Project: J 06344

Plant Noise Assessment:

Units 33-35 Clayton Road, Hayes, UB3 1AN

Consultants: Sound Planning Ltd

25a Vicarage Hill

Lower Bourne

Farnham

Surrey

GU10 3QS

TEL: 01252 711972

Client: Cistus

Prepared by: J. Willmott

Signed:

J. Willmott MSc M.I.O.A

Senior Acoustic Consultant

Dated: Wednesday 15th July 2026

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1. BACKGROUND

1.1. The assessment concerns the installation of 4 new external AC units with 1 existing unit to be retained at the site.

See APPENDIX 2 - Site Location/Plans.

1.2. Sound Planning understands that the following equipment will contribute to the noise emissions from the proposed new activity areas:

- 1 x Mitsubishi PUHY-P300YNW-A2 installed in the rear car park at the site at ground level (existing and to be retained)
- 3 x Mitsubishi PUHY-P1150YSNW-A2 AC units proposed for installation in the rear car park of the site at ground floor level
- 1 x Mitsubishi PUZ-M125VKA AC unit proposed for installation on the rear façade of the building at approximately 3m elevation

1.3. Sound Planning has been retained to evaluate potential noise impact on the nearest noise sensitive receiver using appropriate methodologies and assessment criteria, and to design a suitable noise mitigation strategy if required.

1.4. Jake Willmott is a Member of the Institute of Acoustics (M.I.O.A) having attained appropriate qualifications in acoustics and has seven years' experience undertaking acoustic assessments including significant experience of BS4142 assessments in the context of planning applications.

Jake has attained the following qualifications within the field of acoustics:

- Institute of Acoustics (IOA) Diploma
- Masters Degree - Applied Acoustics (Solent University)

1.5. Site and Location

1.5.1. The site is in a predominantly commercial area with residential to the west and north. See APPENDIX 2 - Site Location/Plans.

1.5.2. The nearest noise sensitive receiver to the proposed plant installation is a residential block at the western boundary of the site approximately 45m from the plant location.

See APPENDIX 2 - Site Location/Plans.

1.5.3. Noise currently affecting the site comprises road traffic noise from the surrounding road network and commercial noise from the surrounding industrial estate.

1.6. Proposed Operation Times:

- Monday – Sunday: up to 24-hours per day as required by site operator

2. ASSESSMENT CRITERIA

2.1. The plant noise assessment should be carried out in accordance with relevant standards and guidelines in conjunction with National Planning Policy (from the National Planning Policy Framework and the Noise Policy Statement for England), and the requirements of local planning policy as defined by The London Borough of Hillingdon.

2.2. National Planning Policy Framework

2.2.1. The National Planning Policy Framework (NPPF) was released in March 2012 and last updated in December 2023.

2.2.2. Paragraph 174 of the NPPF states: *'Planning policies and decisions should contribute to and enhance the natural and local environment by… preventing new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by, unacceptable levels of… noise pollution…'.*

2.2.3. Paragraph 185 of the NPPF states that; *'Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*

- *mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life (see Explanatory Note to the Noise Policy Statement for England (DEFRA)).*
- *identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and*

- *limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.'*

2.2.4. Paragraph 193 of the NPPF states that; *'Planning policies and decisions should ensure that new development4 can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.'*

2.2.5. Therefore, the NPPF requires that significant impacts are avoided, adverse impacts be mitigated and reduced to a minimum, and places an obligation on developers to not unduly constrain the operation of existing businesses and other noise sources in the area (the *'agent of change'* principle).

2.3. Noise Policy Statement for England (NPSE)

2.3.1. The NPSE requires that developments:

- 'Avoid significant adverse impacts on health and quality of life;
- Mitigate and minimise adverse impacts on health and quality of life; and
- Where possible contribute to the improvement of health and quality of life'

2.4. Local Planning Policy (SPD Development Control for Noise Generating and Noise Sensitive Development – London Borough of Hillingdon)

2.4.1. The London Borough of Hillingdon require that rating levels from commercial noise sources are at least 5 dB below the existing background noise level at the nearest/worst affected NSR.

2.5. Noise Measurement Protocol - British Standard 7445-1: 2003[1]

[1] Description and measurement of environmental noise. Part 1 – Guide to quantities and procedures.

2.5.1. The methods and procedures described in BS 7445 are intended to be applicable to sounds from all sources, individually and in combination, which contribute to the total noise at a site.

2.5.2. The aim of the BS 7445 series is to provide authorities with material for the description of noise in community environments. Based on the principles described in this standard, acceptable limits of noise can be specified and compliance with these limits can be controlled.

2.5.3. BS 7445 does not specify limits for environmental noise.

2.6. BS 4142: 2014+A1: 2019 – Assessment of Impacts

2.6.1. The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs.

2.6.2. Evaluation of Adverse Impact

- 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.

2.6.3. Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.

2.6.4. The specific sound source level has character corrections applied during the assessment which account for the specific nature of the sound and whether it is more or less likely to be disruptive to the receptor. The available character corrections within the standard are:

Tonality
A correction of up to +6 dB may be applied for a sound which is likely to have discernible tonal elements at the receptor location. Tonality may be assessed via subjective (i.e. perceived on-site) or objective methods, with the subjective method given preference in the standard, where possible. The objective method may be calculated in either 1/3 octave or octave bands based, with the 1/3rd octave calculation given preference in the standard.

Impulsivity
A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of +3 dB for impulsivity which is just perceptible at the noise receptor, +6 dB where it is clearly perceptible, and +9 dB where it is highly perceptible. A reference method is provided in the standard if a subjective assessment is inconclusive or not possible to undertake.

Intermittency
When the specific sound has identifiable on/off conditions a penalty of +3 dB can be applied.

Other sound characteristics
Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of +3 dB can be applied.

3. NOISE SURVEY METHODOLOGY

3.1. Sound Planning completed a noise survey at the site between Thursday 18th June and Monday 22nd June.

3.2. Background Noise Measurements

3.2.1. Sound monitoring equipment was installed in the rear car park of the site in a location exposed to similar noise sources to the NSR, which is on the boundary of the car park. Existing external AC unit (VRF unit) was switched off.

See APPENDIX 2 – Site Location & APPENDIX 3 – Site Photographs.

3.2.2. The background noise measurements were carried out over a full weekend period plus one weekday.

3.2.3. The sound level meter was Class 1 – details provided in 3.3. The microphone was positioned 1.5m above ground level and at least 3.5m from any vertical reflective façade.

3.3. Sound Level Measurement Equipment

Equipment	Make	Model	Class	Serial Number	UKAS Calibration
SLM	Norsonic	NOR140	1	1406175	U50957 (13/05/25)
Field Calibrator	Norsonic	NOR1255	1	125525638	U55078 (05/06/26)

3.4. The Sound Level Meter (SLM) was field calibrated before and after the on-site noise measurements. No deviation was detected (1kHz). UKAS accredited calibration certificates are available on request.

3.5. The noise measurements were undertaken in accordance with BS 7445 and BS 4142.

3.6. Full background noise measurements are provided in APPENDIX 4 – Noise Measurement Data

4. NOISE CALCULATION METHODOLOGY

4.1. The noise level at the nearest external noise sensitive receiver (NSR) will be calculated using the formula:

$$SPL_2 = SPL_1 - 20 \log (r_2/r_1)$$

Where 'r' = radius; SPL = Sound Pressure Level.

4.2. Acoustic Feature Corrections – see 2.6.4 The feature corrections to be applied to the noise sources are as follows:

4.2.1. +3 for 'other sound characteristics' as noise from air conditioning equipment is not reliably tonal or impulsive but can be distinctive against the prevailing acoustic environment in residential settings.

4.3. The resultant (combined) Rating Level (dB L_{Aeq}) will be compared to the existing background noise levels and evaluated against criteria in BS 4142: 2014+A1: 2019.

5. NOISE MEASUREMENT RESULTS

5.1. Background Noise Levels – see APPENDIX 4

The typical background noise level has been determined by excluding outliers at the bottom end of the scale that occurred once per day/night or less.

Noise Sensitive Receiver	Typical Night-time Background Noise Level dB $L_{A90,15min}$
NSR	32

6. NOISE CALCULATION RESULTS

6.1. NSR 1 – Noise Rating Level Calculations

Equipment / Activity	Specific	Distance Attenuation (45m)	Directivity	Correction for number of units	BS 4142 Penalties	Rating
	dB L_{Aeq}	dB L_{Aeq}	(dB)	(dB)	(dB)	(dB)
1x Mitsubishi PUHY-P300YNW-A2 (existing)	64.5	-33.1	+6	0	+3	40
3x Mitsubishi PUHY-P1150YSNW-A2	71.5	-33.1	+3	+4.8	+3	49
1x Mitsubishi PUZ-M125VKA	56	-33.1	+3	0	+3	29

7. BS4142:2014 ASSESSMENT

7.1. NSR 1 – BS4142 Assessment:

Equipment / Activity	**Rating**	**Background Level**	**Excess**	
	(dB)	**dB L_{A90}**	**(dB)**	
1x Mitsubishi PUHY-P300YNW-A2 (existing)	40	32	+8	
3x Mitsubishi PUHY-P1150YSNW-A2	49	32	+17	
1x Mitsubishi PUZ-M125VKA	29	32	-3	
Combined	**50**	**32**	**+18**	***Significant Impact / does not meet local authority requirements***

8. NOISE MITIGATION STRATEGY

8.1. The predicted rating level at the noise sensitive receiver should be considered to cause *'significant impact'* in accordance with BS 4142: 2014+A1: 2019. In addition, the predicted level of noise output does not comply with the requirements of the London Borough of Hillingdon.

8.2. A noise mitigation strategy is required to reduce rating levels down to 5 dB below the background noise level; this requires a strategy which achieves 23 dB(A) attenuation.

8.3. We recommend the following noise mitigation strategy for the plant installation:

Equipment / Activity	Noise Mitigation Type / Product
1 x Mitsubishi PUHY-P300YNW-A2 (existing)	*Unit to be fitted with an acoustic enclosure achieving 18 dB(A) attenuation*
3 x Mitsubishi PUHY-P1150YSNW-A2	*Units to be fitted with acoustic enclosures achieving 24 dB(A) attenuation*
1 x Mitsubishi PUZ-M125VKA	*Unit to be fitted with an acoustic enclosure achieving 10 dB(A) attenuation*

See APPENDIX 6 – Data Sheets

8.4. Suitable acoustic enclosures for the AC units:

8.4.1. QuietBox VE – can be configured to achieve 10-25 dBA attenuation by varying louvre / attenuator configurations. QuietBox VE enclosures can incorporate more than 1 unit and therefore it may be more cost efficient to house all Mitsubishi PUHY VRF units in one enclosure.

8.4.2. Other acoustic enclosure suppliers including Environ[2], EEC[3] and Bespoke Acoustic Solutions[4] will also be able to provide suitable acoustic enclosures to meet the attenuation levels required.

9. CONCLUSIONS

9.1. Sound Planning has carried out an environmental noise impact assessment in accordance with the requirements of BS 4142: 2014+A1: 2019 and BS 7445: 2003.

9.2. The predicted combined noise rating level (BS 4142) of all equipment proposed for installation at the site has been compared to the existing background noise level at the nearest noise sensitive receiver.

[2] https://www.environ.co.uk/
[3] http://eec.co.uk/products/
[4] https://www.bas-ltd.co.uk/products/heat-pump-enclosures

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9.3. The evaluation shows that the predicted noise rating level at the nearest noise sensitive receiver is ***'significant impact'*** in accordance with BS 4142:2014+A1:2019.

9.4. To minimise noise impact to ***'low impact'*** for the nearest noise sensitive receivers and to meet the requirements of the London Borough of Hillingdon, the following noise mitigation strategy is recommended:

Equipment / Activity	Noise Mitigation Type / Product
1 x Mitsubishi PUHY-P300YNW-A2 (existing)	Unit to be fitted with an acoustic enclosure achieving 18 dB(A) attenuation
3 x Mitsubishi PUHY-P1150YSNW-A2	Units to be fitted with acoustic enclosures achieving 24 dB(A) attenuation
1 x Mitsubishi PUZ-M125VKA	Unit to be fitted with an acoustic enclosure achieving 10 dB(A) attenuation

9.5. Subject to the installation of the recommended noise mitigation strategy the plant installation will comply with the requirements of local and national planning policy and adverse impacts on nearby noise sensitive receivers will be avoided.

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APPENDIX 1

Glossary of Acoustic Terms

The Decibel, dB

The unit used to describe the magnitude of sound is the decibel (dB) and the quantity measured is the sound pressure level. The decibel scale is logarithmic and it ascribes equal values to proportional changes in sound pressure, which is a characteristic of the ear. Use of a logarithmic scale has the added advantage that it compresses the very wide range of sound pressures to which the ear may typically be exposed to a more manageable range of numbers. The threshold of hearing occurs at approximately 0 dB (which corresponds to a reference sound pressure of 2×10^{-5} pascals) and the threshold of pain is around 120 dB. The sound energy radiated by a source can also be expressed in decibels. The sound power is a measure of the total sound energy radiated by a source per second, in watts. The sound power level, L_w is expressed in decibels, referenced to 10^{-12} watts.

Frequency, Hz

Frequency is analogous to musical pitch. It depends upon the rate of vibration of the air molecules that transmit the sound and is measure as the number of cycles per second or Hertz (Hz). The human ear is sensitive to sound in the range 20 Hz to 20,000 Hz (20 kHz). For acoustic engineering purposes, the frequency range is normally divided up into discrete bands. The most commonly used bands are octave bands, in which the upper limiting frequency for any band is twice the lower limiting frequency, and one-third octave bands, in which each octave band is divided into three. The bands are described by their centre frequency value and the ranges which are typically used for building acoustics purposes are 63 Hz to 4 kHz (octave bands) and 100 Hz to 3150 Hz (one-third octave bands).

Noise Rating

The Noise Rating (NR) system is a set of octave band sound pressure level curves used for specifying limiting values for building services noise. The Noise Criteria (NC) and Preferred Noise Criteria (PNC) systems are similar.

A-weighting

The sensitivity of the ear is frequency dependent. Sound level meters are fitted with a weighting network which approximates to this response and allows sound levels to be expressed as an overall single figure value, in dB(A).

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Noise Descriptors

Where noise levels vary with time, it is necessary to express the results of a measurement over a period of time in statistical terms. Some commonly used descriptors follow.

$L_{Aeq,T}$ *The most widely applicable unit is the equivalent continuous A-weighted sound pressure level ($L_{Aeq,T}$). It is an energy average and is defined as the level of a notional sound which (over a defined period of time, T) would deliver the same A-weighted sound energy as the actual fluctuating sound.*

L_{AE} *Where the overall noise level over a given period is made up of individual noise events, the $L_{Aeq,T}$ can be predicted by measuring the noise of the individual noise events using the sound exposure level, L_{AE} (or SEL or L_{AX}). It is defined as the level that, if maintained constant for a period of one second, would deliver the same A-weighted sound energy as the actual noise event.*

L_{A1} *The level exceeded for 1% of the time is sometimes used to represent typical noise maxima.*

L_{A10} *The level exceeded for 10% of the time is often used to describe road traffic noise.*

L_{A90} *The level exceeded for 90% of the time is normally used to describe background noise.*

Sound Transmission Descriptors

D_{nT} Standardised level difference

$D_{nT,w}$ Weighted standardised level difference

L_1 The average sound pressure level in the source room

L_2 The average sound pressure level in the receiving room

T Reverberation time (receiving room)

T_0 Reference reverberation time = 0.5s

C_{tr} Adaption spectrum which takes account for low to medium speed road/rail/air traffic; disco music; and factory noise (medium to low frequency noise).

C Adaptation spectrum which takes account of domestic activities including speech, music, radio and television.

Frequency Analysis

Octave Band *A band of frequencies the upper limit of which is twice the lower limit. They are known by their centre frequency, e.g., 63, 125, 250, 500, 1000, 2000 Hz…*

One Third Octave	*The logarithmic frequency interval between a lower frequency f_2, when f_2/f_1 equals $2^{1/3}$ apart. Frequencies include: 100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1000Hz.*

Sound Transmission in the Open Air

Most sources of sound can be characterised as a single point in space. The sound energy radiated is proportional to the surface area of a sphere centred on the point. The area of a sphere is proportional to the square of the radius, so the sound energy is inversely proportional to the square of the radius. This is the inverse square law.

In decibel terms, every time the distance from a point source is doubled, the sound pressure level is reduced by 6 dB. Road traffic noise is a notable exception to this rule, as it approximates to a line source, which is represented by the line of the road. The sound energy radiated is inversely proportional to the area of a cylinder centred on the line. In decibel terms, every time the distance from a line source is doubled, the sound pressure level is reduced by 3 dB.

Factors Affecting Sound Transmission in the Open Air

Reflection

When sound waves encounter a hard surface, such as concrete, brickwork, glass, timber or plasterboard, it is reflected from it. As a result, the sound pressure level measured immediately in front of a building façade is approximately 3 dB higher than it would be in the absence of the façade.

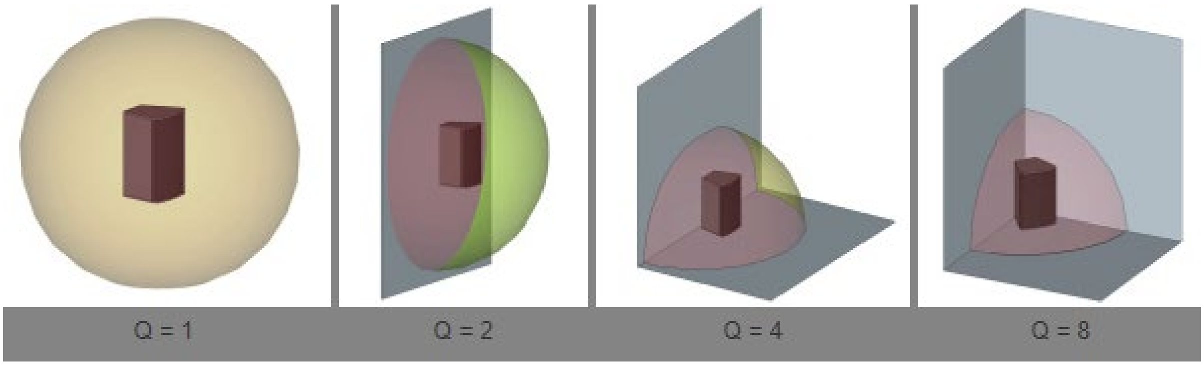
Screening and Diffraction

If a solid screen is introduced between a source and receiver, interrupting the sound path, a reduction in sound level is experienced. This reduction is limited, however, by diffraction of the sound energy at the edges of the screen. Screens can provide valuable noise attenuation however. For example, a timber boarded fence built next to a motorway can reduce noise levels on the land beyond, typically by around 10 dB(A). The best results are obtained when a screen is situated close to the source or close to the receiver.

Meteorological Effects

Temperature and wind gradients affect noise transmission, especially over large distances. The wind effects range from increasing the level by typically 2 dB downwind, to reducing it by typically 10 dB upwind – or even more in extreme conditions. Temperature and wind gradient are variable and difficult to predict.

Directivity Index



APPENDIX 2

Site Location/Plans

Google Earth

Key:

NSR – Residential Property

Noise Monitoring Position (MP1)

Plant Location (approx.)

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APPENDIX 3

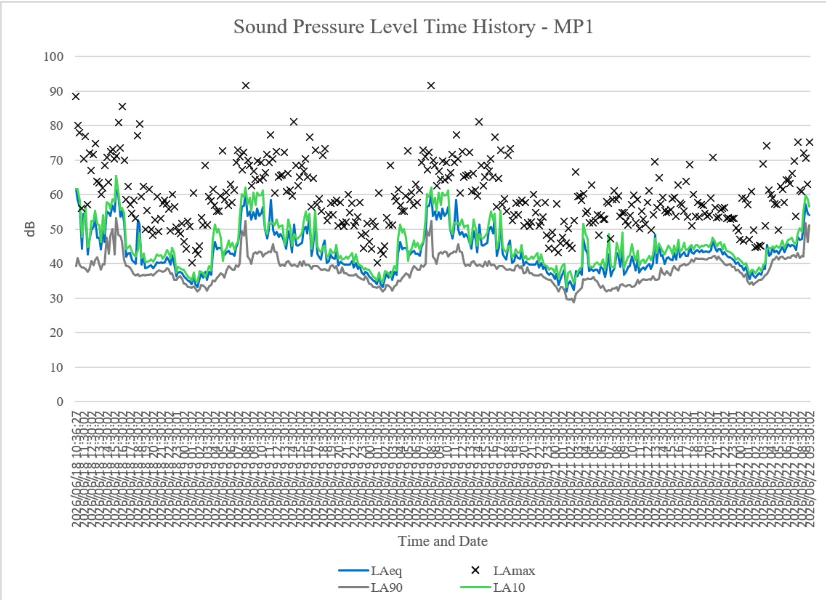
Site Photographs

Background Noise Measurement Position

APPENDIX 4

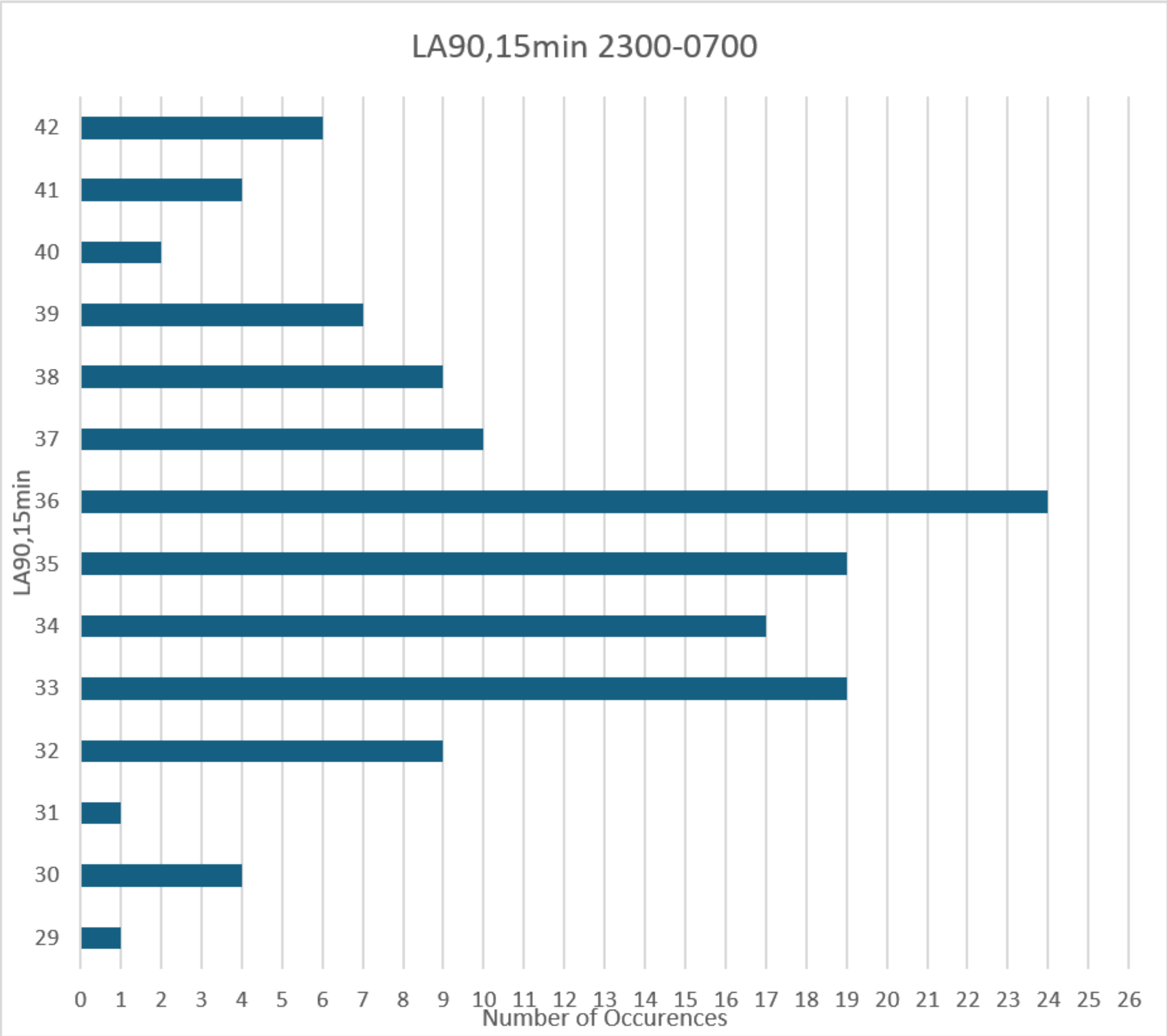
Noise Measurement Data

Background Noise Levels – MP1



Background Noise Level Analysis

The typical background noise level has been determined by excluding outliers at the bottom end of the scale that occurred once per day/night or less.



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APPENDIX 5
Levels of Uncertainty

Category	Notes
Complexity of Sound Source	*5 x AC units installed externally*
Complexity of Acoustic Environment (Residual)	*Residual environment is shielded from nearby noise sources and controlled by distant traffic and commercial noise*
Level of Residual Sound (including Specific)	*n/a*
Measurement Location	*Representative of closest receptor*
Distance Between Sound Source & Measurement Position	*n/a*
Number of Measurements Taken	*24-hours*
Measurement Time Intervals	*15-minute measurements*
Range of Times	*Includes quietest likely times of proposed operation*
Range of Suitable Weather Conditions	*1 measurement period – Suitable weather conditions*
Measurement Method/Practitioners	*1 measurement period (Jake Willmott) measurements taken in line with BS7445*
Level of Rounding	*Rounded to nearest DP; 0.5 rounded up*
Instrumentation	*Class 1 SLM (suitable)*

APPENDIX 6

Data Sheets

AC Units

3 SPECIFICATIONS

Service Ref			PUZ-M100VKA.TH PUZ-M100VKA-ET.TH	PUZ-M125VKA.TH PUZ-M125VKA-ET.TH	PUZ-M140VKA.TH PUZ-M140VKA-ET.TH	PUZ-M100YKA.TH PUZ-M100YKA-ET.TH	PUZ-M125YKA.TH PUZ-M125YKA-ET.TH	PUZ-M140YKA.TH PUZ-M140YKA-ET.TH
Power supply (phase, voltage, cycle)			Single phase, 230 V, 50 Hz			3-phase, 400 V, 50 Hz		
	Max. current	A	20	26.5	30	11.5		
External finish			Munsell 3Y 7.8/1.1					
Refrigerant control			Linear Expansion Valve					
Compressor			Hermetic					
	Model		SVB220FBGMT	MVB33FBVMC	MVB33FBVMC	SVB220FBAMT	MVB33FBVMC	MVB33FBVMC
	Motor output	kW	1.5	2.5	2.5	1.5	2.5	2.5
	Starter type		Direct input					
	Protection devices		Shell thermistor H.P. switch					
Heat exchanger			Plate fin coil					
Fan	Fan(drive) x No.		Propeller fan x 1					
	Fan motor output	kW	0.200					
	Air volume	m³/min	79	86	86	79	86	86
Noise level	Cooling	SPL(dB)	51	54	55	51	54	55
	Heating	SPL(dB)	54	56	57	54	56	57
	Cooling	PWL(dB)	70	72	73	70	72	73
Dimensions	W	mm(inch)	1,050 (41-5/16)					
	D	mm(inch)	330+40 (13+1-3/16)					
	H	mm(inch)	981 (38-5/8)					
Weight		kg	76	84	84	78	85	85
Refrigerant			R32					
	Charge	kg	3.1	3.6	3.6	3.1	3.6	3.6
	Oil (Model)	cc	700 (FW68S)	1100 (FW68S)	1100 (FW68S)	700 (FW68S)	1100 (FW68S)	1100 (FW68S)

1. SPECIFICATIONS

Y-Series

PUHY-P-Y(S)NW-A2

Model			PUHY-P1150YSNW-A2 (-BS)
Power source			3-phase 4-wire 380-400-415 V 50/60 Hz
Cooling capacity (Nominal) *1		kW	130.0
		BTU/h	443,600
	Power input	kW	50.58
	Current input	A	85.3-81.1-78.1
	EER	kW/kW	2.57
	SEER	kW/kW	5.82
Temp. range of cooling	Indoor	W.B.	15.0~24.0°C (59~75°F)
	Outdoor	D.B.	-5.0~52.0°C (23~126°F)
Heating capacity (Max) *2		kW	145.0
		BTU/h	494,700
	Power input	kW	40.84
	Current input	A	68.9-65.4-63.1
	COP	kW/kW	3.55
(Nominal) *3		kW	130.0
		BTU/h	443,600
	Power input	kW	34.21
	Current input	A	57.7-54.8-52.8
	COP	kW/kW	3.80
	SCOP	kW/kW	4.09
Temp. range of heating	Indoor	D.B.	15.0~27.0°C (59~81°F)
	Outdoor	W.B.	-20.0~15.5°C (-4~60°F)
Indoor unit connectable	Total capacity		50~130% of outdoor unit capacity
	Model/Quantity		P10~P250, M20~M140/3~50
Sound pressure level (measured in anechoic room) *4, 5		dB <A>	69.5/71.5
Sound power level (measured in anechoic room) *4		dB <A>	86/90
Refrigerant piping diameter	Liquid pipe	mm (in.)	19.05 (3/4) Brazed
	Gas pipe	mm (in.)	41.28 (1-5/8) Brazed

1. SPECIFICATIONS

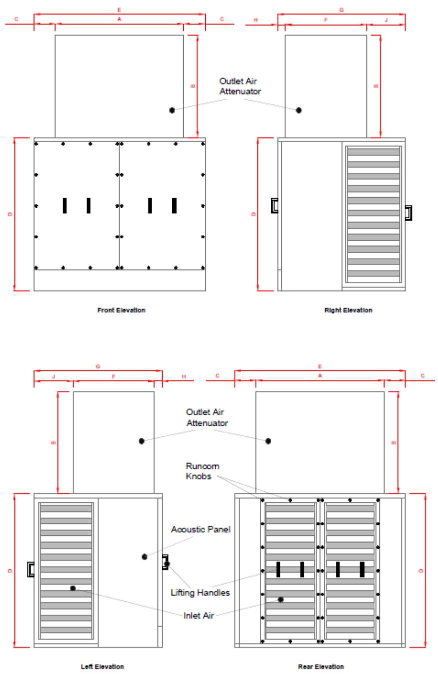
Y-Series

PUHY-P-Y(S)NW-A2

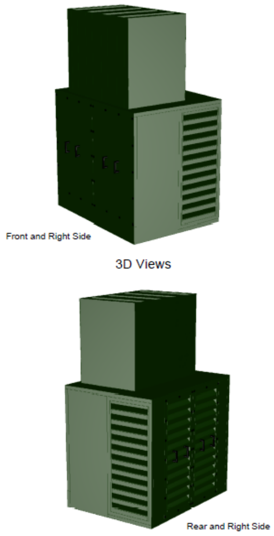
Model			PUHY-P300YNW-A2 (-BS)
Power source			3-phase 4-wire 380-400-415 V 50/60 Hz
Cooling capacity (Nominal) *1		kW	33.5
		BTU/h	114,300
	Power input	kW	11.31
	Current input	A	19.0-18.1-17.4
	EER	kW/kW	2.96
	SEER	kW/kW	6.70
Temp. range of cooling	Indoor	W.B.	15.0~24.0°C (59~75°F)
	Outdoor	D.B.	-5.0~52.0°C (23~126°F)
Heating capacity (Max) *2		kW	37.5
		BTU/h	128,000
	Power input	kW	10.30
	Current input	A	17.3-16.5-15.9
	COP	kW/kW	3.64
(Nominal) *3		kW	33.5
		BTU/h	114,300
	Power input	kW	8.74
	Current input	A	14.7-14.0-13.5
	COP	kW/kW	3.83
	SCOP	kW/kW	4.12
Temp. range of heating	Indoor	D.B.	15.0~27.0°C (59~81°F)
	Outdoor	W.B.	-20.0~15.5°C (-4~60°F)
Indoor unit connectable	Total capacity		50~130% of outdoor unit capacity
	Model/Quantity		P10~P250, M20~M140/1~30
Sound pressure level (measured in anechoic room) *4, 5		dB <A>	61.0/64.5
Sound power level (measured in anechoic room) *4		dB <A>	80/84

Acoustic Enclosure

QuietBox VE (standard)



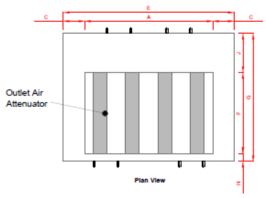
Flexible Connector / Air Divider



3D Views

SOUND REDUCTION								
Frequency (Hz)	63	125	250	500	1k	2k	4k	8k
IL (to 1DP) (dB)	13	15.5	19.5	21	18.5	21	22.5	23.5

Field test was carried out in accordance with BS EN ISO 11546-2: 1996 acoustics -Determination of sound insulation performance of enclosures. Part 2 Measurements in situ (for acceptance and verification purposes).



Notes

- Galvanised Steel Construction (Polyester Powder Coated to any standard RAL)
- High Density Acoustic Media
- Demountable Service Access Panels
- Designed for compliance with recommended OEM pressure drops

Rev	Amendment	Date	Project:	Scale: N.T.S	Date: 18/07/2023	Sound Planning Limited Farnham Surrey
Notes: No scaling permitted from this drawing. All dimensions shown to be verified prior to construction / manufacture.			Title: QuietBox VE - VRF Twin Fan Enclosure Generic	Drawn: B.Walker		Phone: 01252 711972 Fax: 01252 601083 Email: enquiries@soundplanning.co.uk
				Drawing No:QuietBox VE TFE		soundplanning

Acoustic Enclosure

QuietBox VE (attenuator variant)