

Air source heat pump acoustic sound pressure calculation as per MCS020 Planning Standards



Calculation Procedure	Result
Description of assessment position tested (This must be detailed enough to allow for identification, including property address and exact location of window / door opening and floor level. It is recommended that a map, sketch, photo or other record be attached to these workings.)	The assessment position is the closest rear opening of 50 Queens Avenue, which we assume leads to a habitable room. The assessment position is over 13m away from the heat pump. We are rounding down to the next lowest distance band of 12m. 50 Queens Avenue is the nearest window or door to any neighbour of 48 Queens Avenue that is used for Class C purposes of the Town and Country Planning (Use Cases) Order 1987. 46 Queens Avenue is used as a surgery, not a Class C purpose.
1. 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).	60dB
2. Use „Note 2: Sound pressure level“ and „Note 3: Determination of directivity“ below to establish the directivity „Q“ of the heat pump noise.	Q4 – “Two Reflective Surfaces”
3. Measure the distance from the heat pump to the assessment position in metres.	12m (actual distance is >13m)
4. Use table in „Note 4: dB distance reduction“ below to obtain a dB reduction.	-26 dB
5. Establish whether there is a solid barrier between the heat pump and the assessment position using „Note 5: Barriers between the heat pump and the assessment position,, and note any dB reduction.	A solid wall sits between the heat pump and the assessment position. The heat pump cannot be seen at the assessment position when moving 25cm from any edge of the heat pump.
6. Calculate the sound pressure level (see „Note 2: Sound pressure level“) from the heat pump at the assessment position using the following calculation: (STEP 1) + (STEP 4) + (STEP 5)	24 dB(A)
7. 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 pumps background noise level“.	40 dB(A)
8. Determine the difference between STEP 7 background noise level and the heat pump noise	16 dB(A)

level using the following calculation: (STEP 7) – (STEP 6)	
9. Using the table in „Note 7: Decibel correction“ obtain an adjustment figure and then add this to whichever is the higher dB figure from STEP 6 and STEP 7. Round this number up to the nearest whole number.	40.1 dB(A)
10. Final Result	41.0 dB(A)
Is the FINAL RESULT in STEP 9 lower than the permitted development noise limit of 42 dB(A)? If YES - the air source heat pump will comply with the permitted development noise limit for this assessment position and may be permitted development (subject to compliance with other permitted development limitations/conditions and parts of this standard). NOTE - Other assessment positions may also need to be tested. If NO – the air source heat pump will not be permitted development. This installation may still go ahead if planning permission is granted by the local planning authority	YES – The air source heat pump complies with the permitted development noise limit for this assessment position and may be permitted.

Calculation Summary as per MCS_Heat_Pump_Calculator_v1_8

ASHP - Sound Power Level	
1. Sound power level (dB)	60
2. Sound pressure level (dB)	Q4 - "Two Reflective Surfaces"
3. Distance from heat pump to assessment position (meters)	12
4. dB Distance Reduction	-26
5. Barriers Between heat pump and assessment position	Barrier (no view)
6. Sound pressure level @ assessment position	24
7. Background noise level (dB)	40
8. Differential between 6. & 7.	16
9. Decibel Correction (dB)	40.1
10. Final Result (dB)	41.0
Pass	

Excerpt from the MCS Standard (<https://mcscertified.com/wp-content/uploads/2021/10/MCS-020.pdf>)

Definitions: For the purposes of this standard:

- **Assessment position** means a position one metre external to the centre point of any door or window to a habitable room of a neighbouring property as measured perpendicular to the plane of the door or window.
- **Habitable room** means a room other than a bathroom, shower room, water closet or kitchen.
- **Neighbouring property.** Means any building used for any of the purposes of Class C of the Town and Country Planning (Use Classes) Order 1987 (as amended) (includes dwellings, houses, hotels, residential institutions and houses in multiple occupation). In instances where the proposed wind turbine will be free standing or is to be installed on a detached building within the curtilage of a block of flats, neighbouring property includes flats within the same block of flats (excluding the flat of the 'owner(s)' of the wind turbine). Building mounted wind turbines installed on blocks of flats are not permitted development.

