ADNITT ACOUSTICS
Renaissance House
32 Upper High Street
Epsom, Surrey
KT17 4QJ

T: +44 (0)20 7099 9735
F: +44 (0)845 127 5121
E: enquiry@adnitt.com
W: www.adnitt.com

| | |
|---|---|
| **Report** | E22128/ENV/R2a- |
| **Issue Date** | 09 February 2023 |

**Project** **Glencar Finchley Road**
**551-557 Finchley Road, London, NW3 7BJ**

**Title** **Environmental Noise Survey**

**Sub Title** **Planning Compliance Report**

**Client** Glencar Construction Ltd
1st Floor, 4 Beaconsfield Rd,
St Albans,
AL1 3RD

**Case No**

| | | |
|---|---|---|
| **Author** | Jodi Smith BSc(Hons) TIOA & Robert Adnitt MEng FIOA | Robert Adnitt — Digitally signed by Robert Adnitt DN: cn=Robert Adnitt, c=GB, o=Adnitt Acoustics, email=robert@adnitt.com Reason: I am the author of this document Location: Epsom Date: 2023.02.10 09:08:25 |
| **Checked** | Graham Shaw BSc(Hons) MSc MIOA MInstP | Graham Shaw — Digitally signed by Graham Shaw DN: cn=Graham Shaw, c=GB, o=Adnitt Acoustics, ou=Glasgow, email=gshaw@adnitt.com Reason: I have reviewed this document Date: 2023.02.10 09:12:20 |

| Revision | Reason | Checked | Signature |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

# CONTENTS



## List of Tables



## List of Attachments



## List of Figures

# 1. INTRODUCTION

1.1 Adnitt Acoustics have been commissioned by Glencar Construction to undertake an ambient & background noise assessment and acoustic study in support of the application at 551-557 Finchley Road, London NW3 7BJ.

1.2 This project is for the change of use of an existing educational building into residential apartments. A background noise survey is required to comply with the London Borough of Camden full planning permission dated 24th December 2021 conditions 11 and 12.

1.3 The following tasks have been undertaken as a part of the acoustic study.

- Unattended long-term environmental noise survey
- Attended day-time measurements to establish the existing background and ambient noise climate at representative locations.
- Impact assessment and feasibility study for glazing and mechanical services

1.4 As this is a technical report it will make reference to some technical terms. To assist the reader a glossary has been included in Appendix A.

***Statement of Qualification***

1.5 This report has been prepared by Jodi Smith and Robert Adnitt.

1.6 Jodi holds an undergraduate degree in Live Sound Technology at Solent University and is a technician member of the Institute of Acoustics, he joined Adnitt Acoustics in June 2022.

1.7 Robert Adnitt is a Fellow of the Institute of Acoustics (FIOA).

1.8 He has worked in the acoustics industry since graduating with MEng (Merit) from the Southampton University Institute of Sound and Vibration Research (ISVR) in 1989. He specialises in acoustics of the built environment and has been the lead consultant on a large number of major projects including leisure and entertainment, healthcare, residential and commercial, uses.

1.9 He is currently honorary treasurer of the Association of Noise Consultants (ANC) and was previously a board member from 2006-2012, he also chaired the Improvement Committee of the ANC.

1.10 The report has been checked by Graham Shaw BSc(Hons) MSc MIOA MInstP for and on behalf of Adnitt Acoustic Services Ltd.

1.11 Graham has a BSc(Hons) in Physics with Music from the University of Edinburgh (2010) and an MSc (Distinction) in Architectural and Environmental Acoustics from London South Bank University (2012).

1.12 He has over ten years post-graduate experience as an Acoustical Consultant working as a Consultant for Adnitt Acoustics since January 2012.

Graham is a corporate member of both the Institute of Acoustics and Institute of Physics.

## 2. SITE DESCRIPTION

2.1 The site is a redevelopment of 551-557 Finchley Road (A41) in the north of the city of London, the site sits within the London Borough of Camden and is shown in Figure E22128/ SP 1.

2.2 To the east is the heavily trafficked A41 Finchley Road; Fortune Green Road (B510) to the west is also heavily trafficked, although this is screened form the site by intervening buildings.

2.3 The main source of background and ambient noise levels is traffic on the Finchley Road.

2.4 The site is surrounded by residential houses and apartments. The nearest noise sensitive receptors are 549 Finchley Road, a house directly south of the site and 559 Finchley Road, a flat built above a restaurant to the north of the site.

# 3. ACOUSTIC DESIGN CRITERIA

3.1 The acoustic criteria for the proposed development are defined in the London Borough of Camden full planning permission granted on 24th December 2021: Application reference 2020/5444/P. The conditions relating to noise are as follows:

*11 The internal noise levels in the dwellings hereby approved shall not exceed an indoor ambient noise levels in unoccupied rooms of 35dB(A) $L_{Aeq,16hour\ (07:00-23:00\ hours)}$ and 30dB(A) $L_{Aeq,\ 8hour\ (23:00-07:00\ hours)}$ and individual noise events shall not normally exceed 45dB $L_{Amax}$ during the night (23:00-07:00 hours). Prior to first occupation of the development hereby approved, noise testing and an associated report to demonstrate compliance with the above levels shall be submitted to and approved in writing by the Local Planning Authority.*

*12 Prior to commencement of the development, details shall be submitted to and approved in writing by the Council, of the external noise level emitted from plant/ machinery/ equipment and mitigation measures as appropriate. The measures shall ensure that the external noise level emitted from plant, machinery/ equipment will be lower than the lowest existing background noise level by at least 10dBA, by 15dBA where the source is tonal, as assessed according to BS4142:2014 at the nearest and/or most affected noise sensitive premises, with all machinery operating together at maximum capacity. Approved details shall be implemented prior to occupation of the development and thereafter be permanently retained.*

3.2 ProPG[1] Figure 2 clarifies the following with respect to maximum noise levels during the night-time period:

*"In most circumstances in noise-sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events* ***do not normally exceed 45dB*** $L_{Amax,F}$ ***more than 10 times a night****. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events".*

3.3 This is expanded in more detail in Appendix A of ProPG which brings together the current research on sleep disturbance.

[1] 'ProPG: Planning & Noise – Professional Practice Guidance on Planning & Noise'

# 4. MEASUREMENT METHODOLOGY

4.1 An unattended environmental noise survey was carried out between Friday 9th December and Friday 16th December 2022 to obtain daytime and night-time ambient noise monitoring results. Daytime measurements were affected by ongoing construction work.

4.2 The survey consisted of two sound level meters, recording at both the front (P1) and rear (P3) of the site. These locations are shown on the attached site plan 2022/SP1.

4.2.1 Position P1 – Located on the balcony at the front of the building overlooking Finchley Road. The microphone was approximately 1m from the façade and approximately 4m from the ground floor level and we consider it to be under façade conditions.

4.2.2 Position P3 - Located out of a window at the rear of the site overlooking behind the property. It is positioned on approximately 1m from the façade and 4m from the ground floor level and we consider it to be under façade conditions.

**Figure E22128/ F1 – Noise Monitoring Location P1**

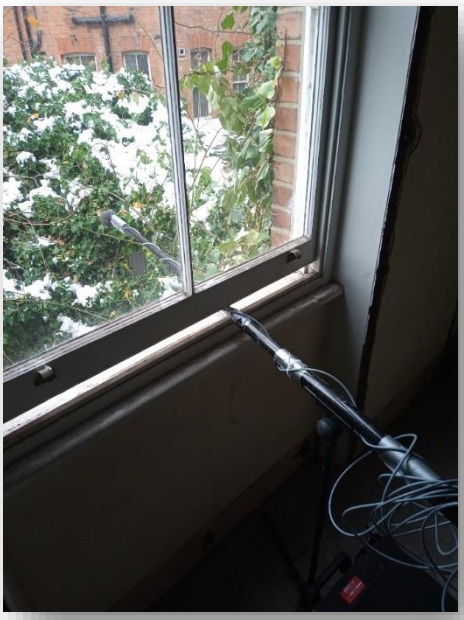


**Figure E22128/ F2 – Noise Monitoring Location P3**

4.3 The acoustic parameters $L_{Aeq}$, $L_{A90}$ and $L_{AF,Max}$ were measured automatically every 15 minutes during the survey along with a 1 second $L_{Aeq}$ and $L_{AF,Max}$ measurement time history.

4.4 Survey measurements were carried out in accordance with guidelines laid down in BS 7445:1991 Part 2 and other relevant standards.

***Equipment and Weather Conditions***

4.5 The equipment used is detailed in Table E22128/T1 below. The sound level meters were fitted with windshields. A sensitivity check was undertaken on the sound level meters

before and after the measurements and the variation was within 0.5dB. Calibration certificates are available on request.

| Equipment | | | Calibration | |
|---|---|---|---|---|
| **Description** | **Manufacturer & Type Number** | **Serial Number** | **Last Date** | **Certificate Number** |
| Integrating sound level meter | Cirrus Optimus Green CR:171B | G061822 | 22/06/22 | 176209 |
| Microphone | Cirrus MK224 | 212796A | 17/06/22 | 176210 |
| Acoustic Calibrator | Cirrus CR:515 | 60704 | 29/04/21 | U37791 |
| Integrating sound level meter | Cirrus Optimus Green CR:171B | G061849 | 04/11/22 | 182660 |
| Microphone | Cirrus MK224 | 214828D | 28/10/22 | 182662 |
| Acoustic Calibrator | Cirrus CR:515 | 64545 | 08/04/21 | U37591 |

Table E22128 **/T1.** – Equipment Details

4.6 The weather during the unattended survey has been assessed using a local weather station[2].

4.7 The weather during the survey was found to be mostly dry. There were spells of rain and snow during the measurement period which we do not deem to have any significant effect on the measurements.

[2] https://www.wunderground.com/wundermap

# 5. NOISE SURVEY RESULTS

***Unattended Survey***

5.1 An unattended background noise survey was undertaken between 9th December and 16th December 2022.

5.2 The appended Figures E22128 /TH1 and E22128 /TH2 show a time history graphical representation of these results.

| Position | Measurement Period | Ambient Noise Level ($L_{Aeq,T}$, dB) | *Typical Maximum Noise Level ($L_{AFMax}$ dB) | **Typical Background Noise Level ($L_{A90,\ 15min}$, dB) |
|---|---|---|---|---|
| Position P1 | Daytime (07:00 – 23:00) | 73 | 91 | 62 |
| | Night-time (23:00 – 07:00) | 71 | 83 | 54 |
| Position P3 | Daytime (07:00 – 23:00) | 50 | 72 | 47 |
| | Night-time (23:00 – 07:00) | 45 | 57 | 39 |

**Table E22128 /T2. – Summary of Automated Noise Measurement Results (façade included)**

*Typical maximum sound levels have been established based upon the criteria given in the clarifications to Note 4 of Table 4 of British Standard BS 8233:2014 found in the ProPG.

**Typical background sound levels (LA90,T) have been established based upon the 'line-of-best-fit' method which is considered a valid method under British Standard BS 4142:2014.

5.3 Daytime measurements were affected by ongoing construction noise.

***Attended Survey***

5.4 Spot measurements were taken at position P2 inside No. 557 on 9th and 13th December 2022 simultaneously with external measurements for a basic assessment of the existing façade acoustic performance. The results of these measurements are given in Table E22128 /T3.

| Position | Measurement Period | Ambient Noise Level ($L_{Aeq,T}$, dB) | Typical Maximum Noise Level ($L_{AFMax}$ dB) | Typical Background Noise Level ($L_{A90,\ 15min}$, dB) |
|---|---|---|---|---|
| Position 1 (façade included) | Daytime (07:00 – 23:00) | 72 | 79 | 63 |
| Position 2 (internal) | Daytime (07:00 – 23:00) | 46 | 53 | 39 |

**Table E22128 /T3. – Summary of Attended Noise Measurement Results**

# 6. EXTERNAL BUILDING FABRIC ASSESSMENT

6.1 A feasibility study and assessment of the required acoustic performance for the external building fabric of the proposed development has been undertaken using the methodology provided in Appendix G of British Standard BS 8233:2014 against the requirements outlined in Section 3, above.

6.2 The facades of the proposed development have been categorised as follows,

6.2.1 A - for the building elevations facing Finchley Road.

6.2.2 B - for the rear building elevation.

6.3 The noise levels have been used in the façade assessment:

| Location | Time Period, T | Parameter | Broadband (dBA) | Octave Band (Hz) Sound Levels (dB) (façade included) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 125Hz | 250Hz | 500Hz | 1kHz | 2kHz |
| Elevation A | Daytime (07:00-23:00) | $L_{eq,T,\ 16Hr}$ | 73 | 80 | 72 | 69 | 69 | 65 |
| | Night-time (23:00-07:00) | $L_{eq,T,\ 8Hr}$ | 71 | 78 | 70 | 67 | 67 | 63 |
| | | $L_{FMax}$ | 83 | 90 | 82 | 79 | 79 | 75 |
| Elevation B | Daytime (07:00-23:00) | $L_{eq,T,\ 16Hr}$ | 50 | 51 | 55 | 48 | 42 | 36 |
| | Night-time (23:00-07:00) | $L_{eq,T,\ 8Hr}$ | 45 | 46 | 50 | 42 | 37 | 31 |
| | | $L_{FMax}$ | 57 | 58 | 62 | 55 | 50 | 43 |

**Table E22128 /T4 - External Noise Levels Used in EBF Assessment**

6.4 The following assumptions have been made in the facade assessment:

| Assumption | Change of use residential units |
|---|---|
| Room Finishes | Plasterboard ceiling;<br>Plasterboard walls; and<br>Soft floor finish within the bedrooms (i.e. carpet). |
| Ventilation | We have assumed the ventilation will be a Mechanical Ventilation Heat Recovery Units (MVHR). |
| Room/Window Sizes | Typical Living Room size 4m x 3m x 2.4m high.<br>Typical Bedroom size 3.5m x 2.5m x 2.4m high.<br>We have assumed that the windows will be 39% (Living Rooms) and 33% (Bedrooms) of the external façade area. |
| External Wall Construction (non-glazed sections) | We have assumed that this will be a retained masonry construction capable of achieving a Weighted Sound Reduction of 52dB $R_w$. |

**Table E22128 /T5 - List of assumptions in EBF assessment**

6.5 The calculated acoustic performance requirements for the building envelope elements are presented below with associated typical constructions which should be capable of achieving the performance requirements (although these are not prescriptive, and alternatives may be used if the acoustic performance requirements are met).

| Location | Element | Single Figure Value | Indicative construction for guidance only (does not form part of the specification) [2] | Sound Reduction Index dB at Octave Band Centre Frequency (Hz) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 125Hz | 250Hz | 500Hz | 1kHz | 2kHz |
| Elevation A (Front) | Ventilation | 55 dB $D_{ne,w}$ | Mechanical Ventilation Heat Recovery Unit (MVHR)<br>OR: Approved Equivalent | | | | | |
| | Glazing Living Room (with frame) | 50 dB Rw | EITHER: DGU 6mm Pane/ 16mm Air/ 4mm Pane & secondary glazing 8.8mm laminated pane on 150mm min. airgap with absorptive reveals<br>OR: Approved Equivalent | 27 | 32 | 42 | 45 | 45 |
| | Glazing Bedroom (with frame) | 50 dB Rw | EITHER: DGU 6mm Pane/ 16mm Air/ 4mm Pane & secondary glazing 8.8mm laminated pane on 150mm min. airgap with absorptive reveals<br>OR: Approved Equivalent | 27 | 32 | 42 | 45 | 45 |
| Elevation B (Rear) | Ventilation | 55 dB $D_{ne,w}$ | Mechanical Ventilation Heat Recovery Unit (MVHR)<br>OR: Approved Equivalent | | | | | |
| | Glazing Living Room (with frame) | 35 dB Rw | EITHER: min. 4mm Pane/ 16mm Air/ 6mm Pane<br>OR: Approved Equivalent | 21 | 19 | 24 | 35 | 37 |
| | Glazing Bedroom (with frame) | 35 dB Rw | EITHER: min. 4mm Pane/ 16mm Air/ 6mm Pane<br>OR: Approved Equivalent | 21 | 19 | 24 | 35 | 37 |

**Table E22128 /T6 – Acoustic Performance Requirements for Building Envelope Elements**

The indicative constructions are for guidance only and alternative glazing configurations may be use to meet the acoustic performance requirement. Any proposed system is required to have independently verified acoustic test data which includes all frames, operable elements, doors, seals, etc.

6.6 On this basis, predicted noise levels within the dwellings meet the recommendations of BS8233:2014 and the WHO guidelines and, therefore, should comply with Planning Condition 11.

# 7. MECHANICAL PLANT

7.1 The nearest noise sensitive receptors, other than the development itself, have been identified to be the residents at:

- Burgess Park Mansions, Fortune Green Road

7.2 The planning condition (12) requires that:

*external noise level emitted from plant, machinery/ equipment will be lower than the lowest existing background noise level by at least 10dBA, by 15dBA where the source is tonal, as assessed according to BS4142:2014 at the nearest and/or most affected noise sensitive premises*

7.3 Therefore, the following cumulative mechanical plant noise emission limits at the nearest noise sensitive receivers are proposed:

| Noise sensitive Location | Measurement Period | Typical Background Noise Level ($L_{A90, 15min}$, dB)[1] (façade included) | Proposed Cumulative Mechanical Plant Criteria ($L_{Aeq,T}$, dB) |
|---|---|---|---|
| Location 1<br>Burgess Park Mansions, Fortune Green Road | Daytime (07:00-23:00) | 47 | 37 (32) |
| | Night-time (23:00-07:00) | 39 | 29 (24) |

Table E22128 /T7 – External Mechanical Plant Noise Criteria

[1]This has been calculated from the measured noise levels:
For the daytime a simple arithmetic average of the measured LA90s has been used as the LA90 was consistent across these measurements.
For the night time the lowest measured LA90 has been used as a worst case scenario

***Feasibility Assessment***

7.4 The following external mechanical plant items are currently proposed:

- Air Source Heat Pump (ASHP) Ecodan R32 Model PUZ-WM60VAA(-BS)
- 3 Units at GF and 2 Units at LGF

7.5 The datasheet for the proposed air source heat pump is attached for reference and the sound power level given is 00dBA.

7.6 The noise levels from the units have been calculated to the noise sensitive receivers on the basis of the methodology of BS 4142:2014+A1:2019.

| | |
|---|---|
| Source | Air Source Heat Pump (ASHP) Ecodan R32 Model PUZ-WM60VAA(-BS) |
| Source Location | 551-557 Finchley Road Lower Ground Floor |
| Assessment Location | Burgess Park Mansions, Fortune Green Road |
| Assessment Period | 23:00 - 07:00 |

| Results | | | Relevant BS4142:2014 Section | Comments |
|---|---|---|---|---|
| Source Noise Level | | distance | | |
| Air Source Heat Pump (ASHP) Ecodan R32 Model PUZ-WM60VAA(-BS) Sound Pressure Level at 1m dB LAeq,t | 45 | 1 | 7.3.6 | Taken from the sound pressure level provided by Mitsubishi on the datasheet |
| On time correction | 0 | | | ASHP is assumed to run throughout 15minute assessment period |
| Typical background sound level at nearest unscreened property (23:00 - 07:00) Burgess Park Mansions, Fortune Green Road LA90(15 min) dB | 39 | | 8.1.3<br>8.1.4<br>8.2 | This is the average 15 minute LA90 measured between 06:00 and 07:00 |
| Correction for acoustic enclosure | -5 | 5 | | OP1 Sound Cover |
| Distance from 551-557 Finchley Road Lower Ground Floor 4m | -12 | 4 | | The closest window of Burgess Park Mansions, Fortune Green Road is approximately 4m away from the proposed ASHP location. We have used a point source attenuation. |
| Directivity correction | | | | ASHP is in garden against wall, but source measurement is directly in front so no additional directivity |
| Screening | -5 | | | Garden wall |
| Correction for number of units | 3 | 2 | | There are 2 units. |
| Façade Correction, dB | 3 | | | Assessment location is 1m from residential window |
| Specific sound level at Burgess Park Mansions, Fortune Green Road $L_{Aeq(15\ min)}$ dB | 29 | | 7.3.6 | |
| Acoustic feature correction, dB | | | 9.2 | |
| Tonality | 0 | | | Character of ASHP in enclosure is not considered to be audibly tonal at assessment location |
| Impulsivity | 0 | | | Character of ASHP in enclosure is not considered to be audibly impulsive at assessment location |
| intermittency | 0 | | | ASHP is assumed to run throughout 15minute assessment period |
| Other | 0 | | | No other acoustic features readily distinctive against the residual acoustic environment |
| Rating level dB: | 29 | | 9 | |
| Excess of rating level over background sound level, dB | -10 | | 11 | |
| Descriptive outcome | | | 11 | The rating level does not exceed the background sound and so this is an indication of the specific sound having a low impact |
| Uncertainty of the assessment, ± dB | 2 | | 10 | This is the combined standard uncertainty based on the following known uncertainties:<br>• ±1dB – ambient sound measurement;<br>• ±2dB – ASHP sound power measurement (from data sheet);<br>• ±0.2dB – distance measurement;<br>The uncertainties were combined using the methodology described in UKAS M3003 – The Expression of Uncertainty and Confidence in Measurement (Edition 3 – November 2012). |
| Uncertainty assessment | | | 10 | Given the degree specific sound is below background sound levels, this is not a significant level of uncertainty |

**Table E22128 /T8 – BS 4142:2014 Assessment Summary – ASHP in enclosure at 551-557 Finchley Road Lower Ground Floor**

7.7 As the units are residential dwellings they could be running for 24hrs a day therefore the night time limits have been used for each noise sensitive receiver.

| Noise sensitive Location | Predicted Noise Level ($L_{Aeq,T}$, dB) | Proposed Limit($L_{Aeq,T}$, dB) | Predicted to Comply |
|---|---|---|---|
| Location 1 | 29 | 29 | Yes |

Table Project Number/T9 – Predicted Noise Levels at the Nearest Noise Sensitive Receivers

7.8 The calculated rating levels achieve the proposed minimum requirements at the nearest noise sensitive receivers.

7.9 The calculation assumes the use of acoustic enclosures are typically capable of providing an overall dBA reduction of at least 5dB, such as the OP1 provided by Environ or equal and approved). Details available from Environ, Regus House, 1010 Cambourne Business Park, Cambourne, Cambridgeshire, UK, CB23 6DP www.environ.co.uk.

**Figure E22128/ F3 – Typical ASHP Noise Enclosure**

7.10 We have not assessed the suitability of such an enclosure for use with the chosen unit in terms of air flow etc. This would need to be confirmed either by the manufacturer or a suitably qualified mechanical engineer.

7.11 The units should be isolated from the building structures using suitable anti-vibration mounts. These can typically be provided by the manufacturer.

# 8. CONCLUSION

8.1 Adnitt Acoustics have been commissioned by Glencar Construction to undertake an ambient background noise assessment and acoustic study in support of the application at 551-557 Finchley Road, London NW3 7BJ.

8.2 The survey showed that the background noise levels were typical of that of a residential building near to a busy road within a London suburb.

8.3 Secondary glazing systems have been recommended to meet the requirements of condition 11, the specification assumes that the dwellings will be ventilated with Mechanical Ventilation Heat Recovery systems with appropriate sound attenuation.

8.4 The nearest noise sensitive receptors were found to be 549 Finchley Road, a house directly south of the site and 559 Finchley Road, a flat built above a restaurant.

8.5 Acoustic enclosures have been specified for external plant (ASHP) to meet the requirements of condition 12.

8.6 Based on the above, the current proposals comply with the requirements of planning conditions 11 & 12.

**Robert Adnitt MEng FIOA**

**for ADNITT ACOUSTICS**

# APPENDIX A: GLOSSARY OF ACOUSTIC TERMS

| | | |
|---|---|---|
| **Ambient Noise** | The noise climate heard over a period of time due to all normal sources, in the absence of extraneous or atypical sounds. Used to describe noise in the absence of the introduced sound, generally. | |
| **Ambient Noise Level** | Describes the average noise level of the ambient noise over a stated period of time, e.g. hourly noise | |
| | Parameter: A-weighted Continuous Equivalent Sound Pressure Level determined over the time period T. | $L_{eq,T}$ or $L_{Aeq,T}$ |
| | Expressed in decibels / A-weighted decibels | dB(A) or dB |
| **Decibel scale dB** | A linear numbering scale used to define a logarithmic amplitude scale, thereby compressing a wide range of amplitude values to a small set of numbers | |
| **dB(A)** | An electronic filter in a sound level meter, which approximates under defined conditions the frequency response of the human ear. | |
| **$L_{Aeq,T}$** | The equivalent continuous sound level. The steady dB(A) level which would produce the same A-weighted sound energy over a stated period of time as the measured sound pressure level. | |
| **$L_{Amax}$** | The maximum dB(A) level measured during a survey period. | |
| **$L_{A10}$** | The dB(A) level exceeded for 10% of the survey period, often used as a quantifier of traffic noise level. | |
| **$L_{A90}$** | The dB(A) level exceeded for 90% of the survey period. Used in BS 4142:1997/2014 as being representative of the background noise level. | |
| **Acoustic screening** | Physical barrier to sound formed by fence, wall, building or other structure, which has the effect of reducing the sound transmitted. | |
| **Individual Event Noise** | The noise of a distinctive event with the varying noise climate, usually a transient activity, such as a vehicle pass-by, aircraft flyover or similar, rather than an isolated impulsive noise. | |
| **Individual Event Noise Level** | Describes the highest noise level during the event as measured under particular conditions of time-weighting | |
| | Parameter: A-weighted Maximum Sound Pressure Level with FAST or SLOW time weighting | $L_{Amax,FAST}$ or $L_{Amax,F}$<br>$L_{Amax,SLOW}$ or $L_{Amax,S}$ |
| | Expressed in decibels / A-weighted decibels | dB(A) or dB |
| ***Sound Reduction Index $R_w$*** | Single number rating used to describe the sound insulation of building elements as defined in BS EN ISO 717 1997. | |
| ***Weighted element-normalized level difference $D_{n,e,w}$*** | Single number rating used to describe the sound insulation of building elements as defined in BS EN ISO 717 1997. | |

## APPENDIX B: ASHP DATASHEET

Heating | Product Information

MITSUBISHI ELECTRIC

# PUZ-WM60VAA(-BS)

## Ecodan R32
## **Monobloc** Air Source Heat Pump

R32

### Key Features:

- A+++ high efficiency system
- Ultra quiet noise levels
- Maintains full heating capacity at low temperatures
- Zero carbon solution
- MELCloud enabled

### Key Benefits:

- Ultra low running cost
- Flexible product placement
- Confident and quick product selection
- Help to tackle the climate crisis
- Remote control, monitoring, maintenance and technical support

MELCloud

Manufactured in the UK

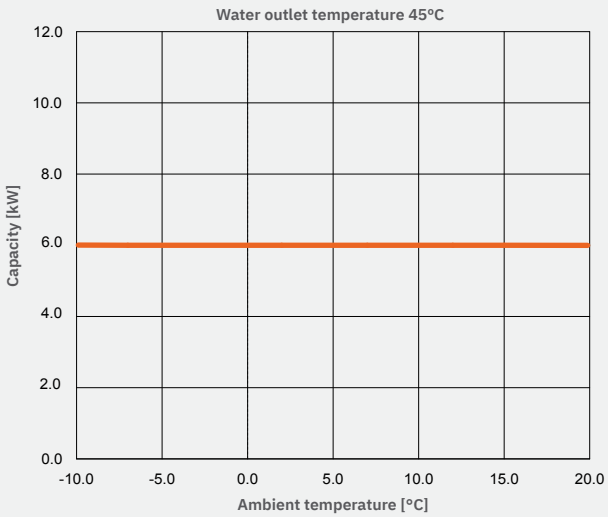
037-0033-20-01

**Heating** | **Product Information**

# PUZ-WM60VAA(-BS)
Ecodan R32
Monobloc Air Source Heat Pump

| OUTDOOR UNIT | | PUZ-WM60VAA(-BS) |
|---|---|---|
| HEAT PUMP SPACE HEATER - 55˚C | ErP Rating | A++ |
| | $\eta_s$ | 142% |
| | SCOP (MCS) | 3.57 |
| HEAT PUMP SPACE HEATER - 35˚C | ErP Rating | A+++ |
| | $\eta_s$ | 190% |
| | SCOP (MCS) | 4.81 |
| HEAT PUMP COMBINATION HEATER - Large Profile*1 | ErP Rating | A+ |
| | $\eta_{wh}$ | 145% |
| HEATING*2 (A-7/W35) | Capacity (kW) | 6.0 |
| | Power Input (kW) | 1.88 |
| | COP | 3.20 |
| OPERATING AMBIENT TEMPERATURE (°C DB) | | -20 ~ +35 |
| SOUND DATA*3 | Pressure Level at 1m (dBA) | 45 |
| | Power Level (dBA)*4 | 58 |
| WATER DATA | Pipework Size (mm) | 22 |
| | Flow Rate (l/min) | 17 |
| | Water Pressure Drop (kPa) | 8.0 |
| DIMENSIONS (mm) | Width | 1050 |
| | Depth | 480 |
| | Height | 1020 |
| WEIGHT (kg) | | 98 |
| ELECTRICAL DATA | Electrical Supply | 220-240v, 50Hz |
| | Phase | Single |
| | Nominal Running Current [MAX] (A)*5 | 5.68 [13] |
| | Fuse Rating - MCB Sizes (A)*6 | 16 |
| REFRIGERANT CHARGE (kg) / $CO_2$ EQUIVALENT (t) | R32 (GWP 675) | 2.2 / 1.49 |

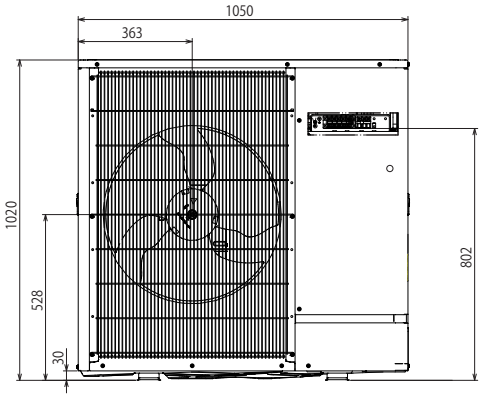
## NOMINAL HEATING CAPACITY



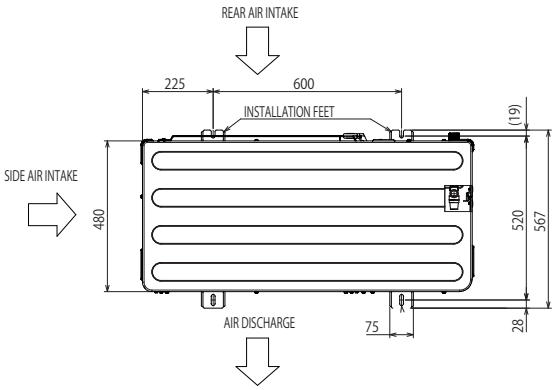

**Notes:**
*1 Combination with E*PT20X Cylinder
*2 Under normal heating conditions at outdoor temp: -7°CDB / -8°CWB, outlet water temp 35°C, inlet water temp 30°C.
*3 Under normal heating conditions at outdoor temp: 7°CDB / 6°CWB, outlet water temp 55°C, inlet water temp 47°C as tested to BS EN14511.
*4 Sound power level tested to BS EN12102.
*5 Under nominal heating conditions at outdoor temp: 7ºC, outlet water temp: 35ºC.
*6 MCB Sizes BS EN60898-2 & BS EN60947-2.
$\eta_s$ is the seasonal space heating energy efficiency (SSHEE) $\eta_{wh}$ is the water heating energy efficiency

## PUZ-WM60VAA(-BS) DIMENSIONS

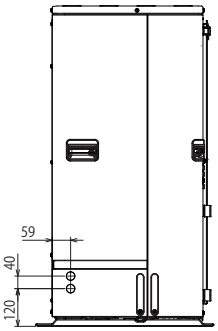
FRONT VIEW




UPPER VIEW




SIDE VIEW




All dimensions (mm)


MITSUBISHI ELECTRIC
*Changes for the Better*

Telephone: **01707 282880**
email: **heating@meuk.mee.com**
**heating.mitsubishielectric.co.uk**

@meuk_les @green_gateway | Mitsubishi Electric Living Environmental Systems UK | Mitsubishi Electric Cooling and Heating UK | mitsubishielectricuk_les | Mitsubishi Electric Living Environmental Systems UK | BLOG thehub.mitsubishielectric.co.uk

**UNITED KINGDOM Mitsubishi Electric Europe Living Environment Systems Division,** Travellers Lane, Hatfield, Hertfordshire, AL10 8XB, England. Telephone: 01707 282880 Fax: 01707 278881
**IRELAND Mitsubishi Electric Europe,** Westgate Business Park, Ballymount, Dublin 24, Ireland. Telephone: (01) 419 8800 Fax: (01) 419 8890 International code: (003531)




**Note:** Refer to 'Installation Manual' and 'Instruction Book' for further 'Technical Information'. The fuse rating is for guidance only and please refer to the relevant databook for detailed specification. It is the responsibility of a qualified electrician/ electrical engineer to select the correct cable size and fuse rating based on current regulation and site specific conditions. Mitsubishi Electric's air conditioning equipment and heat pump systems contain a fluorinated greenhouse gas, R410A (GWP:2088), R32 (GWP:675), R407C (GWP:1774), R134a (GWP:1430), R513A (GWP:631), R454B (GWP:466), R1234ze (GWP:7) or R1234yf (GWP:4). *These GWP values are based on Regulation (EU) No 517/2014 from IPCC 4th edition. In case of Regulation (EU) No.626/2011 from IPCC 3rd edition, these are as follows. R410A (GWP:1975), R32 (GWP:550), R407C (GWP:1650) or R134a (GWP:1300).

**Effective as of August 2020**

Green Gateway greengateway.mitsubishielectric.co.uk

## Figure E22128/ SP 1 : Site Plan Showing Measurement Positions


Legend

- Site Boundary
- Measurement Locations
- Features

CLIENT: Glencar Construction

SIZE: A4

TITLE: Site Plan

Adnitt Acoustics
Renaissance House
32 Upper High Street
Epsom
Surrey, KT17 4QJ
Tel: 020 7099 9735
Fax: 0845 127 5121



DATE: 21/12/2022 | CHECKED: RA | PROJECT: E22128

DRAWN: JS | APPROVED: RA | SCALE: 1:500

DRAWING: E22128 221221

REV: -

## Figure E22128/ TH 1 : Time History of Automated Measurements for P1

**Figure E22128/ TH 2 : Time History of Automated Measurements for P3**