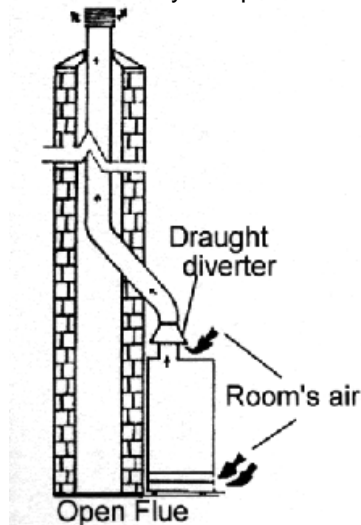


Boiler Types

Open Flue Boilers

Also known as conventional flue boilers, these can be a back boiler, wall mounted or free standing. Open flue boilers are less efficient and in certain situations dangerous. An open flue boiler must sacrifice some efficiency in order to vent unwanted products of combustion from the house. By allowing flue gases to retain high temperature, the natural force of rising hot air creates chimney draft, which contain water vapour, carbon dioxide and oxides on nitrogen: all products of combustion. At the same time, air from the room is drawn into the burner to maintain combustion. In most cases it will be the heated air.

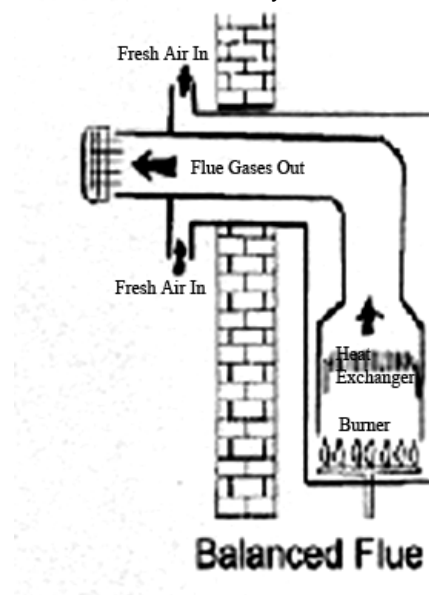
If there is insufficient air for the combustion process, poisonous carbon monoxide will be produced at the burner. When there is down draft in the chimney this poisonous gas will be carried into the room.



Balanced Flue Boilers

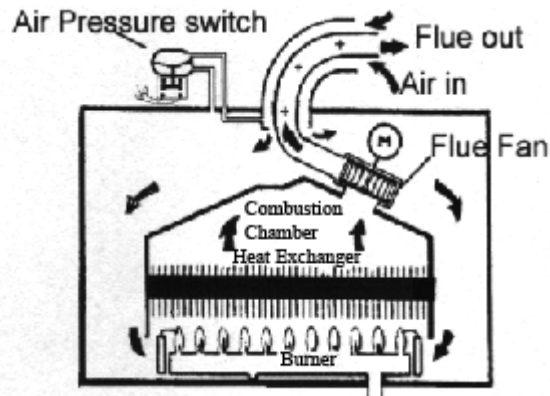
A balanced flue consists of two ducts, one inside the other. The fresh air for the combustion is taken from the outer duct and the products of combustion is taken out by the central duct to outside the house. Hence the balanced flue terminal may only be fitted on an external wall. The combustion is independent of any air supply within the room, these boilers are often called room sealed.

Balanced flue are normally less than a metre, hence they are more efficient than open flue boilers.



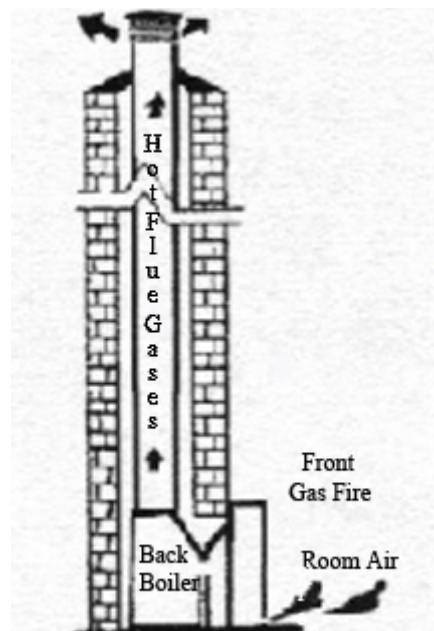
Fan Assisted Boilers

Most boilers now are fan assisted. They have small cross sectional flue ducts. The flue fan provides the fresh air to the burner and also removes the products of combustion from the combustion chamber. The combustion is independent of any air supply within the room. Hence these are room sealed boilers. There is no need for the flue gases to have thermal energy to drive the gases out, these boilers are more efficient than the balanced flue.



Back Boiler

This type of boiler can provide controlled central heating and an independent gas fire of room heater at the front. The back boiler and the gas fire or room heater share the same open flue in the chimney. Most importantly the fresh air supply to the boiler and gas fire should come from the air in the room. Hence the room must have adequately sized fresh air vents fitted for the boiler and gas fire to function without danger. Otherwise the boilers can poisonous carbon monoxide. In very cold days these air vents may create a cold draught in the room, for safety reason never partly or totally block them. If you have draught proofed or double glazed your house call in a CORGI registered professional to checkout the fresh air requirements for the boiler & fire, and obtain a safety certificate from him. Its a good practice to check & service the boiler & fire every year, is a legal requirement if you are a land load. As back boiler uses open flue which demand high temperature flue gas these are not very energy efficient even the new ones rated at about 78%.

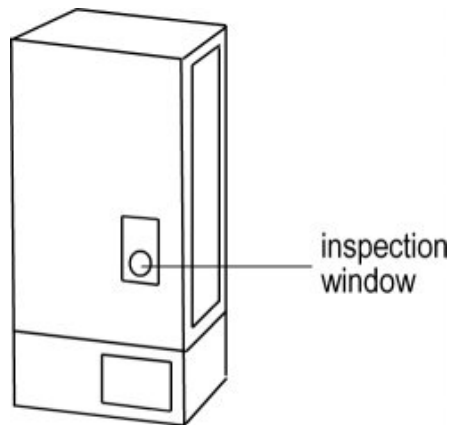


Wall Mounted Boiler

This is popular because in most kitchen floor space is at a premium. They are similar to free standing boilers but are light enough to be fixed to a wall and do not have to rest on the floor. Most wall mounted boilers now are fan assisted, there balanced flue models both are room sealed and the open flue version is not available.

Wall mounted boilers are also known as low-water content boilers because the heat exchanger in them have very little capacity, there some with cast iron heat exchanger, which can hold reasonable water capacity. Because of the low water content their heat exchanger can easily overheat, hence high flow rate of water through the boiler must be maintained. A wall mounted boiler is not suitable for gravity central heating system or gravity hot water system.

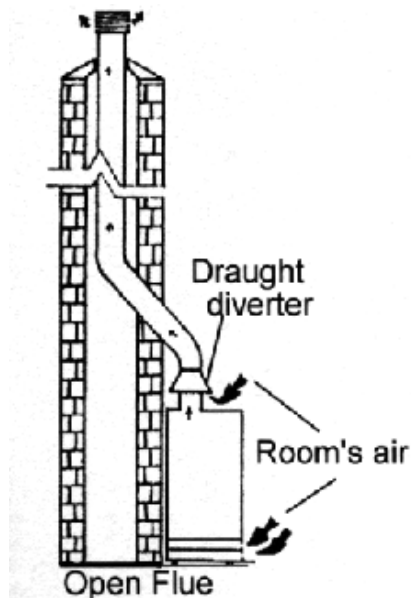
It is common to hide them in a kitchen cupboard, although the room sealed boiler does not need air from the room to burn, do not fill the space in the cupboard the boiler need air circulation to prevent over heating. This is known as boiler compartment ventilation.



Free Standing Boiler

These are very popular in 70s and 80s, usually positioned on the floor in the kitchen or in an out boiler house. They have cast iron heat exchanger. All oil boilers are free standing, free standing gas boilers, because they take floor space are not normally considered for small houses, auto hopper feed solid fuel boilers are normally free standing ones.

A Free Standing Boiler can be a conventional boiler, combination boiler or condensing boiler and they can have open flue, balanced flue or fan assisted flue.

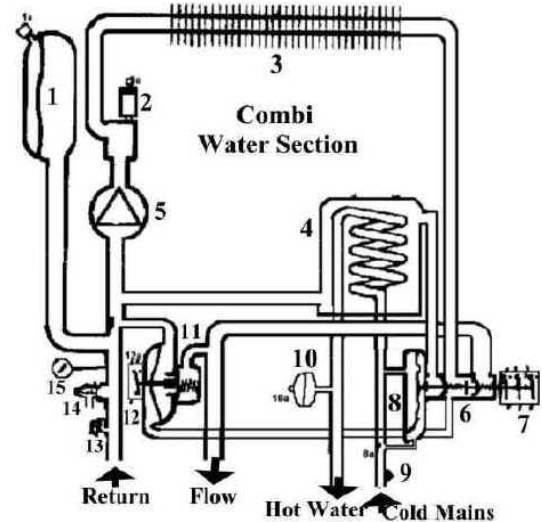


Combination Boiler

A Combination Boiler (Combi) can provide central heating and hot water without the need for a hot water cylinder. There no need to store hot water at higher temperatures where heat will be lost, hence a Combi can save money. The problem with them is that they can only supply one tap at a time and have hot water priority that is they will stop the central heating while heating water.

Components:

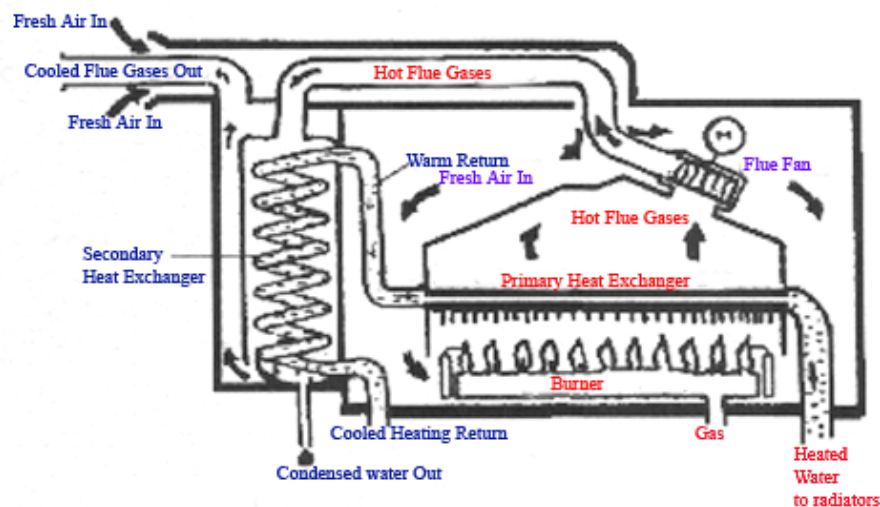
1. Expansion Vessel
2. Auto Air Vent
3. Heat Exchanger
4. Domestic Hot Water Heat Exchanger
5. Pump
6. Diverter Valve
7. Micro Switches
8. Differential Pressure Unit
9. Water Governor
10. Domestic Hot water Expansion Vessel
11. By Pass Valve
12. Flow Switch
13. Low Pressure Sensor
14. Pressure Relief Valve
15. Pressure Gauge



Condensing Boiler

Traditional gas boiler discharges hot flue gases directly into the atmosphere, and in doing so throw away a considerable amount (nearly 25%) of heat which has been generated at a cost.

The condensing boiler is designed to extract more heat from a same quantity of gas than is possible when using traditional boilers. Hence saving gas and money in the process. This increase in efficiency of the boiler is obtained by retrieving most of the heat from the hot flue gases which would otherwise have gone to waste. The Condensing Boiler uses a secondary heat exchanger or condensing coil to recover heat from the hot flue gases. In gas combustion heat is produced along with water vapour (steam) and mixture of carbon & Nitrogen oxides. The temperature of this flue gas will be near to that of flame. The flue fan draws the hot flue gas through the primary heat exchanger (the main heat exchanger as in the traditional boiler) which is situated over the flame. The system water is heated when it passes through it and fed to the radiators. The returning water from the system after circulating through the radiators will be at low temperature. This low temperature returning water enters the secondary heat exchanger. Which is heated by the hot flue gas that went through the primary heat exchanger. The water in the secondary heat exchanger will now recover some heat that normally lost on standard boilers.



Reference:

http://www.centralheatingcentre.com/Central_Heating/boilers.htm