

## System radiator balancing

It is not possible to give specific information regarding the speed setting for the pump, as the required pump performance depends on the resistance of the system to flow. Larger systems will generally require a higher pump speed setting than for smaller systems. However, following the method below will allow the system to be balanced.

Set the speed selector switch to speed II initially.

If a bypass valve is fitted, set the bypass valve to give satisfactory operation of the boiler under minimum heat load conditions. The bypass will need to be re-adjusted if the pump speed setting is changed.

Set all thermostatic radiator valves to full open, or remove the valve heads, ensure that the valve pin is free and not holding the valve closed.

Initially set the lock shield valves, for radiators close to the pump set the valve to  $\frac{1}{4}$  of a turn open, and those more remote to  $\frac{1}{2}$  to 1 turn open.

Allow the system to stabilise, then check the temperatures of the flow and return pipes of each radiator.

The temperature difference should be between 10 °C and 20 °C depending on the boiler operating requirements, for example flow temperature 70 °C with and return temperature of 50 °C to 60 °C.

For balancing the system, it is suggested to use a flow temperature of 60 °C to 65 °C, as this temperature can be just about be felt by hand without burning. A return temperature of 40 °C to 55 °C can be felt comfortably by hand.

If the differential temperature is too low, slightly open the lock shield valve; and if the differential temperature is too high close the lock shield valve slightly. Work around the system several times until system balance has been achieved.

When the system is finally balanced, it may be that lock shield valves on radiators close to the pump are only  $\frac{1}{16}$ <sup>th</sup> or  $\frac{1}{8}$ <sup>th</sup> of a turn open, this is perfectly acceptable as long as there is a good temperature difference across the radiator. Radiators further from the pump may have the lock shield valve set to full open. The regulation of the lock shield valve has the most effect in the first half a turn.

If the system can not be balanced using speed II, and there are radiators where the temperature differential is too great, then the pump speed setting should be increased to speed setting III.

If the system can be balanced, but the lock shield valves are generally  $\frac{1}{8}$ <sup>th</sup> to  $\frac{1}{4}$  of a turn open, then it may be possible to re-balance the system using speed setting I, and opening the lock shield valves.

A high a temperature differential across the boiler indicates insufficient flow. Correct this by either increasing the pump speed setting and or opening radiator lock shield valves while maintaining the system balance.

Operating the circulator on a high speed setting or operating with a low temperature differential, leads to unnecessarily high power consumption. A high speed setting may also lead to noise in the system and radiator valves.

For systems with condensing boilers, it is important to operate the boiler with a return temperature of 55 °C for the most part, in order for the boiler to be in condensing mode to achieve a good efficiency.