

Ambient Design Temperatures for Heat Pumps - V2

MCS details ambient temperatures for 8 areas within the UK in Table 2 in MIS3005. Many installers wrongly assume that this temperature is the external temperature that the heating system should be designed to. It is actually the ambient temperature that any internal immersion heaters in the heat pump should not operate above. The actual design ambient temperature should actually be lower than this. Table 2 in MIS3005 is taken from CIBSE Guide A and the National Annex to BS EN12831 and are the external temperatures which local temperatures do not fall below in 99% of the year. If heat pumps are sized to this temperature, a factor of 1.2 (previously 1.15) should be applied to the peak kW load. These systems are classed as intermittent systems (i.e. the system has the ability to provide the entire space heating requirement on the design day within a period of no more than 16 hours without the use of supplementary heaters).

The actual design ambient temperature of the system is something which should be agreed between the installer and client, however MCS states that the heat losses should be carried out in accordance to BS EN12831 and the National UK annex. In this document there is a second table of temperatures (also from CIBSE Guide A) which details the external temperatures which local temperatures do not fall below 99.6% of the year. The National UK annex allows these temperatures to be used for continuous systems (defined as systems with the ability to provide the entire space heating requirement on the design day within a period of greater than 16 hours without the use of supplementary heating) as the external ambient design temperature without any factors applied to the peak load.

If there is local knowledge regarding the temperatures experienced in the location, it is possible to adjust these temperatures accordingly. The temperatures should also be decreased by 0.6C per 100m above sea level.

Location	External Temp A	External Temp B
	99.6%	99%
Belfast	-2.6	-1.2
Birmingham	-5.4	-3.4
Cardiff	-3.2	-1.6
Edinburgh	-5.4	-3.4
Glasgow	-5.9	-3.9
London	-3.3	-1.8
Manchester	-3.6	-2.2
Plymouth	-1.6	-0.2