

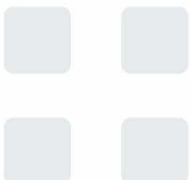
**Proposed Installation of
Mechanical Plant**

**The Beeches, Westmill,
East Hertfordshire, SG9 9LL.**

Environmental Noise Assessment

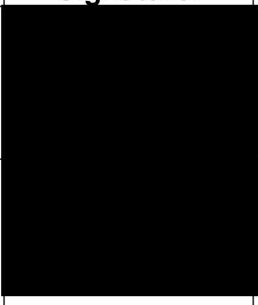
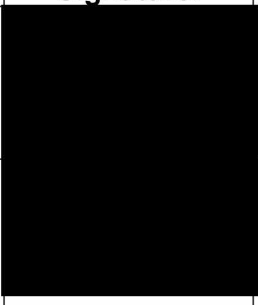
Author: Andy Dodd B.Sc. (Hons) MIOA
Senior Consultant

Doc Ref: 104541.ad.Issue2



Proposed Installation of Mechanical Plant	
Project Address:	The Beeches Westmill East Hertfordshire SG9 9LL
Project Reference:	104541

Issue/Revision Record			
Issue:	Date:	Remarks:	Author:
1	01/11/2023	First Issue	Andy Dodd
2	13/11/2023	Second Issue	Andy Dodd

	Signature:	Print:	Title:	Date:
Author:		Andy Dodd	Senior Consultant	13/11/2023
Reviewer:		Phil Huffer	Principal Consultant	13/11/2023

1. INTRODUCTION

- 1.1 Acoustics Plus Ltd (APL) is an independent firm of multi-disciplinary acoustic engineers. APL is engaged by both private and public sector clients.
- 1.2 APL is a registered member of The Association of Noise Consultants (ANC) and the author is a corporate member of The Institute of Acoustics (IOA).
- 1.3 APL has been instructed by the applicant's agent, Hertford Planning Service, to consider and advise upon the noise implications of the proposed installation of a comfort cooling system.
- 1.4 The comfort cooling system will consist of 1No. condenser unit. The unit will be located on a flank wall at the rear of the property.
- 1.5 It is understood the Local Planning Authority (LPA) require further information on noise levels from the proposed installation in order to fully assess the noise impact upon the surrounding neighbourhood.
- 1.6 This report provides the response to the LPA, on behalf of the Applicant.
- 1.7 This report has been prepared by Acoustics Plus Limited (APL) with all reasonable skill, care, and diligence in accordance with generally accepted acoustic consultancy principles and taking account the services and terms agreed between APL and our client.
- 1.8 Any information provided by third-parties and referred to herein may not have been checked or verified by APL unless expressly stated otherwise. Certain statements made in the report are predictions based on reasonable assumptions and good industry practice.
- 1.9 Such statements involve risk and uncertainty which could cause measured and predicted results to differ materially. APL does therefore not guarantee or warrant any prediction contained in this report.

2. BASELINE SITUATION

- 2.1 The Application Site (the “site”) is situated at The Beeches, Westmill, East Hertfordshire, SG9 9LL. A site location plan is shown below.

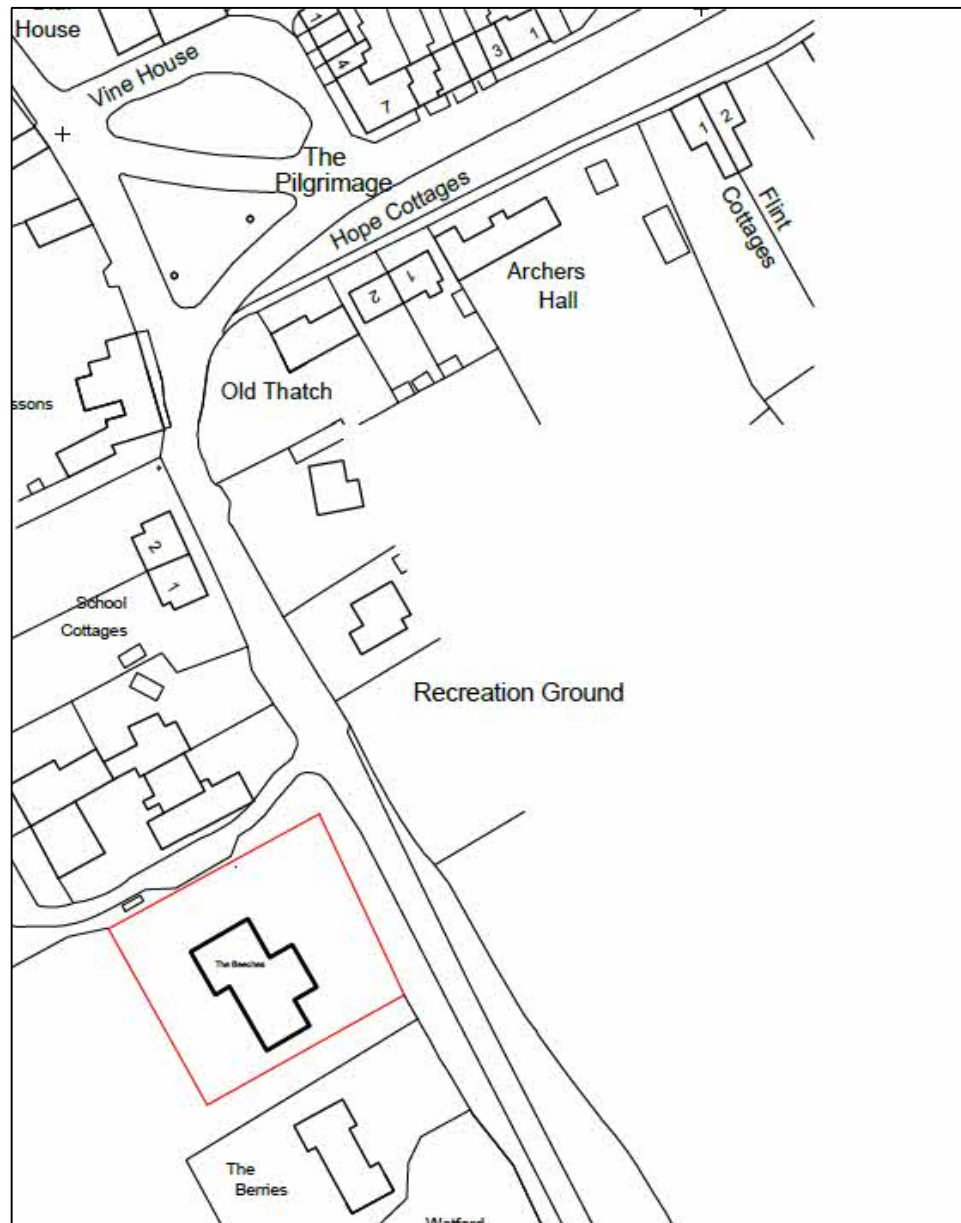


Diagram 1

- 2.2 The site and surrounding neighbourhood can be seen within the Figures appended to this report.

- 2.3 The proposed location of the condenser unit on the northern flank wall of the site is highlighted in Diagram 2 below:

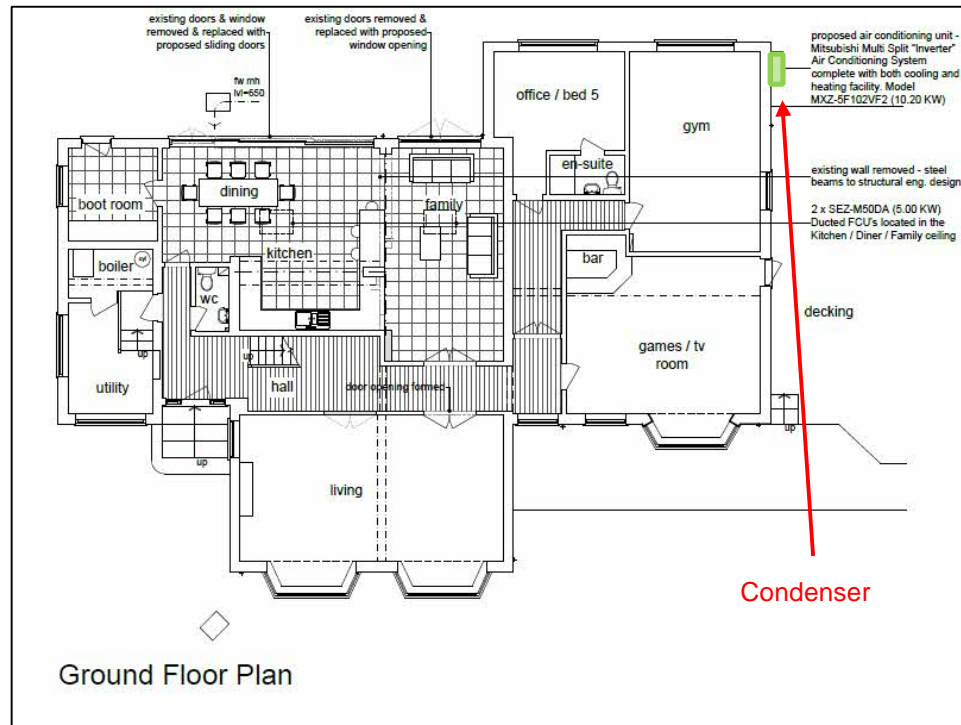


Diagram 2

- 2.4 The proposed condenser unit to be installed is detailed below:

(a) 1no. Mitsubishi MXZ-5F102VF at 52dBA @1m (cooling)

- 2.5 The nearest noise sensitive window is noted to be the ground-floor windows of the neighbouring residential accommodation at School Court. The distance (obtained from scaled drawings) has been judged to be a minimum 16m away from the unit.

- 2.6 The location of the nearest affected noise sensitive window is identified in the photo below:



Nearest noise sensitive
façade at the adjacent
School Court building

Photo 1

3. NOISE OUTLINE

- 3.1 In order to produce an environmental noise assessment, consideration must be given to the prevailing background noise in the locality of the installation.
- 3.2 Measurements of background noise were obtained over a 24 hour period at a location deemed representative of background noise levels experienced at the nearest noise sensitive façade.
- 3.3 The particulars of the measurement exercise are recorded below. The weather conditions were assessed as appropriate to monitor environmental noise.

Date: 30th & 31st October 2023
 Start Time: 12:45 hrs
 Location: Boundary fence with School Court at ground floor level.

- 3.4 Minimum background and average noise levels are shown in Table 1 below with the full 24 hour time history shown in Diagram 3 (L_{Aeq} and L_{A90}).

Time period	Lowest L _{A90,15min}	Average L _{Aeq,T}
07:00-23:00hrs	46	51
23:00-07:00hrs	46	50

Table 1

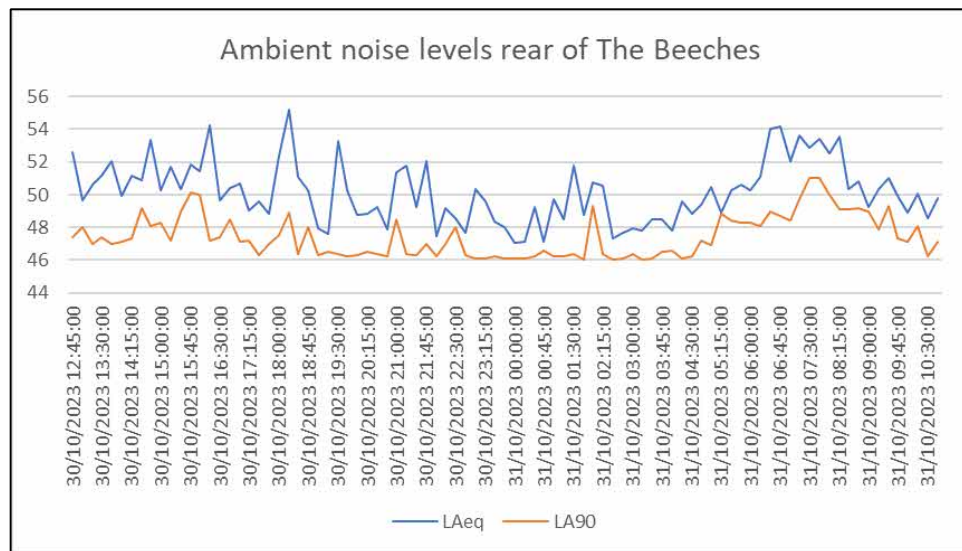


Diagram 3

- 3.5 It was noted that the background noise was influenced by a constantly running water feature (see Figure 4) within the rear garden of The Beeches and that the measured background noise level is most likely to be higher than expected given its rural location.

4. EQUIPMENT

- 4.1 All measurements were obtained using the following equipment:

*Svantek Svan 971 Approved Class 1 SLM Serial No. 51704
Rion Calibrator Type NC-74 Class 1 Serial No. 00410215*

- 4.2 The relevant equipment carries full and current traceable calibration.

5. DESIGN CRITERIA

- 5.1 Information regarding the noise levels not to be exceeded by the proposed installation was advised by the LPA (East Herts Council).

- 5.2 A typical planning condition relating to the installation of mechanical plant would require that:

“The sound level emitted by the air source heat pump (ASHP) inclusive of any mitigation measures as appropriate shall be lower than the existing background noise level by at least 5dBA at the nearest and / or at the most affected noise sensitive premises, with equipment operating at maximum capacity.

Reason

In order to ensure an adequate level of amenity for occupiers in the vicinity of the proposed development in accordance with Policy DES4 and EQ2 Noise Pollution of the adopted East Herts District Plan 2018.”

- 5.3 Based on the foregoing, the noise emission limits for the plant noise are outlined in Table 2 below.

Climate control operational hours	Noise emission limit L_{Aeq}
On demand 24hrs/day	≤ 41 dB

Table 2

- 5.4 Notwithstanding the noise emission limit given above in Table 2 and given the higher than expected measured background noise level, it is suggested that in the absence of noise from the water feature, the background noise level could be 10-15dB lower than reported.

6. CALCULATIONS

- 6.1 In order to predict the noise impact of the climate control system, noise egress from the condenser unit to the nearest noise sensitive façade has been calculated.
- 6.2 The noise impact was assessed assuming point source propagation of noise from the condenser unit.
- 6.3 The distance from the unit to the nearest noise sensitive property was determined from scaled drawings and derived to be a minimum of 16m.
- 6.4 The predicted noise impact from the condenser unit running in cooling mode can be calculated as follows:

Noise impact	L _p dBA
Mitsubishi MXZ-5F102VF on flank wall	52dBA @ 1m
Distance to noise receptor	16m
Distance attenuation (15m, 1m from façade)	-24dB
Reflective plane correction (wall and ground)	+6dB
Building edge diffraction correction	0dB
Noise level at nearest noise sensitive façade	≤34dBA

Table 3

- 6.5 In order to comply with the requirements of the LPA, any noise from the proposed installation of mechanical plant should not exceed a level of 41 dBA (-5dB below the measured background noise over the operational hours of the plant) at 1m from the nearest noise sensitive façade.
- 6.6 The calculation exercise (Table 3) demonstrates that proposed installation of the condenser unit meets the LPA criteria.

7. CONCLUSION

- 7.1 The foregoing assessment indicates that the proposed installation will meet the requirements imposed by the LPA. No further acoustic mitigation measures will be required.
- 7.2 If an alternative supplier or manufacturer of condenser is chosen, the acoustic performance should be checked prior to installation to ensure that the installation will still meet the requirements imposed by the LPA.
- 7.3 In the event that the water feature (whose noise dominates the environmental noise climate) were to cease operation and the background noise levels were to fall significantly as a result, it is recommended that the noise impact assessment is re-evaluated.
- 7.4 In the absence of the additional ambient noise created by the water feature, consideration would need to be given to protecting the neighbouring residential façades from the proposed installation with the erection of an acoustic barrier or screen around the proposed location of the condenser.
- 7.5 A suitably high solid acoustic barrier or screen would provide a minimum 10dB reduction on the stated noise output of the proposed condenser unit.
- 7.6 A suggested location for the screen is marked in red in Diagram 4 below.

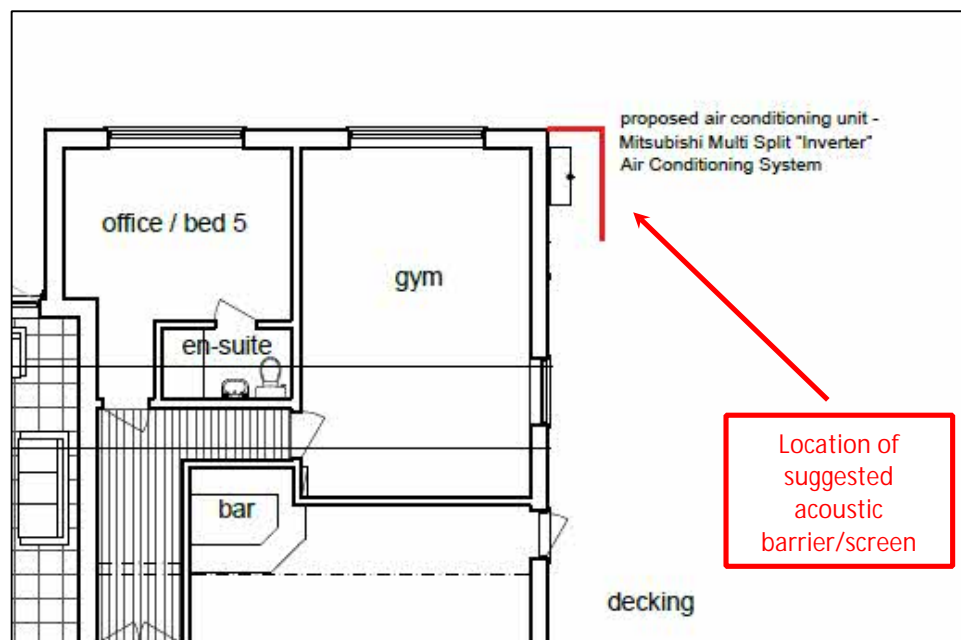


Diagram 4

- 7.7 The height of the screen should be a minimum 250mm higher than the installed unit and should have a mass of at least 10kg/m².

Figures

The Beeches, Westmill, East Hertfordshire, SG9 9LL



Figure 1



Figure 2



Figure 3



Figure 4



Figure 5



Figure 6



Figure 7



Figure 8

Appendix A

MXZ-F

Multi-Split System

R32 Inverter Heat Pump

M series Mr.SLIM™

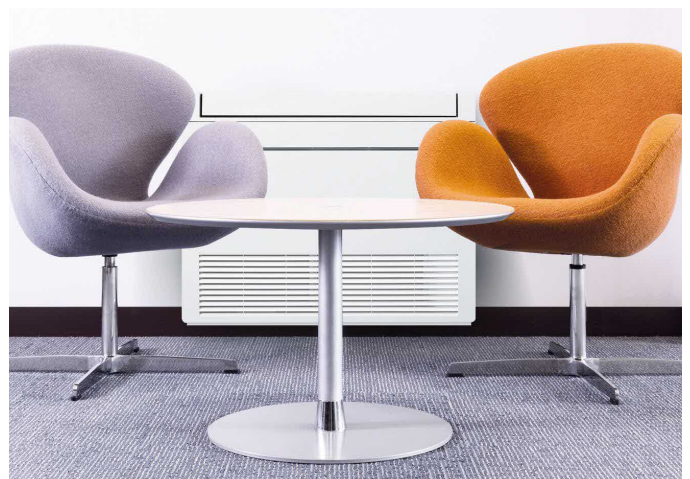
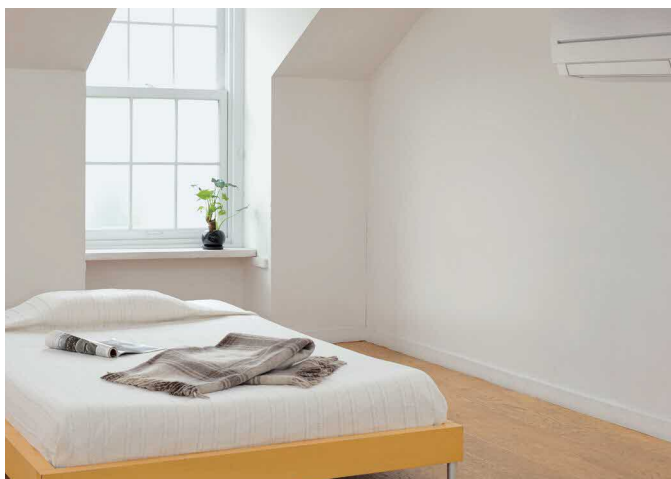
The MXZ-F Multi-Split outdoor unit range gives our customers the ultimate in flexibility for their air conditioning projects.

Connectable to M Series and Mr Slim indoor units, the range boasts 8 models from 3.3kW (2 connection) to 12.2kW (6 connection). This multi-split capability covers a huge range of applications from a 2 bedroom loft conversion to a 6 room office space.



Key Features & Benefits:

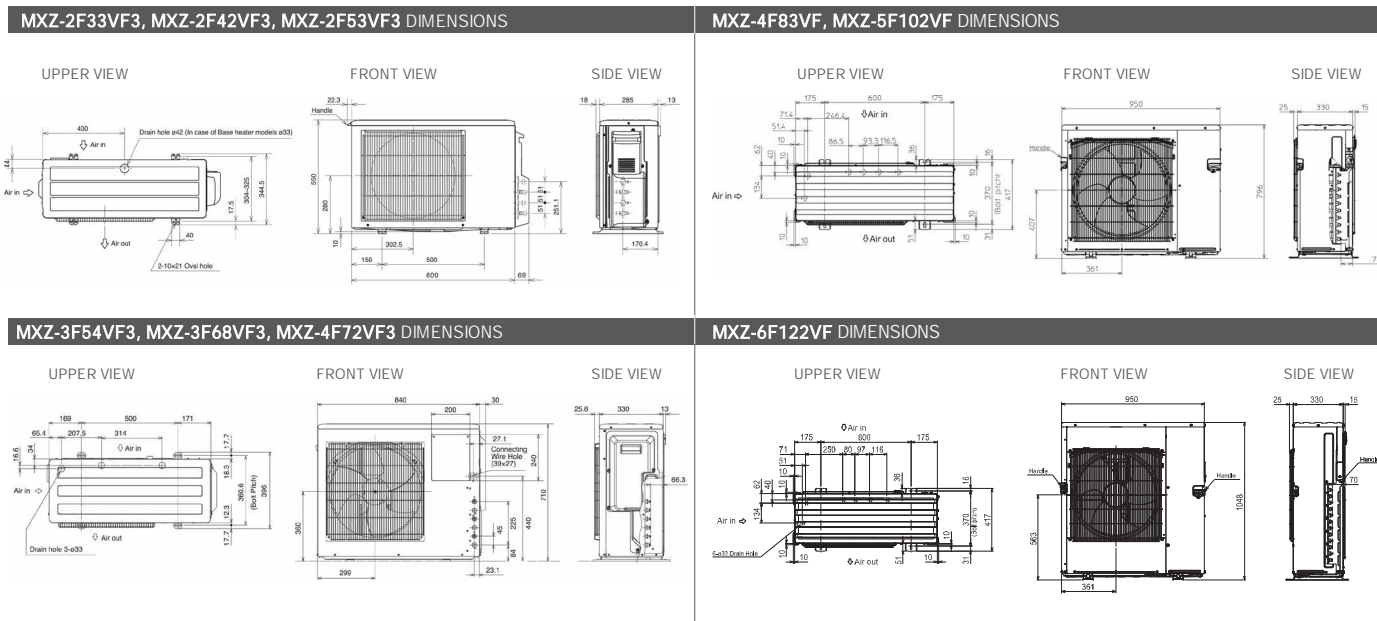
- Specific customer needs are met by allowing multiple indoor unit types and capacities to be mixed across individual rooms
- Inverter controlled outdoor units provide economic and efficient solutions for multi-room applications
- Stylish air conditioning for modern spaces through connection to our award winning M Series MSZ indoor units
- Helps our customers meet their corporate social responsibility targets by using lower GWP R32 refrigerant



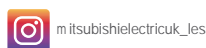
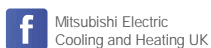


MXZ-F OUTDOOR UNITS	MXZ-2F33VF3	MXZ-2F42VF3	MXZ-2F53VF3	MXZ-3F54VF3	MXZ-3F68VF3	MXZ-4F72VF3	MXZ-4F83VF	MXZ-5F102VF	MXZ-6F122VF	
NUMBER OF CONNECTABLE INDOOR UNITS	2	2	2	2-3	2-3	2-4	2-4	2-5	2-6	
CAPACITY (kW)	Heating (nominal)	4.0 (1.0-4.1)	4.5 (1.0-4.8)	6.4 (1.1-7.0)	7.0 (2.6-9.0)	8.6 (2.6-10.6)	8.6 (3.4-10.7)	9.3 (3.4-11.6)	10.5 (4.1-14.0)	14.0 (3.5-16.5)
	Cooling (nominal)	3.3 (1.1-3.8)	4.2 (1.1-4.4)	5.3 (1.1-5.6)	5.4 (2.9-6.8)	6.8 (2.9-8.4)	7.2 (3.7-8.8)	8.3 (3.7-9.2)	10.2 (3.9-11.0)	12.2 (3.5-13.5)
	Heating (UK)	3.32 (0.83-3.40)	3.74 (0.84-3.99)	5.38 (0.92 - 5.88)	5.81 (2.16-7.47)	7.14 (2.16-8.80)	7.14 (2.82-8.89)	7.8 (2.82-9.63)	8.7 (3.40-11.63)	11.6 (2.90-13.71)
	Cooling (UK)	3.23 (1.07-3.72)	4.12 (1.08-4.32)	5.30 (1.10-5.60)	5.3 (2.85-6.67)	6.66 (2.84-8.23)	7.0 (3.59-8.56)	8.2 (3.67-9.12)	10.1 (3.86-10.90)	12.1 (3.47-13.39)
COP / EER (nominal)*1	4.40 / 3.90	5.10 / 4.30	4.10 / 3.79	4.60 / 4.10	4.50 / 3.70	4.60 / 3.90	4.65 / 4.21	4.60 / 3.64	4.23 / 3.33	
SCOP (ηsc) / SEER (ηsc) (BS EN14825)	4.16 / 6.13	4.60 / 8.69	4.6 / 8.6	4.61 / 8.52	4.12 / 7.96	4.07 / 8.13	4.72 (185.89%) / 8.51 (337.4%)	4.65 (183.1%) / 8.21 (325.4%)	4.65 (183.1%) / 7.65 (303%)	
ERP ENERGY EFFICIENCY CLASS	Heating/Cooling	A+ / A++	A++ / A+++	A++ / A+++	A++ / A+++	A+ / A++	A++ / A+++	A++ / A+++	A++ / A+++	
	MAX AIRFLOW (m³/min)	33.7 / 32.9	33.3 / 27.7	34.7 / 32.7	43.0 / 42.1	43.0 / 42.1	43.0 / 42.1	71 / 55	74 / 62	77 / 63
SOUND PRESSURE LEVEL (dBA)	Heating	50 / 49	50 / 44	51 / 46	50 / 46	53 / 48	54 / 48	51 / 49	56 / 51	57 / 55
	Cooling	60	59	61	59	63	63	61	65	69
DIMENSIONS (mm)	Width x Depth x Height	800 x 285 x 550	800 x 285 x 550	800 x 285 x 550	840 x 330 x 710	840 x 330 x 710	840 x 330 x 710	950 x 330 x 796	950 x 330 x 1048	
WEIGHT (kg)		33	37	37	58	58	59	62	87	
ELECTRICAL SUPPLY		220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	220-240v, 50Hz	
PHASE		Single	Single	Single	Single	Single	Single	Single	Single	
POWER INPUT (kW)	Heating/Cooling (nominal)	0.909 / 0.846	0.88 / 0.98	1.56 / 1.40	1.52 / 1.32	1.91 / 1.84	1.87 / 1.85	2.00 / 1.97	2.28 / 2.80	3.31 / 3.66
	Heating/Cooling (UK)	0.82 / 0.68	0.90 / 0.78	1.40 / 1.20	1.38 / 1.06	1.73 / 1.47	1.69 / 1.48	1.80 / 1.57	2.09 / 2.66	3.04 / 3.44
STARTING CURRENT (A)		4.6	4.2	7.6	7.0	10.5	10.0	10.0	12.3	16.1
RUNNING CURRENT (A)	Heating/Cooling [MAX]	4.6 / 4.3 [10.0]	4.2 / 4.5 [12.2]	7.1 / 6.2 [10.2]	7.0 / 5.9 [18.0]	10.5 / 9.6 [18.0]	10.0 / 9.5 [18.0]	8.8 / 8.7 [21.4]	10.0 / 12.3 [21.4]	14.5 / 16.1 [29.8]
INTERCONNECTING CABLE No. CORES		4 Core	4 Core	4 Core	4 Core	4 Core	4 Core	4 Core	4 Core	
TOTAL PIPE LENGTH (m)		20	30	30	50	60	70	80	80	
MAX PIPE LENGTH PER INDOOR UNIT (m)		15	20	20	25	25	25	25	25	
MAX HEIGHT DIFFERENCE (m)		10	15 (10 if OU higher than IU)	15 (10 if OU higher than IU)	15 (10 if OU higher than IU)	15 (10 if OU higher than IU)	15 (10 if OU higher than IU)	15	15	
CHARGE REFRIGERANT (kg) / CO ₂ EQUIVALENT (l) - R32 (GWP 675)		0.8 / 0.54 (20m)	1.0 / 0.68 (30m)	1.0 / 0.68 (30m)	2.4 / 1.62 (50m)	2.4 / 1.62 (60m)	2.4 / 1.62 (60m)	2.4 / 1.62 (70m)	2.4 / 1.62 (80m)	
FUSE RATING (BS88) -HRC (A)		16	16	16	25	25	25	25	32	

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



Telephone: 01707 282880
 email: air.conditioning@meuk.mee.com
les.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)

Country of origin: United Kingdom - Japan - Thailand - Malaysia. ©Mitsubishi Electric Europe 2022. Mitsubishi and Mitsubishi Electric are trademarks of Mitsubishi Electric Europe B.V. The company reserves the right to make any variation in technical specification to the equipment described, or to withdraw or replace products without prior notification or public announcement. Mitsubishi Electric is constantly developing and improving its products. All descriptions, illustrations, drawings and specifications in this publication represent only general particulars and shall not form part of any contract. All goods are supplied subject to the Company's General Conditions of Sale, a copy of which is available on request. Third-party product and brand names may be trademarks or registered trademarks of their respective owners.

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 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 May 2022

