

Table taken from MCS 020 Issue 1.3, 2019

Section 3 pages 15-22

Description of the Assessment Position

The Assessment position is a first floor bedroom window, in School Cottage, What3Words :
///speeds.riding.reap, it is 9.4 m away from Heat Pump A and 6.2 m away from Heat Pump B.
The line of sight is blocked by the cable wall of School cottage as Heat pumps and the bedroom window face the same direction.

Step

From manufacturer's data, obtain the A-weighted sound power level of the heat pump. See 'Note 1: Sound power level'. The highest sound power level specified should be used (the power in "low noise mode" should not be used). Example. Manufacturer's data states the sound power level of the heat pump is 55 dB(A)

1

Use 'Note 2: Sound pressure level' and 'Note 3: Determination of directivity' to establish the directivity 'Q' of the heat pump noise. Example. The heat pump is to be installed on the ground and against a single wall hence the directivity (Q) of the heat pump noise is Q4

2

Measure the distance from the heat pump to the assessment position in metres. Example. Distance between heat pump and assessment position is 4 metres.

3

Use table in 'Note 4: dB distance reduction' below to obtain a dB reduction. Example. 4metres@ Q4 = -17 db.

4

Establish whether there is a solid barrier between the STEP 5 RESULT= heat pump and the assessment position using 'Note 5: Barriers between the heat i;1umi;1 and the assessment i;1osition' and note any dB reduction. Example. There is a brick wall between the heat pump and the assessment position Moving less than 25cm enables the assessment position to be seen dB reduction = -5 dB

5

Calculate the sound pressure level (see 'Note 2: Sound i;1ressure level') from the heat pump at the assessment position using the following calculation: (STEP 1) + (STEP 4) + (STEP 5) Example (55) + (-17) + (-5)=55 -17- 5 =33 dB(A) Lp

6

Background noise level. For the purposes of the MCS Planning Standard for air source heat pumps the background noise level is assumed to be 40 dB(A) Lp. For information see 'Note 6: MCS Planning Standard for air source heat i;1umi;1s background noise level'. Example.

7

Background noise level is 40 dB(A)

- 8 Determine the difference between STEP 7 background noise level and the heat pump noise level using the following calculation: (STEP 7) - (STEP 6)

Noise Calculation at Bedroom window is 40dB(A)+29dB(A)+32dB(A)

If Heat Pump B is moved 30 cm then the "determination of directionality" changes from a Q8 to a Q4 then the MCS Calculated noise at the window falls from 35 dB(A) to 32 dB(A) and the overall noise level at the window falls to 40.9 dB(A)

Formula Used to add the noise levels of the 2 HPs to notional background 40dB(A)

$$L = 10 \log_{10} \left(\sum_{i=1}^n 10^{(L_i / 10)} \right)$$

For example, adding three levels 94.0 + 96.0 + 98.0:

$$L = 10 \log_{10} (10^{9.4} + 10^{9.6} + 10^{9.8}) = 101.1 \text{ dB}$$

MCS Planning Standards for Performance of Wind Turbines and Air Source Heat Pumps

Heat Pump A

62dB(A)

Q4

9.4 m

-23

-10

29

40 dB(A)

41.5 dB(A)

mitted Development Installations

Heat Pumps on Domestic Premises

Heat Pump B

62dB(A)

Q8

6.2m

17

-10

35

40 dB(A)

[Decibel Calculator - dB Calculator - Addition and Subtraction of dB Values \(noisemeters.com\)](https://noisemeters.com/decibel-calculator)