Warren Court
Tottenham Court Road
London
NW1 3AA

Sustainability and Energy Statement

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ferguson brown
Engineering | Energy | Sustainability

Warren Court
Tottenham Court Road
London
NW1 3AA

Sustainability and Energy Statement

For

Warren Court Investments LLP

04/01/2023

Revision 1.2

Project 6725

Executive Summary

This sustainability and energy statement has been prepared on behalf of Warren Court Investments LLP for the Warren Court residential scheme development Warren Court, Tottenham Court Road, London, NW1 3AA.

The proposed scheme is for the replacement of the current 6th floor to create four residential units, three one-bedroom studio flats and one two-bedroom flat.

This document demonstrates that the London Plan and Camden Council planning policies relevant to sustainable design and energy will be addressed by the proposed development in a structured and comprehensive manner.

In accordance with Camden Local Plan policies CC1, CC2, CC3, CC4, CC5 and Camden Planning Guidance: Energy efficiency and adaptation, an abridged statement demonstrating the overall energy performance and outline design features has been provided due to the small scale of this development.

Section 1.0 of this document presents how the development will implement the sustainable design principles as noted in the Camden policy. In particular, it demonstrates the development is capable of achieving a maximum internal water use of 105 litres per day (plus an additional 5 litres for external water use).

Section 2.0 of this document presents an energy strategy to achieve:

- A 70% improvement over the associated emission rate for Part L 2022 compliance
- At least a B-Rated EPC score for each apartment using the online SAP 10 software program by Elmhurst.

This document should be read in conjunction with the Design and Access Statement for further description of the existing site and proposed development.

Contents

Revision Table

This report has been checked in accordance with Ferguson Brown's internal quality assurance procedures.

Issue	Rev	Prepared by	Approved by	Description	Issued
1	0	Damian Poyzer	Ken Crawford	Sustainability and Energy Statement	26/03/2020
2	1	Piet Sportel	Ken Crawford	January 2023 Update	04/01/2023

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1.0 Proposed Sustainable Design and Construction

The proposed development seeks to maximise the use of sustainable design and construction principles, including (but not limited to) those outlined in Camden Planning Guidance: Energy efficiency and adaptation, appropriate to the scale and nature of the site. This will be achieved through the following measures.

1.1 Management

Commissioning of building services will be carried out in a co-ordinated and comprehensive manner, thus ensuring optimum performance under actual occupancy conditions.

Responsible construction site practices that are environmentally and socially considerate and accountable will be committed to through certification with Considerate Constructors Scheme, and a site monitoring regime.

Home user guides will be provided for residents so that they can understand and operate the homes efficiently.

1.2 Health and Well being

The quality of light available to the apartments has been maximised by insertion of centralised services and utility spaces close to the building's core to allow for bedroom, kitchen and living areas to take full advantage of the remaining floor space while also maximising daylight into the apartments.

The design will comply with statutory requirements, British Standards and Part M of the Building Regulations.

1.3 Energy

Details of the energy strategy are given in section 2 Energy Strategy, it is a strategy that minimises operational energy demand, consumption and associated carbon dioxide emissions. In particular, the use of low carbon passive design features to minimise heat gains and losses, and active design features such as a high efficiency air source heat pumps for hot water and comfort cooling, and direct electric space.

On site renewable energy use is maximised through the incorporation on PV panels for each unit.

The scheme avoids internal overheating and contributing to the urban heat island effect through design features and controls selected to maintain a thermally comfortable and efficient environment for occupants.

Energy sub-metering will be provided to enable monitoring of operational energy consumption and on-going management.

1.4 Climate Change

The site does not lie within any flood risk zone.

The development will not increase existing surface water run-off rates and will seek to reduce the surface water run-off rates through the use of planting, rain-water storage for external use, and brown/ green roof areas.

The roof will incorporate areas of brown / green roof where possible, and hard landscaping materials to minimise contribution the heat island effect.

1.5 Water

Each residential unit will be specified with reduced water consumption sanitary fittings to meet the requirement for a maximum internal water use threshold of 105 litres / person / day (plus an additional 5 litres for external water use). The indicative water efficiency sanitary fittings performance specification to achieve this is as follows.

- WC: 4 / 2.6 litre dual flush
- Taps (excluding kitchen and external taps): flow rate 5 litres / minute
- Bath: 200 litre capacity to overflow
- Shower: 8 litres / minute flow rate
- Kitchen sink taps: 5 litres / minute flow rate
- Washing machine: 60 litres / kg
- Dishwasher: 4.5 litres / person / day
- Water softener: non specified

In accordance with the Code for Sustainable Homes and Building Regulations 17.K calculation methodology the above performance specification achieves an overall consumption level of 103.9 litres / person / day.

In addition, any external use fittings will be specified to comply with the maximum external water use threshold of 5 litres / person /day.

A level of sub-metering will be specified to facilitate the monitoring of operational water consumption.

1.6 Transport

The site has excellent connections to public transport and has the highest available Public Transport Accessibility Level (PTAL) 6b. The development sits directly above Warren Street underground station and in the near vicinity including Euston Square and Euston, providing regular services along the Hammersmith & City, Metropolitan and Circle lines, and London Overground and London Midland lines.

There are benefits from excellent pedestrian links with an established network of footways and footpaths surrounding the site. A large number of facilities are

accessible within 15 minutes' walk, including local convenience stores restaurants, health care facilities, sports and leisure facilities and schools.

The site is on the edge of the Central London Congestion Zone for which there is an access charge on weekdays from 07.00 to18. 00.

The proposal does not provide any on-site car parking facility and will provide necessary legal agreement to secure car-free housing for the residential units.

1.7 Materials

The proposed scheme is an extension to an existing building; it will refurbish a proportion of the existing build elements, with facades cleaned and repaired to achieve visual continuity across all levels.

The new build material will be specified to achieve a BRE A / A+ Green Guide rating, with a purchasing policy priority for responsibly sourced products with low environmental and health impact performance.

1.8 Waste

The project will prioritise the reduction, re-use and recycling of materials. In line with the waste Hierarchy set out in Camden policy CC5 Waste.

Construction site waste will be minimised and quantities monitored.

The residential units will allow for internal storage space for operational domestic recycling volumes in accordance with best practice.

1.9 Pollution

The design will minimise unnecessary noise and light pollution and nuisance to neighbouring properties.

1.10 Biodiversity

The roof will incorporate brown / green areas where possible to encourage habitat creation to increase the ecological value of the existing site.

2.0 Energy Statement

The proposed energy strategy has been developed in accordance with the London Plan 2021 and Camden Local Plan 2017 policies CC1, CC2 and CC4, and the associated planning guidance documents.

The energy hierarchy of "Be Lean, Be Clean and Be Green" has been applied to implement climate change mitigation measures to the scheme's design that are appropriate to the development. As the proposed development is for four residential units with floor area totalling under 500 sqm, an overall emissions reduction figure has been provided rather than calculations at each stage of the hierarchy.

2.1 Regulated Carbon Dioxide Emissions

The overall emissions have been calculated for each dwelling in line with Building Regulations 2022 Part L1a with online SAP 10 software program by Elmhurst.

The overall regulated carbon dioxide emissions and savings achieved in relation to Building Regulations Part L1A compliance and the Camden CC1 policy are illustrated below in Tables 1 and 2.

Table 1: Overall Carbon Dioxide Emissions

	Regulated Carbon Dioxide Emissions (Tonnes CO_2 per annum)
Baseline: Building Regulations 2022 Part L1a Compliant	3.10
Final solution (Lean, Clean and Green)	0.88

Table 2: Overall Regulated Carbon Dioxide Emission Savings

	Regulated Carbon Dioxide Emissions Savings	
	Tonnes CO_2 per annum	%
Total Cumulative Savings compared to Base Case	2.22	71.56

2.1.1 Unregulated Carbon Dioxide Emissions

Emissions associated with unregulated energy use, such as cooking and appliances, are omitted by the Part L calculations. It has been assumed that unregulated emissions remain the same for all stages of the energy hierarchy. However, the provision of a Home User Guide / User Manual for occupants of the development will provide a means of encouraging more energy-efficient behaviour, and the specification of user-friendly controls to the building services will enable this. The effect of these measures will only be determined upon occupation of the building and will depend on occupant behaviour.

2.2 Low Carbon Design

The design parameters and resulting carbon dioxide emission values which are demonstrated in Appendix 1: Draft EPC's

2.2.1 Be Lean – Use Less Energy

The first step in pursuing low carbon design under the energy hierarchy is to minimise the scheme's energy demand. This is achieved both by passive measures and the introduction of more energy efficient services. These measures will help the effectiveness of the measures implemented at the subsequent 'be clean' and 'be green' stages.

Design measures at this stage have been selected with consideration to:

- maximising the potential of the building to satisfy market expectations (balancing of scope of works with value to create the optimal specification)
- achieving acceptable environmental comfort conditions, occupant wellbeing and buildability whilst avoiding unnecessary costs of construction
- Improving building thermal performance.

2.2.2 Lighting

The specification of low energy lighting will be maximised internally and externally and, where appropriate, automatic lighting control systems that provide both occupancy and daylight control will be incorporated.

Within the confines of the existing structure the room layouts and glazing dimensions / type will be designed to optimise the balance between the requirement for a high level of day lighting to reduce dependency on electric lighting and the requirement for a low amount of glazing to reduce heat loss.

2.2.3 Heating, Ventilation and Cooling

The new dwellings will have independent buildings services and will be entirely separate to the existing gas-based site heating network. The proposed electrical heating and cooling systems for each dwelling will provide a highly efficient solution that utilises the modern air source heat pump technology, and the potential for site based renewable energy generation from PV panels.

The direct electrical space heating will be activated based on timer and occupant requirements. The detailed design will determine whether the space heating distribution system will be underfloor and/ or wall mounted emitters.

The development is within the Camden Air Quality Management Area (AQMA), therefore, treated fresh air will be supplied to all living rooms and bedrooms. Kitchen cooking space will be provided with re-circulating extract canopies with cleanable filter cassettes.

The ventilation systems with will specified with low specific fan powers and heat recovery, in accordance with:

Mechanical Variable fresh air rate according to Part F

Heat recovery	95% eff.
Specific Fan Power	0.96 W / l s

Additionally, purge ventilation will be provided by openable windows.

The design demand for mechanical cooling has been reduced as far as is practical for this scheme through the minimisation of heat gains. Mechanical cooling has been incorporated due to the proximity of the air vents of the below tube station and to ensure comfort levels required for residential units will be satisfactory during operation.

The incorporation of mechanical ventilation and cooling will ensure overheating of areas does not occur. The cooling provision will be provided by high efficiency air source heat pumps, see section 2.2.5 Be Green.

2.2.4 Be Clean - Supply Energy Efficiently

The next step in the Energy Hierarchy is to investigate the opportunity for the efficient supply of energy to the development through the use of decentralised combined heat and power (CHP) technology in line with Policy 5.6 of the London Plan. This is not considered applicable to this development due to its scale and the application of a highly efficient electric based solution.

2.2.5 Be Green

The final stage of the energy hierarchy is the consideration of the green energy technologies feasible. As a result of a site-specific analysis of all green energy technologies, the green energy technology considered feasible for the scheme is Photovoltaic Panels (PV) and air source heat pumps for water heating and cooling.

Each dwelling will have an independent PV generated electrical supply averaging approx. 3kWp.

Two separate pieces of air source heat pump technology will be incorporated into the water heating system, and the comfort cooling units. These have both been selected with high performance efficiencies, with datasheets for each provided in Appendix 3: ASHP Datasheets.

3.0 Conclusion

The proposed development seeks to maximise the use of sustainable design and construction principles appropriate to the size and nature of the site.

Low energy building design has been utilised as a matter of course by integrating passive and low carbon active design measures.

The methodology of the London Plan and Camden Planning Guidance: Energy efficiency and adaptation has been followed with the proposed energy strategy achieving:

- A 70 % improvement over the associated emission rate for Part L1a 2022 compliance

This exceeds the minimum requirement of the Camden Local Plan and London Plan for a 19% and 35% improvement over the associated Part L 2022 compliance emission rate respectively.

Key characteristics of the final building services system solution for the energy strategy are summarised in the table below:

M&E Strategy Summary	
Heating	• High efficiency direct electric system • Metering with out-of-range values • Central time control • Optimum start / stop • Local temperature control
Cooling	• Air Source Heat Pump (high COP) • Metering with out-of-range values • Central time control • Optimum start / stop • Local temperature control
Ventilation	• Filtrated air supply with heat recovery • Openable windows for purge ventilation
DHW	• High efficiency air source heat pump
Electricity	• Grid Supplied + Solar PV
Lighting	• Energy efficient (primarily LED) lighting throughout.

4.0 Appendices

Appendix 1: Draft EPCs

Flat 1

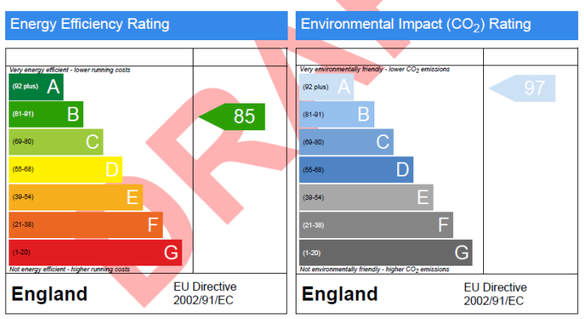
Predicted Energy Assessment

elmhurst energy

Dwelling type:	Flat, Detached
Date of assessment:	04/01/2023
Produced by:	Piet Sportel
Total floor area:	41 m²
DRRN:	

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.



Flat 3

Predicted Energy Assessment

elmhurst energy

Dwelling type:	Flat, Detached
Date of assessment:	04/01/2023
Produced by:	Piet Sportel
Total floor area:	40 m²
DRRN:	

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

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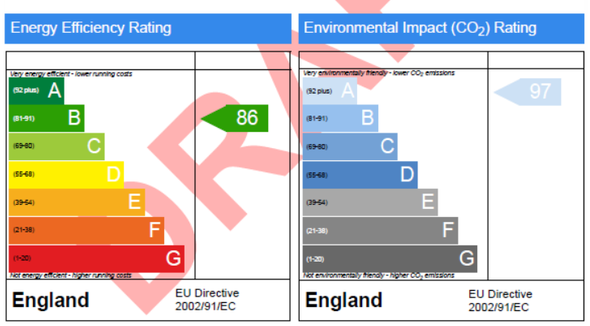

Flat 2

Predicted Energy Assessment

elmhurst energy

Dwelling type:	Flat, Detached
Date of assessment:	04/01/2023
Produced by:	Piet Sportel
Total floor area:	40 m²
DRRN:	

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

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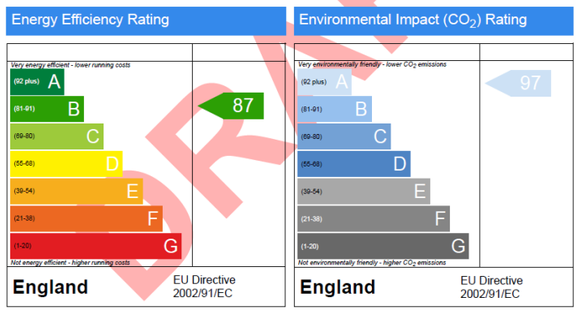


Flat 4

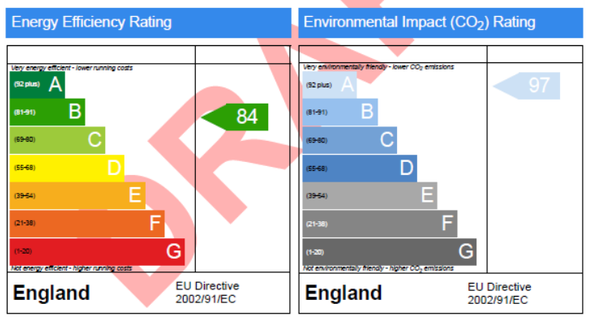
Predicted Energy Assessment

elmhurst energy

Dwelling type:	Flat, Detached
Date of assessment:	04/01/2023
Produced by:	Piet Sportel
Total floor area:	65 m²
DRRN:	

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

The energy performance has been assessed using the Government approved SAP 10 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO2) emissions.



Appendix 2: ASHP Datasheet

Air Conditioning

Product Information

MXZ-F R32
Inverter Heat Pump (3.3-8.0kW)
Multi-Split Units

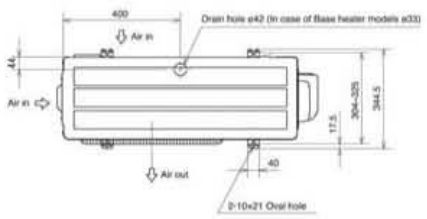
Making a World of Difference

MXZ-F - OUTDOOR UNITS		MXZ-2F33VF2	MXZ-2F42VF2	MXZ-3F54VF2	MXZ-3F68VF2	MXZ-4F72VF2	MXZ-4F80VF2
NUMBER OF CONNECTABLE INDOOR UNITS		2	2	2 3	2 3	2 4	2 4
CAPACITY (kW)	Heating (nominal)	4.0 (1.0 4.1)	4.5 (1.0 4.8)	7.0 (2.6 9.0)	8.6 (2.6 10.6)	8.6 (3.4 10.7)	8.8 (3.4 11.0)
	Cooling (nominal)	3.3 (1.1 3.8)	4.2 (1.1 4.4)	5.4 (2.9 6.8)	6.8 (2.9 8.4)	7.2 (3.7 8.8)	8.0 (3.7 9.0)
	Heating (UK)	3.32 (0.83 3.40)	3.74 (0.84 3.99)	5.81 (2.16 7.47)	7.14 (2.16 8.80)	7.14 (2.82 8.89)	7.31 (2.82 9.12)
	Cooling (UK)	3.23 (1.07 3.72)	4.12 (1.08 4.32)	5.3 (2.85 6.67)	6.66 (2.84 8.23)	7.0 (3.59 8.56)	7.77 (3.59 8.75)
COP / EER (nominal)*1		4.40 / 3.90	5.10 / 4.30	4.60 / 4.10	4.50 / 3.70	4.60 / 3.90	4.40 / 3.56
SCOP / SEER (BS EN14825)		4.16 / 6.13	4.60 / 8.69	4.61 / 8.52	4.12 / 7.96	4.07 / 8.13	4.07 / 7.55
ErP ENERGY EFFICIENCY CLASS	Heating/Cooling	A+ / A++	A++ / A+++	A++ / A+++	A+ / A++	A+ / A++	A+ / A++
MAX AIRFLOW (m³/min)	Heating/Cooling	33.7 / 32.9	33.3 / 27.7	43.0 / 42.1	43.0 / 42.1	43.0 / 42.1	44.1 / 40.3
SOUND PRESSURE LEVEL (dBA)	Heating/Cooling	50 / 49	50 / 44	50 / 46	53 / 48	54 / 48	55 / 50
SOUND POWER LEVEL (dBA)	Cooling	60	59	59	63	63	65
DIMENSIONS (mm)	Width x Depth x Height	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	840 x 330 x 710
WEIGHT (kg)		33	37	58	58	59	59
ELECTRICAL SUPPLY		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
POWER INPUT (kW)	Heating/Cooling (nominal)	0.909 / 0.846	0.88 / 0.98	1.52 / 1.32	1.91 / 1.84	1.87 / 1.85	2.00 / 2.25
	Heating/Cooling (UK)	0.82 / 0.68	0.90 / 0.78	1.38 / 1.06	1.73 / 1.47	1.69 / 1.48	1.81 / 1.80
STARTING CURRENT (A)		4.6	4.2	7.0	10.5	10.0	10.1
RUNNING CURRENT (A)	Heating/Cooling (MAX)	4.6 / 4.3 [10.0]	4.2 / 4.5 [12.2]	7.0 / 5.9 [18.0]	10.5 / 9.6 [18.0]	10.0 / 9.5 [18.0]	9.2 / 10.3 [18.0]
INTERCONNECTING CABLE No. CORES		4 Core	4 Core	4 Core	4 Core	4 Core	4 Core
TOTAL PIPE LENGTH (m)		20	30	50	60	60	60
MAX PIPE LENGTH PER INDOOR UNIT (m)		15	20	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)
CHARGE REFRIGERANT (kg) /CO_2 EQUIVALENT (t) R32 (GWP 675)		1.00 / 0.68 (20m)	1.20 / 0.81 (20m)	1.40 / 0.95 (50m)	1.40 / 0.95 (60m)	1.40 / 0.95 (60m)	2.40 / 1.62 (60m)
MAX ADDITIONAL REFRIGERANT (kg) /CO_2 EQUIVALENT (t) R32 (GWP 675)		1.00 / 0.68	1.40 / 0.95	2.40 / 1.62	2.40 / 1.62	2.40 / 1.62	2.40 / 1.62
FUSE RATING (BS88) HRC (A)		16	16	25	25	25	25

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.

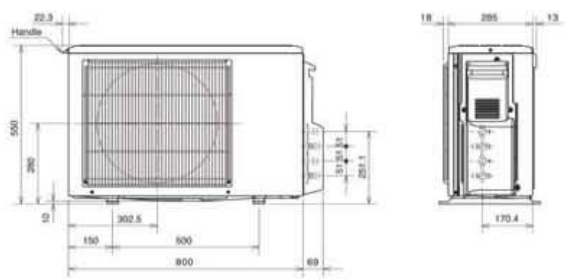
PRODUCT DIMENSIONS MXZ-2F33VF2, MXZ-2F42VF2

Upper View



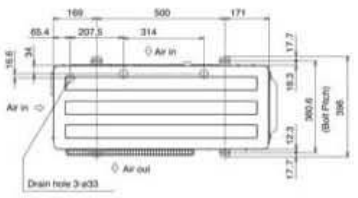
Side View

Front View



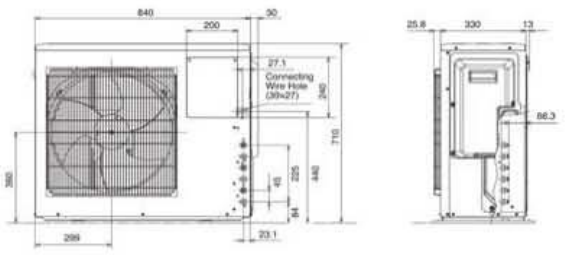
PRODUCT DIMENSIONS MXZ-3F54VF2, MXZ-3F68VF2, MXZ-4F72VF2, MXZ-4F80VF2

Upper View



Side View

Front View



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Changes for the Better

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IRELAND Mitsubishi Electric Europe Westgate Business Park, Ballymount, Dublin 24, Ireland
Telephone: Dublin (01) 419 8800 Fax: Dublin (01) 419 8890 International code: (003531)

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) or R134a (GWP:1430). *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).

Green Gateway
www.greengateway.mitsubishielectric.co.uk
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Effective as of August 2019

Proposed Heating / Cooling ASHP

Edel Hot Water Heat Pump

EDL200UK-630 and EDL270UK-630

The Edel range of heat pump cylinders comes in two sizes, 200L and 270L. The inner vessel is made from Stainless Steel with a Hot Water Heat Pump mounted on top. The heat pump can produce hot water very efficiently as it extracts heat from external air supplied via insulated ductwork, which is available as an accessory. Due to the high efficiencies, the cylinder reduces the Dwelling emissions in SAP making it possible to pass using electric space heating and the Edel cylinder.

ERP rating A

- The Edel heat pump consumes 5 times less electricity than standard electric water heaters.
- Helps to pass Part L building of the regulations whilst specifying electric heating.
- Compact unit with 630mm diameter with options of 200L or 270L storage
- Stainless steel tank with 5 year guarantee and no requirement for sacrificial anode.
- Very quiet operation due to sound proof hood, variable speed fan and a high performance rotary compressor mounted on anti-vibration pads.
- Patented high performance heat exchanger and defrost mode of operation in UK climates.

Heat pump performance		Edel 200 Air UK	Edel 270 Air UK
Nominal volume	L	200	270
Air operating range	°C	-7 to +35	
Achievable hot water temperature via heat pump	°C	60	
Maximum power input (heat pump and immersion)	W	700 + 1500 = 2200	
Maximum power output from ONLY the heat pump at 45°C	W	1650	
Maximum power output from the heat pump AND boost immersion at 45°C	W	1650 + 1500 = 3150	
Air flow	m^3/h	250 to 400	
Sound pressure level at 2m	dB(A)	33	
Refrigerant	/kg	R290/ 0.14	
Standing heat loss	kWh/24h	1.61	1.77
Air ducting method		Separate inlet and outlet to exterior	
Heating time		6h21	9h28
Coefficient of performance		3.21	3.24
Dimensions and connections			
Dimensions	mm	630 x H 1426	630 x H 1690
Weight	kg	80	90
Air duct diameter	mm	160	
Maximum ducting length	m	Smooth ducting: 20m total (intake and outlet)	
Water connections	Inch	M 3/4"	
Condensate tube	mm	18/23	
Electrical supply		230V~ 50Hz 1P&N	
IP rating		IPX1	
MCB type C		16	
Hot water cylinder			
Material		Stainless steel	
Insulation		45mm PU foam with PVC outer	
Refrigeration heat exchanger		Double walled separation from potable water	
Maximum operating pressure	bar	6	
Maximum condensate production	L/h	0.3	
Integrated electric immersion	W	1500	
Maximum temperature with immersion	°C	65	
Approvals			
Water regulations		G3 KIWA approval to EN12897 pending	
T&P valve		Factory fitted	
Accessories		Inlet group, tundish, expansion vessel	

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Proposed Domestic Water Heater ASHP