Philip Acoustics Ltd.

Consultants in Noise & Vibration
Building Regulations Certification Sound Insulation Testing

REPORT TITLE: ACOUSTIC REPORT FOR A PROPOSED EXTERNAL AIR SOURCE HEAT PUMP AT APARTMENT 7, 69 GREENCROFT GARDENS, LONDON NW6 3LJ

REPORT REF: 22037-002

ISSUED TO: Mrs Astrid Joublanc & Mr Tomer Sofer
Apartment 7
69 Greencroft Gardens
London
NW6 3LJ

ISSUED BY: Chris Swiejkowski MEng MIOA

DATE: May 2022

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SUMMARY

- Philip Acoustics has been commissioned to provide an acoustic (noise & vibration) assessment report for a new air source heat pump (ASHP) unit, proposed to be installed to serve a residential property Apartment 7 at 69 Greencroft Gardens, London NW6 3LJ.

- The assessment is conducted with reference to London Borough of Camden's planning consent acoustic requirements for mechanical services equipment (including items such as ASHP units) as contained in Policy A4: *Noise & Vibration* of Section 6: *Protecting Amenity* of Camden Local Plan (adopted June 2017).

- As part of the assessment a background noise survey has been carried out over a five-day period including sample weekdays and a full weekend. The survey establishes existing background noise levels during operational times of the proposed ASHP unit, at a position representative of outside the nearest neighbouring residential property.

- Based on results of the background noise survey and noise model calculations using the proposed ASHP unit manufacturer's noise data, the overall noise level from the unit complies with London Borough of Camden's planning consent requirement.

- Proposed location of the ASHP unit at roof level of the building is potentially structurally linked, albeit indirectly and at distance, to neighbouring residential properties and therefore it is possible that unit vibration could transmit into neighbouring properties. Although this is considered extremely unlikely as vibration from this type of modern relatively small domestic use ASHP unit is generally low as good practice it is advised the unit be installed on conventional proprietary vibration isolators. Specification details for suitable vibration isolators are provided in Section 6 of the report.

1. INTRODUCTION

A new Mitsubishi Air Source Heat Pump (ASHP) unit is proposed to be installed to serve a residential property Apartment 7, 69 Greencroft Gardens, London NW6 3LJ.

The unit is proposed to be located externally at roof level of the building.

As part of the planning process associated with the proposed ASHP unit, the Local Planning Authority (London Borough of Camden) as validation to the planning application requires information in the form of an acoustic report in order to seek to protect the amenity of neighbouring residents in the vicinity with regard to possible noise and vibration from the unit.

Philip Acoustics has therefore been commissioned to provide an acoustic (noise & vibration assessment) report for the proposed ASHP unit, the assessment to be in accordance with the relevant requirements of London Borough of Camden as contained within Policy A4: *Noise & Vibration* of Section 6: *Protecting Amenity* of the Camden Local Plan (adopted June 2017).

This report presents results of the assessment and includes:

- Criteria - London Borough of Camden planning consent acoustic requirements;
- Measurement survey of existing background noise levels;
- Manufacturer noise data for the ASHP unit and calculation of unit noise levels;
- Consideration of vibration from the ASHP unit;
- Specification for vibration isolation as necessary to ensure compliance with London Borough of Camden's planning consent acoustic requirements.

2. CRITERIA *(London Borough Of Camden Acoustic Requirements)*

Policy A4: *Noise & Vibration* from Section 6 – *Protecting Amenity* of the Camden Local Plan (adopted June 2017) covers in detail noise issues relating to a wide range of planning and noise pollution scenarios, including of proposed new mechanical services plant / equipment such as domestic use ASHP units.

Policy A4: *Noise & Vibration* is reproduced below:

Policy A4 Noise and vibration

The Council will seek to ensure that noise and vibration is controlled and managed.

Development should have regard to Camden's Noise and Vibration Thresholds (Appendix 3). We will not grant planning permission for:

a. development likely to generate unacceptable noise and vibration impacts; or
b. development sensitive to noise in locations which experience high levels of noise, unless appropriate attenuation measures can be provided and will not harm the continued operation of existing uses.

We will only grant permission for noise generating development, including any plant and machinery, if it can be operated without causing harm to amenity. We will also seek to minimise the impact on local amenity from deliveries and from the demolition and construction phases of development.

"Camden's Noise & Vibration Thresholds" referenced in Policy A4 as applicable for proposed new plant / equipment such as ASHP units are advised in Table C from Section: *Industrial & Commercial Noise Sources* of Appendix 3 to the Camden Local Plan document as reproduced below:

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

Existing Noise sensitive receptor	Assessment Location	Design Period	LOAEL (Green)	LOAEL to SOAEL (Amber)	SOAL (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' between 9dB below and 5dB above background	'Rating level' greater than 5dB above background
Dwellings**	Outside bedroom window (façade)	Night	'Rating level' 10dB* below background and no events exceeding 57dBL_{Amax}	'Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88dB L_{Amax}	'Rating level' greater than 5dB above background and/or events exceeding 88dBL_{Amax}

Supporting notes to Table C and as relevant for the proposed ASHP unit include:

- A Rating Level ($L_{Ar,Tr}$ dB) of 10dB below the background noise (15dB if tonal components are present) should be considered the design criterion, the Rating Level established as per the provisions of BS4142:2014;
- The periods in Table C correspond to 7am to 11pm for the day & 11pm to 7am for the night;
- For smaller equipment such as air source heat pumps where achievement of the Rating Level may not afford protection, the Council will generally also require NR35 or below. To be achieved (in terms of $L_{eq,5mins}$ dB octave band levels) 1m externally from the façade of premises located in a quiet background area.

Full title of the current edition of the referenced British Standard is BS4142:2014+A1:2019 "*Methods for rating and assessing industrial and commercial sound*". All reference within this report to BS4142:2014 relates to this current edition of the standard. Note that as an aid to clarity and consistent with wording / guidance of *"Camden's Noise & Vibration Thresholds"* referenced in Policy A4, this report retains use of the more familiar term *"noise"* throughout as opposed to the replacement term *"sound"* of BS4142:2014.

It is the author's experience of undertaking many surveys and assessments of noise from air source heat pumps and similar equipment items in similar scenarios and contexts to that as Apartment 7, 69 Greencroft Gardens, that compliance with London Borough of Camden's policy requirements, and as the clarification points below, would mean noise from the proposed ASHP unit is not generally audible / disturbing or otherwise of impact to persons inside or outside neighbouring residential dwellings.

Additional clarification points relevant to the assessment and noise criterion are provided below:

ASHP Unit Operating Mode

The noise criterion is cautiously/robustly applied for the ASHP unit operating at standard duty (i.e. normal 100% capacity), potentially over a complete 24-hour period (i.e. including during the night).

In practice it is expected the unit would operate at a reduced capacity (and thus with reduced noise output over standard duty) for much of the time including during the late evening and night period.

Rating Noise Level

The noise criterion is applied in terms of a noise Rating Level $L_{Ar,Tr}$ dB and thus with any correction for tonal characteristics noise applied as necessary to the ASHP unit noise at the assessment positions as per the BS4142:2014 assessment methodology.

Assessment Positions

Camden's noise criterion requirement is applicable to outside nearest residential windows (to living areas and/or bedrooms) and also to within residential gardens used as main amenity (external amenity space). As normal convention and practice the assessment position is with reference to nearest non-associated residential properties (i.e. not the application property itself Apartment 7, 69 Greencroft Gardens).

Background Noise Level

The noise criterion is applied as "worse case", cautiously/robustly based on the representative minimum existing background noise level over 24 hours (i.e. including during the night), based on results of a five-day background noise survey including sample weekdays and a full weekend (see Section 3 of the report).

Very Low Background Noise Level

In accordance with the guidance of BS4142:2014, then for scenarios of very low background noise it is generally unreasonable / unnecessary to apply a noise limit relative to the background level, in terms of ensuring amenity noise protection such that noise from plant/equipment (including such as ASHP units) does not cause disturbance or is otherwise of adverse impact.

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

Thus, where background levels are very low it is instead appropriate to apply a minimum threshold cap plant noise Rating Level limit of $L_{Ar,Tr}$ 30dB. The previous edition of the standard; BS4142:1997 advised that noise Rating Levels of below 35dB be considered very low. Thus a minimum threshold cap plant noise limit set at 30dB is significantly below (i.e. as betterment) to this guidance.

Table A from Section *Vibration* of Appendix 3 to the Camden Local Plan document provides vibration level thresholds. The thresholds are applicable for a wide range of vibration sources such as railways, roads, leisure & entertainment premises as well as plant/machinery (so including such as air source heat pumps), as affecting (i.e. occurring inside) various types of property including residential dwellings.

The vibration level thresholds are in terms of Vibration Dose Values (VDVs) and for dwellings with separate level thresholds applicable for the day and night period.

Proposed location of the ASHP unit at roof level of the building is potentially structurally linked, albeit indirectly and at distance, to neighbouring residential properties and therefore it is possible that unit vibration could transmit into neighbouring properties. Although this is considered extremely unlikely as vibration from this type of modern relatively small domestic use ASHP unit is generally low as good practice it is advised the unit be installed on conventional proprietary vibration isolators. Specification details for suitable vibration isolators are provided in Section 6 of the report.

3. BACKGROUND NOISE SURVEY

To assess noise from the ASHP unit against London Borough Of Camden's planning consent noise requirements it is necessary to establish background noise levels representative of at the assessment positions. Details of the background noise survey carried out are provided in Sections 3.1 to 3.3.

3.1 Survey Instrumentation

Details of the noise survey instrumentation used are provided in Appendix A. The sound level meter was calibration verified before and after the survey measurements using the UKAS certified calibrator.

3.2 Survey Details & Procedure

Although the ASHP unit would likely only tend to operate during the daytime and evening periods, as it is to serve a residential property then it will potentially operate at any time over 24 hours. Therefore, the survey was conducted over at least a full 24-hour period to obtain representative samples of the existing noise climate during the entire range of possible times of unit operation.

The survey was carried out over a five-day period from Thursday 07 April 2022 through to Monday 11 April 2022, to include sample weekdays and also a full weekend.

The weather included dry and calm / light wind (i.e. suitable survey conditions) during majority of the day and night periods of the survey with exception from the midday into afternoon of Thursday 07 April 2022 when some stronger winds occurred; the background noise survey results are disregarded from the assessment during this time.

Measurements of background noise were recorded continually in terms of consecutive 15-minute samples of overall equivalent free-field $L_{A90,T}$ dB values (T= 15 minutes) over the entire survey duration.

Proposed location of the ASHP unit and the nearest neighbouring residential properties are indicated on a site aerial image and layout plan drawing in Appendix B The nearest noise sensitive positions to proposed location of the ASHP unit are:

- Position 1: upper floor level terrace (external amenity space) to the rear elevation of the adjacent property at 67 Greencroft Gardens circa 17m distance from the unit;
- Position 2: front elevation windows of upper floor level of the adjacent property at 71 Greencroft Gardens circa 9m distance from the unit.

The background noise survey position was externally from Apartment 7, 69 Greencroft Gardens rear terrace at third floor level, with the instrumentation microphone nominally 1.5m above the floor and in equivalent free-field conditions as per the procedural guidance of BS4142:2014. The survey position selected as closest to and as best practicable representative of outside nearest windows and external amenity space of neighbouring properties.

3.3 Survey Results, Observations & ASHP Unit Noise Limits

Background noise levels are low (very low during the evening - night period) and predominantly due to underlying noise from road traffic generally in the wider area

Background noise fluctuates during the day and then gradually reduce during the evening and night, being lowest during the middle of the night / early morning between circa 2am to 4am before then increasing again in the morning. This diurnal environmental noise profile is normal for this location where there is traffic on surrounding roads and streets plus the wider area during the day followed by a reduction in traffic during the evening and night.

Full raw data results of the five-day noise survey are provided in graphical format in Appendix C.

Summary of the representative lowest measured $L_{A90,T}$ background noise levels and associated ASHP unit noise limits based on London Borough of Camden's noise requirements (as detailed in Section 2 of this report) are shown in Table 1. The background levels and limits are split into two separate time period values such that noise from the ASHP unit to external amenity space and to outside windows of neighbouring residential properties is assessed using the representative lowest background noise during times as relevant.

ASHP Unit Operating Mode	**Assessment Positions & Relevant Times**	**Representative Minimum Background Noise Level** $L_{A90,15min}$	**ASHP Unit Noise Criterion (Limit)** ***(Rating Level)***
Unit operating full 100% duty in heating mode	Assessment Position 1: External amenity space of neighbouring properties *Assessment range: 7am to 11pm*	34dB *(occurs late evening up to 11pm)*	$L_{Ar,Tr}$ ≤24dBA *(10dB below background)* $L_{Ar,Tr}$ ≤19dBA *(15dB below background, applicable if unit noise has tonal components)* ***$L_{Ar,Tr}$ ≤30dB (minimum threshold cap 30dBA applicable)***
	Assessment Position 2: Outside windows of neighbouring properties *Assessment range: Over 24 hours*	31dB *(occurs during middle of the night circa 2am to 4am)*	$L_{Ar,Tr}$ ≤21dBA *(10dB below background)* $L_{Ar,Tr}$ ≤16dBA *(15dB below background, applicable if unit noise has tonal components)* ***$L_{Ar,Tr}$ ≤30dB (minimum threshold cap 30dBA applicable)***

Table 1: Measured representative minimum background noise & associated ASHP unit noise limits

In this instance and because of the very low existing background noise levels (minimum threshold cap 30dBA applicable), the same noise criterion limit applies for the ASHP unit operating during the day period and also during the night period.

4. NOISE FROM AIR SOURCE HEAT PUMP

The proposed ASHP unit is a Mitsubishi model PUZ WM85VAA. Manufacturer's noise data for the unit is provided in Appendix D.

The client has advised the unit will operate in heating mode only.

The manufacturer noise data is in terms of free-field overall dBA and linear octave band dB sound pressure levels at 1m distance in front of the unit. Summary of noise output from the ASHP unit operating in heating mode, including octave band values is shown in Table 2.

Description	Overall dBA	Octave Band Centre Frequency (Hz) (Linear dB)							
		63	125	250	500	1k	2k	4k	8k
Mitsubishi model PUZ WM85VAA *(full normal 100% duty heating mode)*	45	48	48	49	43	36	34	27	20

Table 2: ASHP unit noise data; free-field sound pressure levels at 1m

Manufacturer noise data indicates the unit generates a broadband type noise without strong, identifiable or clearly perceptible tonal elements. This correlates with experience of the author in measuring noise levels from installed and similar type ASHP units used in domestic settings.

To calculate the noise contribution from the ASHP unit to the assessment positions outside nearest windows and external amenity space of the neighbouring residential properties a spreadsheet-based noise model has been used. The model takes account of the distance between the unit and the assessment positions, acoustic directivity, acoustic reflections and any natural / default line of sight acoustic screening.

Noise model calculation details are provided in Appendix E.

The overall calculated noise Rating Level from the proposed ASHP unit to external amenity space and to outside nearest windows of neighbouring residential properties compared with London Borough of Camden's noise requirement is shown in Table 3.

Noise from the ASHP unit to outside other windows of neighbouring properties and/or other external amenity spaces that are more distant from, or more significantly screened from, location of the unit will be lower.

ASHP Unit Operating Mode	Assessment Positions & Relevant Times	ASHP Unit Overall Noise Level *(Rating Level)*	Noise Limit	Comment
Unit operating full 100% duty in heating mode	Assessment Position 1: External amenity space of neighbouring properties *Assessment time range: 7am to 11pm*	≤10dB	$L_{Ar,Tr}$ ≤30dBA	Complies
	Assessment Position 2: Outside windows of neighbouring properties *Assessment time range: Over 24 hours*	≤16dB	$L_{Ar,Tr}$ ≤30dBA	Complies

Table 3: Noise from proposed ASHP unit to assessment positions

Table 3 shows that noise from the proposed ASHP unit, complies with the noise limit criteria as per London Borough of Camden's requirements.

At this level, noise from the ASHP unit will be significantly below existing lowest background noise levels and be subjectively very low such that it would not be expected to give rise to any noise impact or disturbance affecting the amenity of residential neighbours.

5. VIBRATION FROM AIR SOURCE HEAT PUMP

Proposed location of the ASHP unit at roof level of the building is potentially structurally linked, albeit indirectly and at distance, to neighbouring residential properties and therefore it is possible that unit vibration could transmit into neighbouring properties.

Although this is considered extremely unlikely as vibration from this type of modern relatively small domestic use ASHP unit is generally low as good practice it is advised the unit be installed on conventional proprietary vibration isolator mountings.

Appropriate proprietary vibration isolators for the unit would be rubber or neoprene turret type mountings, fitted to under each mounting foot / bracket of the unit. The vibration isolators should each have a static deflection nominally ≥5mm under weight of the unit.

Details of three example suppliers and their typically suitable vibration isolators are provided below.

The suppliers are not listed in any order of preference, a copy of each of the supplier's data sheets for the suitable isolators is provided in Appendix F. Other suppliers will also be able to offer suitable equivalent vibration isolators.

Example Supplier 1:

EMTEC: www.emtecproducts.co.uk Isolator type: Neoprene Mountings Series R/RD

Mitsubishi PUZ WM85VAA (gross weight ≈98kg) = Isolator RD-1 Red (max load per isolator 31,7kg)

Example Supplier 2:

Christie & Grey: www.christiegrey.co.uk Isolator type: Rubber Turret Mountings RM

Mitsubishi PUZ WM85VAA (gross weight ≈98kg) = Isolator RM 19.100.Y.F Yellow (max load per isolator 28kg)

Example Supplier 3:

Vibracoustics: www.vibracoustics.com Isolator type: Vi-Turret Mountings

Mitsubishi PUZ WM85VAA (gross weight ≈98kg) = Isolator VS42000 Yellow (max load per isolator 35kg)

APPENDIX A

Noise Survey Instrumentation

Site: Apartment 7, 69 Greencroft Gardens, London NW6 3LJ

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Date: May 2022

NOISE SURVEY INSTRUMENTATION

- Rion sound level meter type NL-31 Class 1 serial number 01193690 plus Rion microphone type UC-53A serial number 317534 complete with weatherproof and lockable outdoor environmental kit, microphone extension lead and extension boom arrangement;
- Bruel & Kjaer calibrator type 4231 serial number 2642929 (UKAS certified).

APPENDIX B

Site Location Aerial Image & Proposed Layout Drawing

Site: Apartment 7, 69 Greencroft Gardens, London NW6 3LJ

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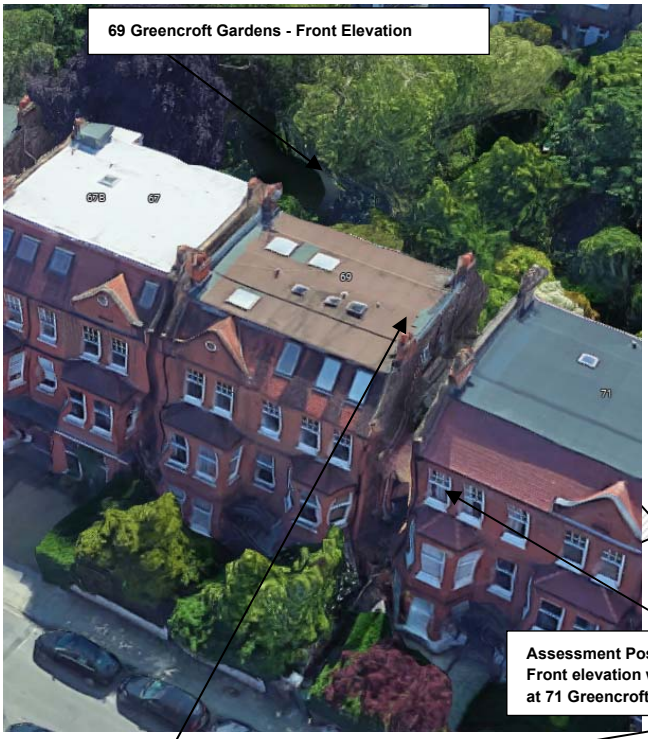
Date: May 2022

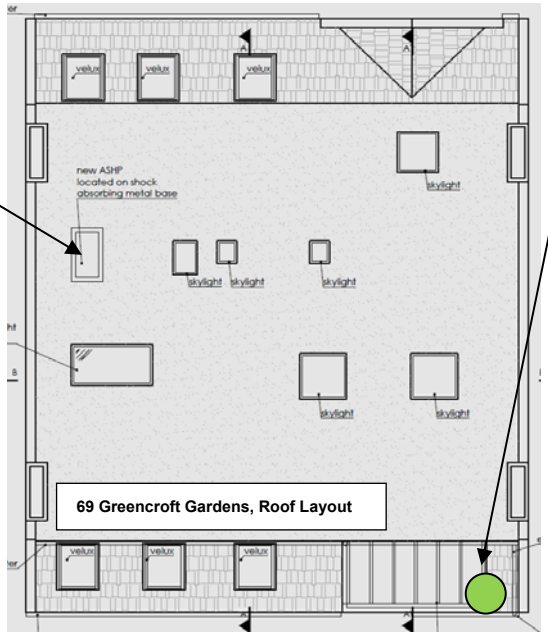
SITE AERIAL IMAGE & DRAWING SHOWING UNIT LOCATION, SURVEY POSITION & DIRECTION TO ASSESSMENT POSITIONS



Assessment Position 2:
Front elevation windows of upper floor level at 71 Greencroft Gardens

Indicates noise survey position externally at top floor terrace to the rear of the building at 69 Greencroft Gardens

Proposed location for ASHP unit externally at roof level



Assessment Position 1:
Upper floor level terrace (external amenity space) at 67 Greencroft Gardens

APPENDIX C

Background Noise Survey Results

Site: Apartment 7, 69 Greencroft Gardens, London NW6 3LJ

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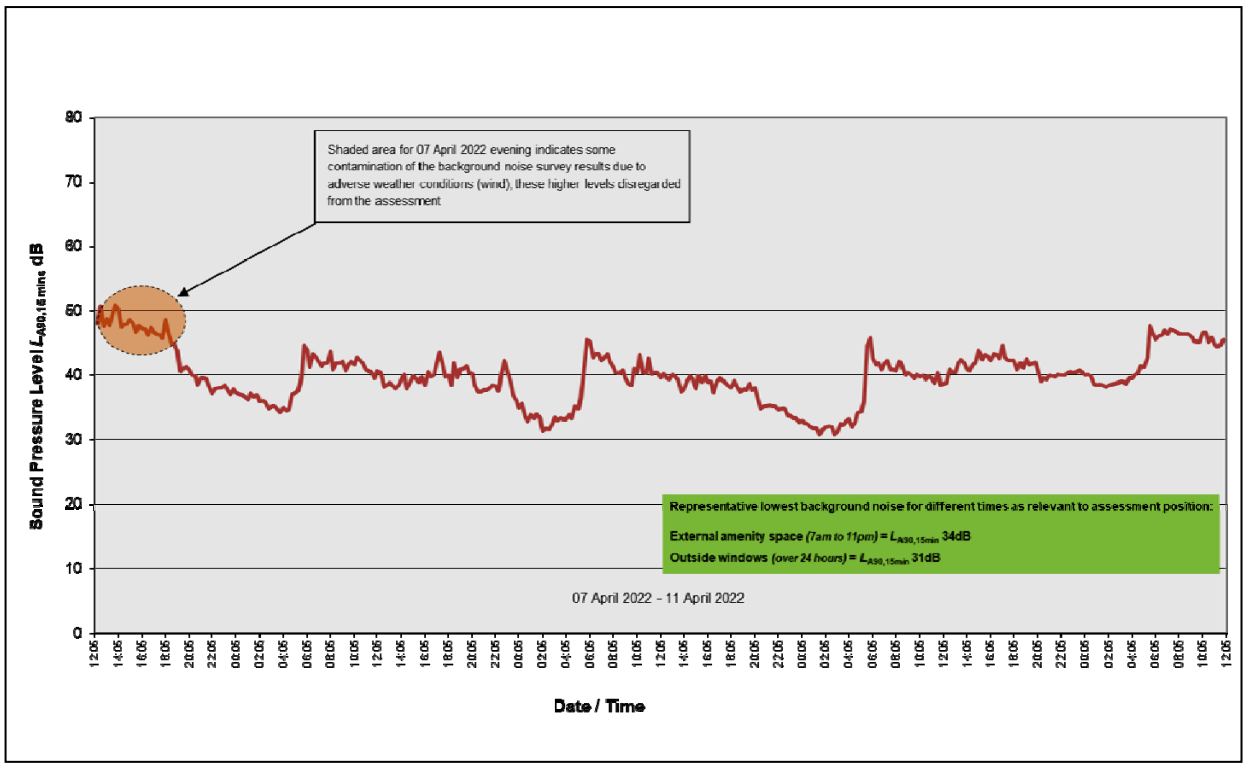
Date: May 2022

NOISE SURVEY RESULTS

Graphical Format Raw Data Five-Day Noise Survey Thursday 07 April 2022 - Monday 11 April 2022:



APPENDIX D

Manufacturer's Noise Data For Proposed ASHP Unit

Site: Apartment 7, 69 Greencroft Gardens, London NW6 3LJ

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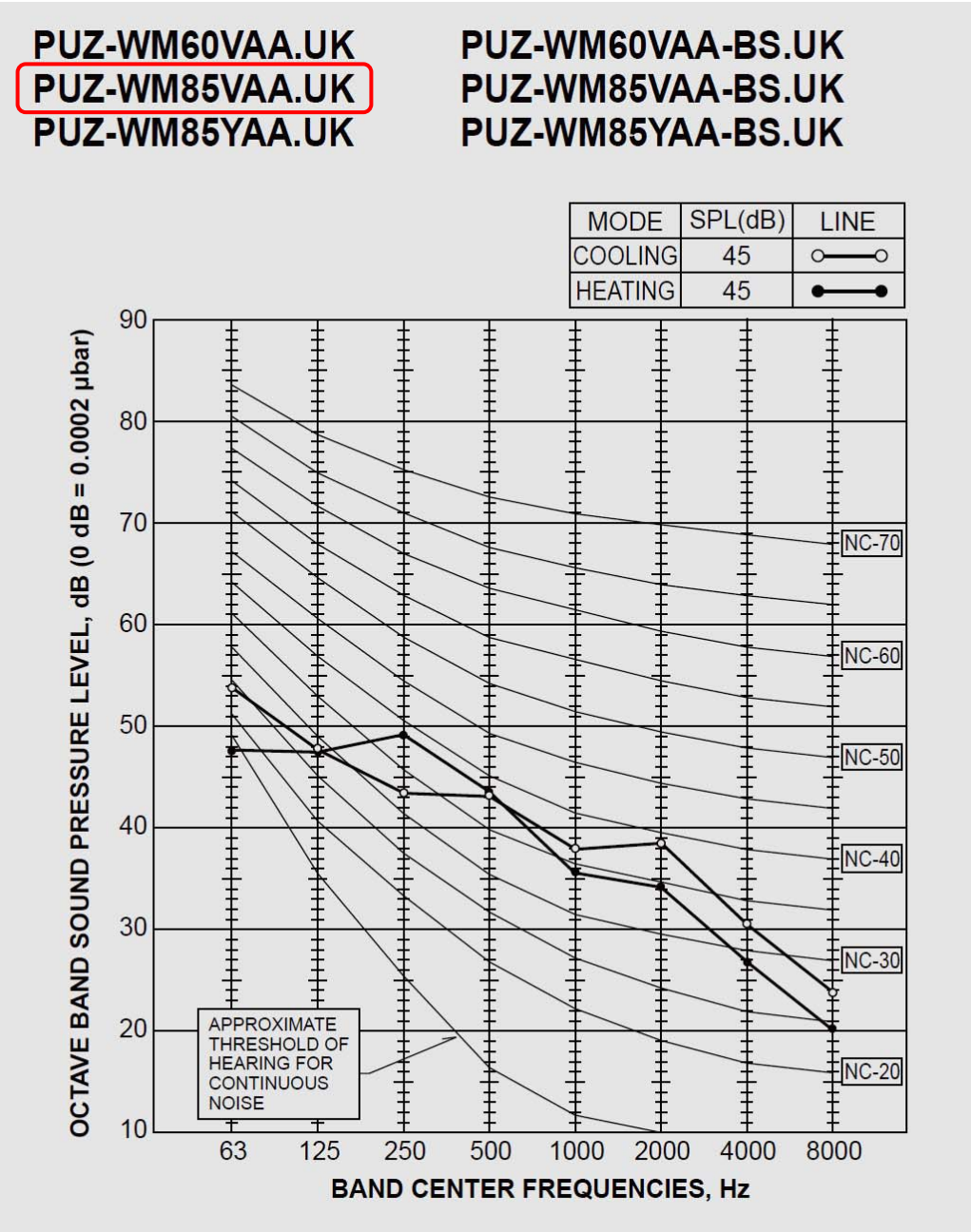
Date: May 2022

MANUFACTURER'S NOISE DATA FOR PROPOSED VRV ASHP UNIT

Mitsubishi model PUZ-WM85VAA

PUZ-WM60VAA.UK **PUZ-WM60VAA-BS.UK**
PUZ-WM85VAA.UK **PUZ-WM85VAA-BS.UK**
PUZ-WM85YAA.UK **PUZ-WM85YAA-BS.UK**



APPENDIX E

Noise Model Calculation For Proposed ASHP Unit

Site: Apartment 7, 69 Greencroft Gardens, London NW6 3LJ

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Date: May 2022

NOISE MODEL CALCULATION FOR PROPOSED VRV ASHP UNIT

Assessment Position 1: Terrace (external amenity space) of neighbouring property 67 Greencroft Gardens

Noise Condition: 1 x VRV ASHP Unit Mitsubishi model PUZ-WM85VAA operating full 100% duty heating mode

		Lin dB at Octave Band Centre Frequency Hz							
Equipment & Description	**Overall dBA**	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
ASHP UNIT: 1 X Mitsubishi model PUZ WM85VAA									
Sound pressure level data at 1m (free-field); *Lp dB for unit operating full 100% duty heating mode*	45	48.0	48.0	49.0	43.0	36.0	34.0	27.0	20.0
Quantity; *0dB unit quantity correction applicable for 1 x unit*		0	0	0	0	0	0	0	0
Noise Mitigation; none applied to the *unit*		0	0	0	0	0	0	0	0
Distance; ≈17*m from unit to external amenity space assessment position*		-24.6	-24.6	-24.6	-24.6	-24.6	-24.6	-24.6	-24.6
Screening; *complete line of sight screening correction applicable (roof edge, level difference), limit to -10dB*		-10	-10	-10	-10	-10	-10	-10	-10
Directivity; *nil propagation directivity correction applicable for ASHP unit*		0	0	0	0	0	0	0	0
Reflections; 0*dB correction applied for unit upon flat roof (i.e. free-field conditions)*		0	0	0	0	0	0	0	0
Contribution at assessment position	10	13.4	13.4	14.4	8.4	1.4	-0.6	-7.6	-14.6
Cumulative contribution all sources at Assessment Position 1	**10**	**13**	**13**	**14**	**8**	**1**	**-1**	**-8**	**-15**

The overall noise level at the assessment position 1 from the VRV ASHP unit operating full 100% duty is 10dBA.

Site: Apartment 7, 69 Greencroft Gardens, London NW6 3LJ

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Date: May 2022

NOISE MODEL CALCULATION FOR PROPOSED VRV ASHP UNIT

Assessment Position 2: Front elevation windows of upper floor flats 71 Greencroft Gardens

Noise Condition: 1 x VRV ASHP Unit Mitsubishi model PUZ-WM85VAA operating full 100% duty heating mode

		Lin dB at Octave Band Centre Frequency Hz							
Equipment & Description	**Overall dBA**	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
ASHP UNIT: 1 X Mitsubishi model PUZ WM85VAA									
Sound pressure level data at 1m (free-field); *Lp dB for unit operating full 100% duty heating mode*	45	48.0	48.0	49.0	43.0	36.0	34.0	27.0	20.0
Quantity; *0dB unit quantity correction applicable for 1 x unit*		0	0	0	0	0	0	0	0
Noise Mitigation; none applied to the *unit*		0	0	0	0	0	0	0	0
Distance; ≈9*m from unit to outsde nearest residential windows assessment position*		-19.1	-19.1	-19.1	-19.1	-19.1	-19.1	-19.1	-19.1
Screening; *complete line of sight screening correction applicable (roof edge, level difference), limit to -10dB*		-10	-10	-10	-10	-10	-10	-10	-10
Directivity; *nil propagation directivity correction applicable for ASHP unit*		0	0	0	0	0	0	0	0
Reflections; 0*dB correction applied for unit upon flat roof (i.e. free-field conditions)*		0	0	0	0	0	0	0	0
Contribution at assessment position	16	18.9	18.9	19.9	13.9	6.9	4.9	-2.1	-9.1
Cumulative contribution all sources at Assessment Position 2	**16**	**19**	**19**	**20**	**14**	**7**	**5**	**-2**	**-9**

The overall noise level at the assessment position from the VRV ASHP unit operating full 100% duty is 16dBA.

APPENDIX F

Details For Example Suitable Vibration Isolators

Site: Apartment 7, 69 Greencroft Gardens, London NW6 3LJ

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Date: May 2022

DETAILS FOR EXAMPLE SUITABLE VIBRATION ISOLATORS

Supplier: EMTEC

Bulletin No. R12/93 (UK)

VMC KORFUND

Neoprene Mountings
Series R/RD

EXCLUSIVE— COLOR CODED

Available in 4 sizes – 5 durometers
Load Range – 10 lbs. to 4,000 lbs.
Deflections to ¼" with type R to ½" with type RD
Corrosion Proof
Molded in colored oil-resistant neoprene
5 colors for error free identification

Effective Isolation for Floor Mounted Equipment

Series R & RD Neoprene Mountings are molded in colored oil-resistant neoprene. This unique color coding provides instant identification of loading capacity — simplifies stocking — prevents installation errors.

The VMC molding process embeds all metal parts in neoprene, preventing corrosion. Mountings can also be molded in other elastomers to meet special requirements.

Typical Applications

Air Handling Units Business Machines
Compressors Fans Instrument Panels
Machine Tools Pumps
Motor Generators Transformers

To Specify:

Neoprene mountings shall consist of a steel top plate and base plate completely embedded in coloured oil-resistant neoprene stock for easy identification of capacity. The mountings shall be Type R or RD, depending upon the required deflection of 1/4" to 1/2", as manufactured by VMC and as supplied by EMTEC Products Limited

EMTEC Products Limited, Enterprise House, Blyth Road, Hayes, Middlesex UB3 1DD
Telephone: 0181 848 3031 Facsimile: 0181 573 3605

TYPE R/RD

TYPE RP/RDP

New design for Type R-4 and RD-4 neoprene mountings.

Type R or RD
IF BOLTING IS PREFERRED—

Type R or RD
NO BOLTING REQUIRED—

Type RP or RDP
IF BOLT HOLE IS INACCESSIBLE

EMTEC Products Limited, Enterprise House, Blyth Road, Hayes, Middlesex UB3 1DD
Telephone: 0181 848 3031 Facsimile: 0181 573 3605

Site: Apartment 7, 69 Greencroft Gardens, London NW6 3LJ

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Date: May 2022

DETAILS FOR EXAMPLE SUITABLE VIBRATION ISOLATORS

Supplier: Christie & Grey

Rubber Turret Mountings

Type RM

Type RM Rubber Turret mountings are designed to provide superior attenuation of medium to high frequency vibration and noise emanating from a wide range of motor driven machines particularly axial and centrifugal fans.

High resilience rubber with low dynamic to static stiffness ratio ensures maximum efficiency, good creep performance and long service life.

DESIGN FEATURES

- Moulded in first grade natural rubber with integral steel base and upper fixing boss.
- Manufactured in three sizes, each available in three rubber compounds identified by a colour spot.
- Static deflections of up to 8 mm with loads from 5 kg to 400 kg.
- Upper fixing screw supplied as standard with optional height adjusters also available.

TYPICAL APPLICATIONS

- Axial and Centrifugal Fans.
- Air Handling Units.
- Refrigeration Plant.
- Pumps.
- Rotary and Multi Cylinder Compressors.
- Floating Floors.
- Isolation of Sensitive Equipment.
- Test Rigs and Special Purpose Machines.

CHRISTIE & GREY Vibration & Shock Control

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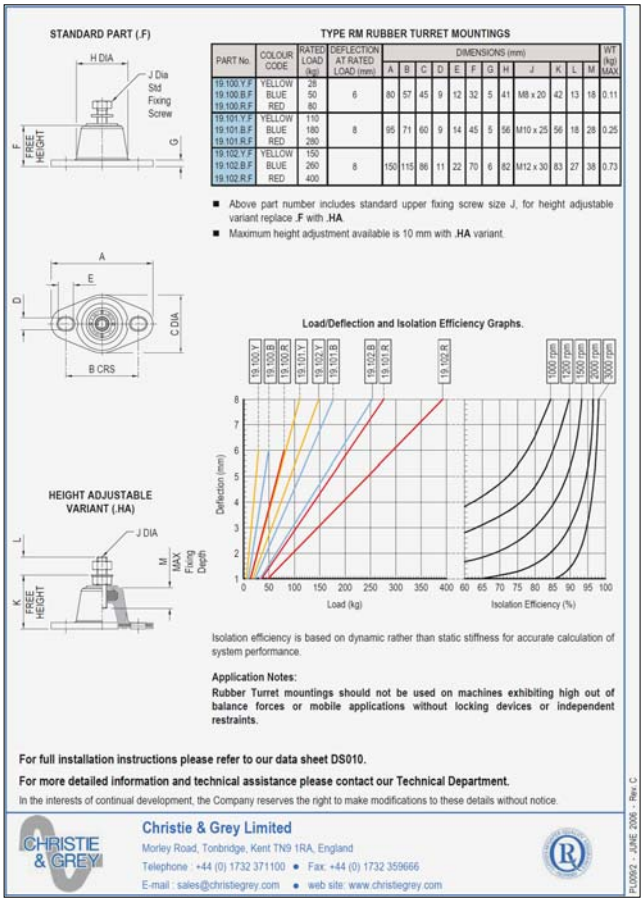

STANDARD PART (.F)

TYPE RM RUBBER TURRET MOUNTINGS

PART No.	COLOUR CODE	RATED LOAD (kg)	DEFLECTION AT RATED LOAD (mm)	DIMENSIONS (mm) A	B	C	D	E	F	G	H	J	K	L	M	WT (kg) MAX
19.100.Y.F	YELLOW	28														
19.100.B.F	BLUE	50	6	80	57	45	9	12	32	5	41	M8 x 20	42	13	18	0.11
19.100.R.F	RED	80														
19.101.Y.F	YELLOW	110														
19.101.B.F	BLUE	180	8	95	71	60	9	14	45	5	56	M10 x 25	56	18	28	0.25
19.101.R.F	RED	280														
19.102.Y.F	YELLOW	150														
19.102.B.F	BLUE	260	8	150	115	86	11	22	70	6	82	M12 x 30	83	27	38	0.73
19.102.R.F	RED	400														

- Above part number includes standard upper fixing screw size J, for height adjustable variant replace **.F** with **.HA**.
- Maximum height adjustment available is 10 mm with **.HA** variant.

Load/Deflection and Isolation Efficiency Graphs.

HEIGHT ADJUSTABLE VARIANT (.HA)

Isolation efficiency is based on dynamic rather than static stiffness for accurate calculation of system performance.

Application Notes:

Rubber Turret mountings should not be used on machines exhibiting high out of balance forces or mobile applications without locking devices or independent restraints.

For full installation instructions please refer to our data sheet DS010.

For more detailed information and technical assistance please contact our Technical Department.

In the interests of continual development, the Company reserves the right to make modifications to these details without notice.

CHRISTIE & GREY

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Site: Apartment 7, 69 Greencroft Gardens, London NW6 3LJ

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Date: May 2022

DETAILS FOR EXAMPLE SUITABLE VIBRATION ISOLATORS

Supplier: Vibracoustics

Vibracoustics™

Products & Services for Vibration, Noise & Shock Control

PRODUCT GROUP 42

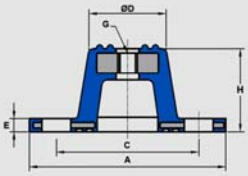
VI-TURRET MOUNTINGS

Description:

Vibracoustics Ltd Vi-Turret Mountings are designed principally for the mounting of HVAC systems, with relatively high levels of deflection ideal for the effective attenuation of noise and vibration from rotating equipment with speeds of 1000rpm (16Hz) and above.

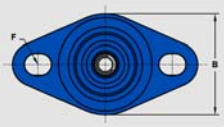
Efficient construction with fully rubber encapsulated metal components for environmental protection, threaded top and stable base fixings with non-skid mounting faces.

Available in a range of sizes and rubber hardness for load capacities 35Kg to 500Kg. Other non-standard sizes available, contact Vibracoustics Ltd technical department for more information.



Typical Applications Include:

- Fans.
- Pumps.
- HVAC.
- Generators.
- Electric motors.
- Compressors.
- General equipment.



Part No.	Dimensions (mm)								Max Load (Kg)	Max Static Deflection (mm)
	H	A	B	C	D	G	F	E		
VS42000 YELLOW	32	80	45	57	41	M8	9x12	5	35	8
VS42000 BLUE	32	80	45	57	41	M8	9x12	5	65	8
VS42000 RED	32	80	45	57	41	M8	9x12	5	100	8
VS42001 YELLOW	45	95	60	71	56	M10	9x14	5	130	10
VS42001 BLUE	45	95	60	71	56	M10	9x14	5	225	10
VS42001 RED	45	95	60	71	56	M10	9x14	5	350	10
VS42002 YELLOW	70	150	86	115	82	M12	11x22	6	185	10
VS42002 BLUE	70	150	86	115	82	M12	11x22	6	320	10
VS42002 RED	70	150	86	115	82	M12	11x22	6	500	10

For applications and technical assistance please contact Vibracoustics, see index Ref 00-A-01

E-mail: mail@vibracoustics.com Website: www.vibracoustics.com Cat Ref: 42-A-01 Iss:21B