

Consultants in Noise & Vibration
Building Regulations Certification Sound Insulation Testing

REPORT TITLE: NOISE ASSESSMENT FOR OUTDOOR HEAT PUMPS AT 164 DUKES AVENUE,
LONDON N10 2QB



REPORT REF: 26007-002

ISSUED TO: Paul Archer Design

ISSUED BY: David R Philip BEng (Hons) MIOA

DATE: March 2026

CONTENTS

SUMMARY

1. INTRODUCTION

2. QUALIFICATIONS & EXPERIENCE

3. NOISE ASSESSMENT METHODOLOGY & CRITERION

3.1 Haringey Council Requirements

3.2 BS4142

3.3 Application of Heat Pumps' Noise Limit (Criterion)

4. BACKGROUND NOISE SURVEY

4.1 Survey Instrumentation

4.2 Survey Details & Procedure

4.3 Survey Results, Observations & Heat Pumps' Noise Limit

5. NOISE FROM HEAT PUMPS

6. VIBRATION FROM HEAT PUMPS

Appendix A: Noise Survey Instrumentation

Appendix B: Aerial Image & Heat Pumps Location Drawing

Appendix C: Background Noise Survey Results

Appendix D: Manufacturer Noise Data For Heat Pumps

Appendix E: Noise Assessment Positions & Noise Model Calculation For Heat Pumps

SUMMARY

- This report provides a noise assessment for outdoor heat pumps at 164 Dukes Avenue, London N10 2QB. There are two Daikin heat pumps, each located on a small concrete slab plinth externally to the rear of the property.
- The assessment is in accordance with the Local Planning Authority (Haringey Council) planning application validation requirements and is conducted with reference to the Council's noise policy, typically imposed noise condition plus guidance of the current edition of relevant British Standard BS4142.
- As part of the assessment a background noise survey has been conducted over several days including sample weekdays and a full weekend. The survey establishes existing background noise levels during the full range of operational times of the heat pumps, at a position directly representative for outside nearest noise sensitive premises (neighbouring residential properties). Results of the noise survey are used to set a noise limit for the heat pumps in accordance with Haringey Council requirements.
- Using manufacturer noise data, a noise model calculation has been used to determine noise from the heat pumps to outside neighbouring properties. Details for the heat pumps' manufacturer noise data and noise model calculation are provided in the report.
- The assessment demonstrates noise generated by the heat pumps to neighbouring properties below background noise levels and compliant with Haringey Council planning consent noise requirements. At this level, noise from the heat pumps would not be expected to cause disturbance to, or otherwise be of impact on, the amenity of neighbouring properties.
- The report also considers vibration. Location of the heat pumps is separate from (i.e. not structurally attached, connected or fixed to) neighbouring properties, plus in addition are installed mounted from their concrete slab plinths on rubber support channel type vibration isolators. Consequently, there will not be any vibration transmission from the heat pumps to neighbouring properties. It is unnecessary to specify additional or replacement vibration isolator mountings to the heat pumps.

1. INTRODUCTION

Two outdoor Daikin heat pump units are installed at 164 Dukes Avenue, London N10 2QB, each located on a small concrete slab plinth externally to the rear of the property.

The Local Planning Authority (Haringey Council) planning application validation requirements include submission of a noise assessment for plant / equipment such as external air conditioning and air source heat pump units etc. This is for reason to enable the Council to assess the potential noise impact of plant / equipment upon occupiers of neighbouring noise sensitive properties.

This report provides a noise assessment for the heat pumps and includes:

- Qualifications & experience;
- Noise assessment methodology & criterion; with reference to Haringey Council noise policy, typically imposed noise condition and current edition relevant British Standard BS4142;
- Measurement survey of background noise levels including procedure, instrumentation, results & observations;
- Details of the heat pumps, including location & manufacturer noise data;
- Calculation & assessment of noise from the heat pumps;
- Consideration of vibration from the heat pumps.

2. QUALIFICATIONS & EXPERIENCE

This report is prepared and issued by David Philip. David Philip graduated in 1989 from The University of Salford Department of Applied Acoustics with a BEng Honours degree in Electroacoustics. David Philip has been since 1995, and continues to be, a fully elected Member of the Institute of Acoustics (MIOA).

David Philip has been the owner / managing director of Philip Acoustics since the firm was formed in 2002. Prior to the formation of Philip Acoustics, David Philip held senior acoustic consultant positions at Sound Research Laboratories (London office) and Spectrum Acoustic Consultants.

Philip Acoustics has held full membership of the Association of Noise Consultants (ANC) since 2003 and is also a full member of the ANC Registration Scheme of approved independent organisations to undertake Building Regulations Approved Document Part E pre-completion certification sound insulation testing.

David Philip has over 35 years' experience as an Acoustic Consultant both in the UK and internationally and has considerable experience undertaking noise surveys and noise assessments for a wide range of commercial uses and also residential developments.

This experience includes a substantial quantity of noise assessments specifically associated with air source heat pumps, air conditioning units and similar plant / equipment serving commercial / retail premises, community use premises and also residential properties.

David Philip is fully familiar with Haringey Council's planning consent noise requirements, provisions of the current (and previous) editions of relevant British Standard BS4142, as well as other acoustics related standards and guidance documents.

The opinions expressed in this report are the true and professional opinions of David Philip. Neither David Philip nor Philip Acoustics is appointed on any incentive fee basis.

3. NOISE ASSESSMENT METHODOLOGY & CRITERION

A review of Haringey Council's noise policy / planning consent noise requirements, details of relevant British Standard BS4142 and appropriate noise criterion for the heat pumps are provided in the following sub-sections.

3.1 Haringey Council Requirements

Policy DM1 and Policy DM23 of Haringey Council Development Management DPD (July 2017) include reference to noise (and vibration) as potentially applicable for planning applications relating to proposed outdoor plant / equipment such as air conditioning units and heat pumps:

- **DM1: *Delivering High Quality Design;***
- **DN23: *Environmental Protection.***

Neither of these policies nor their supporting paragraphs provide specific technical guidance in terms of noise assessment methodology or noise limit criteria for proposed plant / equipment.

In granting planning approval for the installation of outdoor air conditioning units and/or air source heat pumps etc. to serve residential dwellings, Haringey Council typically impose a standard condition including with noise criterion limit for reason including reference to Policy DM1 as the two examples reproduced below:

4. The noise level from air source heat pump shall at all times remain 5dB(A) below background levels when measured at any nearby residential window or other noise sensitive receptor.

The plant/ equipment shall be serviced regularly in accordance with the manufacturer's instructions and as necessary to ensure that the requirements of the condition are maintained. If at any time the plant is determined by the local planning authority to be failing to comply with this condition, it shall be switched off upon written instruction from the local planning authority and not used again until it is able to comply.

Reason: In order to protect the amenities of nearby residential occupiers consistent with Policy D14 of the London Plan 2021 and Policy DM1 of The Development Management DPD 2017.

3. The design and installation of the air conditioning unit shall be such that when operating the cumulative noise level LAeq TR arising from the unit, measured or predicated at 1m from the facade of the nearest noise sensitive premises, shall be a rating level of at least 5dB(A) below the background noise level LAF90 Tbg. The measurement and/or predication of the noise should be carried out in accordance with the methodology contained within BS 4142:2014

Reason: To protect neighbouring resident's amenity.

In overview terms, the Council's condition sets a criterion / limit that noise from proposed plant / equipment to serve residential dwellings such as air conditioning units and air source heat pumps shall be at least 5dBA lower than background noise levels, applicable to outside windows of nearest noise sensitive premises, with reference to the measurement and assessment provisions of BS4142:2014. This is used as noise assessment methodology and criterion for the heat pumps at 164 Dukes Avenue.

Additional information and clarification details associated with the noise assessment methodology and criterion with reference to BS4142 as applicable for the outdoor heat pumps are provided in Sub-Sections 3.2 & 3.3.

3.2 BS4142

Full title of the current edition of this standard is BS4142:2014+A1:2019 "*Methods for rating and assessing industrial and commercial sound*". Unless stated otherwise, reference throughout this report to BS4142 relates to this current edition British Standard.

As an aid to clarity and as consistent with wording of the Council's policy plus example conditions, this report retains use of the more commonly used term "*noise*" as opposed to the replacement term "*sound*" of the current edition BS4142.

BS4142 provides a well-established methodology to assess the likely effect (impact) to people regarding noise of an "industrial or commercial" nature including noise from mechanical services plant / equipment. Consequently, in requesting noise assessments for proposed air conditioning units or air source heat pumps and regardless of whether to serve an industrial, commercial or residential property, most Local Planning Authorities refer to BS4142.

In this scenario, the BS4142 assessment method requires that source noise data for the heat pumps is established, and existing background noise levels be measured. The assessment is then carried out by comparing the heat pumps' overall noise Rating Level with background noise levels, at position outside nearest neighbouring residential properties.

The heat pumps' overall noise Rating Level is the Specific (actual) Noise Level of the heat pumps plus with any corrections applied to account for subjective characteristics of the noise at the assessment position that might mean it is more noticeable and potentially have more impact.

The BS4142 assessment method then provides guidance on the likely noise impact (effect) to people depending on the magnitude of the excess of the heat pumps' noise Rating Level over the pre-existing background noise; the higher the excess the more likely there would be an adverse impact and correspondingly, the lower the excess (or no excess) the less likely there would be an adverse impact.

BS4142 does not provide any specific guidance on suitable noise limits / criteria or standards including for proposed new plant / equipment such as heat pumps, only guidance on how to determine the likelihood of adverse impact.

In terms of likelihood of adverse (noise) impact, BS4142 advises the following, dependent upon context:

- i) **Where the (heat pumps) noise Rating Level is around +10dB or more above the background, this is likely to be an indication of significant adverse impact;**
- ii) **Where the (heat pumps) noise Rating Level is around +5dB above the background, this is likely to be an indication of adverse impact;**
- iii) **Where the (heat pumps) noise Rating Level does not exceed the background, this is an indication of low impact.**

It is important to note the BS4142 assessment methodology does not have a "no impact" indication categorisation. "Indication of low impact" for where the noise Rating Level does not exceed the pre-existing background is the lowest / least likely noise impact categorisation of BS4142.

Different Local Planning Authorities interpret and apply the guidance of BS4142 differently, some require that the noise Rating Level of proposed new plant / equipment be not higher than +5dB above the existing background, some require not higher than the background, some require a certain amount below the background noise. Some do not have any set requirement and consider each situation / proposed development application individually.

As consistent with Haringey Council's noise condition, then for the purpose of this assessment a noise limit (criterion) is applied that the heat pumps' overall noise Rating Level shall be at least 5dB below the existing background noise at neighbouring noise sensitive (residential) properties.

It is the author's experience of undertaking many noise surveys and assessments of noise from outdoor heat pumps and similar equipment, in similar scenarios and residential use contexts to that as for 164 Dukes Avenue, that at this level, noise from the heat pumps would not be expected to be disturbing or otherwise of impact detrimental to occupiers of neighbouring properties.

3.3 Application of Heat Pumps' Noise Limit (Criterion)

Additional clarification points in respect to the assessment and application of the noise limit are provided below.

a) Heat Pumps' Operating Condition

The noise limit is cautiously/robustly applied for the heat pumps operating simultaneously (cumulatively both at same time) at full rated (100%) duty heating or cooling mode potentially over a full 24-hour period, i.e. including during the middle of the night.

In practice, and as normal, it is expected the heat pumps would operate at a reduced capacity (and thus with reduced noise output over full rated duty) for much of the time, particularly during the night period.

Manufacturer noise data for the heat pumps is provided in Section 5 of the report.

b) Rating Noise Level

The noise limit is applied in terms of a noise Rating Level ($L_{A,T}$ dB) and thus with any corrections (such as for tonal character noise) applied as necessary to the heat pumps' noise at the assessment position as per the BS4142 assessment methodology.

c) Assessment Position

As per normal noise assessment procedures / convention, as Haringey Council's typical conditions, plus with reference to BS4142, the noise limit is applied to an assessment position directly outside nearest windows of nearest noise sensitive properties.

Nearest noise sensitive properties are neighbouring residential dwellings. Details of these are provided in sub-section 4.2 of the report.

d) Background Noise Level

The noise limit is applied cautiously / robustly based on the measured lower value background noise level $L_{A90,T}$ dB ($T = 15$ mins), representative of at the assessment position over 24 hours based on results of a six day noise survey including sample weekdays and a full weekend (see Section 4 of the report). The representative lower value background noise level is established as per BS4142 guidance based on the survey night period results midnight to 6am.

e) **Very Low Background Noise Levels** (for information only – item e not applicable to assessment)

In accordance with the guidance and assessment provisions of BS4142, then for scenarios of very low background noise it is unreasonable / unnecessary to apply a Rating Level noise limit directly relative to the background level, in terms of ensuring amenity protection such that noise from plant (including such as heat pumps) does not cause disturbance or is otherwise of adverse / detrimental impact.

This simply due to that there is a lower threshold level at which plant noise would become inaudible / not noticeable to occupiers of neighbouring properties and thus it being unreasonable and unnecessary to further reduce the plant noise below that level.

BS4142:2014 advises “Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.”

Where background levels are very low it is instead appropriate to apply a minimum (lower level) threshold cap plant Rating Level limit of L_{Ar,T_r} 30dB at assessment positions. BS4142:1997 advised that noise Rating Levels of below 35dB be considered very low.

Thus a minimum threshold cap plant noise limit (Rating Level) set at L_{Ar,T_r} 30dB is significantly below (i.e. as 5dB betterment) to this guidance and for scenarios of very low background noise levels (i.e. regardless of the low background noise) will maintain surety of protection for from loss of amenity due to noise disturbance.

Notwithstanding the above, it is sometimes appropriate to apply a lower plant noise limit (i.e. below the threshold cap) in consideration to avoid “background noise creep”. This potentially occurs in scenarios where multiple plant items serving the same or different directly adjacent premises (i.e. multiple air conditioning units and/or heat pumps etc) are in turn installed in close / immediate proximity to one another and as then cumulatively contributing a higher overall noise level to the same receptor (noise sensitive properties).

4. BACKGROUND NOISE SURVEY

To assess noise from the heat pumps as the Council's requirement it is necessary to establish existing background noise levels representative outside nearest neighbouring residential properties. Details of the conducted background noise survey are provided in the sub-sections below.

4.1 Survey Instrumentation

Details of instrumentation used for the background noise survey are provided in Appendix A. The sound level meter was calibration verified before and after the survey.

4.2 Survey Details & Procedure

The survey was conducted over at least a full 24-hour period to obtain representative samples of the background noise climate during the entire range of possible times of heat pumps' operation.

The survey was over a six-day period from Wednesday 25 February 2026 through Monday 02 March 2026; to include sample weekdays and also a full weekend.

Weather conditions were monitored and with exception of the Friday morning of the survey (light rainfall / drizzle conditions noted), were suitable for the background noise survey in accordance with BS4142 dry (nil precipitation) and with light wind.

Measurements of background noise were recorded continually in terms of consecutive samples of overall $L_{A90,T}$ dB values ($T = 15$ minutes; *BS4142 reference time interval*) for the full survey duration.

The survey measurement position was in accordance with guidance of BS4142; externally in equivalent free-field conditions ≈ 1.5 m above ground level to the rear of the property, facilitated by positioning the instrumentation microphone on a telescopic boom and extension cable arrangement.

The survey position was selected as directly representative for outside nearest noise sensitive properties to location of the heat pumps. Nearest noise sensitive properties are neighbouring residential dwellings adjacent either side at 162 & 166 Dukes Avenue. The heat pumps are installed but not yet operating, therefore were both off during the entire survey period, i.e. did not contribute to the measured noise levels.

An aerial image and plan layout drawing are provided in Appendix B. These indicate location of the heat pumps, neighbouring properties and background noise survey position.

4.3 Survey Results, Observations & Heat Pumps' Noise Limit

Full raw data and analysis of the background noise survey results are provided in Appendix C.

The background noise climate is moderate falling to low during the late evening - night period, and is reasonably consistent from day to day, predominantly due to underlying noise from distant traffic on roads and streets in the local and wider vicinity.

In addition to noise of distant traffic, the author also observed some faintly noticeable (not dominant) noise from distant unidentified plant / equipment; expected to be ventilation plant associated with the nearby Alexandra Palace.

Background noise fluctuates during the day, then gradually reduces during the evening and into the night (lowest between midnight to 6am), before then increasing again in the morning as traffic and activity in the wider area increases.

This diurnal noise profile and the background noise levels are normal for this location.

Summary of the measured representative lower value $L_{A90,T}$ background noise level as occurs during the night period and associated heat pumps' noise limit requirement are shown in Table 1.

Description	Assessment Position & Relevant Times	Representative Lower Background Noise $L_{A90,15min}$	Heat Pumps Noise Limit (Rating Level)
Both Heat Pumps operating full rated duty cooling or heating mode	Outside windows of neighbouring properties <i>Assessment over 24 hours</i>	38dB <i>(occurs during night period)</i>	$L_{A,T,r} \leq 33dB$ <i>($\geq 5dB$ below background)</i>

Table 1: Measured representative lower value background noise & associated heat pumps' noise limit

5. NOISE FROM HEAT PUMPS

Informative 1: Heat Pumps Make & Models

This report and noise assessment is based on the Daikin heat pumps as detailed below. If an alternative make and/or model of heat pump is selected as part of possible future system upgrade or replacement, it is important that noise levels for the alternative heat pump be checked by Philip Acoustics or another Acoustic Consultant to ensure noise emission of the alternative heat pump remains compliant with Haringey Council's requirements.

The two heat pumps are 1 x Daikin RZAG71N and 1 x Daikin RXYSQ8T.

Informative 2: Heat Pumps Noise Data

The heat pumps are installed; however it is not possible, technically appropriate or accurate to conduct the assessment by direct on-site measurement of noise generated by the heat pumps. This is for the following reasons:

- *The heat pumps not operational at date of the author's survey visits;*
- *Attempt at direct measurement of heat pumps noise would be contaminated by the prevailing noise climate; day period underlying ambient noise levels to rear of the property & in proximity of the heat pumps are circa 48 - 50 Leq dBA;*
- *If conducting on-site direct noise level measurement, it is not possible with certainty to determine the heat pumps are operating at full rated duty, as opposed to at a lower duty with consequent lower noise output than for full duty.*

For purpose of this report the assessment is conducted as normal practice using heat pumps' manufacturer published noise data.

Manufacturer's noise data for the heat pumps is provided in Appendix D. The noise data is for the heat pumps operating at full rated (100%) duty in terms of free-field overall dBA and linear dB octave band sound pressure levels at 1m distance. Summary of noise data for the heat pumps is shown in Table 2.

Description	Overall dBA	Octave Band Centre Frequency (Hz) Lin dB							
		63	125	250	500	1k	2k	4k	8k
<u>Daikin RZAG71N</u>									
Full rated duty Cooling Mode	46	50	60	43	42	42	33	29	28
Full rated duty Heating Mode	48	49	59	47	45	44	35	32	27
<u>Daikin RXYSQ8T</u>									
Full rated duty Cooling or Heating Mode	55	60	63	55	52	44	43	42	34

Table 2: Heat Pumps noise data; free-field sound pressure levels at 1m

To establish the overall cumulative noise contribution from the heat pumps to outside windows of nearest neighbouring residential properties (assessment position) a spreadsheet noise calculation model has been used.

Consultants in Noise & Vibration
Building Regulations Certification Sound Insulation Testing

The model takes account of the distance between the heat pumps and assessment position, acoustic directivity, acoustic reflections (i.e. non free-field conditions) and any natural / default line of sight acoustic screening due to orientation and any intervening buildings, walls, fences or other solid structures etc. where applicable. Noise assessment position and model calculation details are provided in Appendix E.

Heat pump overall noise levels to the assessment positions compared with the noise limit are shown in Table 3. Noise to other residential properties in the vicinity that are more distant from the heat pumps will be lower.

Although heat pumps' noise is significantly below background noise levels, the assessment includes a +2dBA correction as current edition BS4142, added to the overall calculated heat pumps' noise levels – to give the noise Rating Levels, to account that noise from the heat pumps potentially has a just perceptible tonal characteristic.

Assessment Position (Neighbouring Properties)	Description	Heat Pumps Overall Noise Level (Rating Level)	Noise Limit (Rating Level)	Comment
A) 162 Dukes Avenue	Heat pumps operating full rated duty <u>Cooling Mode</u>	$L_{Ae,Ti}$ 33dB	$L_{Ae,Ti} \leq 33dB$ ($\geq 5dB$ below background)	Heat pumps noise significantly below the background level & compiles with noise limit
	Heat pumps operating full rated duty <u>Heating Mode</u>	$L_{Ae,Ti}$ 33dB		
B) 166 Dukes Avenue	Heat pumps operating full rated duty <u>Cooling Mode</u>	$L_{Ae,Ti}$ 31dB		
	Heat pumps operating full rated duty <u>Heating Mode</u>	$L_{Ae,Ti}$ 31dB		

Table 3: Heat pumps' noise assessment

The assessment as Table 3 demonstrates noise from the heat pumps compliant with Haringey Council's planning consent noise limit requirement.

At this level, noise from the heat pumps will be significantly below existing lower value background noise levels as occur during the night period, plus in absolute terms be low and would not be expected to cause disturbance to, or otherwise be of impact detrimental to, the amenity of neighbouring residential occupiers.

Additionally, it is important to note the noise model calculation and associated assessment is cautious / robust and in practice noise from the heat pumps will be lower and further below the background noise and limit requirement for the following reasons:

- The assessment is based on the heat pumps operating as "worse-case" at full rated (100%) duty all the time over 24-hours; including all through the night period. This is extremely unlikely to occur for majority of the time. It is likely the heat pumps would operate at a reduced capacity with consequent lower noise output for a significant proportion of the time, particularly during the night period;
- The noise limit used for the assessment is cautiously based on the representative lower value background noise level over 24-hours (i.e. as occurs during the night), as measured during a survey over several days including sample weekdays and a full weekend. Background noise for the majority of the time is higher than the value used for the assessment. Correspondingly, for these times heat pump noise would be further below the background noise occurring during these times.

6. VIBRATION FROM HEAT PUMPS

Locations of the heat pumps are at distance from and separate from (i.e. not structurally attached, connected or fixed to) neighbouring properties.

In addition, the heat pumps are installed mounted from their concrete slab plinths on Flexi-Foot rubber support channel type vibration isolators as indicated in the photo image below (photograph taken by author 02 March 2026).

Consequently, there will not be any vibration transmission from the heat pumps to neighbouring properties. It is not necessary to specify additional or replacement vibration isolator mountings to the heat pumps.



Heat pumps installed mounted from concrete slab plinths on Flexi Foot rubber support channel type vibration isolators (*both heat pumps mounted as this*)

A P P E N D I X A

Noise Survey Instrumentation

Site: 164 Dukes Avenue, London N10 2QB

Report: 26007-002 Appendix A (page 1 of 1)

Date: March 2026

NOISE SURVEY INSTRUMENTATION

Instrumentation Used:

- Rion sound level meter type NL-31 Class 1, Rion preamplifier type NH-21, Rion microphone type UC-53A, Rion microphone windshield type WS-10, Rion microphone extension cable type EC-04A and tripod / boom arrangement;
- Bruel & Kjaer calibrator type 4231.

Instrumentation Calibration Certification:

Description	Type Number	Manufacturer	Date of Calibration Expiration	Calibration Certificate Number
Class 1 Sound Level Meter s/n 00903983	NL-31	Rion	22/03/2026	TCRT24/1257
Microphone s/n 317502	UC-53A			
Preamplifier s/n 33991	NH-21			
Calibrator s/n 2642929	4231	Bruel & Kjaer	22/03/2026	TCRT24/1256

Instrumentation On-Site Calibration Check:

Description	Calibrator Reference Level	Measured Level	Comment
Before survey measurements	94.0dB	93.9dB	Pass
After survey measurements		93.9dB	Pass (<i>nil drift</i>)

APPENDIX B

Aerial Image & Heat Pumps Location Drawing

Site: 164 Dukes Avenue, London N10 2QB

Report: 26007-002 Appendix B (page 1 of 2)

Date: March 2026

AERIAL IMAGE

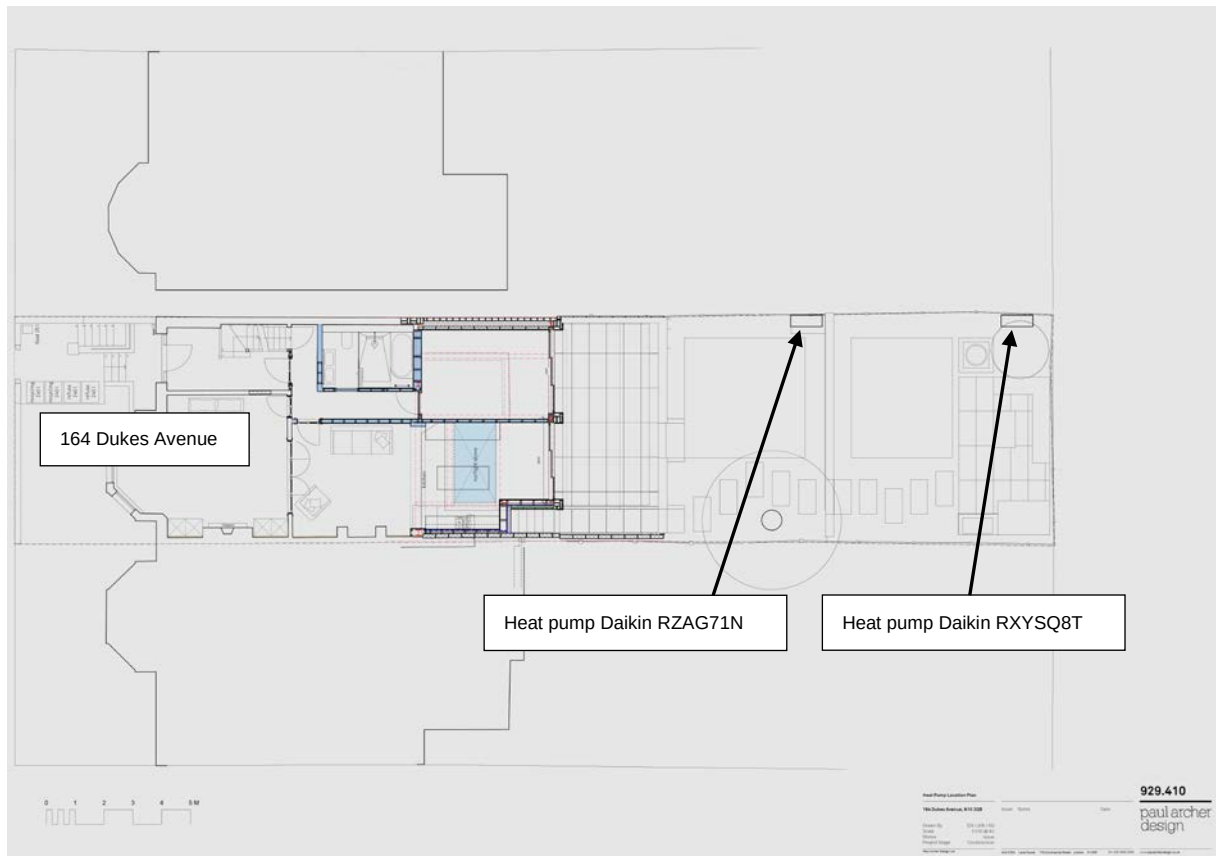


Site: 164 Dukes Avenue, London N10 2QB

Report: 26007-002 Appendix B (page 2 of 2)

Date: March 2026

HEAT PUMPS LOCATION DRAWING



APPENDIX C

Background Noise Survey Results

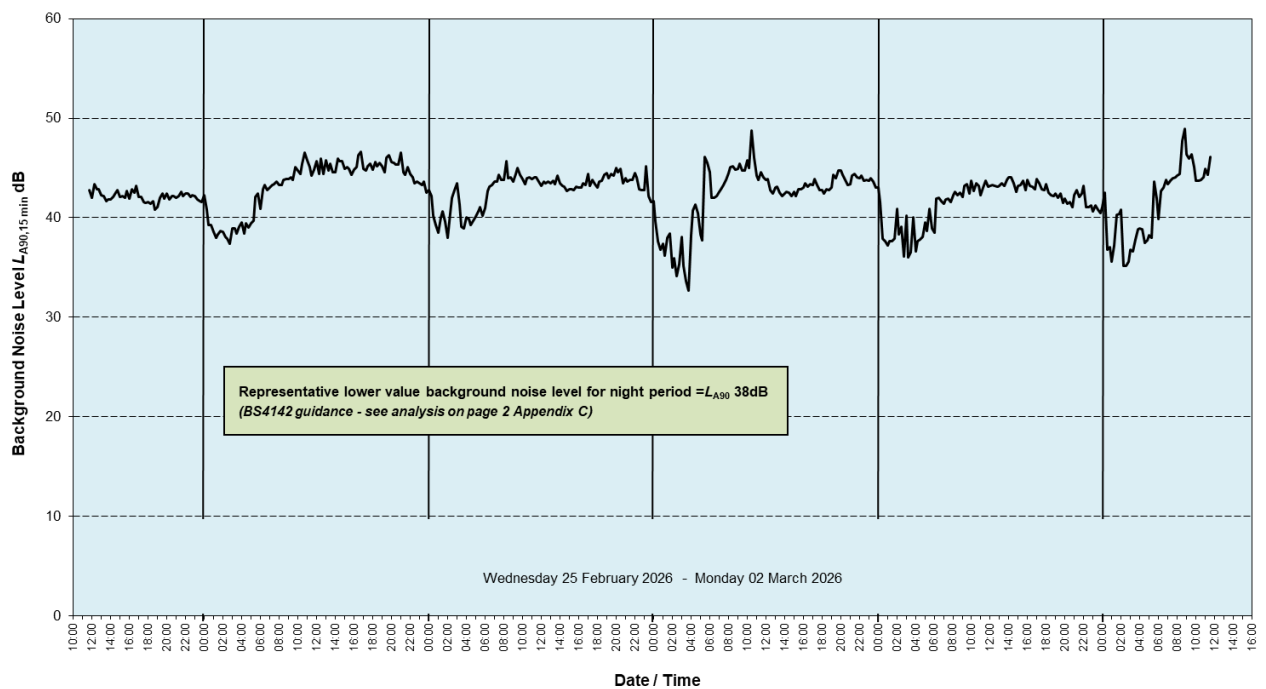
Site: 164 Dukes Avenue, London N10 2QB

Report: 26007-002 Appendix C (page 1 of 2)

Date: March 2026

BACKGROUND NOISE SURVEY RESULTS

Complete Raw Data Results Of Six-Day Background Noise Levels Survey:



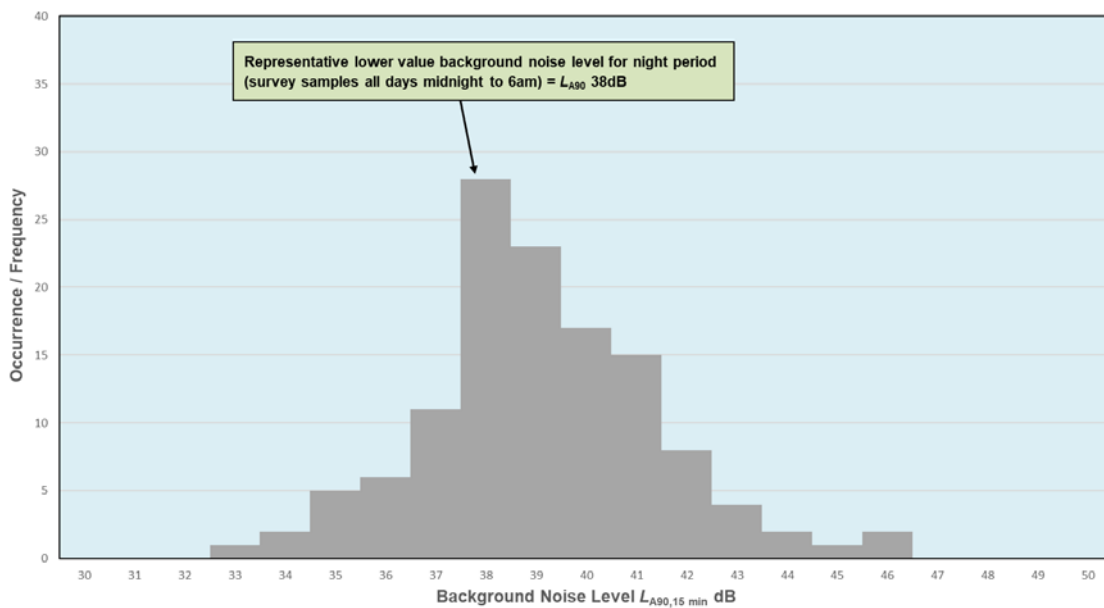
Site: 164 Dukes Avenue, London N10 2QB

Report: 26007-002 Appendix C (page 2 of 2)

Date: March 2026

BACKGROUND NOISE SURVEY RESULTS

Survey Results Analysis To Establish Representative Lower Value Background Noise Level (as BS4142 Guidance):



A P P E N D I X D

Manufacturer Noise Data For Heat Pumps

Site: 164 Dukes Avenue, London N10 2QB

Report: 26007-002 Appendix D (page 1 of 2)

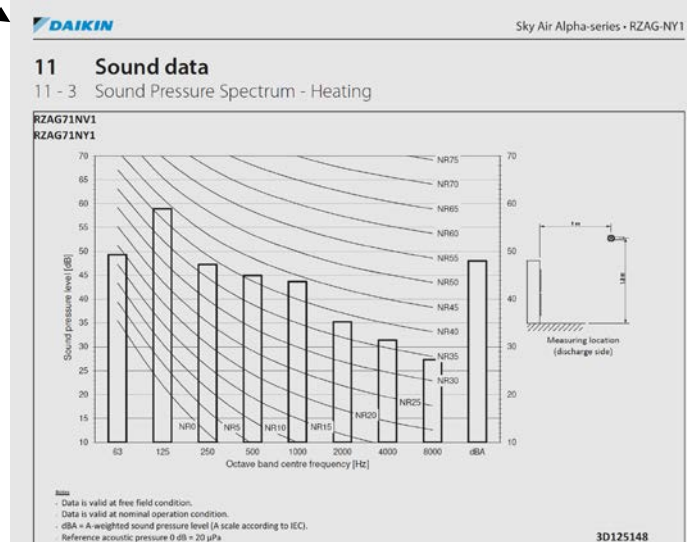
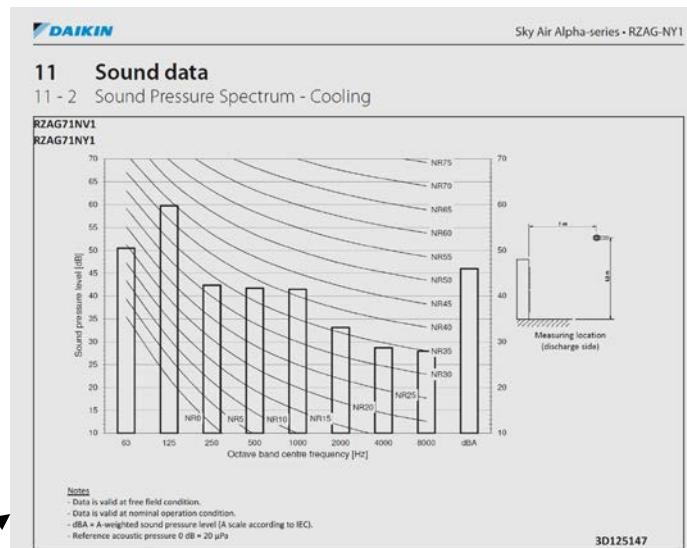
Date: March 2026

MANUFACTURER NOISE DATA FOR HEAT PUMPS

Daikin RZAG71N



Manufacturer noise data is in terms of free-field overall dBA & linear dB octave band sound pressure levels at 1m; heat pump operating rated full (100%) duty heating & cooling modes



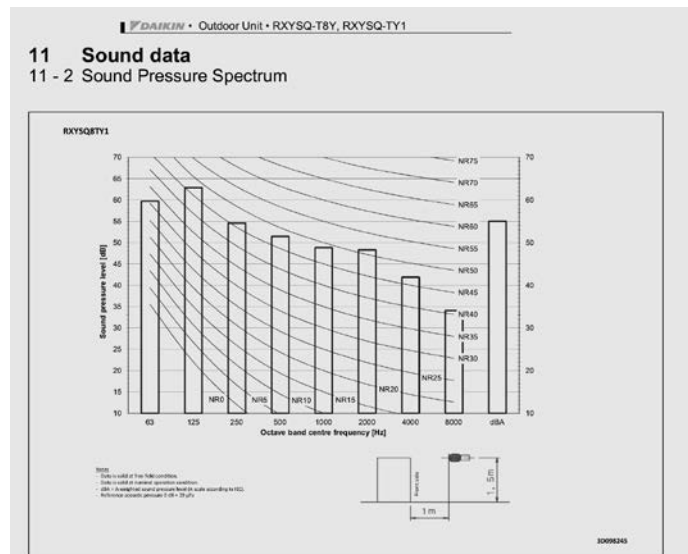
Site: 164 Dukes Avenue, London N10 2QB

Report: 26007-002 Appendix D (page 2 of 2)

Date: March 2026

MANUFACTURER NOISE DATA FOR HEAT PUMPS

Daikin RXYSQ8T



Manufacturer noise data is in terms of free-field overall dBA & linear dB octave band sound pressure levels at 1m; heat pump operating rated full (100%) duty. Same noise data applicable for heat pump heating & cooling modes

A P P E N D I X E

Noise Assessment Positions & Noise Model Calculation For Heat Pumps

Site: 164 Dukes Avenue, London N10 2QB

Report: 26007-002 Appendix E (page 1 of 5)

Date: March 2026

NOISE ASSESSMENT POSITIONS



Site: 164 Dukes Avenue, London N10 2QB

Report: 26007-002 Appendix E (page 2 of 5)

Date: March 2026

NOISE MODEL CALCULATION

Assessment Position A: 162 Dukes Avenue

Noise Condition: Heat pumps 1 x Daikin RZAG71N & 1 x Daikin RXYSQ8T operating full rated duty Cooling Mode

Noise Mitigation: None applied

Noise Calculation Model: Assessment Position A - Cooling Mode		Lin dB at Octave Band Centre Frequency Hz							
Plant & Description	Overall dBA	63	125	250	500	1k	2k	4k	8k
Heat Pump: Daikin RZAG71N									
Noise Data: sound pressure level at 1m (free-field); Lp dB heat pump operating full rated duty <u>cooling mode</u>		50	60	43	42	42	33	29	28
Quantity; 0dB quantity correction applicable for 1 x heat pump		0	0	0	0	0	0	0	0
Noise Mitigation; none applied		0	0	0	0	0	0	0	0
Distance; free-field correction for ≈17m distance from heat pump to assessment position		-25	-25	-25	-25	-25	-25	-25	-25
Screening; nil default screening correction applicable (no intervening structures to assessment position)		0	0	0	0	0	0	0	0
Directivity; nil propagation directivity correction applicable (heat pump radiates noise equally all directions)		0	0	0	0	0	0	0	0
Non Free-Field / Reflections; +3dB correction applied for heat pump adjacent to boundary fence structure		3	3	3	3	3	3	3	3
Heat pump contribution at assessment position	26	28	38	21	20	20	11	7	6
Heat Pump: Daikin RXYSQ8									
Noise Data: sound pressure level at 1m (free-field); Lp dB heat pump operating full rated duty <u>cooling mode</u>		60	63	55	52	44	43	42	34
Quantity; 0dB quantity correction applicable for 1 x heat pump		0	0	0	0	0	0	0	0
Noise Mitigation; none applied		0	0	0	0	0	0	0	0
Distance; free-field correction for ≈24m distance from heat pump to assessment position		-28	-28	-28	-28	-28	-28	-28	-28
Screening; nil default screening correction applicable (no intervening structures to assessment position)		0	0	0	0	0	0	0	0
Directivity; nil propagation directivity correction applicable (heat pump radiates noise equally all directions)		0	0	0	0	0	0	0	0
Non Free-Field / Reflections; +3dB correction applied for heat pump adjacent to boundary fence structure		3	3	3	3	3	3	3	3
Heat pump contribution at assessment position	29	35	38	30	27	19	18	17	9
Cumulative Contribution All Plant At Assessment Position	31	36	41	31	28	23	19	18	11

The heat pumps' cumulative overall noise level (Specific Noise Level) at the assessment position is 31dBA.

Although heat pumps' noise is significantly below background noise levels at the assessment position and not expected to cause disturbance to, or otherwise be of impact detrimental to, the amenity of neighbouring residential occupiers, the assessment includes a +2dBA correction as per the current edition BS4142, added to the heat pumps' cumulative overall noise level – to give the noise Rating Level, to account that noise from the heat pumps potentially has a just perceptible tonal characteristic.

Therefore, in accordance with the noise assessment guidance of BS4142, cumulative overall noise from the heat pumps at the assessment position in terms of a noise Rating Level = $L_{Aeq,Tr}$ 33dBA.

Consultants in Noise & Vibration
Building Regulations Certification Sound Insulation Testing

Site: 164 Dukes Avenue, London N10 2QB

Report: 26007-002 Appendix E (page 3 of 5)

Date: March 2026

NOISE MODEL CALCULATION

Assessment Position A: 162 Dukes Avenue

Noise Condition: Heat pumps 1 x Daikin RZAG71N & 1 x Daikin RXYSQ8T operating full rated duty Heating Mode

Noise Mitigation: None applied

Noise Calculation Model: Assessment Position A - Heating Mode		Lin dB at Octave Band Centre Frequency Hz							
Plant & Description	Overall dBA	63	125	250	500	1k	2k	4k	8k
<u>Heat Pump: Daikin RZAG71N</u>									
Noise Data: sound pressure level at 1m (free-field); Lp dB heat pump operating full rated duty <u>heating mode</u>		49	59	47	45	44	35	32	27
Quantity; 0dB quantity correction applicable for 1 x heat pump		0	0	0	0	0	0	0	0
Noise Mitigation; none applied		0	0	0	0	0	0	0	0
Distance; free-field correction for ≈17m distance from heat pump to assessment position		-25	-25	-25	-25	-25	-25	-25	-25
Screening; nil default screening correction applicable (no intervening structures to assessment position)		0	0	0	0	0	0	0	0
Directivity; nil propagation directivity correction applicable (heat pump radiates noise equally all directions)		0	0	0	0	0	0	0	0
Non Free-Field / Reflections; +3dB correction applied for heat pump adjacent to boundary fence structure		3	3	3	3	3	3	3	3
Heat pump contribution at assessment position	27	27	37	25	23	22	13	10	5
<u>Heat Pump: Daikin RXYSQ8</u>									
Noise Data: sound pressure level at 1m (free-field); Lp dB heat pump operating full rated duty <u>heating mode</u>		60	63	55	52	44	43	42	34
Quantity; 0dB quantity correction applicable for 1 x heat pump		0	0	0	0	0	0	0	0
Noise Mitigation; none applied		0	0	0	0	0	0	0	0
Distance; free-field correction for ≈24m distance from heat pump to assessment position		-28	-28	-28	-28	-28	-28	-28	-28
Screening; nil default screening correction applicable (no intervening structures to assessment position)		0	0	0	0	0	0	0	0
Directivity; nil propagation directivity correction applicable (heat pump radiates noise equally all directions)		0	0	0	0	0	0	0	0
Non Free-Field / Reflections; +3dB correction applied for heat pump adjacent to boundary fence structure		3	3	3	3	3	3	3	3
Heat pump contribution at assessment position	29	35	38	30	27	19	18	17	9
Cumulative Contribution All Plant At Assessment Position	31	36	41	32	29	24	20	18	11

The heat pumps' cumulative overall noise level (Specific Noise Level) at the assessment position is 31dBA.

Although heat pumps' noise is significantly below background noise levels at the assessment position and not expected to cause disturbance to, or otherwise be of impact detrimental to, the amenity of neighbouring residential occupiers, the assessment includes a +2dBA correction as per the current edition BS4142, added to the heat pumps' cumulative overall noise level – to give the noise Rating Level, to account that noise from the heat pumps potentially has a just perceptible tonal characteristic.

Therefore, in accordance with the noise assessment guidance of BS4142, cumulative overall noise from the heat pumps at the assessment position in terms of a noise Rating Level = $L_{Aeq,Tr}$ 33dBA.

Site: 164 Dukes Avenue, London N10 2QB

Report: 26007-002 Appendix E (page 4 of 5)

Date: March 2026

NOISE MODEL CALCULATION

Assessment Position B: 166 Dukes Avenue

Noise Condition: Heat pumps 1 x Daikin RZAG71N & 1 x Daikin RXYSQ8T operating full rated duty Cooling Mode

Noise Mitigation: None applied

Noise Calculation Model: Assessment Position B - Cooling Mode		Lin dB at Octave Band Centre Frequency Hz							
Plant & Description	Overall dBA	63	125	250	500	1k	2k	4k	8k
<u>Heat Pump: Daikin RZAG71N</u> Noise Data: sound pressure level at 1m (free-field); Lp dB heat pump operating full rated duty <u>cooling mode</u> Quantity; 0dB quantity correction applicable for 1 x heat pump Noise Mitigation; none applied Distance; free-field correction for ≈11m distance from heat pump to assessment position Screening; default screening correction applicable (intervening boundary fence structure), limit to -5dB Directivity; nil propagation directivity correction applicable (heat pump radiates noise equally all directions) Non Free-Field / Reflections; +3dB correction applied for heat pump adjacent to boundary fence structure Heat pump contribution at assessment position	25	50	60	43	42	42	33	29	28
		0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0
		-21	-21	-21	-21	-21	-21	-21	-21
		-5	-5	-5	-5	-5	-5	-5	-5
		0	0	0	0	0	0	0	0
		3	3	3	3	3	3	3	3
		27	37	20	19	19	10	6	5
<u>Heat Pump: Daikin RXYSQ8</u> Noise Data: sound pressure level at 1m (free-field); Lp dB heat pump operating full rated duty <u>cooling mode</u> Quantity; 0dB quantity correction applicable for 1 x heat pump Noise Mitigation; none applied Distance; free-field correction for ≈19m distance from heat pump to assessment position Screening; default screening correction applicable (intervening boundary fence structure), limit to -5dB Directivity; nil propagation directivity correction applicable (heat pump radiates noise equally all directions) Non Free-Field / Reflections; +3dB correction applied for heat pump adjacent to boundary fence structure Heat pump contribution at assessment position	26	60	63	55	52	44	43	42	34
		0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0
		-26	-26	-26	-26	-26	-26	-26	-26
		-5	-5	-5	-5	-5	-5	-5	-5
		0	0	0	0	0	0	0	0
		3	3	3	3	3	3	3	3
		32	35	27	24	16	15	14	6
Cumulative Contribution All Plant At Assessment Position	29	34	39	28	26	21	17	15	9

The heat pumps' cumulative overall noise level (Specific Noise Level) at the assessment position is 29dBA.

Although heat pumps' noise is significantly below background noise levels at the assessment position and not expected to cause disturbance to, or otherwise be of impact detrimental to, the amenity of neighbouring residential occupiers, the assessment includes a +2dBA correction as per the current edition BS4142, added to the heat pumps' cumulative overall noise level – to give the noise Rating Level, to account that noise from the heat pumps potentially has a just perceptible tonal characteristic.

Therefore, in accordance with the noise assessment guidance of BS4142, cumulative overall noise from the heat pumps at the assessment position in terms of a noise Rating Level = $L_{Aeq,Tr}$ 31dBA.

Site: 164 Dukes Avenue, London N10 2QB

Report: 26007-002 Appendix E (page 5 of 5)

Date: March 2026

NOISE MODEL CALCULATION

Assessment Position B: 166 Dukes Avenue

Noise Condition: Heat pumps 1 x Daikin RZAG71N & 1 x Daikin RXYSQ8T operating full rated duty Heating Mode

Noise Mitigation: None applied

Noise Calculation Model: Assessment Position B - Heating Mode		Lin dB at Octave Band Centre Frequency Hz							
Plant & Description	Overall dBA	63	125	250	500	1k	2k	4k	8k
<u>Heat Pump: Daikin RZAG71N</u>									
Noise Data: sound pressure level at 1m (free-field); Lp dB heat pump operating full rated duty <u>heating mode</u>		49	59	47	45	44	35	32	27
Quantity; 0dB quantity correction applicable for 1 x heat pump		0	0	0	0	0	0	0	0
Noise Mitigation; none applied		0	0	0	0	0	0	0	0
Distance; free-field correction for ≈17m distance from heat pump to assessment position		-21	-21	-21	-21	-21	-21	-21	-21
Screening; default screening correction applicable (intervening boundary fence structure), limit to -5dB		-5	-5	-5	-5	-5	-5	-5	-5
Directivity; nil propagation directivity correction applicable (heat pump radiates noise equally all directions)		0	0	0	0	0	0	0	0
Non Free-Field / Reflections; +3dB correction applied for heat pump adjacent to boundary fence structure		3	3	3	3	3	3	3	3
Heat pump contribution at assessment position	26	26	36	24	22	21	12	9	4
<u>Heat Pump: Daikin RXYSQ8</u>									
Noise Data: sound pressure level at 1m (free-field); Lp dB heat pump operating full rated duty <u>heating mode</u>		60	63	55	52	44	43	42	34
Quantity; 0dB quantity correction applicable for 1 x heat pump		0	0	0	0	0	0	0	0
Noise Mitigation; none applied		0	0	0	0	0	0	0	0
Distance; free-field correction for ≈24m distance from heat pump to assessment position		-26	-26	-26	-26	-26	-26	-26	-26
Screening; default screening correction applicable (intervening boundary fence structure), limit to -5dB		-5	-5	-5	-5	-5	-5	-5	-5
Directivity; nil propagation directivity correction applicable (heat pump radiates noise equally all directions)		0	0	0	0	0	0	0	0
Non Free-Field / Reflections; +3dB correction applied for heat pump adjacent to boundary fence structure		3	3	3	3	3	3	3	3
Heat pump contribution at assessment position	26	32	35	27	24	16	15	14	6
Cumulative Contribution All Plant At Assessment Position	29	33	39	29	26	22	17	16	8

The heat pumps' cumulative overall noise level (Specific Noise Level) at the assessment position is 29dBA.

Although heat pumps' noise is significantly below background noise levels at the assessment position and not expected to cause disturbance to, or otherwise be of impact detrimental to, the amenity of neighbouring residential occupiers, the assessment includes a +2dBA correction as per the current edition BS4142, added to the heat pumps' cumulative overall noise level – to give the noise Rating Level, to account that noise from the heat pumps potentially has a just perceptible tonal characteristic.

Therefore, in accordance with the noise assessment guidance of BS4142, cumulative overall noise from the heat pumps at the assessment position in terms of a noise Rating Level = $L_{Aeq,Tr}$ 31dBA.