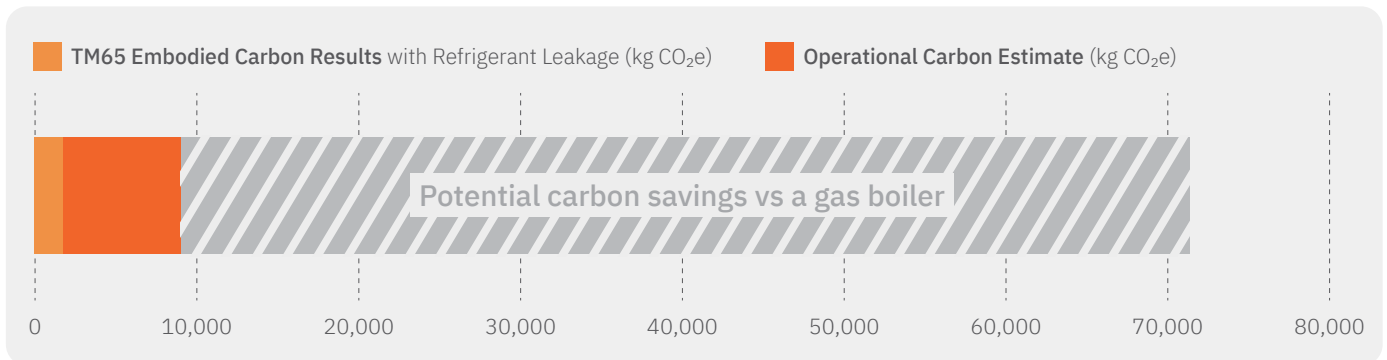


# PUZ-WM112VAA

CIBSE TM65 Embodied Carbon Mid-level Calculation  
Including Operational Carbon Benchmark Estimate


  
Renewable Heating Technology

<b>Assessment date:</b>	29th of September 2021	<b>Embodied Carbon Result with 'Mid-level TM65 Calculation' Method:</b> <b>1,677</b> (kg CO <sub>2</sub> e)	<b>Operational Carbon Result:</b> <b>7,257</b> (kg CO <sub>2</sub> e)
<b>Assessor:</b>	Residential Product Marketing		
<b>Organisation:</b>	Mitsubishi Electric		
<b>Contact:</b>	embodied.carbon@meuk.mee.com		
		<b>Total = 8,934</b> (kg CO <sub>2</sub> e)	



Operational carbon data for heating requirements, according to heat pump [ErP fiche](#) at medium temperature (55°C), average climate conditions and equivalent boiler heat output. Gas boiler assumptions: embodied carbon of 300kg CO<sub>2</sub>e, efficiency of 93%, service life of 15 years.

#### Carbon factors sources:

Electrical grid according to Greenbook forecast for residential use. (source: [gov.uk](#), [IAG spreadsheet toolkit for valuing changes in greenhouse gas emissions, sheet conversion CO<sub>2</sub>](#)). Gas network according to SAP 10.1 carbon emissions factor (source: [BRE Group, SAP-10.1-01-10-2019, Page 171](#)).

## PUZ-WM112VAA - Product Information

Type of product	<b>A2W Heat pump</b>
Capacity of equipment (kW)	<b>11.2</b>
Product weight (kg)	<b>116</b>
Material breakdown for at least 95% of the product weight? (Y/N)	<b>Y</b>
Service life of the product (years)	<b>15</b>
Type of refrigerant	<b>R32</b>
Refrigerant GWP	<b>675</b>
Refrigerant charge (kg)	<b>3.0</b>
Energy consumption of the factory per unit of product (kWh)	<b>66.66</b>
Location of manufacture	<b>UK</b>
Product Complexity	<b>Category 3: High</b>



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## Embodied Carbon Results Breakdown (kg CO<sub>2</sub>e)

A1: Material extraction	542
A2: Transport	92
A3: Manufacturing	77
A4: Transport to Site	1
B1: Use	608
B3: Repair	73
C1: Deconstruction	20
C2: Transport	2
C3: Waste Processing	19
C4: Disposal	0

## Embodied Carbon Results - without Refrigerant Leakage (kg CO<sub>2</sub>e)

A1-C4 (excluding B1,C1)	807
A1-C4 with Buffer Factor (excluding B1, C1)	1,049

## Embodied Carbon Result - Refrigerant Leakage Only (kg CO<sub>2</sub>e)

B1 (Refrigerant leakage during use) + C1 (Refrigerant leakage end of life)	628
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## Assumptions

A1: Material carbon coefficient source	TM65 Table 2.1 & The ICE Database
B1: Refrigerant annual leakage rate (%)	2 (TM65 Assumption)
C1: Refrigerant end of life recovery rate (%)	99 (TM65 Assumption)
B3: Materials replaced as part of repair (%)	10 (TM65 Assumption)
C4: Percentage of product going to landfill (%)	30 (TM65 Assumption)

## Operational Carbon

Year <sup>*1</sup>	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Cumulative Total
Heat Pump (kg CO <sub>2</sub> e)	632	661	616	622	583	622	589	542	489	430	362	335	292	241	241	7,257

Note: kg CO<sub>2</sub>e calculation results are rounded to the nearest whole number. \*1 Y1 = starting from 2022



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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 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 November 2021

