The use of 6 port PICV's in Closed Systems

The purpose of these valves is to allow the fan coil/terminal units to be used for both heating & cooling, therefore reducing installation costs by reducing the number of terminal units required.

6 port valves are widely used on the continent for 4-pipe change over systems feeding heating and cooling ceilings, decentralized ventilation units, fan coil systems and convection heating and cooling units.

However, whenever their use is proposed in the UK, the common response from both contractors and consulting engineers is that water treatment issues arise on typical UK 4-pipe systems as, whenever the mode changes from heating to cooling or vice versa, cross contamination between the LTHW and CHW circuit occurs.

Although this is true, the CHW and LTHW circuits remain pressure isolated at the mid-point and are unlikely to change from heating to cooling mode without a period that neither is required so there are no pressure or temperature issues.

a) Is there anything in BG29 or BG50 which indicates that using these valves presents a problem, or non-compliance with these guidance notes?

b) Providing that both CHW & LTHW are utilising an identical water treatment programme, is there any problem in mixing the system water?

CSCA Technical Committee, during a previous discussion, covered the following:

a) The use of 6 port valves could reduce installation costs.

b) 6 port valves could facilitate mixing of the LTHW & CHW systems at time of changeover, however, this would not be a problem if both systems were treated by the same methodology and chemistry was identical.

c) The flow & return pipework of the chilled water system could be static when in heating mode and LTHW pipework could be static when in cooling mode. This could effectively produce dead-legs which could remain static for some months and is in contravention of the guidance in BG50 2.2.2 para 3 which recommends circulation for at least 1 hour/day.
This could result in depletion of inhibitor, settlement and adsorption of suspended solids, under deposit corrosion, etc.

We now understand that this may be the case with some 6 port valves and that the remedy could possibly be e.g.:

i) Installation of bypasses within the 6 port valve to facilitate continuous flow or

ii) regular switching of modes to facilitate circulation for the recommended 1 hour/day.