Rev. 0 01/02/2017

Noise Impact Assessment

Project Reference Number: PA188

Report Reference Number: IB1301174NR

Client: Sue Hastelow

Site: The Private Clinic, Fitzroy Square, London, W1T 5HE

Project Consultant	**Proofing Consultant**
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Project Information

Peak Acoustics have been commissioned to undertake the assessment detailed within this report. Below is a summary of pre-commencement requirements and comments as communicated to Peak Acoustics by involved parties, this information forms the basis of the assessment and report.

Client Contact	Sue Hastelow on 13/01/2017.
Client Requirement	A noise assessment has been requested to determine the potential noise impact of a proposed condenser unit and to specify mitigation, if required.
Site details as communicated by client.	A condenser unit is proposed to be installed at The Private Clinic, Fitzroy Square, London, W1T 5HE.
Selected Methodology	To assess the noise impact of a proposed condenser unit on the nearest sensitive receptor, Peak Acoustics will undertake measurement and assessment using BS4142:2014.
Methodology Justification	'BS4142:2014 – Methods for rating and assessing industrial and commercial sound' is a recognised standard for determining the noise impact of fixed plant machinery via relation of noise emissions to the measured background noise level on site.
Local Authority Contact	N/A
Local Authority Consultation	N/A
Local Authority Guidance/Unitary Development Plans/Unique or bespoke standards	For noise emissions from the proposed condenser units to be 10dB below current, representative background noise levels.

Assessment Summary

A noise assessment has been undertaken at The Private Clinic, Fitzroy Square, London, W1T 5HE. This is to assess the impact of a proposed condenser unit on the nearest sensitive receptor (NSR).

The NSR has been identified as a residential dwelling located on Grafton Mews.

Background noise levels have been recorded on site and measured at their lowest as **42.5dB $L_{A90,\ 10mins}$**. A noise limit of 32.5dB has been set in line local authority requirements.

The sound rating level of the proposed condenser unit is determined be **25.9dB L_{Ar},** 6.6dB below the noise limit, classed as **Low Impact** in line with BS4142:2014.

1. Subjective Impressions

1.1 Background noise levels were measured at a representative location to the NSR, taken to be the residential dwelling located on Grafton Mews.

1.2 The primary noise sources on site were identified as external plant equipment, road traffic from the surrounding roads and pedestrians. Secondary noise sources were noted as distant traffic (aerodynamic noise).

2. Measurement Location

2.1 Background noise measurements were taken at a representative location to the NSR.

2.2 The measurement location is shown below.

Site location

Background measurement location

NSR location

3. Measurement Equipment

3.1 Measurements were undertaken using a Svantek 971 Class 1 Sound Level Meter. SN: 40305. Full equipment details can be found in **Appendix B**.

3.2 The calibrator reference level was 113.0dB and calibration levels were measured at 112.25 before and after 112.21 after measurement (0.04dB drift). Full calibration details can be found in **Appendix D**.

4. Weather Conditions

4.1 Weather conditions were deemed acceptable for environmental noise measurement; detailed weather conditions are given in **Appendix C**.

5. Measurement Procedure

5.1 Background noise measurements were conducted over a weekday period from 25th – 26th January 2017. Full measurement times and durations can be found in **Appendix A**.

5.2 Background noise measurements were obtained in 5 minute time intervals at a distance of at least 1m from any reflective surface and at a representative location to the NSR.

5.3 Measured noise levels are shown graphically in **Appendix E** and show that the current background noise is dominated by external plant equipment running intermittently.

6. Specific Sound Level

6.1 The proposed condenser unit (Mitsubishi, MXZ-4E83VA-E2) has a sound power level of 61.0dB L_{WA}. Full specifications are given in **Appendix F**.

6.2 The unit is to be wall mounted and a reduction of -8.0db is applied due to hemispherical propagation to give a sound pressure level of 53.0dB L_{Aeq}.

6.3 The noise level is distance corrected to the NSR approximately 32m away as follows:

$$L_2 = L_1 - 20*\log(r_1/r_2)$$

$$L_2 = 53.0 - 20*\log(32/1)$$

$$L_2 = 22.9\text{dB } L_{Assl}$$

(Point source distance attenuation is applied, where r_1 is the distance between the noise source and NSR and r_2 is the distance between microphone and noise source)

6.4 The resulting specific sound level is therefore **22.9dB L_{Assl}**.

7. Rating Level

7.1 The specific sound level is to be corrected for intermittency as the unit will not run continuously.

7.2 A +3dB intermittency penalty is applied to the specific sound.

7.3 This gives a sound rating level at the NSR of **25.9dB L_{Ar}**.

8. Background Sound Level

8.1 Background noise levels were measured over a weekday period from 25th – 26th January 2017.

8.2 From the noise measurement details in **Appendix E** the current plant equipment runs intermittently approximately every 10 minutes throughout the day and night. The lowest 10 minutes measured are deemed representative of the background noise.

8.3 Background noise levels were measured at their lowest as **42.5dB $L_{A90, 10mins}$** between 00:31 - 00:41.

8.4 The local authority has requested for noise emissions from the proposed condenser unit to be 10dB below current, representative background noise levels.

8.5 A noise limit of 32.5dB is therefore set.

9. BS4142:2014 Assessment Outcome

9.1 The sound rating level is **6.6dB** below the noise limit at the NSR.

9.2 This is classed as **Low Impact** under BS4142:2014.

9.3 No mitigation is deemed necessary.

10. Uncertainty

10.1 The monitoring equipment is subject to a 1dB error margin, however calibration before and after measurements allows the drift within the margin to be monitored and thus demonstrates that minimal drift occurred throughout the measurement.

10.2 The path between the source and NSR is an alleyway. Multiple reflections/absorption of sound from the hard surfaces of the adjacent buildings has not been considered to give a concise assessment.

Appendices

APPENDIX A - Measurement Details					
Measurement	Kit	Start Date	Start Time	End Date	End Time
M1	A2	25/01/2017	13:06	26/01/2017	12:51

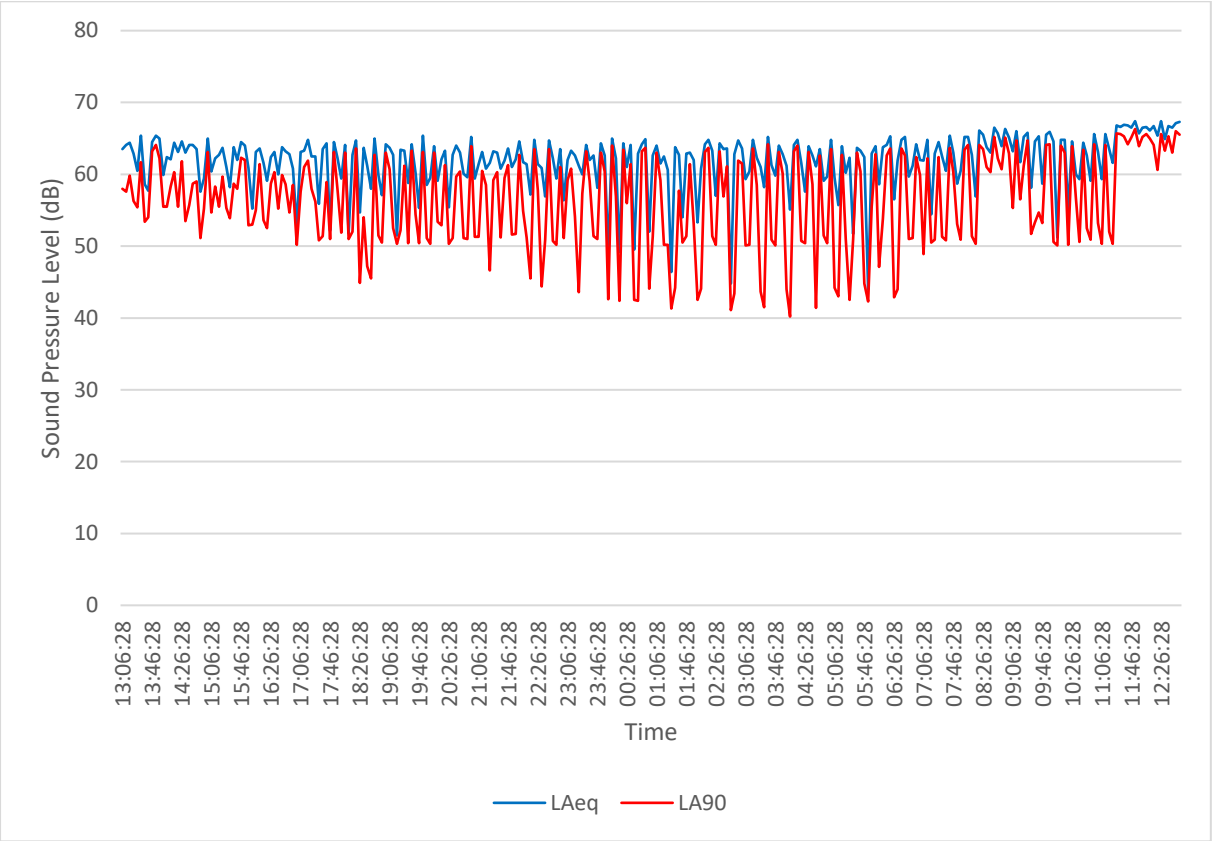
APPENDIX B - Equipment Details					
Kit	Equipment	Make	Model	Class	Serial Number
A2	Sound Meter	Svantek	971	1	40305
A2	Pre-Amp	Svantek	SV12L	1	32484
A2	Calibrator	Svantek	SV31	1	43806

APPENDIX C - Meteorology Details							
Measurement	Date	Temp C	Wind Speed m/s	Wind Direction	Humidity %	Precipitation mm	Cloud Cover (Oktas)
M1	25/01/2017	1	1.9	SE	98	0.2	6/8
M1	26/01/2017	-1	3.9	SE	89	0.0	8/8

APPENDIX D - Calibration Details					
Measurement	Calibrator Ref Level (dB)	Level Before (dB)	Deviation Before (dB)	Level After (dB)	Deviation After (dB)
M1	113.0	112.25	0.75	112.21	0.79

APPENDIX E – Noise Measurement Details

Measured Background Noise Levels, Graph: 25th- 26th January 2017



APPENDIX F – Proposed Condenser Unit Specifications

Air Conditioning

Product Information

MXZ-4E83VA Inverter Heat Pump
Multi-Split Unit

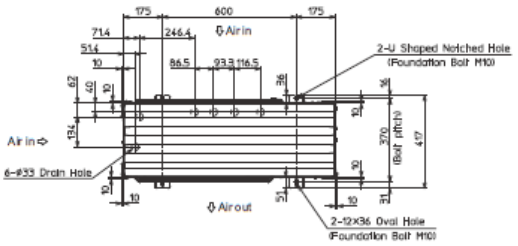
Making a World of Difference

MULTI-SPLIT - INDOOR UNITS	MXZ-4E83VA
WALL MOUNTED	MSZ-SF20VE / MSZ-SF/25/35/50VE2 / MSZ-GF60/71VE MSZ-FH25/35VE / MSZ-EF25/35/50VE2B/S/W
FLOOR MOUNTED	MFZ-KJ25/35/50VE
DUCTED	SEZ-KD25/35/50/60/71VAQ*3 PEAD-RP50/60/71JAQ*1
CEILING CASSETTE	SLZ-KA25/35/50VAQ PLA-RP50/60/71BA
CEILING DUCTED	PCA-RP50/60/71KAQ

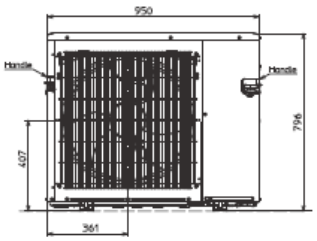
MXZ-D/C - OUTDOOR UNITS		MXZ-4E83VA
NUMBER OF CONNECTABLE INDOOR UNITS		2 - 4
CAPACITY (kW)	Heating (nominal)	9.3 (3.4-11.6)
	Cooling (nominal)	8.3 (3.7-9.2)
	Heating (UK)	7.8 (2.82-9.63)
	Cooling (UK)	8.2 (3.67-9.12)
COP / EER (nominal)*2		4.65 / 3.40
SCOP / SEER (BSEN14825)		4.2 / 6.3
ErP ENERGY EFFICIENCY CLASS	Heating/Cooling	A+ / A++
MAX AIRFLOW (m³/min)	Heating/Cooling	64.9 / 55.7
SOUND PRESSURE LEVEL (dBA)	Heating/Cooling - SI-Hi	51 / 49
SOUND POWER LEVEL (dBA)	Cooling	61
DIMENSIONS (mm)	Width x Depth x Height	950 x 330 x 796
WEIGHT (kg)		62
ELECTRICAL SUPPLY		220-240v, 50Hz
PHASE		Single
POWER INPUT (kW)	Heating/Cooling (nominal)	2.44 / 2.83
	Heating/Cooling (UK)	2.20 / 2.26
STARTING CURRENT (A)		10.7
RUNNING CURRENT (A)	Heating/Cooling (MAX)	10.7 / 12.4 [20.4]
INTERCONNECTING CABLE No. CORES		4 Core
TOTAL PIPE LENGTH (m)		70
MAX PIPE LENGTH PER INDOOR UNIT (m)		25
MAX HEIGHT DIFFERENCE (m)		15 (10 if OU higher than IU)
CHARGE R410A (kg) [Precharged Length]		2.99 [20m]
FUSE RATING (BS88) – HRC (A)		25

DIMENSIONS

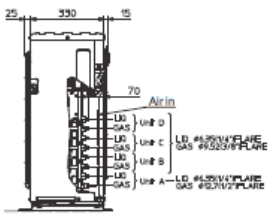
Upper View



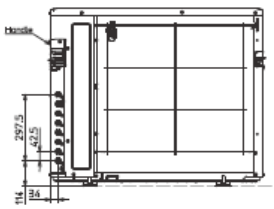
Front View



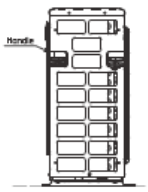
Side View



Back View



Side View



Notes: Multi Split models with eight ports, 14 and 15.5kW can now be found in Y Series (6.5-8hp) City Multi section.
*1 Combined max running current of all indoors on system must not exceed 3A if PEAD-RP is used.
*2 System COP / EER when connected to MSZ-EF x indoor unit connections.
*3 The SEZ-KD25VAQ cannot be used when the total indoor capacity is equal to the outdoor capacity i.e. when the capacity ratio is 1.

MITSUBISHI ELECTRIC
Changes for the Better

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Note: The fuse rating is for guidance only. 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 and heat pump systems contain fluorinated greenhouse gases R410A, R407C and R134a.

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Effective as of April 2015