

Noise Report

Planning application reference: N/A

for

Unit B, Corporation Street, Manchester, M4 4DZ
conducted on
22 October 2025

by

Environmentally Sound Limited

Tel: 01908 643433

Email: info@environmentallysound.co.uk

Report authorised by



P. A. Schmitz MBA CEng MIOA MIMechE
27 October 2025

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Introduction

This report presents an environmental noise assessment for the proposed installation of three air conditioning units (Panasonic U 4LE2E8, Panasonic U 60PZH3E5 and Panasonic CU Z25YKEA) at the commercial premises on Commercial Road. The purpose of the assessment is to determine the potential noise impact of the specific sound sources on the nearest sensitive receptor (NSR), identified as the hotel room directly above the installation location.

The methodology applied follows the requirements and assessment framework set out in **BS 4142:2014+A1:2019 - Methods for rating and assessing industrial and commercial sound**, which is specifically applicable to mechanical and electrical plant associated with commercial operations. The report documents the noise survey procedure, measurement instrumentation, background noise levels, and the calculated rating levels to determine the likelihood of adverse impact.

1) Scope

To determine the noise impact on the nearest sensitive receptors (NSRs) of the proposed installation of three air conditioning units - Panasonic U 4LE2E8, Panasonic U 60PZH3E5 and Panasonic CU Z25YKEA.

According to the British Standards BS4142:2014, the standard is used in this report to assess the

“sound of an industrial and/or a commercial nature, which includes:

c) sound from fixed installations which comprise mechanical and electrical plant and equipment; ...”

2) Noise Survey

The information for the noise survey is reported in this section, and includes the requested detail prescribed, in section 12 of BS 4142:2014.

a) Statement of qualifications

The noise survey was performed by Paul Schmitz MBA CEng MloA MIMechE of Environmentally Sound Limited, a corporate member of the Institute of Acoustics and the Institute of Mechanical Engineers; an experienced chartered engineer in noise and vibration measurements, surveys and assessments using data acquisition equipment for over 29 years.

b) Sources being assessed

1) Description of the main sound sources and of the specific sound:

Air conditioning units	Panasonic U 4LE2E8 – outdoor unit
	Panasonic U 60PZH3E5 – outdoor unit
	Panasonic CU Z25YKEA – indoor unit

2) Hours of operation

- 08:00 to 17:00, no operation of the units outside these hours

3) Mode of operation

- Any time during the hours of operation, depending on the outdoor temperature and indoor temperature.

4) Operational load

- Dependent on the heating or cooling demand, and the outdoor temperature.

5) Location of main sound source

- The proposed location for the air conditioning units is shown in Figure 1, shown by the white dot.

Figure 1 shows façade of the unit, the location of the air conditioning units and the location of the sound level meter.



Figure 1: The proposed location of the air conditioning units (white rectangle), and the location of the sound level meter (green dot)

c) Subjective Impression

1) Dominance or audibility of the specific sound

The air conditioning units are not yet wired into the control units

2) Main sources contributing the residual sound

Ambient noise from the area – traffic noise from Commercial Road, the trams nearby and the buses on route – 41 to Cheetham Hill and 135 to Bury Exchange; the bus stop is directly outside this unit.

d) Sensitivity of the receptor

For this noise assessment, the nearest sensitive receptor (NSR) is the hotel room above the unit, as shown in Figure 1.

e) Measurement location

Figure 1 shows the location of the sound level meter (SLM) – green dot.

f) Sound measuring system

Sound Level Meter

- 1) Type and model: Rion Sound Level Meter NL-53
- 2) Manufacturer: Rion
- 3) Serial number: 00351918 (see Appendix A)

g) Operational test

- 1) Reference level of calibrator

94dB at 1kHz

- 2) Meter readings

± 0.1dB change at the end of the measurement

h) Weather Conditions

The sound level measurements were taken outside, the residual noise levels came from outside, and therefore the weather conditions for the time of the noise measurements are included.

- 1) wind direction, light breeze gusts towards the units
- 2) Wednesday, 22 October 2025
- 3) Precipitation: none
- 4) Fog: none
- 5) wet ground: no
- 6) frozen ground or snow covered: no
- 7) Temperature: 12°C to 18°C
- 8) Cloud cover: mostly sunny with isolated clouds moving over from the Southeast

i) Date and time of measurements

22 October 2025

j) Measurement time intervals

L _p Store Interval	100ms
L _{eq} Calculation Interval	15 minutes

k) Specific sound level

Sound pressure level at 1 metre:

Panasonic U 4LE2E8 -	LAeq = 54dBA (maximum sound pressure level)
Panasonic U 60PZH3E5 -	LAeq = 50dBA (maximum sound pressure level)

l) Background sound level

The background sound level measured at this location ranged between $L_{A90, 15 \text{ minutes}} = 57.4\text{dBA}$ and 58.5dBA .

m) Rating levels

It is unknown whether the air conditioning units will have tonality or other noise penalties.

n) Excess of the rating level(s) over the measured background sound level(s)

The lowest background sound level measured was 57.4dBA in front of the commercial unit.

The maximum combined sound pressure level of the air conditioning units at 1 metre from the units is 50dBA and $54\text{dBA} = 55.9\text{dBA} < 57.4\text{dBA}$.

With the louvres in front of the units, the sound level will be attenuated a further 5 to 8dB below 55.9dBA , so resulting in 50.9dBA to 47.4dBA .

Considering the construction of the façade (Figure 2), the overhang mitigates the sound level even further, the gold coloured section acting like a barrier.



Figure 2: Overhang of the façade section that mitigates the specific sound even further.

Using the dimensions from the plans for the installation of the protruding façade section (overhang) – see Figure 3, a sound path can be estimated.

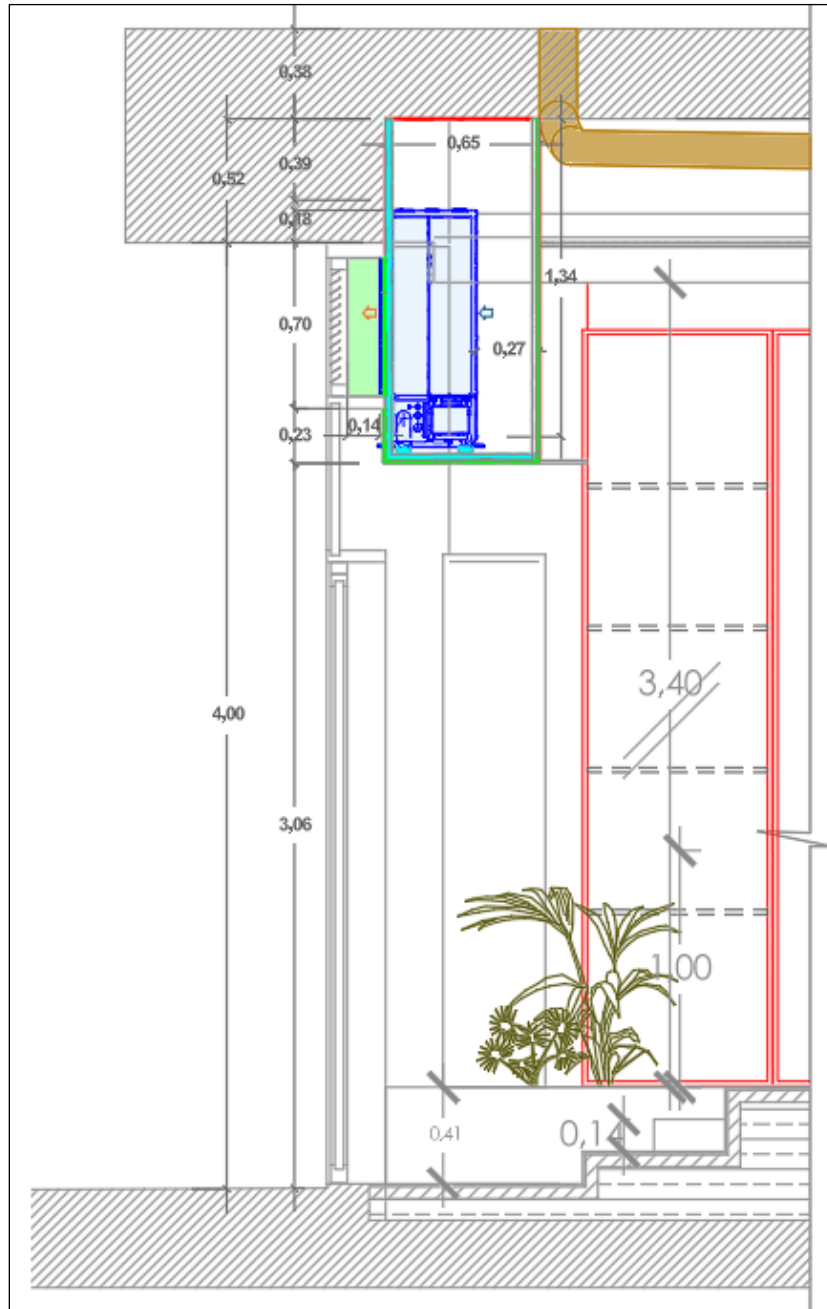


Figure 3: Dimensions of the installation

Modelling this sound path in the facility available on noisetools.net, an approximate estimate can be established.

The sound at the 1 metre in front of the NSR window is 27dBA, which is approximately 30dB below the background sound level, see Figure 4.

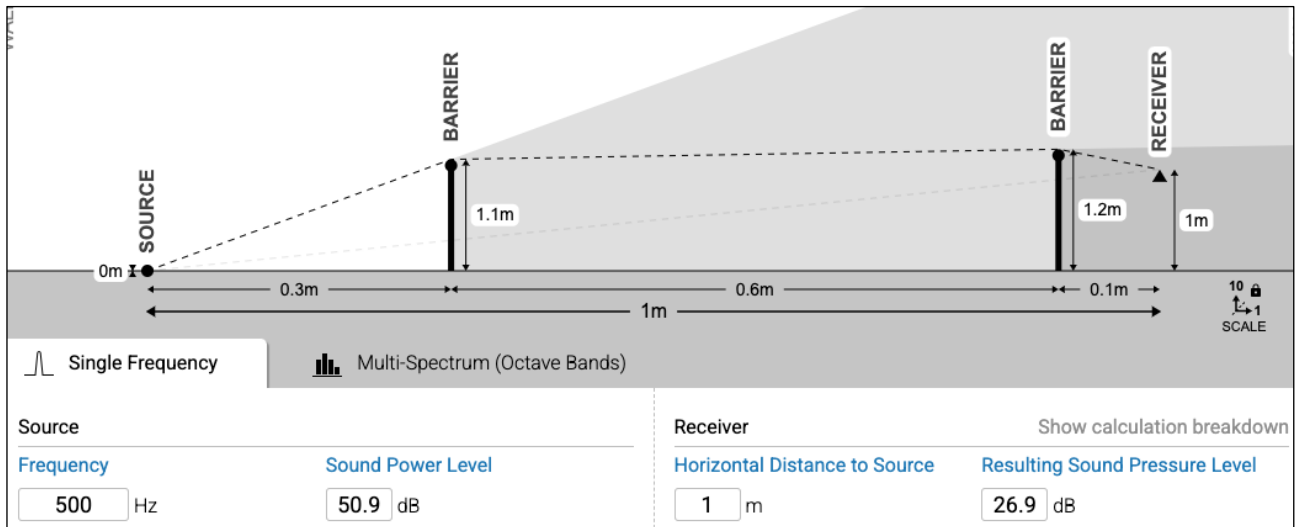


Figure 4: The approximate sound path from the louvre (in front of the air conditioning units) to 1 metre in front of the NSR window.

3) Initial estimate of the impact

There is no adverse impact of the air conditioning units on the NSR, as at 1 metre from the units the specific sound level is lower than the background sound level.

4) Noise Mitigation

Due to the specific sound level being considerably lower than the background sound level in the area, no additional mitigation is required.

5) Conclusion

Based on the BS 4142 assessment, the specific sound level from the proposed air conditioning units is calculated to be significantly below the measured background sound level at the NSR.

Considering the shielding effects provided by the installed façade, louvres, and overhang structure, the sound level at 1 metre from the NSR window is expected to be approximately **30 dB below** the prevailing background noise.

In accordance with the BS 4142 impact descriptors, this margin indicates **no adverse impact** on the nearest sensitive receptor, both during daytime operational hours and under the assumed operating conditions.

Therefore, no additional noise mitigation is required.

Appendix A: RION N-53 Calibration Certificate



CERTIFICATE OF CALIBRATION




0653

Date of Issue: 20 June 2025
 Calibrated at & Certificate issued by:
 ANV Measurement Systems
 Beaufort Court
 17 Roebuck Way
 Milton Keynes MK5 8HL
 Telephone 01908 642846 Fax 01908 642814
 E-Mail: info@noise-and-vibration.co.uk
 Web: www.noise-and-vibration.co.uk
 Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Certificate Number: UCRT25/1916

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Approved Signatory



B. Bogdan

Customer	ANV Measurement Systems Beaufort Court 17 Roebuck Way Milton Keynes MK5 8HL		
Order No.	ANV MS HIRE		
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator		
Identification	<i>Manufacturer</i>	<i>Instrument</i>	<i>Type</i> <i>Serial No. / Version</i>
	Rion	Sound Level Meter	NL-53 00351918
	Rion	Firmware	
	Rion	Pre Amplifier	NH-25 54887
	Rion	Microphone	UC-59 27304
	Rion	Calibrator	NC-75 34334830
		Calibrator adaptor type if applicable	NC-75-022
Performance Class	1		
Test Procedure	TP 10. SLM 61672-3:2013 <i>Procedures from IEC 61672-3:2013 were used to perform the periodic tests.</i>		
Pattern Approved to IEC 61672-1:2013	No	See Comment on page 2 <i>If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2013</i>	
Date Received	17 June 2025	ANV Job No.	UKAS25/06471
Date Calibrated	20 June 2025		

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about conformance of the sound level meter to the full specifications of IEC 61672-1:2013 because (a) evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013 and (b) because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Previous Certificate	Dated	Certificate No.	Laboratory
	Initial Calibration		

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

CERTIFICATE OF CALIBRATION

Certificate Number

UCRT25/1916

UKAS Accredited Calibration Laboratory No. 0653

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Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	NL-53 NL-43 Instruction Manual Technical Guide		
SLM instruction manual ref / issue	66200 23-02		
Date provided or internet download date	11 May 2023	Source	Rion
	Case Corrections	Wind Shield Corrections	Mic Pressure to Free Field Corrections
Uncertainties provided	Yes	Yes	Yes
Total expanded uncertainties within the requirements of IEC 61672-1:2013			YES
Specified or equivalent Calibrator	Specified		
Customer or Lab Calibrator	Lab Calibrator		
Calibrator adaptor type if applicable	NC-75-022		
Calibrator cal. date	22 May 2025		
Calibrator cert. number	UCRT25/1779		
Calibrator cal cert issued by Lab	0653		
Calibrator SPL @ STP	94.01	dB	Calibration reference sound pressure level
Calibrator frequency	1000.00	Hz	Calibration check frequency
Reference level range	Single	dB	
Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15			
Note - The Extension Cable was used between the SLM and the pre-amp for this calibration.			

Environmental conditions during tests	Start	End	
Temperature	23.06	22.78	± 0.30 °C
Humidity	53.0	52.6	± 3.00 %RH
Ambient Pressure	101.17	101.15	± 0.03 kPa

Indication at the Calibration Check Frequency	Calibration carried out using channel	N/A
Initial indicated level	94.0	dB
Adjusted indicated level	94.0	dB
Uncertainty of calibrator used for Indication at the Calibration Check Frequency ±	0.10	dB

Self Generated Noise

Microphone installed - Less Than 15.7 dB A Weighting

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A	C	Z
	12.1	14.9	20.4
	dB	dB	dB
	UR	UR	UR

Self Generated Noise reported for information only and not used to assess conformance to a requirement

Comment:

Firmware Version 01.03 has been submitted to PTB for Pattern Approval in December 2024

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Additional Comments The results on this certificate only relate to the items calibrated as identified above.

None

END

Calibrated by: K. Zablocki

R 1

Appendix B: Panasonic U 4LE2E8 – outdoor unit

Panasonic

Mini ECOi LE2 Series High Efficiency 4 to 6HP



Panasonic Mini ECOi. Extraordinary energy-saving. The most compact ECOi system ever.

For tight commercial use
Mini ECOi allows easier installation in condominiums and medium sized buildings with limited spaces. Utilising R410A and DC inverter technology, Panasonic offers VRF to a new and growing market.

Short height of 996mm
In addition to raising efficiency, the outdoor unit has been designed to be as compact as possible. It can now be installed in places that were previously too small.

Technical focus

- Outstanding SEER and SCOP
- Better efficiency even compared to 2 fan outdoor units
- 50m piping length free of refrigeration charge
- 35Pa high static pressure
- High COP mode selectable with maintenance remote controller
- Selectable silent mode

HP		4HP		5HP		6HP		4HP		5HP		6HP	
		U-4LE2E5		U-5LE2E5		U-6LE2E5		U-4LE2E8		U-5LE2E8		U-6LE2E8	
Outdoor units													
Power supply	Voltage	V		220/230/240		220/230/240		220/230/240		380/400/415		380/400/415	
	Phase	Single Phase		Single Phase		Single Phase		Three Phase		Three Phase		Three Phase	
	Frequency	Hz		50		50		50		50		50	
Cooling capacity		kW		12.10		14.00		15.50		12.10		14.00	
EER ¹⁾		W/W		4.50		4.06		3.73		4.50		4.06	
SEER ²⁾				7.85		7.48		7.25		7.85		7.48	
Running current cooling		A		13.30/12.70/12.20		16.38/15.40/17.80		20.30/19.40/18.40		4.39/4.17/4.02		5.58/5.30/5.11	
Input power cooling		kW		2.49		3.45		4.15		2.49		3.45	
Heating capacity		kW		12.50		14.00		16.5		12.50		14.00	
COP ³⁾		W/W		5.19		4.40		4.27		5.19		4.40	
SCOP ⁴⁾				4.87		4.40		4.24		4.87		4.40	
Running current heating		A		12.20/11.60/11.20		17.48/16.80/16.10		19.10/18.20/17.50		3.98/3.78/3.64		5.62/5.34/5.14	
Input power heating		kW		2.41		3.48		3.86		2.41		3.48	
Starting current		A		1.80		1.00		1.80		1.00		1.00	
Maximum current		A		17.30		24.20		27.40		7.50		10.10	
Maximum input power		kW		3.50/3.66/3.82		4.92/5.16/5.39		5.61/5.86/6.12		4.34/5.09/5.26		6.25/6.55/6.82	
Maximum number of connectable indoor units				7(10) ⁵⁾		8(10) ⁵⁾		9(12) ⁵⁾		7(10) ⁵⁾		8(12) ⁵⁾	
External static pressure		Pa		0-35		0-35		0-35		0-35		0-35	
Air volume		m³/min		49		72		94		69		74	
Sound pressure	Cool	dB(A)		52		53		54		52		53	
	Cool (Silent 1/2/3/4)	dB(A)		50,5/49/47/45		51,5/50/48/46		52,5/51/48/46		50,5/49/49/47		48,5/50/48/46	
	Heat	dB(A)		54		56		56		54		56	
Sound power	Cool / Heat	dB		69/72		71/75		73/75		69/72		71/75	
	Dimension H x W x D	mm		996 x 980 x 370		996 x 980 x 370		996 x 980 x 370		996 x 980 x 370		996 x 980 x 370	
Net weight		kg		106		106		106		106		106	
Piping connections	Liquid pipe	inch (mm)		3/8(9.52)		3/8(9.52)		3/8(9.52)		3/8(9.52)		3/8(9.52)	
	Gas pipe	inch (mm)		5/8(15.88)		5/8(15.88)		5/8(15.88)		5/8(15.88)		5/8(15.88)	
Maximum piping length (total)		m		150(180)		150(180)		150(180)		150(180)		150(180)	
Elevation difference (m/out)		m		50(Outdoor unit upper) / 40(Outdoor unit lower)		50(Outdoor unit upper) / 40(Outdoor unit lower)		50(Outdoor unit upper) / 40(Outdoor unit lower)		50(Outdoor unit upper) / 40(Outdoor unit lower)		50(Outdoor unit upper) / 40(Outdoor unit lower)	
Refrigerant (R410A) / CO ₂ Eq.		kg / T		6.70(14.40) / 13,98%		6.70(14.40) / 13,98%		6.70(14.40) / 13,98%		6.70(14.40) / 13,98%		6.70(14.40) / 13,98%	
Maximum allowable indoor / outdoor capacity ratio		%		50 ~ 130		50 ~ 130		50 ~ 130		50 ~ 130		50 ~ 130	
Operating range	Cool Min ~ Max	°C		-10 ~ +45		-10 ~ +46		-10 ~ +46		-10 ~ +46		-10 ~ +46	
	Heat Min ~ Max	°C		-20 ~ +18		-20 ~ +18		-20 ~ +18		-20 ~ +18		-20 ~ +18	

1) EER and COP calculation is based on accordance to EN14813. SEER and SCOP is calculated based on the seasonal space cooling/heating efficiency "η_{sp}" values of the COPAH 523/34 R134A/134 (10/15/07/201). SEER, SCOP = 1/3 = Correction = 1/3. 2) SCOP is based on 1.5kW indoor units selected, able to connect maximum 10 indoor units.












INTERNET CONTROL SYSTEM



Mini ECOi LE1 Series High Efficiency 8 and 10HP



Prepare to be blown away by Panasonic's New Mini VRF system. The Mini VRF compact system is the ideal solution for minimum outdoor space. Panasonic extends the Mini VRF range by 8 and 10HP units.

Increase external static pressure

When unit is installed on a narrow balcony, the fence at front side will be the obstacle. High external static pressure will overcome this obstacle and maintain operation capacity.

High ambient temperature performance

Cooling operation range up to 46°C. The system can maintain the rated (100%) capacity up to 40°C by 8HP model & up to 37°C by 10HP model.

Technical focus

- Piping flexibility with 150m maximum length
- High efficiency
- 15 indoor units connectable
- Quiet operation mode (one of the lowest in the market)
- High ambient temp performance
- High static pressure 35Pa

HP			8HP	10HP
Outdoor units			U-8LE1E8	U-10LE1E8
Power supply	Voltage	V	380/400/415	380/400/415
	Phase		Three Phase	Three Phase
	Frequency	Hz	50	50
Cooling capacity		kW	22.40	28.00
EER ¹⁾		W/W	3.50	3.11
SEER ²⁾			6.27	6.37
Running current cooling		A	9.60/9.15/8.80	14.70/14.00/13.50
Input power cooling		kW	5.89	9.00
Heating capacity		kW	25.00	28.00
COP ³⁾		W/W	4.02	3.93
SCOP ⁴⁾			4.24	4.31
Running current heating		A	10.20/9.65/9.30	11.60/11.10/10.70
Input power heating		kW	6.22	7.13
Starting current		A	1.00	1.00
Maximum current		A	13.70	19.60
Maximum input power		kW	9.14	13.10
Maximum number of connectable indoor units			15 ⁵⁾	15 ⁴⁾
External static pressure		Pa	0-35	0-35
Air volume		m ³ /min	150	160
Sound pressure	Cool	dB(A)	60	63
	Cool (Silent 1/2/3/4)	dB(A)	57/55/53	60/58/56
	Heat	dB(A)	64	65
Sound power	Cool / Heat	dB	81/85	84/86
Dimension	HxWxD	mm	1500x980x370	1500x980x370
Net weight		kg	132	133
Piping connections	Liquid pipe	Inch (mm)	3/8(9.52) / 1/2(12.70) ⁶⁾	3/8(9.52) / 1/2(12.70) ⁶⁾
	Gas pipe	Inch (mm)	3/4(19.05) / 5/8(22.22) ⁶⁾	5/8(22.22) / 1(25.40) ⁶⁾
Maximum piping length (total)		m	7.5 - 150(7.5 - 300)	7.5 - 150(7.5 - 300)
Elevation difference (in/out)		m	50 (Outdoor unit upper) / 40 (Outdoor unit lower)	50 (Outdoor unit upper) / 40 (Outdoor unit lower)
Refrigerant (R410A) / CO ₂ Eq.		kg / T	6.30(24.00) / 13,1564	6.60(24.00) / 13,7608
Maximum allowable indoor / outdoor capacity ratio		%	50 - 130	50 - 130
Operating range	Cool Min - Max	°C	-10 - +46	-10 - +46
	Heat Min - Max	°C	-20 - +18	-20 - +18

1) EER and COP calculation is based on accordance to EN14811. 2) SEER/SCOP is calculated based on the seasonal space cooling/heating efficiency "sc" values of the COMMISSION REGULATION (EU) 2016/2301. SEER, SCOP = (E_{sc} + Correction) / P_{sc} (In case of 1.5kW indoor units connection, able to connect maximum 12 indoor units. 3) If the heating at least, it is necessary to increase 1 size with respect to the main liquid pipe, depending on the combination of the indoor unit. 4) Under 10m for ultimate indoor unit. 5) Over 10m for ultimate indoor unit. 6) Over 10m for ultimate indoor unit. If the longest piping equivalent length exceeds 90m, increase the size of the main liquid by 1 inch for gas and liquid pipes.



Rating Conditions: Cooling Indoor 27°C DB / 19°C WB, Heating Indoor 21°C DB / 14°C WB, Cooling Outdoor 35°C DB / 24°C WB, Heating Outdoor 7°C DB / 5°C WB, 100% Dry Bulb, 90% Wet Bulb. Specifications subject to change without notice. For detailed information about R-410A, please refer to our website www.panasonic.com or contact your nearest Panasonic representative.

Appendix C: Panasonic U 60PZH3E5– outdoor unit

To be provided by VARO Consulting