



Goodhand
Acoustics

External Plant Noise Assessment

Drill Hall

On Behalf of

Lifespring

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1 Introduction

Goodhand Acoustics Ltd has been commissioned by Lifespring to undertake a noise assessment to accompany a planning application covering the renovation of Drill Hall, Denne Road, Horsham, West Sussex, RH12 1JF.

The application includes new heating, ventilation and air-conditioning (HVAC) plant, including air source heat pumps, air handling units and condenser units, proposed on two flat roof areas either side of the hall. Up to nine rooftop plant items are proposed. The final plant selection has not yet been made; however, for the purposes of this planning application, acoustic data from equivalent units have been used to undertake an indicative BS 4142 (1) assessment and to establish a noise design requirement for the final plant selection.

This report assesses the potential noise impact of the proposed external plant at nearby noise -sensitive receptors and sets a design noise requirement for the final plant selection. Predictions are supported by unattended baseline monitoring. The assessment has been undertaken primarily in accordance with BS 4142, with supporting reference to the Chartered Institute of Environmental Health and Institute of Acoustics Heat Pumps Professional Advice Note (2), the ANC BS 4142 Technical Note (3), and Planning Noise Advice Document: Sussex (4).

This report was prepared by Daniel Goodhand. With more than 20 years of experience in noise and vibration management, Daniel Goodhand advises on projects across the UK, ranging from commercial and residential developments to major infrastructure. Goodhand Acoustics Ltd is a member of the Association of Noise Consultants. Daniel Goodhand also serves as a director and trustee of the Institute of Acoustics.

2 Planning Context

2.1 Horsham District Planning Framework

The Horsham District Planning Framework (5) sets out the Horsham District Council's (HDC) statutory planning strategy and the policies used to determine planning applications. Policy 33 (Development Principles) includes requirements relating to noise and residential amenity.

Policy 33 (Development Principles)

In order to conserve and enhance the natural and built environment developments shall be required to:

[...]

2. Ensure that it is designed to avoid unacceptable harm to the amenity of occupiers/users of nearby property and land, for example through overlooking or noise, whilst having regard to the sensitivities of surrounding development;

[...]

2.2 National Planning Policy Framework

The Horsham District Planning Framework has been developed to be consistent with the National Planning Policy Framework (NPPF) (6). The NPPF is supported by the Noise Policy Statement for England (NPSE) and associated online guidance (7). These documents set out objectives but do not prescribe specific numerical noise limits or a single assessment method.

2.3 Planning Noise Advice Document: Sussex

Horsham District Council, together with other local authorities in Sussex, has produced the Planning Noise Advice Document: Sussex (4) to provide technical guidance for planning applications. The document represents good practice guidance rather than adopted policy. Chapter 3 addresses industrial and commercial sound sources affecting noise-sensitive receptors; this report has regard to the relevant guidance alongside the assessment method in BS 4142.

2.4 Other Policy, Guidance, and Standard

A description of other relevant policies, guidance and standards are contained in Appendix A. These are presented for context.

3 Background Sound Level Survey Details

3.1 Equipment and Location

Background sound levels were measured using 01dB Black Solo precision integrating Class 1 sound level meters by Acoustics South East and reported in their Noise Impact Assessment report dated 21 October 2024 (8). Table 3.1 summarises the instrumentation.

Table 3.1: Equipment details

Sound Level Meter	01dB Black Solo
Serial Number	60673
Field Calibrator	Norsonic Type 1443 Acoustic Calibrator
Sound Level Meter Field Calibration Check	All calibration checks were within acceptable drift of the reference level.

Unattended monitoring was undertaken at the front façade of Drill Hall, with the microphone mounted on a pole projecting from a first-floor window. The survey was conducted from 14:00 on 10 October 2024 until 11:00 on 17 October 2024. The monitoring location is shown in Figure 3.1 and Figure 3.2. The Acoustics South East report did not note any periods of adverse weather during the survey.

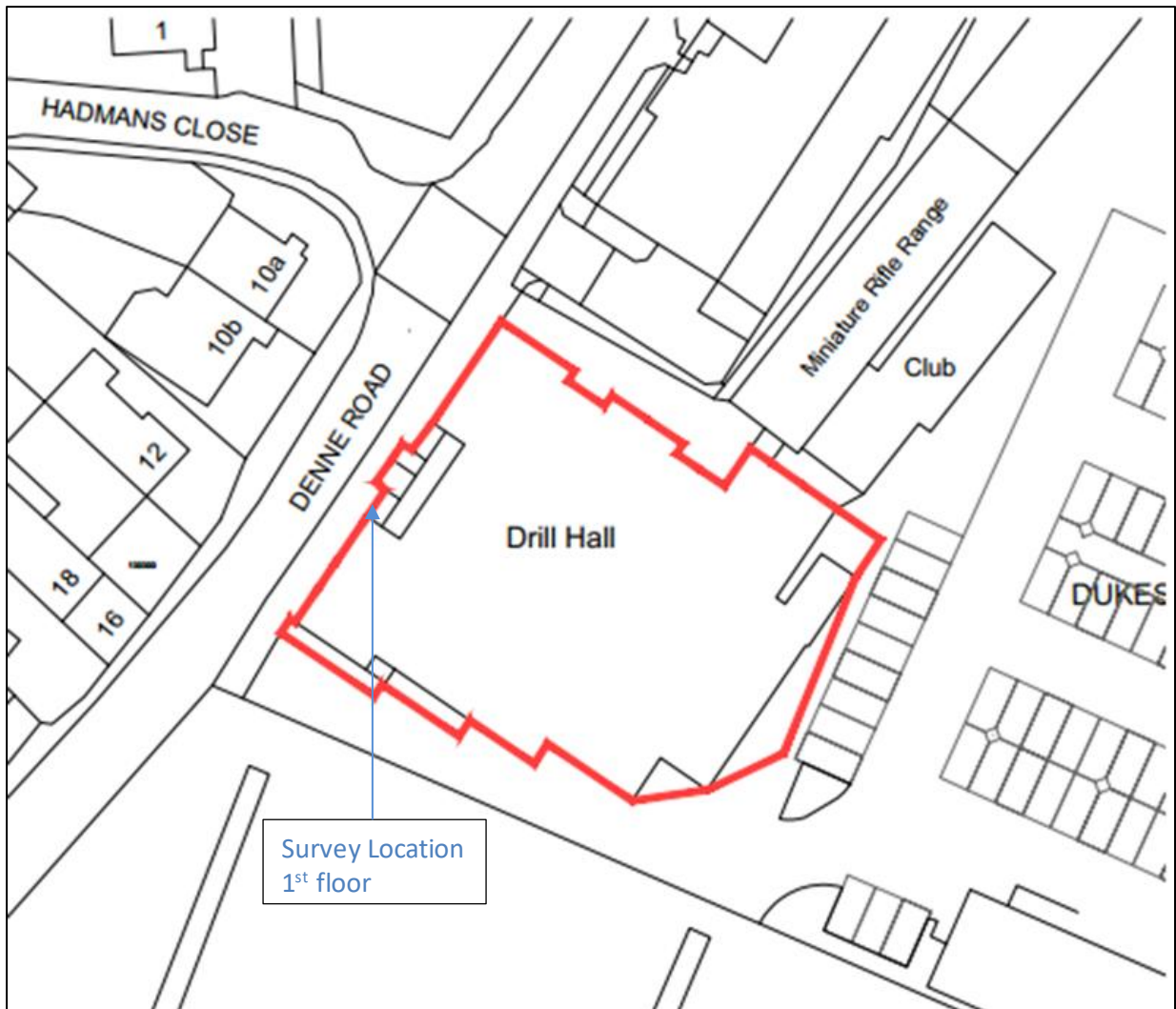


Figure 3.1: Location of the background sound level survey



Figure 3.2: Photo of background sound level survey

3.2 Sound Level Results

The monitoring was undertaken to establish representative background sound levels for the BS 4142 assessment. In BS 4142, the background sound level is typically described using the $L_{A90,T}$ parameter (the A-weighted sound level exceeded for 90% of the measurement period). For this survey, L_{A90} was recorded in 5-minute intervals.

A time history of $L_{A90,5min}$ is presented in Figure 3.3 and statistical distributions are presented in Figure 3.4. Representative background sounds level were selected with reference to BS 4142 (1) and the ANC Technical Note (3), based on the mode average during the day and the lower end of the typical distribution at other times.

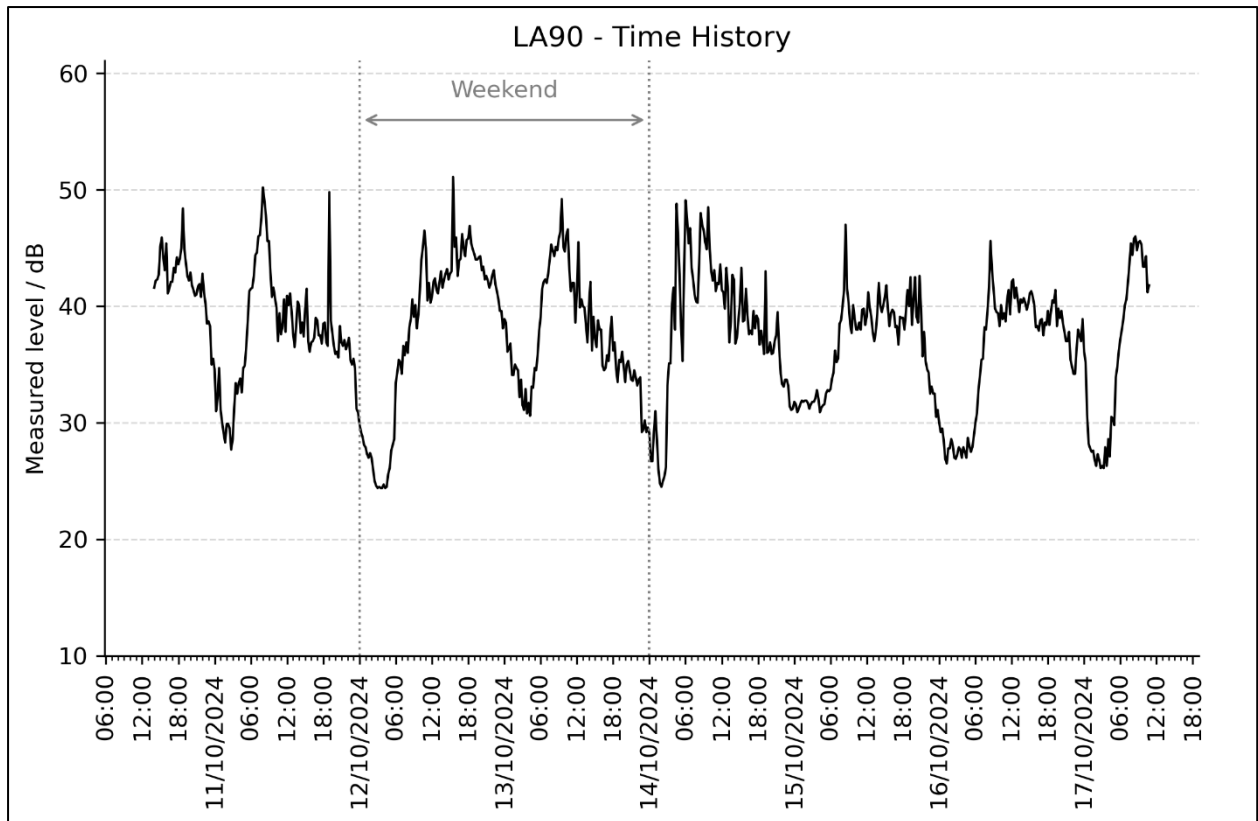


Figure 3.3: Background sound level chart – $L_{A90,5 \text{ min}}$

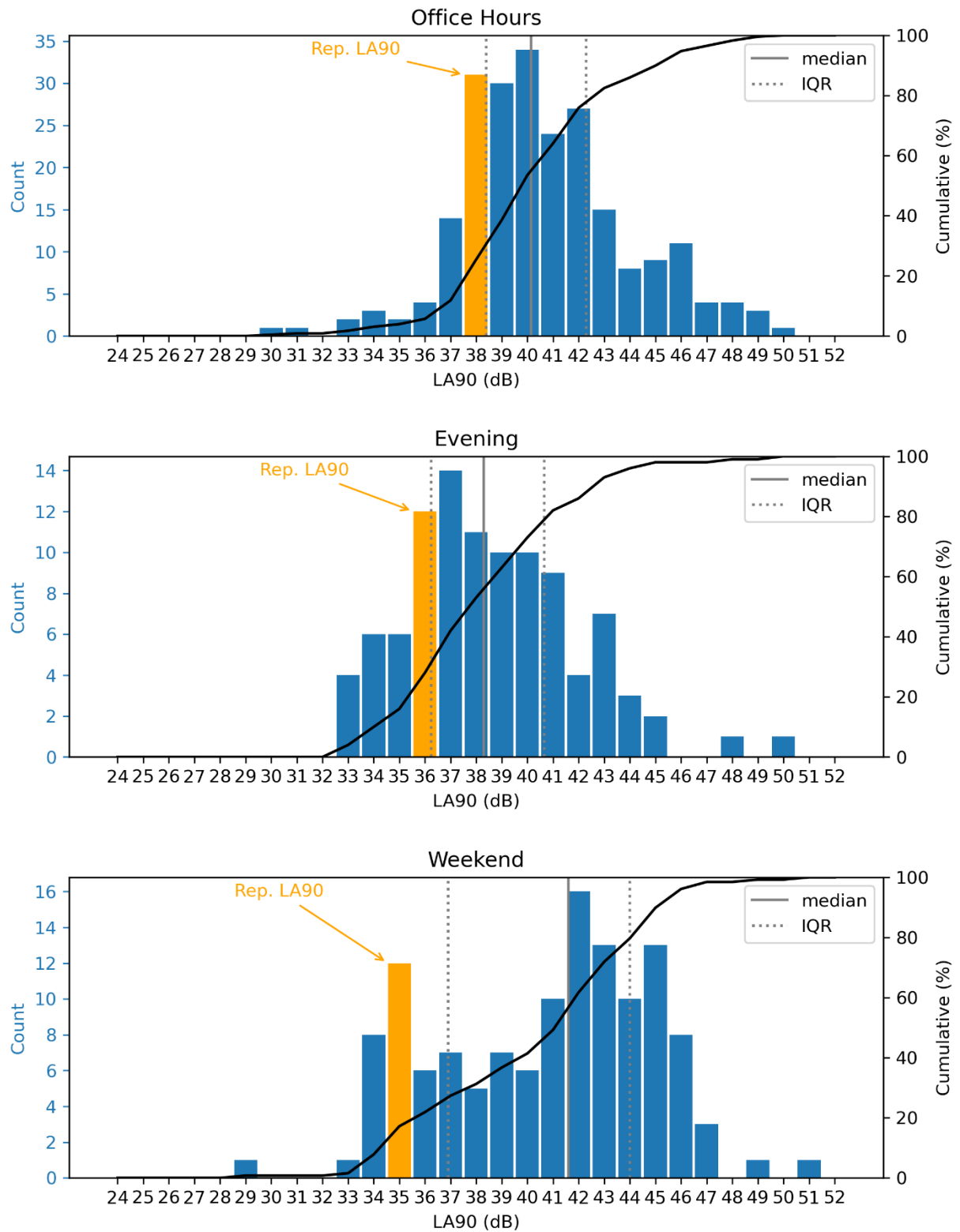


Figure 3.4: $L_{A90,5min}$ Sound level statistical distribution

Table 3.2: Background sound level survey results

Period	Times	Mode $L_{A90,5min}$ (dB)	Median $L_{A90,5min}$ (dB)	Mean $L_{A90,5min}$ (dB)	Representative Background Level L_{A90} (dB)
Office Hours	Mon - Fri: 06:00 - 18:00 hrs	40	40	41	38
Evening	Mon - Fri: 18:00 - 23:00 hrs	37	38	39	36
Weekend	Sat - Sun: 07:00 - 23:00 hrs	42	42	41	35

The weekend $L_{A90,5min}$ distribution was bimodal, indicating two distinct background sound regimes. The higher cluster relates to typical daytime activity/road traffic conditions, whereas a lower cluster occurs during quieter periods. For a conservative BS 4142 assessment (and to provide a design target that remains robust if plant operates during quieter periods), the representative background sound level for the weekend period was selected as 35 dB L_{A90} based on the lower modal band shown in Figure 3.4.

The selected representative background levels are used in Section 4 to derive the BS 4142 assessment outcome.

4 Noise Prediction and Assessment

4.1 Proposed HVAC

Up to nine rooftop plant items are proposed. These comprise four air source heat pumps (ASHPs), two air handling units (AHUs) and three condenser units, serving the main hall and the remainder of the building. The final plant selection has not yet been made; however, for the purposes of this planning application, acoustic data from equivalent units have been used in the noise model:

1. ASHP – Baxi Auriga HP 40T
2. ASHP – Baxi Auriga HP 40T
3. ASHP – Baxi Auriga HP 40T
4. ASHP – Baxi Auriga HP 40T
5. AHU – Nuaire Thermal Wheel Heat Exchanger B22T/LN/ES-L
6. Condenser – Mitsubishi Electric PUMY P300
7. Condenser – Mitsubishi Electric PUMY P300
8. AHU – Nuaire Thermal Wheel Heat Exchanger B22T/LN/ES-L
9. Condenser – Mitsubishi Electric PUHY P350

A barrier/enclosure is required around the units. For the purposes of this assessment, the barrier has been modelled with its top edge 1.5 m above the noise sources (i.e. providing line-of-sight screening between the units and the receptors). Additionally, the PUHY P350 has been assumed to operating in low noise mode. The plant locations and the nearest receptors are illustrated in Figure 4.1. Relevant specification extracts are provided in Appendix B.

4.2 Operating Hours

The plant is expected to operate predominantly during daytime and for Sunday services, with occasional extended operation during evening and weekend events. For assessment purposes, the following periods have been considered:

- Office Hours: Monday – Friday, 06:00 - 18:00 hrs;
- Evening Hours: Monday – Friday, 18:00 - 23:00 hrs; and
- Weekends: Saturday/Sunday, 07:00 - 23:00 hrs.



Figure 4.1: HVAC location plan

4.3 Noise Predictions

Noise modelling was undertaken accounting for distance attenuation, air absorption, ground effects and barrier attenuation using in-house software implementing the calculation method in BS ISO 9613-2 (9).

The receptors considered at highest risk of being affected by noise were identified as:

- Mill River Lodge Care Home
- 10A Denne Road
- 10B Denne Road
- 12 Denne Road
- 14 Denne Road

Sound power levels were taken from manufacturers' technical manuals. No acoustic feature corrections have been applied in the BS 4142 assessment because no such features are identified in the published data. If acoustic features are identified following installation/commissioning, further mitigation and/or operational controls will be implemented to ensure the plant meets the noise design requirement.

Table 4.1 shows predicted cumulative plant noise levels at the assessment locations assuming the barrier described in Section 4.1. Predictions assume simultaneous operation of all items at the required duty for maximum occupation of the hall and should therefore be treated as worst-case. In practice,

plant will operate in response to demand (e.g. AHUs under load when the main hall is fully occupied), and simultaneous operation at maximum duty is expected to occur only occasionally.

Table 4.1: Predicted cumulative noise levels

Assessment Position	Predicted Level (dB $L_{Aeq,t}$)
Mill River Lodge Care	33
10A Denne Road	28
10B Denne Road	28
12 Denne Road	30
14 Denne Road	30

4.4 BS 4142 Assessment

Table 4.2 shows a BS 4142 assessment using the predictions summarised in Section 4.3.

Table 4.2: Assessment of noise from HVAC units

Parameter	Mill River Lodge Care	10A Denne Road	10B Denne Road	12 Denne Road	14 Denne Road	Commentary
Specific noise level at assessment location (total from all units)	33 dB	28 dB	28 dB	30 dB	30 dB	From Section 4.3
Acoustic feature correction	+0 dB					No acoustic feature correction.
Rating level	L _{Ar} = 33 dB	L _{Ar} = 28 dB	L _{Ar} = 28 dB	L _{Ar} = 30 dB	L _{Ar} = 30 dB	
Background sound level during operating hours	Office Hours: LA90,5min = 38 dB					Measured at a position representative of the nearest receptor. See Figure 3.1, Figure 3.2, and Table 3.2.
	Evening: LA90,5min = 36 dB					
	Weekend: LA90,5min = 35 dB					
Excess of rating over background sound level	-5 dB	-10 dB	-10 dB	-8 dB	-8 dB	Office Hours
	-3 dB	-8 dB	-8 dB	-6 dB	-6 dB	Evening
	-2 dB	-7 dB	-7 dB	-5 dB	-5 dB	Weekend
After taking context into account, assessment indicates that the noise levels predicted are not likely to be an adverse impact	The HVAC system operates between normal working hours and so would not have an impact on sleep. Additionally, the predictions assume that all plant is operating simultaneously, which is only expected to occur occasionally .					

The indicative BS 4142 assessment predicts rating levels below the representative background sound level at all assessment positions for all periods considered. In context, this indicates a low likelihood of adverse impact.

The Planning Noise Advice Document: Sussex notes that, where practicable, rating levels should be no greater than the representative background sound level, and that lower targets may be appropriate

depending on context. This assessment indicates compliance with that general expectation on a worst-case basis.

Given that the plant selection is indicative at this stage, this report should be treated as establishing a noise design requirement. The final plant selection, layout and any operational controls should be demonstrated (by updated calculation and/or commissioning measurements) to achieve rating levels no greater than the representative background sound level at the nearest noise-sensitive receptors, in accordance with BS 4142.

5 Design Recommendations

These recommendations are provided to guide the detailed mechanical design and final plant selection. As the plant schedule is indicative at this stage, the measures below should be adopted as part of a noise design strategy to ensure the installed rooftop HVAC meets the BS 4142 design requirement at the nearest noise-sensitive receptors. A recommended planning condition is provided in Section 5.5 below.

5.1 Selection of low noise units

- Select plant with low sound power levels such that the BS 4142 rating level meets the design requirement set out in this report.

5.2 Operational controls and ductborne noise

- Where practicable, implement operational controls (e.g. quiet modes and fan speed limits) during quieter periods.
- Provide duct attenuation/silencers where required to control ductborne noise.

5.3 Barrier or enclosure

- Provide a barrier/enclosure around the rooftop plant.
- Minimise openings and, where practicable, orient any louvres/openings away from the nearest noise-sensitive receptors.
- Ensure the barrier/enclosure is compatible with airflow, maintenance access and manufacturers' requirements, and provide performance information to demonstrate the expected acoustic benefit.

5.4 Future Design Coordination

- Confirm that the final plant selections, layout and any operational controls remain consistent with the assumptions used in this assessment.
- If the plant selection or layout changes materially, update the noise assessment to confirm the BS 4142 design requirement is still achieved.
- Verify compliance following installation/commissioning by updated calculations and/or commissioning measurements.

5.5 Recommended planning condition

Noise from external plant

Prior to the commissioning of any external plant or equipment associated with the development (including, but not limited to, air source heat pumps, air handling units and condenser units), a report shall be submitted to and approved in writing by the Local Planning Authority demonstrating that the cumulative noise rating level of the installed plant, assessed in accordance with BS 4142:2014+A1:2019, does not exceed the representative background sound level ($L_{A90,T}$) at the worst affected residential window under normal operating conditions. The assessment shall include any acoustic feature corrections required by BS 4142.

The approved measures and/or operational controls (including any acoustic screening, enclosures, silencers and plant settings) shall be implemented prior to commissioning and shall be retained and maintained thereafter.

Reason: To protect the amenity of nearby residents, in accordance with Horsham District Planning Framework Policy 33 (Development Principles).

6 Uncertainty

This chapter summarises the main sources of uncertainty associated with the ISO 9613-2 noise predictions and the BS 4142 assessment. The predictions rely on manufacturers' acoustic data and several assumptions regarding plant operation, installation and propagation. Unattended background sound level monitoring was undertaken on site to inform the assessment.

6.1 Sources of Data

The final HVAC plant selection and detailed design are still to be confirmed; therefore, predictions are based on acoustic data from equivalent units and are subject to change. Manufacturers' data are typically derived from standardised test methods; however, the sound emission of installed plant can vary due to installation details, maintenance condition, control strategy, and operating duty. The results should be regarded as indicative and demonstrate that compliant noise levels are achievable, subject to appropriate design, mitigation and verification at commissioning.

6.2 Prediction Methodology

Propagation was predicted using BS ISO 9613-2, which provides a general method for calculating external sound levels under meteorological conditions favourable to propagation. The model includes distance attenuation and atmospheric absorption and incorporates assumptions regarding source/receiver heights, ground effects and screening from the proposed barrier/enclosure. The method is widely used for environmental noise assessment and is considered appropriate for the purposes of this planning-stage assessment.

6.3 Measurement Uncertainty

Background sound levels were obtained from unattended monitoring at the Drill Hall façade at a position considered representative of the nearest noise-sensitive receptors on Denne Road. As with all environmental measurements, background levels can vary with weather, traffic flow and local activity. The monitoring period captured a range of conditions and is considered suitable to inform representative background sound levels for the BS 4142 assessment. The location was considered representative of the locality; however, there are likely some variations around the building. However, the uncertainty introduced is limited.

6.4 Sound Level Meter

The sound level meter was Class One and laboratory calibrated every two years. Additionally, a field calibration check was made of the sound level meter before and after the sound level survey and no significant drift was measured. Therefore, it is considered that the equipment did not introduce a significant amount of uncertainty.

6.5 Mitigation of Uncertainty

A conservative approach has been adopted by assuming simultaneous operation of all rooftop plant assuming the main hall is occupied and by applying ISO 9613-2 propagation assumptions. The uncertainty in the calculations is considered appropriate for a planning application.

7 Summary and Conclusion

Goodhand Acoustics Ltd has been commissioned by Lifespring to undertake a noise assessment to accompany a planning application covering the renovation of Drill Hall, Denne Road, Horsham, West Sussex, RH12 1JF.

The proposals include new rooftop HVAC plant (air source heat pumps, air handling units and condenser units) located on two flat roof areas either side of the hall. Up to nine rooftop plant items are proposed. As the final plant selection has not yet been made, acoustic data from equivalent units have been used to undertake an indicative BS 4142 assessment and to establish a noise design requirement for the final plant selection.

Unattended baseline monitoring has been used to derive representative background sound levels. Predicted rating levels indicate a low likelihood of adverse impact at the nearest noise-sensitive receptors, with rating levels below the representative background sound level for the periods assessed, subject to the assumptions set out in this report.

With implementation of the design recommendations in Section 5 and the recommended planning condition in Section 5.5, the development is considered capable of complying with Horsham District Planning Framework Policy 33 (Development Principles) in respect of noise. Planning permission should not be refused on grounds of noise.

Appendix A – Noise Guidance and Standards

Introduction to Sound and Noise

Sound is the transmission of vibrations through a medium, typically air. The human ear can generally perceive frequencies between approximately 18 Hz (cycles per second) and 18 kHz, with sensitivity varying across this range. Due to this variation in sensitivity, sound measurements commonly apply an ‘A-weighting’ filter, expressed as dBA, to approximate human hearing response.

Human hearing typically has a threshold around 0 dBA, with the threshold of pain around 120 dBA. Subjectively, a 3 dB change is typically just perceptible under controlled conditions, while a 10 dB change generally corresponds to a perceived doubling or halving in loudness.

Common noise metrics include:

$L_{Aeq,T}$: Represents the equivalent continuous (average) noise level over a specified period and is widely used in noise assessments.

L_{A90} : The sound level exceeded for 90% of the measurement period, often representing background noise.

L_{Amax} : The highest sound level recorded over the measurement interval, typically related to discrete noise events.

National Standards and Guidance

National Planning Policy Framework

The National Planning Policy Framework (NPPF) (6) provides guidance for planning authorities managing noise and pollution. Key policy points from the NPPF include:

- Development should avoid causing, or being exposed to, unacceptable levels of noise pollution.
- Adverse noise impacts from development should be mitigated or reduced to a minimum.
- Development should seek to enhance environmental quality, including through noise management.

Detailed numerical criteria are not set by the NPPF; instead, local guidance and standards (such as ProPG, BS 8233, and BS 4142) are commonly referenced.

Noise Policy Statement for England

The NPSE (2010) (10) outlines a policy objective to promote health and quality of life through effective noise management within sustainable development principles. It establishes three key thresholds for noise impact:

No Observed Effect Level (NOEL): No detectable effect on health or quality of life.

Lowest Observed Adverse Effect Level (LOAEL): The lowest noise level at which adverse effects begin to occur.

Significant Observed Adverse Effect Level (SOAEL): Noise levels significantly impacting health and quality of life.

British Standard 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

BS 4142 (1) describes methods for rating and assessing sound of an industrial and/or commercial nature. The methods described use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

The standard uses a rating level for sources of sound of an industrial and/or commercial nature and ambient, background, and residual sound levels at outdoor locations to assess the likely effects of the sound on people and provides a methodology for determining these levels.

The main purposes of BS 4142 are for investigating complaints; assessing sound from proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and assessing sound at proposed new dwellings or premises used for residential purposes.

The rating level for a source is calculated by adding a character correction to the specific sound level which has been measured, calculated and/or predicted at the dwelling or premises used for residential purposes. The character correction takes into account that certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level.

The acoustic features that are considered for the character correction are tonality, impulsivity, intermittency or other sound characteristics that are readily distinctive against the residual acoustic environment. BS 4142 provides three methods for determining the character correction: the subjective method, the objective method for tonality, and the reference method.

An initial estimate of the impact of the specific sound is obtained by subtracting the measured background sound level from the rating level and considering the following:

- Typically, the greater this difference, the greater the magnitude of the impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

The final estimate of the impact may need to be modified due to the context, all pertinent factors should be taken into consideration, including the absolute level of sound, the character and level of the residual sound relative to the specific sound, and the sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.

Association of Noise Consultants BS 4142:2014+A1:2019 Technical Note, Version 1.0, March 2020

The ANC Technical Note on BS 4142:2014+A1:2019 (11) has been published to clarify ambiguous content, to offer additional ancillary advice in some instances where strict interpretation may not be possible and provide real-life examples to illustrate the decision-making process. The guide recognises that there are many instances in the application of BS 4142 where professional judgement is required and a range of interpretations is possible. The technical note has been designed for the reader to access the views of the members of the working group and is not intended to be definitive or prescriptive, rather it has been designed to complement BS 4142.

Appendix B – Specifications

BAZI Auriga HP 40T

Auriga HP 40T - 7832032

Auriga HP/TX 40T (Coastal Protection) - 7837263

BAXI

Further information can be found at baxi.co.uk/auriga

Date: 19/03/25

Performance		40 kW	
Heating capacity at A7/W35		40.2kW	
Power input at A7/W35**		9.35	
COP at A7/W35		4.3	
Heating capacity at A-10/W35		22.74	
Power input at A-10/W35**		8.45	
COP at A-10/W35		2.69	
SCOP at Water 35		4.8	
SCOP at Water 55		3.61	
Seasonal efficiency at Water 35		189%	
Seasonal efficiency at Water 55		142%	
ERP Data			
Energy label rating at Water 35		A+++	
Sound power rating at A7/W35		65 dB(A)	
Refrigerant			
Refrigerant type		R32	
Refrigerant weight		5.6 kg	
Refrigerant GWP		675	
Equivalent CO ₂		3.78 Tn	
Hydraulics			
Nominal volume flow rate		1.94 l/s	
Minimum volume flow rate		1.17l/s	
Water temperature min/max		+25/+60°C	
Available water pressure		2.8 mwc	
Max operating pressure		6 bar	
Min operating pressure		0.5 bar	
Max supply temperature		60°C	
Flow connection size***		2 Inch	
Return connection size***		2 Inch	
Circulation pump integrated		Yes	
Pressure relief valve integrated		Yes	
Expansion vessel integrated		No	
Source Data		40 kW	
Operating limits, source [air]		-20 to +40°C	
Nominal volume flow rate, source		11200 m³/h	
Electrical			
Protection class		IP 24	
Power Source			
Power supply compressor		3 Phase + Neutral	
		50 Hz	
Nominal voltage compressor		400 V	
Nominal voltage fans		400 V	
Number of compressors		1 x Scroll Inverter	
Number of fans		2 x DC Inverter	
Starting current		8.4 A	
Minimum Cable Size****		10 mm²	
Max operating current FLC		46 A	
Circuit Protection Type		50 A Type C	
General			
Nominal Sound power level LwA*		71 dB(A)	
Nominal Sound pressure LpA @5m		49 dB(A)	
Unit dimensions (mm)		1581 Height	
		1882 Width	
		683 Depth	
Unit Weight Net		363 kg	
Service clearances (mm)		1500 Front	
		600 Rear	
		800 Left Side	
		800 Right Side	

* In accordance with EN 9614-2 under condition A7/W55. ** Calculated from Line to Line voltage of 400v and a Power Factor of 0.85. *** Ensure a flexible pipe is utilized for the flow and return connections to prevent vibration transmission. A water filter must be installed on the return line to the appliance. **** The wiring installation must comply with BS 7671, cable size may need to be increased depending on length of cable, cable type and any other installation factors that need to be taken into account. © Ours is a policy of continuous development, we therefore reserve the right to alter specification without prior notification. Baxi accept no liability for any loss or damage arising from any errors or omissions that may be inadvertently contained in this specification sheet.

BAXI

remeha

**ANDREWS
WATER HEATERS**

HEATRAESADIA

**Commercial heating
and hot water solutions**

BAXI

Noise Level Spectrum Baxi Auriga HP 40T

Carried out to the following Norms

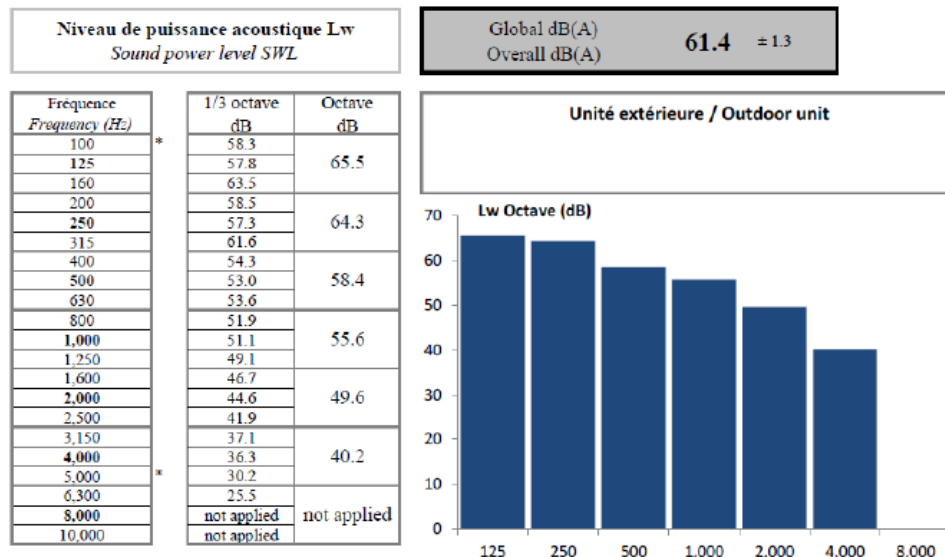
DIN EN 14511 "Air conditioners, liquid chillers and heat pumps with electrically driven compressors for space heating and cooling" Version EN14511:2013

DIN EN ISO 9614-1 "Determination of the sound power level of noise sources from sound intensity measurements - Part 2: Measurement with continuous sampling" Version EN ISO 9614-2:1996

DIN EN 12102-1 "Air conditioners, heat pumps and dehumidifiers with electrically driven compressors - Measurement of airborne noise emissions - Determination of the sound power level" Version EN12102:2013-10

Condition A7/W55 ErP

Figure 1 Sound powers of the third-octave bands and sound power



Auriga 40T 020126-A

Nuaire Thermal Wheel Heat Exchanger B22t/LN/ES-L



SUMMARY FAN DATA SHEET

Nuaire, Western Industrial Estate, Caerphilly, CF83 1NA, United Kingdom. email:info@nuaire.co.uk

UK Commercial enquiries T:029 2085 8200 UK Residential enquiries T:029 2085 8500 International enquiries T:+44.29 2085 8497

Whilst the information given on this data sheet is fan specific, it is in summary and reference to the product selection catalogue and installation & maintenance documents is recommended.

This data sheet produced on 23 Jan 2026 12:07 using software version 5.8.4611.0

Project: n/a

Drill Hall, Horsham

Location: Main AHUs

Technical Data

Boxer Packaged Solution - Thermal Wheel Heat Exchanger

Fan Code: B22T/LN/ES-L

Installation Manual Links: 671746

Supply

Required duty: 1.5 m³/s at 300 Pa

Actual duty: 2.368 m³/s at 748 Pa

Actual at required flow: 1.5 m³/s at 1037 Pa

Extract

Required duty: 1.5 m³/s at 300 Pa

Actual duty: 2.454 m³/s at 803 Pa

Actual at required flow: 1.5 m³/s at 1088 Pa

When speed controlled to required duty:

Motor input power: 1.904 kW

Specific Fan Power: 1.3 W/(l/s)

At full speed:

Motor input power: 7.891 kW

Specific Fan Power: 3.2 W/(l/s)

Maximum Fan Speed: 1,890 RPM

Electrical Supply: 3 Phase 50 Hz

Nominal Motor Rating

7.6 kW

Motor Current (flc):

16.8 A

Motor Current (sc):

16.8 A

Max. operating temp:

60°C

Weight:

1,493 kg

Starting currents are nominal.

Sound Data

Noise calculated speed controlled to required duty (61.14%)

Sound Power Levels re 1 pWatts (Hz):

Hz	63	125	250	500	1k	2k	4k	8k	dBA
Breakout	72	59	68	53	45	38	24	<16	39
Open Intake	69	67	78	66	65	63	59	45	51
Open Supply	80	80	84	77	71	67	63	48	58
Open Extract	69	67	78	66	65	63	59	45	51
Open Discharge	80	80	84	77	71	67	63	48	58
For 100% speed:	+3	+4	+6	+8	+11	+11	+11	+11	

dBA is spherical at 3 metres. For hemi-spherical add 3 dBA.

B22A/V-900

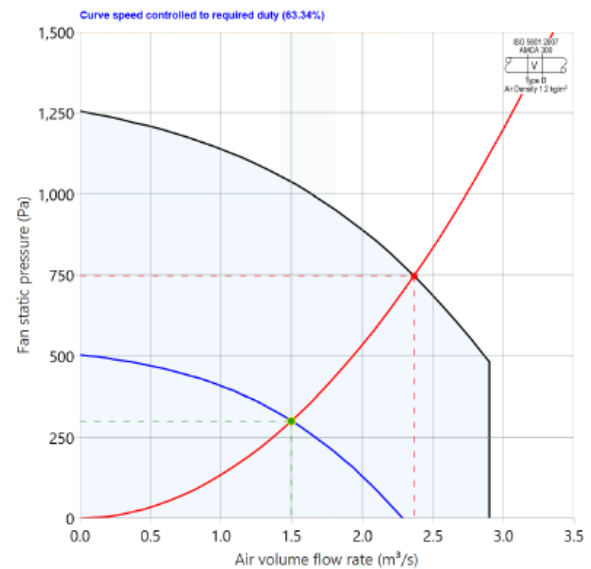
At all volumes -6 -9 -19 -38 -43 -35 -24 -20

B22A/V-900

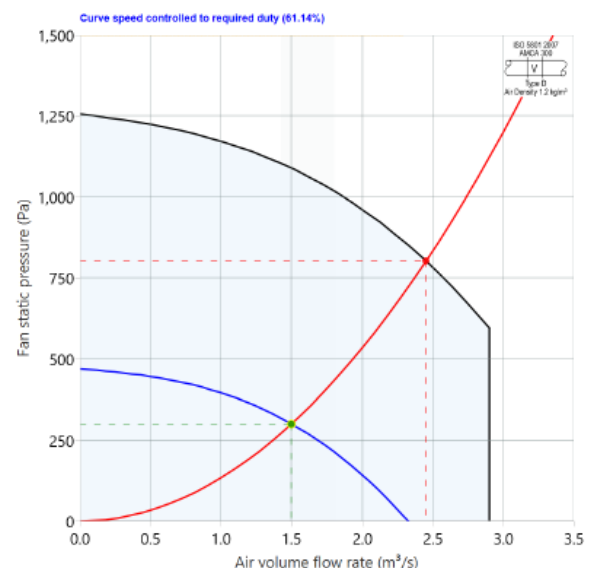
At all volumes -6 -9 -19 -38 -43 -35 -24 -20

Please note that the noise data stated on this data sheet for the unit and/or silencer is tested in accordance with UK, European and International industry laboratory standards. However onsite conditions may vary and we would recommend that this information is verified by an acoustic specialist in order to ensure its suitability for the intended application.

Performance Chart (supply)



Performance Chart (extract)

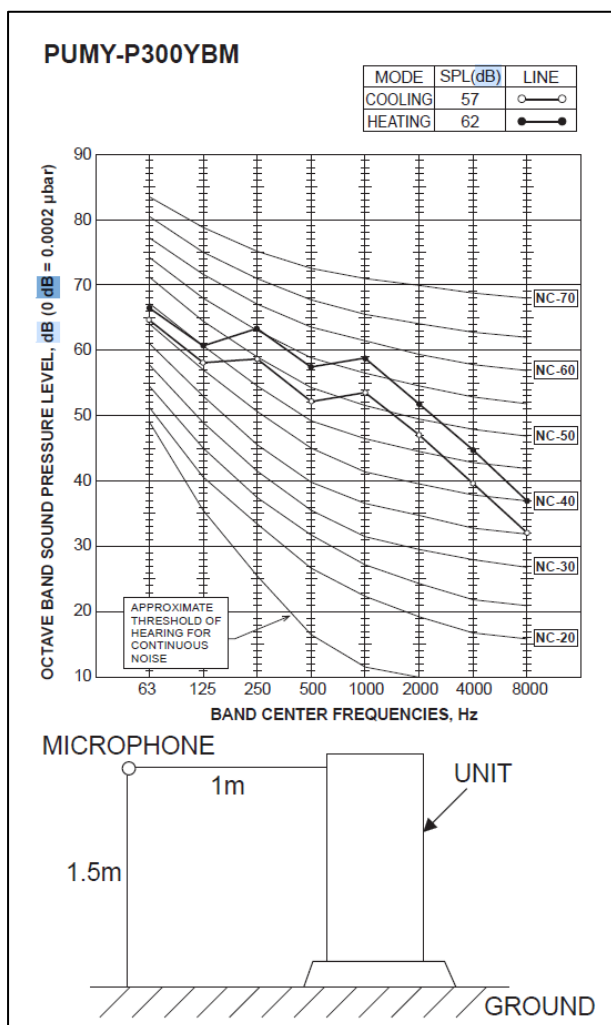


Additional Notes

Mitsubishi Electric PUMY-P300

OUTDOOR UNITS		PUMY-P250YBM2	③	PUMY-P300YBM2	③
CAPACITY (kW)	Heating (nominal)	31.5		37.5	
	Cooling (nominal)	28.0		33.5	
	Heating (UK)	31.5		37.5	
	Cooling (UK)	22.1		26.4	
POWER INPUT (kW)	Heating (nominal)	7.91		9.69	
	Cooling (nominal)	8.21		11.96	
	Heating (UK)	9.81		12.02	
	Cooling (UK)	4.56		6.65	
COP / EER (nominal)		3.98 / 3.41		3.87 / 2.80	
SCOP / SEER		-		-	
MAX NO. OF CONNECTABLE INDOOR UNITS		30		30	
MAX CONNECTABLE CAPACITY		50-130% OU Capacity		50-130% OU Capacity	
AIRFLOW (m³/min)		183		183	
PIPE SIZE mm (in)	Gas	22.4 (7/8")		25.4(1")	
	Liquid	9.52 (3/8")		12.7 (1/2")	
SOUND PRESSURE LEVEL (dBA)		55		57	
SOUND POWER LEVEL (dBA)		73		75	
WEIGHT (kg)		192		192	
DIMENSIONS (mm)	Width	1050		1050	
	Depth	460+45		460+45	
	Height	1662		1662	
ELECTRICAL SUPPLY		380-415v, 50Hz		380-415v, 50Hz	
PHASE		Three		Three	
STARTING CURRENT (A)		7		7	
NOMINAL SYSTEM RUNNING CURRENT (A)	Heating / Cooling [MAX]	12.28 / 12.74 [28.4]		15.04 / 18.56 [31.74]	
GUARANTEED OPERATING RANGE (°C)	Heating / Cooling	-20-15 / -5-46		-20-15 / -5-46	
FUSE RATING (BS88) - HRC (A)		1 x 30		1 x 32	
MAINS CABLE No. Cores		4 + earth		4 + earth	
CHARGE REFRIGERANT (kg) / CO ₂ EQUIVALENT (T) R410A (GWP 2088)		9.3 / 19.4		9.3 / 19.4	
MAX ADDITIONAL REFRIGERANT (KG) / CO ₂ EQUIVALENT (T) R410A (GWP 2088)		22.4 / 46.8		22.4 / 46.8	

③ Three Phase



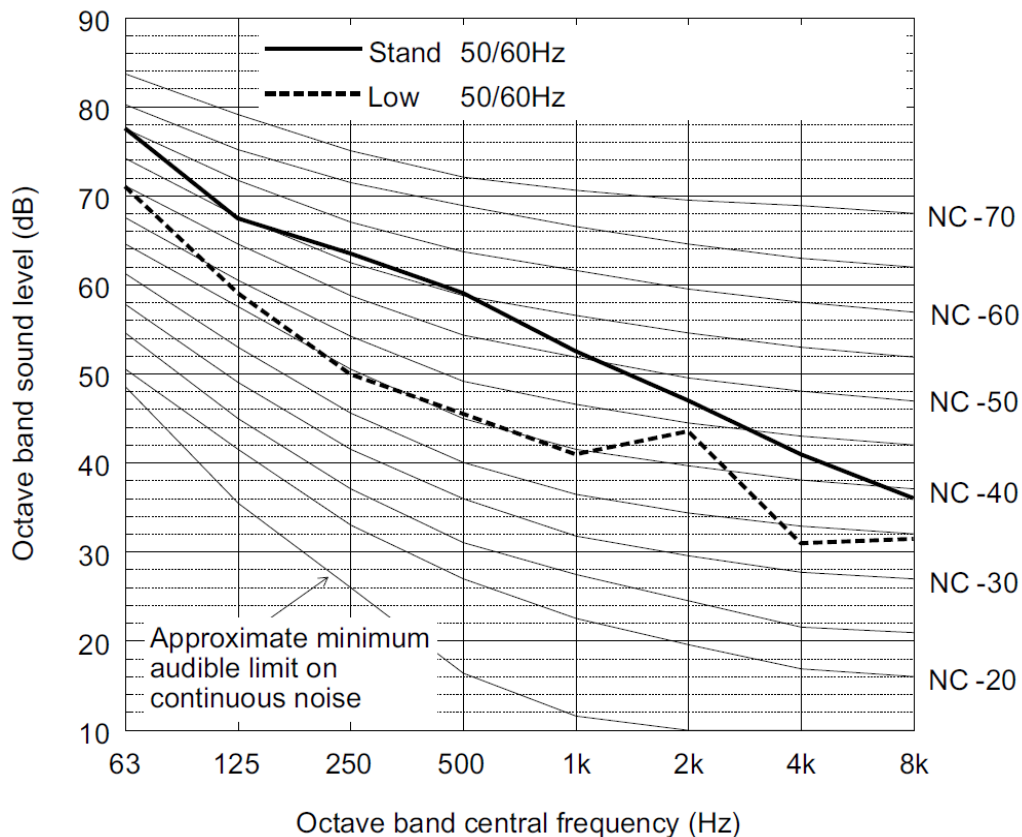
Mitsubishi Electric PUHY P350

OUTDOOR UNITS		PUHY-P200YNW-A2	PUHY-P250YNW-A2	PUHY-P300YNW-A2	PUHY-P350YNW-A2	PUHY-P400YNW-A2	PUHY-P400YSNW-A2
CAPACITY (kW)	Heating (nominal)	25.0	31.5	37.5	45.0	50.0	50.0
	Cooling (nominal)	22.4	28.0	33.5	40.0	45.0	44.8
	High Performance Heating (UK)	25.0	31.5	35.6	42.8	45.0	50.0
	COP Priority Heating (UK)	22.8	28.7	34.1	41.0	43.0	45.5
	Cooling (UK)	20.0	25.1	30.0	35.8	40.3	40.1
POWER INPUT (kW)	Heating (nominal)	6.08	8.49	10.30	12.32	14.20	12.16
	Cooling (nominal)	6.03	9.62	11.31	13.98	17.57	12.47
	High Performance Heating (UK)	7.66	10.70	13.70	16.39	16.05	15.56
	COP Priority Heating (UK)	6.08	8.49	10.30	12.32	13.77	12.16
	Cooling (UK)	3.50	5.58	6.56	8.11	11.24	7.23
COP / EER (nominal)		4.11 / 3.71	3.71 / 2.91	3.64 / 2.96	3.65 / 2.86	3.52 / 2.56	4.11 / 3.59
MAX NO. OF CONNECTABLE INDOOR UNITS		20	25	30	35	40	40
MAX CONNECTABLE CAPACITY		50~130% OU Capacity	50~130% OU Capacity	50~130% OU Capacity	50~130% OU Capacity	50~130% OU Capacity	50~130% OU Capacity
AIRFLOW (m³/min)	High	170	185	240	270	300	170 / 170
	Gas	22.2 (7/8")	22.2 (7/8")	22.2 (7/8")	28.58 (1-1/8")	28.58 (1-1/8")	28.58 (1-1/8")
PIPE SIZE mm (in)	Liquid	9.52 (3/8")	9.52 (3/8")*1	9.52 (3/8")*1	12.7 (1/2")	12.7 (1/2")	12.7 (1/2")
	Heating / Cooling	59.0 / 58.0	61.0 / 60.0	64.5 / 61.0	64.5 / 62.0	67.0 / 65.0	62.0 / 61.0
SOUND POWER LEVEL (dBA)		77.0 / 75.0	80.0 / 78.0	84.0 / 80.0	84.0 / 80.0	86.0 / 82.0	80.0 / 78.0
WEIGHT (kg)	Width	213	213	226	277	277	213 + 213
	Depth	920	920	920	1240	1240	920 + 920
DIMENSIONS (mm)	Height	740	740	740	740	740	740
	(1798mm without legs)	1858	1858	1858	1858	1858	1858
ELECTRICAL SUPPLY*2		380-415v, 50Hz	380-415v, 50Hz	380-415v, 50Hz	380-415v, 50Hz	380-415v, 50Hz	380-415v, 50Hz
PHASE*2		Three	Three	Three	Three	Three	Three
STARTING CURRENT (A)*2		8	8	8	8	8	8
NOMINAL SYSTEM RUNNING CURRENT (A)*2		9.7 / 9.6 [16.1]	13.6 / 15.4 [17.8]	16.5 / 18.1 [22.7]	19.7 / 22.4 [26.4]	22.7 / 28.1 [31.9]	19.5 / 19.9 [16.1 + 16.1]
GUARANTEED OPERATING RANGE (°C)		-20~15.5 / -5~52	-20~15.5 / -5~52	-20~15.5 / -5~52	-20~15.5 / -5~52	-20~15.5 / -5~52	-20~15.5 / -5~52
FUSE RATING (MCB sizes BS EN 60947-2) - (A)*2		1 x 20	1 x 20	1 x 25	1 x 32	1 x 32	1 x 20 / 1 x 20
MAINS CABLE No. Cores*2		4 + earth	4 + earth	4 + earth	4 + earth	4 + earth	4 + earth / 4 + earth
CHARGE REFRIGERANT (kg) / CO ₂ EQUIVALENT (T) R410A (GWP 2088)		6.5 / 13.6	6.5 / 13.6	6.5 / 13.6	9.8 / 24.0	9.8 / 20.5	13 / 27.1
MAX ADDITIONAL REFRIGERANT (KG) / CO ₂ EQUIVALENT (T) R410A (GWP 2088)		15.9 / 33.2	22.9 / 47.8	23.4 / 48.9	24 / 50.1	24.4 / 51.0	32 / 66.8

Notes: *SEER/SCOP available separately in the 'City Multi VRF Seasonal Efficiency' document. Based on Ecodesign Lot 21/6 to EN14825 standard.

*1 12.7mm(1/2") if P250 furthest length ≥ 90m, P300 furthest length ≥ 40m. *2 A separate power supply is required for each module. Where more than one figure is quoted there are multiple modules.

Sound level of PUHY-P350YKB-A1(-BS)



		63	125	250	500	1k	2k	4k	8k	dB(A)
Standard	50/60Hz	77.5	67.5	63.5	59.0	52.5	47.0	41.0	36.0	61.0
Low noise mode	50/60Hz	71.0	59.0	50.0	45.5	41.0	43.5	31.0	31.5	51.0

When Low noise mode is set, the A/C system's capacity is limited. The system could return to normal operation from Low noise mode automatically in the case that the operation condition is severe.

References

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2. **Chartered Institute of Environmental Health and Institute of Acoustics.** *CIEH Website.* [Online] November 2022. [Cited: 21 08 2024.] <https://www.cieh.org/media/7539/heat-pumps-briefing-note.pdf>.
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4. **East Sussex County Council, Hastings Borough Council, Horsham District Council, Lewes District Council, Mid Sussex District Council, Rother District Council, Wealden District Council, West Sussex County Council, Worthing Borough Council.** *Planning Noise Advice Document: Sussex.* November 2023.
5. **Horesham District Council.** *Horesham District Planning Framework (excluding South Downs National Park).* 2015.
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8. **Acoustic South East.** *Noise Impact Assessment Change to the Hours of Use.* 21 Oct 2024. J3924.
9. **British Standards Institution.** *BS ISO 9613 Acoustics - Attenuation of sound during propagation outdoors. Part 2: Engineering method for the prediction of sound pressure levels outdoors.* 2024. BS ISO 9613-2:2024.
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11. **The Association of Noise Consultants.** *BS 4142:2014+A1:2019 Technical Note, Version 1.0.* March 2020.
12. **Wealden District Council & South Downs National Park Authority.** *Wealden District (incorporating part of the South Downs National Park) Core Strategy Local Plan.* s.l. : Wealden District Council, 19 February 2013.