DHW from a Combination boiler.

Combination boilers have domestic hot water production (dhw) as a supplementary feature. DHW performance for various combination boilers will range between 10L and 21 L per minute at 25 Degrees temperature rise depending on the make and model of the appliance.

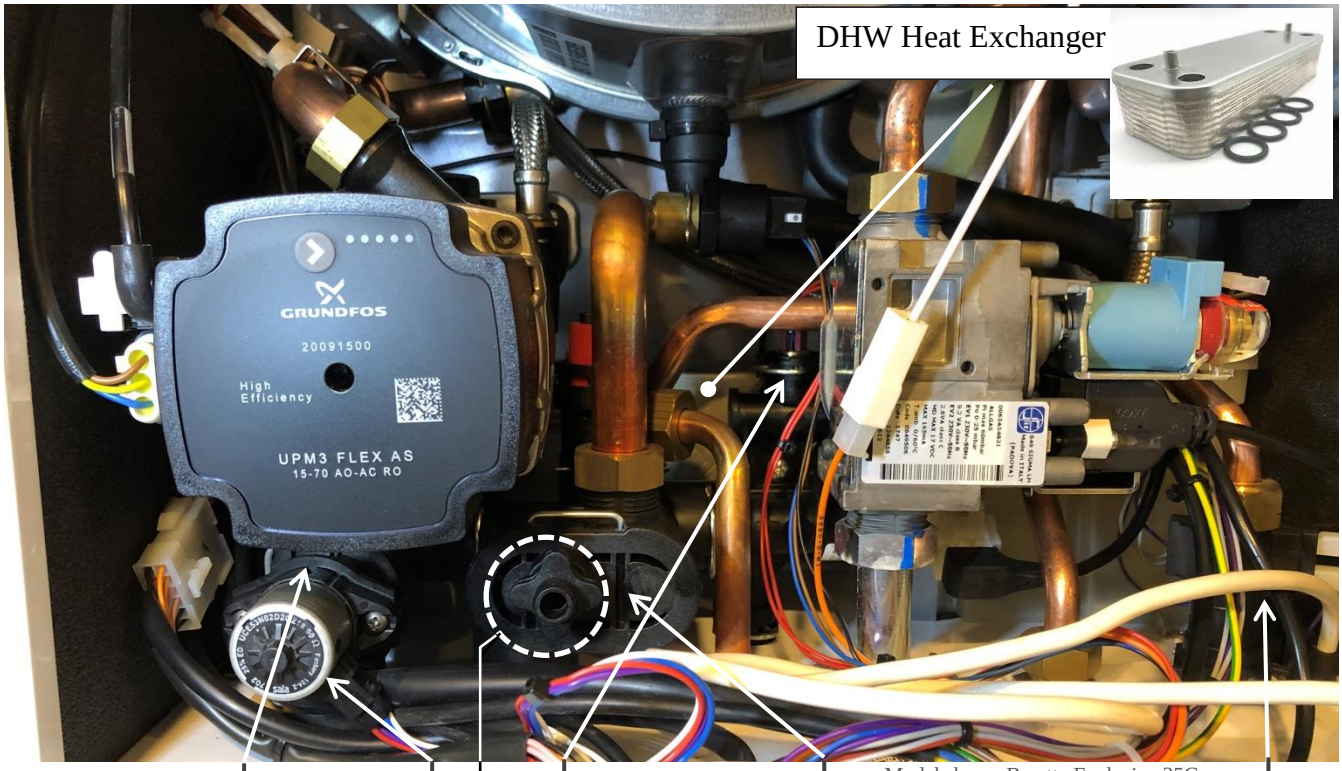
Most manufacturers use the 25 Degrees rise when quoting performance (This is in line with the 25 degree rise quoted for leading brand on demand water heaters)
However In reality the requirements of the user are better considered at 35 Degrees rise.
Example: An appliance supplying **21L @ 25** Deg rise, - will give around **15 L @ 35** Deg rise.

It is interesting to note that a condensing boiler will use 10 to 15% less energy per litre to produce this hot water, when compared to than a conventional wall hung instantaneous gas water heater.

How it works
A combination boiler incorporates a secondary plate heat exchanger and a diverter valve assembly when there is a demand for domestic hot water the diverter valve closes the heating output port and diverts the energy from the primary heat exchanger through the plate heat exchanger. This action is triggered by a flow switch which activates as the user runs a tap. When the tap is closed the diverter valve returns to provide any heating demand.

This Combination system is generally trouble free, but just like any other appliance there can occasionally be issues. Here we list some faults and checks *(Though similar for other brands we may refer here to items which are specifically associated to the* **Beretta** *boilers we provide)*

- **Lime-scale build up and blockage of the domestic side of the plate heat exchanger.**
  This is rare but possible in areas with high scale in water supply. Usually evident by low flow at taps The dhw heat exchanger is held in place by two Philips screws through the assembly
- **Ferrous magnetite sludge blockages in the Heating side of the plate heat exchanger and throughout the diverter assembly.**
  Usually an issue in older systems, or systems that have inadequate inhibitor dosage. Often displays as fluctuating performance or overheating of the Primary HX
- **Diverter valve cartridge sticking allowing partial flow into the heating circuit.**
  Easily detected when the heating is off by feeling the heating flow pipe when a hot tap is running if the flow is warming up there is pass by which will usually display as under heating of the dhw
- **Diverter valve actuator not operating.**
  The system continues in heating mode , but doesn't produce heat output to the dhw
- **DHW Thermistor calibration fault.**
  Usually triggers a thermistor alarm code, but can occasionally be a source of wide mid range fluctuation of dhw temperature without triggering an alarm as the alarm happens when it goes over or under a set point
- **Incoming domestic flow switch not maintaining connection.**
  Usually results in unexplained dropping in and out of the burner despite not reaching temperature
- **Check valves within the diverter assembly sticking.**
  This is usually as a result of dirt and debris in the system and generally displays as ramping of the burner and flame lock out followed by re ignition whilst the hot water performance is not as hot as expected. This is often found to be the root issue especially when the system is inadequately inhibitor protected **see over for more guidance.**



Model shown Beretta Exclusive 35C

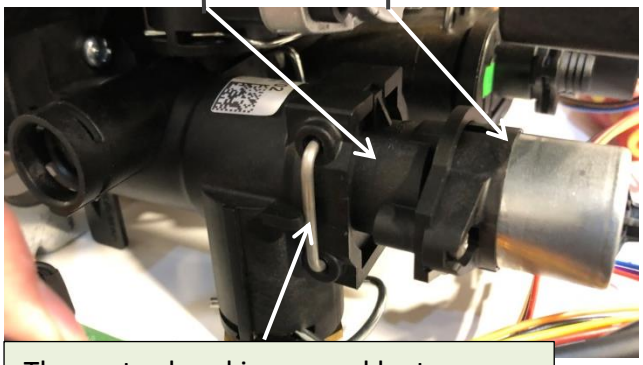
Diverter cartridge

Diverter valve head

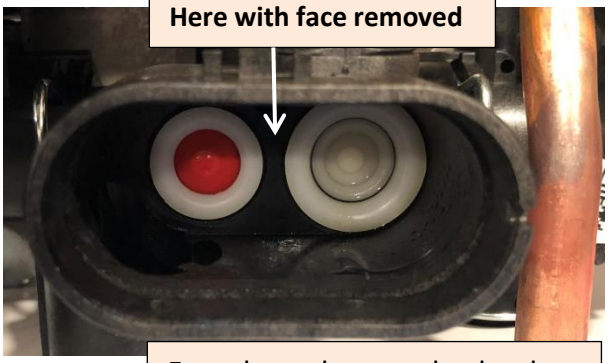
DHW thermistor

Drain and check valve assembly

DHW flow switch assembly



The motor head is secured by two screws the cartridge is held in place by this lock pin



From here the two check valves can be removed. The red (Left one) is the DHW side

To Remove Clean or replace any of the above items you will first need to isolate the water and power supply and turn off the two valves on the heating flow and return. You can then drain out the boiler using the drain valve in the dotted circle using a suitable drain tube on the spigot. Take care to protect the electrical components from water during any procedure.
Please also refer to the boiler manual.

The dhw flow switch is on the cold input it includes a strainer which can be accessed from the connection below the boiler In some boiler models it also includes a flow restrictor. Within the assembly is a cartridge with a shuttle magnet which triggers the switch