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Noise Impact Report

Project Details	
Client	Danielle and Yaniv Neuner
Client Address	6 Byron Mews London NW3 2NQ
Site Address	6 Byron Mews London NW3 2NQ
Reference	21813E

Quality Assurance	
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Revision History

Version	Date	Editor	Notes
V1	06/08/2024	Justyna Lubas	First issue
V2	07/08/2024	Justyna Lubas	Update to conclusion and appendix section
V3	27/08/2024	Justyna Lubas	Confirmed location of proposed AC unit and minor formatting

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1 Introduction

Danielle and Yaniv Neuner has instructed Spratt and Hamer Limited to undertake a noise survey to assess the impact of the proposed mechanical plant on nearby occupants.

It is proposed that a new air-conditioning unit be installed in the garden of an existing house. The assessment is to be submitted as part of a planning application for the development site to the London Borough of Camden.

This report is prepared solely for Danielle and Yaniv Neuner. Spratt and Hamer Limited accepts no responsibility for its use by any third party.

This document has been prepared using the various documents listed within the appendices of this report, together with drawings, technical information and additional verbal representations made by third parties. We have not audited nor independently verified the content or accuracy of any of the documents and information provided to us in the preparation of this report.

If additional information comes to light subsequent to the production of this report, we reserve the right to revise our opinions and the conclusions reached within this report.

1.1 Environmental Noise Assessment

Spratt and Hamer Limited has undertaken a noise impact assessment at the above site with noise levels measured externally over a 24-hour period, consisting of a 16-hour day (07:00 – 23:00) and eight-hour night (23:00 – 07:00) in order to establish background levels around the vicinity. The measurements were carried out during Tuesday and Wednesday.

This report will state the measured noise levels and will refer to guidance relevant to the nature of this survey whilst considering possible Local Planning Authority guidance and conditions.

2 Assumptions, Limitations & Uncertainty

a. All suggested specifications require a good level of workmanship and for materials to be installed as the manufacture intends. Any poor workmanship may lead to weaknesses in the sound attenuation provided by the building elements.
b. It is assumed that the sound pressure levels measured on site during the environmental noise survey are typical of the site.
c. It is assumed that the technical data and drawings provided by De-Unit is up to date and correct.

3 Planning Policies, Guidance and Criteria

The planning policies and criteria listed below are taken from associated relevant guidance documents, all of which should be considered for the internal and external noise and vibration levels.

3.1 National Planning Policy

The National Planning Policy Framework (NPPF) December 2023 set out the Government's planning policies for England and how they are expected to be applied. It provides a framework within which the Local Authorities are to prepare local plans and use their planning powers to minimise the adverse impact of noise. It should contain the following in relation to noise impacts.

174. Planning policies and decisions should contribute to and enhance the natural and local environment by:

'preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.'

185. 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 impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life*'

NPPF previously characterised noise by grading and recommending actions and different effect levels as reproduced in Table 1.

Perception	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

Table 1: Noise exposure hierarchy based on likely average response.

3.2 Criteria

3.2.1 Local Planning Authority Criteria

The London Borough of Camden's Local Plan Section A4 (6.99) states:

"Planning conditions will be imposed to require that plant and equipment which may be a source of noise is kept working efficiently and within the required noise limits and time restrictions. Air conditioning will only be permitted where it is demonstrated that there is a clear need for it after other measures have been considered (Policy CC2 Adapting to climate change). Conditions may also be imposed to ensure that attenuation measures are kept in place and are effective throughout the life of the development."

Appendix 3 states:

"Where appropriate and within the scope of the document it is expected that British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound' (BS 4142) will be used. For such cases a 'Rating Level' of 10 dB below the background (15dB if tonal components are present) should be considered as the design criterion).

Existing Noise Sensitive Receptor	Assessment Location	Design Period	LOAEL (Green)	LOAEL to SOAEL (Amber)	SOAEL (Red)
Dwellings**	Garden used for main amenity (free field) and Outside living or dining or bedroom window (façade)	Day	'Rating level' 10dB* below background	'Rating level' 10dB* below background	'Rating level' 10dB* below background
Dwellings**	Outside bedroom window (façade)	Night	'Rating level' 10dB* below background and no events exceeding 57dBLAmax	'Rating level' 10dB* below background and no events exceeding 57dBLAmax	'Rating level' 10dB* below background and no events exceeding 57dBLAmax

Table 2: Table C: Noise levels applicable to proposed industrial and commercial developments (including plant and machinery)

*10dB should be increased to 15dB if the noise contains audible tonal elements. (day and night). However, if it can be demonstrated that there is no significant difference in the character of the residual background noise and the specific noise from the proposed development then this reduction may not be required. In addition, a frequency analysis (to include the use of Noise Rating (NR) curves or other criteria curves) for the assessment of tonal or low-frequency noise may be required.

**levels given are for dwellings, however, levels are use specific and different levels will apply dependent on the use of the premises.

3.2.2 BS 4142 Method for rating and assessing industrial and commercial sound

BS 4142:2014+A1:2019 Method for rating and assessing industrial and commercial sound is routinely used by local authorities in assessing noise associated with industrial and/or commercial activity.

In brief, BS 4142 provides a means of assessment whereby noise from industrial and commercial sources (the "specific sound level", $L_{Aeq,t}$) is compared with background noise ("background sound level", L_{AF90}).

The specific sound level may be corrected by a numerical penalty if it includes acoustic features that are considered to be distinctive. The corrected specific sound level is termed a "rating level" ($L_{Aeq,t}$) and is designed to reflect people's subjective reaction to noise characteristics that may be considered annoying.

The rating level is then compared to the background sound level to assess its impact. BS 4142 describes an indication of the impact according to the numerical difference between the rating level and the background sound level. This is shown below in Table 3.

Rating Level – Background Sound Level	Indication of Impact
+ 10dB	Significant Adverse Impact
+ 5dB	Adverse Impact
≤ 0dB	Low Impact

Table 3: BS 4142 Rating Level Impact

3.3 Criteria Summary

To meet the requirements of the Local Authority, the assessment and recommendations will be made in reference to the *BS 4142:2014+A1:2019 Method for rating and assessing industrial and commercial sound* and provided design criteria of 10dB below background in Local Plan section A4 and Appendix 3, table C.

4 Site Description

The proposed development site is a terraced house located at 6 Byron Mews in the Belsize Park area of London. The house occupies a central position within a residential estate. The surrounding area is mostly residential in nature with some takeaway restaurants located to the southeast (The Rajdoot Hampstead being 90m away), northwest (Matchbox café being 85m away) and west approximately 77m away. A railway line runs approximately 158 meters north of the property, while an ambulance station is situated approximately 145 meters to the east. Although the site is surrounded by commercial properties, the house and its garden are shielded from commercial activity noise by the surrounding buildings.

The closest 'nearest sensitive receptor' (NSR1) to the site is the adjoining house to the west, approximately 3m away from the proposed air conditioning unit.

4.1 Subjective Observations

During site attendance, subjectively the noise was mostly dominated by garden tools, resident's conversations and distant road works.

4.2 Weather

It was noted during the site attendance that weather was clement, with no rain on either the day or throughout the measurement period. Wind speeds did not exceed 5m/s over the course of the survey.

30 – 31/07/2024	Tuesday	Wednesday
Temperature (°C)	17.7 – 30.9	18.7 – 28.7
Wind Speed (m/s)	0.0 – 0.8	0.0 – 0.7
Wind Direction	NE	ENE
Precipitation (mm/h)	0.0	0.0
Damp road/ wet ground	No	No
Fog/snow/ice	None	None

Table 4: Weather Conditions

All weather data was taken from wow.metoffice.gov.uk. Weather data has been taken from the Primrose Hill weather station, located at approximately 1.8km southeast of the proposed development.

5 Noise Measurement Procedure

5.1 Survey Dates

30/07/2024 – 31/07/2024

5.2 Personnel Present

Luke Owen BSc

5.3 Survey Equipment Used

Manufacturer	Model	Serial No.	Description
Rion	NL-52	01032413	Integrating Sound Level Meter and Real Time Analyser
Pulsar	Model 105	93357	Acoustic Calibrator

Table 5: Survey Equipment Used

5.4 Calibration

The sound level meters were calibrated with the field calibrator to a level of 94.0 dB @ 1 kHz prior to and on completion of the survey. No significant drift in calibration was observed. The meters used during the survey are precision grade Class 1.

Calibration certificates are available on request.

5.5 Background Sound Measurements

The measurement locations chosen during the survey were deemed suitable for the determination of the baseline noise levels of the area.

The sound level meters were set to measure A-weighted broadband and 1:1 octave frequency bands L_{Aeq}, L_{A90}, in 5-minute periods.

5.5.1 Monitoring Position 1

A microphone was placed in a free field environment, in the garden of the client's house. The meter was set to measure the complete 24-hour period.

See the Appendix for further details of the monitoring position.

5.6 Location Plan of the Measurement Position/s

The location plan below shows the proposed development and position/s of the monitoring equipment.

Figure 1: Indicative Site Map. Image taken from www.google.com/maps

6 Survey Results and Analysis

6.1 External Background Measurement Results

The following table presents the measured $L_{A90,15\text{-mins}}$ background results from the monitoring position during the daytime period 07:00 – 23:00 and the nighttime period 23:00 – 07:00.

All values are rounded to integers such that 0.5 is rounded up. Data charts can be found in the appendix.

Monitoring position	Time Period *t*	Min $L_{A90,t}$ (dB)	Max $L_{A90,t}$ (dB)	Modal $L_{A90,t}$ (dB)
1	Daytime	36	39	38
	Nighttime	34	37	35

Table 6: Measurement Results

The following histogram presents the measured $L_{A90,15\text{-min}}$ background results from the monitoring position during the night-time period 23:00 – 07:00 and daytime period 07:00 – 23:00 for measuring positions 1.

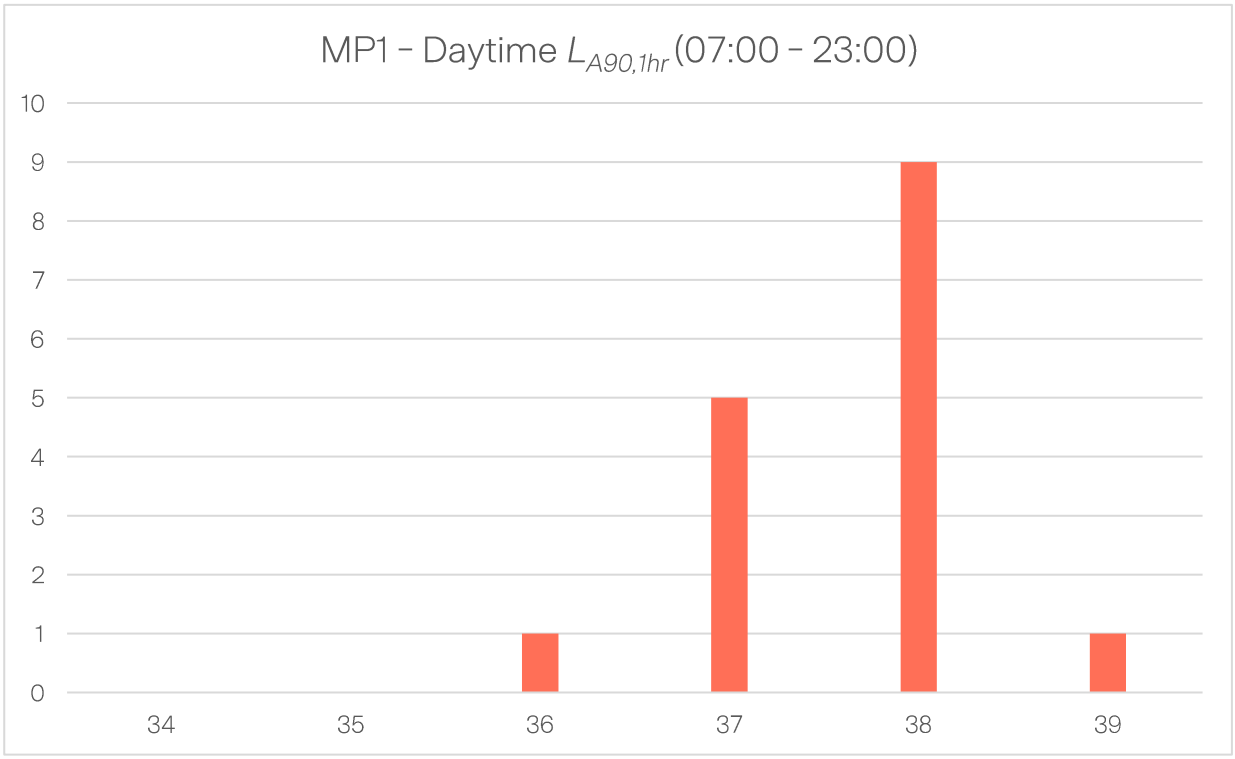


Figure 2: $L_{A90,t}$ Histogram- daytime, measuring position 1

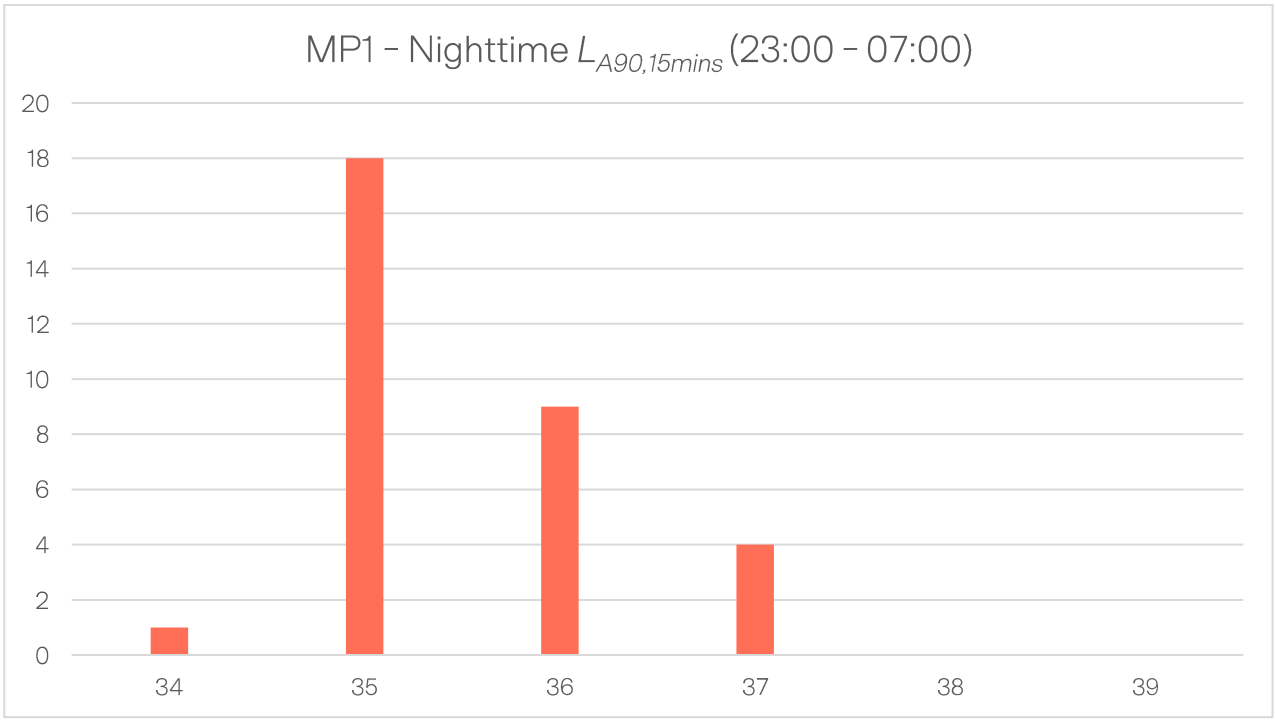


Figure 3: $L_{A90,t}$ Histogram- nighttime, measuring position 1

As can be seen, the modal SMR (statistically most repeated) $L_{A90,t}$ during the daytime is 38 dB and 35dB during nighttime for measuring position 1. To be robust, the second lowest values for daytime 37dB and nighttime 35dB will be used in the assessment to represent the prevailing background level in the garden (daytime) and by the window (nighttime) of the nearest sensitive receptor.

7 Noise Impact Assessment

7.1 Assessment of Mechanical Plant in Accordance with BS4142:2014

We are informed that the proposed air-conditioning plant to be installed at the front or the back of the building in the garden, by the fence will be a Mitsubishi MXZ-6F122VF with a Sound Power Level (SWL) of 69dB(A).

Installation of the proposed A/C unit at the front of the building is not feasible due to the close distance to the NSR, lack of shielding and as a result required noise reduction. Therefore, only rear placement was considered within the assessment.

7.2 Subjective Assessment

BS 4142:2014 states that where appropriate a rating penalty should be established for a sound on a subjective assessment of its characteristics and to correct the Specific Sound Level if a tone, impulse or other characteristics occur e.g intermittency.

BS4142:2014 says of Impulsivity:

"A correction of up to +9dB 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 3dB for impulsivity which is just perceptible at the noise receptor, 6dB where it is clearly perceptible, and 9dB where it is highly perceptible."

BS4142 says of tonality:

"... a penalty of 2dB for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible and 6dB where it is highly perceptible."

BS4142 says of intermittency:

"... If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied."

Due to insufficient data from the air conditioning unit manufacturer and the unit not being installed to measure in situ; it is unclear as to whether the units will be considered impulsive, tonal or to have any other detrimental acoustic characteristics. Modern AC units are typically designed to not be tonal during their operation. It is unlikely that there will be any of the above acoustic characteristics present in the operational noise of the proposed AC unit and so long as the unit is regularly maintained this should remain the case.

7.3 Numerical Assessment

The datasheet shows that the sound power level for both cooling is 69 dBA.

The following assumptions have been made based on our understanding of where the plant is to be located:

- A/C unit can operate anytime during daytime and nighttime,
- The plant will be installed in the corner of the garden, approximately 1m away from the fence. Therefore, a Q factor of 4 has been included in the calculations.
- The nearest residential dwelling (noise-sensitive receptor) is the house located to the west of the proposed A/C unit approximately 3m and 2m away fro the neighbouring window and garden, respectively.
- The unit will be placed out of the line of sight and will be screened by the fence, therefore -10dB will be deducted.
- Noise reduction due to the distance has been calculated using the following formula which incorporates the Q factor:

$$Lp = Lw - 10 \times \log\left(\frac{4\pi r^2}{Q}\right)$$

The council requires the plant to be at least 10dB below the representative background level, therefore, 27 dB will be used for the assessment during the daytime (within garden) and 25 dB will be used for the assessment during the night-time (at the window).

The following table demonstrates the impact of the air-conditioning unit on the nearest noise-sensitive dwelling.

Description	Daytime (dBA) – Garden	Nighttime (dBA) – Window
Sound Power Level *Lw* on manufacturer's datasheet	69	69
Sound Pressure Level L_p at 1m	64	64
Distance correction (2m/3m)	-6	-10
Screening	-10	-10
Rating Noise level at NSR1	48	44
10dB below Background Noise Level L_{A90}	27	25
Difference	+21	+19

Table 7: BS4142 Impact Assessment

The table above indicates that the noise impact due to the air-conditioning plant will be up to 21 dB above the required noise level at the garden during daytime and up to 19dB at the window during nighttime, both having "Significant Adverse Impact" according to BS 4142 definitions reproduced in Table 2, Section 3.2.2.

7.4 Mitigation & Recommendations

The following mitigation measures will need to be implemented in order to minimise the impact on the nearest receptors:

- An acoustic enclosure providing a minimum of 21dB should be installed to protect the amenities of the existing residents.
- A minimum distance of 3m should separate the unit from the nearest non-associated residential window. See the appendix for the site plan showing the proposed location.

The table below presents noise levels in the garden and by the window of NSR1.

Description	Daytime (dBA) – Garden	Nighttime (dBA) – Window
Sound Power Level *Lw* on manufacturer's datasheet	69	69
Sound Pressure Level L_p at 1m	64	64
Distance correction (2m / 3m)	-6	-10
Screening	-10	-10
Acoustic Enclosure	-21	-21
Rating Noise level at NSR1	27	23
10dB below Background Noise Level L_{A90}	27	25
Difference	0	-2

Table 8: Rating Noise level inclusive of the proposed mitigation.

As can be seen, the tables above indicate that the noise impact due to the proposed mitigation will be at least 10dB below the background noise level, thus falling in line with the Local Policy and a resultant 'Low Impact' according to BS 4142 definitions reproduced in Table 2, Section 3.2.2.

7.5 Context

The noise levels used for the assessment assume that the unit is always operating at full capacity and continuously. As such,the likelihood is that the difference between plant noise and background noise will be even greater for the majority of the time resulting in an even lower level of impact on nearby receptors.

8 Conclusion

The report concludes that, based on the understanding of the manufacturer's data, the proposed AC unit will require to be located at the rear garden of the property within an acoustic enclosure at least 3m away from the nearest receptor window in order to fall in line with the criteria set out in the London Borough of Camden Local Plan (2015). thus resulting in 'low impact' according to the methodology in BS 4142:2014 and NOAEL (No Observed Adverse Effect Level as per the National Planning Policy Framework (NPPF).

9 References

National Planning Policy Framework (NPPF)

BS 4142:2014+A1:2019 Method for rating and assessing industrial and commercial sound

BS 7445-1:2003 Description and measurement of environmental noise – Part 1: Guide to quantities and procedures

www.google.co.uk/maps.

wow.metoffice.gov.uk

London Borough of Camden Local Plan (2015)

9.1 Drawings:

6BM_planning_240416-DRAFT_AC

Appendix

Figure 1: Monitoring Position 1

Figure 2: Site Plan

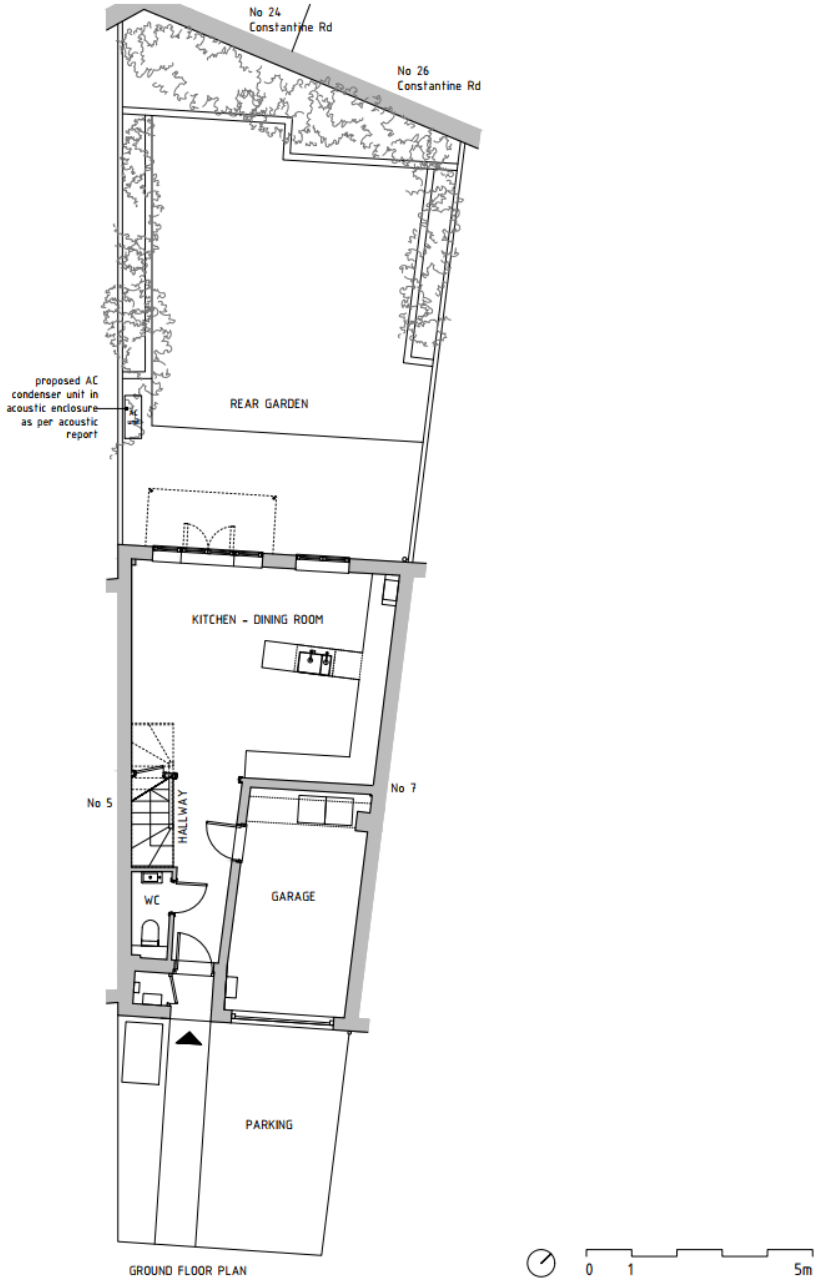


Figure 3: Technical Datasheets

	Outdoor model		MXZ-6F122VF	
	Outdoor unit power supply		Single phase 220 - 230 - 240V, 50 Hz ✻3	
System	Indoor units number		1 to 6 ✻4	
	Piping total length	m	Max. 80	
	Connecting pipe length	m	Max. 25	
	Height difference (Indoor ~ Outdoor)	m	Refer to 8 REFRIGERANT SYSTEM DIAGRAM.	
	Height difference (Indoor ~ Indoor)	m	Refer to 8 REFRIGERANT SYSTEM DIAGRAM.	
	Function		Cooling	Heating
	Capacity Rated (Min.-Max.) ✻2	kW	12.2 (3.5 - 14.0)	14.0 (3.5 - 16.5)
	Breaker capacity	A	32	
Electrical data	Power input (Total) ✻1, ✻2	W	3,660	3,310
	Running current (Total) ✻1, ✻2	A	16.8 - 16.1 - 15.4	15.2 - 14.5 - 13.9
	Power factor (Total) ✻1, ✻2	%	99	
	Starting current (Total) ✻1, ✻2	A	16.1	
Coefficient of performance (C.O.P) (Total) ✻1, ✻2			3.33	4.23
Compressor	Model		MVB33FBFMC	
	Output	W	3,300	
	Current ✻1, ✻2	A	14.2	12.6
	Refrigeration oil (Model)	L	1.10 (FW68CA)	
Fan motor	Model		SIC-88FWJ-D888-4	
	Current ✻1, ✻2	A	0.3	
	Dimensions W x H x D	mm	950 x 1,048 x 330	
	Weight	kg	87	
Special remarks	Air flow (Rated)	m^3 /h	3,780	4,620
	Sound level (Rated)	dB(A)	55	57
	Fan speed (Rated)	rpm	650	770
	Pre-charged refrigerant quantity (R32)	kg	2.4	
	Refrigerant filling capacity (R32)	kg	2.4	

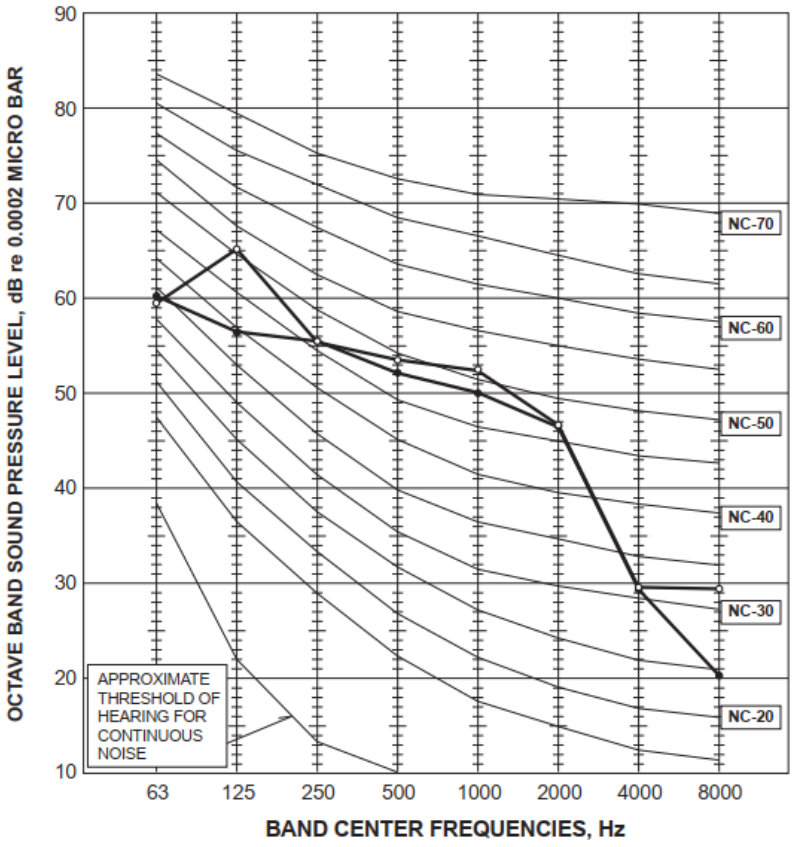
✻1 Measured under rated operating frequency.
✻2 When connected with indoor units below.
MSZ-LN18VG2 + MSZ-LN18VG2 + MSZ-LN18VG2 + MSZ-LN18VG2 + MSZ-LN25VG2 + MSZ-LN25VG2
✻3 220 and 240 V are only -E1.
✻4 At least 2 indoor units must be connected when using indoor unit with capacity lower than 25 class.
NOTE: Test conditions are based on ISO 5151. (Refrigerant piping length (one way): 5 m)
COOLING INDOOR Dry-bulb temperature 27.0 °C Wet-bulb temperature 19.0 °C
OUTDOOR Dry-bulb temperature 35.0 °C Wet-bulb temperature 24.0 °C
HEATING INDOOR Dry-bulb temperature 20.0 °C
OUTDOOR Dry-bulb temperature 7.0 °C Wet-bulb temperature 6.0 °C

MXZ-F OUTDOOR UNITS		MXZ-2F33VF3	MXZ-2F42VF3	MXZ-2F53VF3	MXZ-3F54VF3	MXZ-3F68VF3	MXZ-4F72VF3	MXZ-4F83VF	MXZ-5F102VF	MXZ-6F122VF
NUMBER OF CONNECTABLE INDOOR UNITS		2	2	2	2 - 3	2 - 3	2 - 4	2 - 4	2 - 5	2 - 6
CAPACITY (kW)	Heating (nominal)	4.0 (1.0-4.1)	4.5 (1.0-4.8)	6.4 (1.1-7.0)	7.0 (2.6-9.0)	8.6 (2.6-10.6)	8.6 (3.4-10.7)	9.3 (3.4-11.6)	10.5 (4.1-14.0)	14.0 (3.5-16.5)
	Cooling (nominal)	3.3 (1.1-3.8)	4.2 (1.1-4.4)	5.3 (1.1-5.6)	5.4 (2.9-6.8)	6.8 (2.9-8.4)	7.2 (3.7-8.8)	8.3 (3.7-9.2)	10.2 (3.9-11.0)	12.2 (3.5-13.5)
	Heating (UK)	3.32 (0.83-3.40)	3.74 (0.84-3.99)	5.38 (0.92 - 5.88)	5.81 (2.16-7.47)	7.14 (2.16-8.80)	7.14 (2.82-8.89)	7.8 (2.82-9.63)	8.7 (3.40-11.63)	11.6 (2.90-13.71)
	Cooling (UK)	3.23 (1.07-3.72)	4.12 (1.08-4.32)	5.30 (1.10-5.60)	5.3 (2.85-6.67)	6.66 (2.84-8.23)	7.0 (3.59-8.56)	8.2 (3.67-9.12)	10.1 (3.86-10.90)	12.1 (3.47-13.39)
COP / EER (nominal)*1		4.40 / 3.90	5.10 / 4.30	4.10 / 3.79	4.60 / 4.10	4.50 / 3.70	4.60 / 3.90	4.65 / 4.21	4.60 / 3.64	4.23 / 3.33
SCOP (nsc) / SEER (nsc) (BS EN14825)		4.16 / 6.13	4.60 / 8.69	4.6 / 8.6	4.61 / 8.52	4.12 / 7.96	4.07 / 8.13	4.72 (185.8%) / 8.51 (337.4%)	4.65 (183%) / 8.21 (325.4%)	4.65 (183.1%) / 7.65 (303%)
ErP ENERGY EFFICIENCY CLASS	Heating/Cooling	A+ / A++	A++ / A+++	A++ / A+++	A++ / A+++	A+ / A++	A+ / A++	A++ / A+++	A++ / A++	A++ / A++
MAX AIRFLOW (m^3/min)	Heating/Cooling	33.7 / 32.9	33.3 / 27.7	34.7 / 32.7	43.0 / 42.1	43.0 / 42.1	43.0 / 42.1	71 / 55	74 / 62	77 / 63
SOUND PRESSURE LEVEL (dBA)	Heating/Cooling	50 / 49	50 / 44	51 / 46	50 / 46	53 / 48	54 / 48	51 / 49	56 / 52	57 / 55
SOUND POWER LEVEL (dBA)	Cooling	60	59	61	59	63	63	61	65	69
DIMENSIONS (mm)	Width x Depth x Height	800 x 285 x 550	800 x 285 x 550	800 x 285 x 550	840 x 330 x 710	840 x 330 x 710	840 x 330 x 710	950 x 330 x 796	950 x 330 x 796	950 x 330 x 1048
WEIGHT (kg)		33	37	37	58	58	59	62	62	87
ELECTRICAL SUPPLY		220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz
PHASE		Single	Single	Single	Single	Single	Single	Single	Single	Single
POWER INPUT (kW)	Heating/Cooling (nominal)	0.909 / 0.846	0.88 / 0.98	1.56 / 1.40	1.52 / 1.32	1.91 / 1.84	1.87 / 1.85	2.00 / 1.97	2.28 / 2.80	3.31 / 3.66
	Heating/Cooling (UK)	0.82 / 0.68	0.90 / 0.78	1.40 / 1.20	1.38 / 1.06	1.73 / 1.47	1.69 / 1.48	1.80 / 1.57	2.09 / 2.66	3.04 / 3.44
STARTING CURRENT (A)		4.6	4.2	7.6	7.0	10.5	10.0	8.8	12.3	16.1
RUNNING CURRENT (A)	Heating/Cooling [MAX]	4.6 / 4.3 [10.0]	4.2 / 4.5 [12.2]	7.1 / 6.2 [10.2]	7.0 / 5.9 [18.0]	10.5 / 9.6 [18.0]	10.0 / 9.5 [18.0]	8.8 / 8.7 [21.4]	10.0 / 12.3 [21.4]	14.5 / 16.1 [29.8]
INTERCONNECTING CABLE No. CORES		4 Core	4 Core	4 Core	4 Core	4 Core	4 Core	4 Core	4 Core	4 Core
TOTAL PIPE LENGTH (m)		20	30	30	50	60	60	70	80	80
MAX PIPE LENGTH PER INDOOR UNIT (m)		15	20	20	25	25	25	25	25	25
MAX HEIGHT DIFFERENCE (m)		10	15 (10 if OU higher than IU)	15 (10 if OU higher than IU)	15 (10 if OU higher than IU)	15 (10 if OU higher than IU)	15 (10 if OU higher than IU)	15	15	15
CHARGE REFRIGERANT (kg) /CO_2 EQUIVALENT (t) - R32 (GWP 675)		0.8 / 0.54 (20m)	1.0 / 0.68 (30m)	1.0 / 0.68 (30m)	2.4 / 1.62 (50m)	2.4 / 1.62 (60m)	2.4 / 1.62 (60m)	2.4 / 1.62 (70m)	2.4 / 1.62 (80m)	2.4 / 1.62 (80m)
FUSE RATING (BS88) – HRC (A)		16	16	16	25	25	25	25	25	32

Notes: *1 System COP / EER when connected to MSZ-LN / MSZ-AP x indoor unit connections. Combined max running current of all indoors on system must not exceed 3A.
The SEZ-M25DA cannot be used when the total indoor capacity is equal to the outdoor capacity, i.e. when the capacity ratio is 1.

MXZ-6F122VF

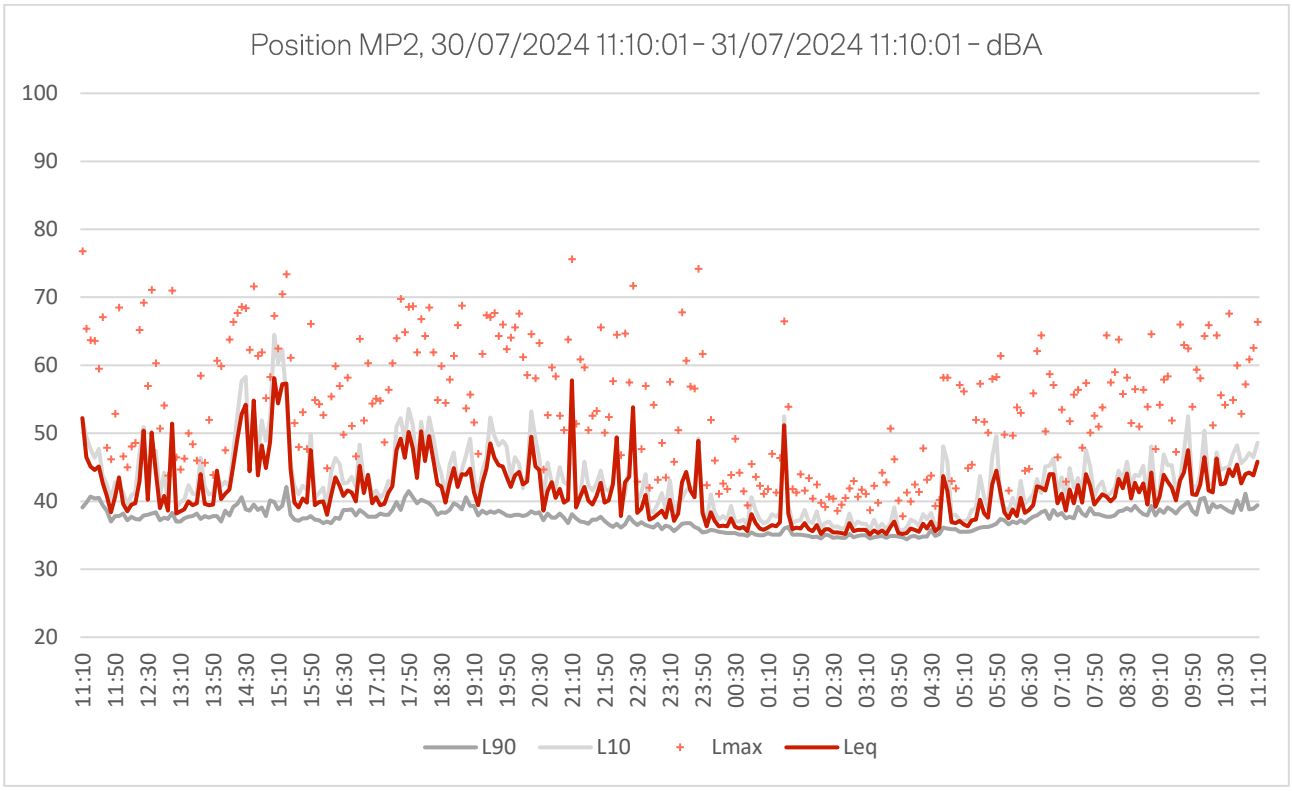
FAN SPEED	FUNCTION	SPL(dB(A))	LINE
High	Cooling	55	●—●
High	Heating	57	○—○



Measurement Results

Monitoring position	Time Period	$L_{Aeq,T}$ (dB)	L_{Amax} (dB)	L_{A90} (dB)	L_{A10} (dB)
1	Daytime	47.0	42.0 - 76.8	36.9	49.6
	Night-time	39.5	37.8 - 74.2	34.7	41.6
	Daytime	42.8	42.9 - 67.6	37.8	44.2

Monitoring Position 1



Glossary of Acoustical Terms

A-weighting

Noise levels are corrected to represent human response to sound.

L_{Aeq}

This is a continuous equivalent of time varying noise, or effectively the average measured (A weighted) noise level over a defined period of time.

$L_{Aeq,16hour}$

A 16 hour long measurement of the L_{Aeq} over the period between 07:00 and 23:00, also known as a daytime measurement.

$L_{Aeq,8hour}$

An 8 hour long measurement of the L_{Aeq} over the period between 23:00 and 07:00, also known as a night time measurement.

L_{AFmax}

The highest, or maximum A-weighted sound pressure level measured over a specified time period. The 'F' defines a time weighting in Fast.

L_{A90}

The A-weighted noise level or average level which is exceeded for 90 percent of the measured time period. Also known as a background level.

L_{A10}

The A-weighted noise level or average level which is exceeded for 10 percent of the measured time period.

1:1 & 1:3 octave spectrum analysis

A single measurement that is separated into frequency bands to allow for a more detailed analysis of the noise source in question.

R_w

The weighted sound reduction index of a partition or facade. A single number value based on the performance of a partition between two rooms across the frequency range 100Hz to 3150Hz. The level is adjusted for the effects of reverberation and background noise.

$D_{n,e,w}$

The weighted level difference of a partition or façade which takes into account a small element such as a grill or vent.

SEL (sound exposure level)

A measure of A-weighted sound energy used to describe a particular event, such as a train pass. It is the sound energy, which, if occurring over one second would contain the same energy as the event.

Free field sound pressure

Is where the radiation or spread of sound is completely unaffected by the presence of any reflecting surfaces or boundaries.

Low Frequency Noise

A term generally used for sound below a frequency of 100 to 150Hz.

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