - 20D	eco condensing - 25D	eco condensing - 30D
Heating Output (Max-Min) (Flow/Return 80/60℃)		kW (kcal/h)	16.3 - 9.9 (14.000- 8.500)	21.0 - 11.6 (18,000- 10,000)	26.8 - 16.3 (23,000- 14,000)	31.4 - 16.3 (27,000- 14,000)
Heating Input (Max-Min)		kW (kcal/h)	19.8 - 10.7 (17,000- 9,200)	26.5 - 14.1 (22,800- 12,100)	31.4 - 17.5 (27,000- 15,000)	36.7 - 17.5 (31,500- 15,000)
Condensing Heating Output (Max-Min) (Flow/Return 50/30℃)		kW (kcal/h)	18.6 - 9.9 (16,000- 8,500)	23.3 - 11.6 (20,000-10,000)	29.1 - 16.3 (25,000-14,000)	34.9 - 16.3 (30,000- 14.000)
Useful Efficiency at Max-Min Heating Output (Flow/Return 80/60℃)		%	**97.1**	**97.8**	**96.7**	**97.8**
Useful Efficiency at Max-Min Heating Output (Flow/Return 50/30℃)		%	**104.6**	**106.0**	**105.1**	**105.6**
Useful Efficiency at 30% Max Heating Output (Return 30℃)		%	**104.1**	**105.8**	**105.0**	**105.3**
Heat Loss through the Case with Burner ON		%				
Heat Loss through the Chimney with Burner ON		%				
Energy Perfomance			★★★★	★★★★	★★★★	★★★★
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)	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=30℃	ℓ/min(gpm)	8.9	11.1	13.9	16.7
Other Comestic Hot Water Rate	△T=25℃	ℓ/min(gpm)	10.7	13.3	16.7	20
Other Comestic Hot Water Rate	△T=40℃	ℓ/min(gpm)	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 Mounted Type			
Intake/Exhaust Flue System Type		mm	FF,FE			
Intake/Exhaust Flue Diameter		mm	75×100			
Connecting Diameter	Heating water Connection	mm	3/4			
	Domestic Hot Water Connection	mm	1/2			
	Gas Connection	mm	1/2			
Physical dimensions	WxDxHmm(Inch)		486x210x730 (19.1x8.3x28.7)			
Weight		kg(lbs)	27 (59.5)		29 (63.9)	
Nox Class			5	5	5	5
Gas Type			LNG	LNG	LNG	LNG
Nozzle Diameter		mm	3.7	4.2	4.7	5.0
Diaphragm Diameter		mm	24.5	28.0	30.0	34.0
Gas Supply Pressure		mbar (mmH2O)	19.6 (200)	19.6 (200)	19.6 (200)	19.6 (200)
Gas Type			LNG	LNG	LNG	LNG
CO2 at Max Output		%	9.1	9.1	9.4	9.3
CO2 at Min Output		%	9	9	8.9	8.8
CO(0%O2) at Max Output		ppm	70	98	132	152
NOx (0%O2) at Max Output		ppm	18	17	20	26
Exhaust Temperature at Max Output		℃(°F)	57.5	56.4	51.7	50.1
Exhaust Temperature at Min Output		℃(°F)	53.7	47.2	44.1	44.7

* 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 free 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.