

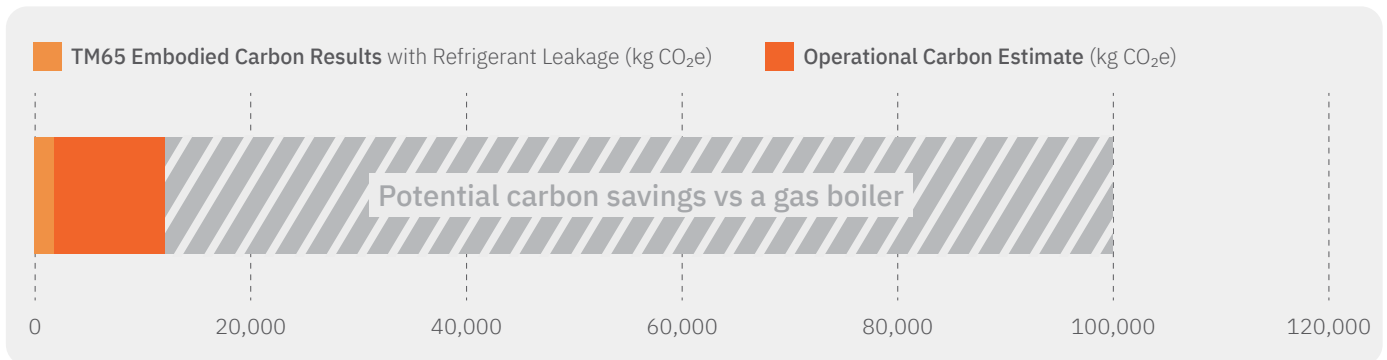
PUZ-HWM140VHA

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



Renewable Heating Technology

Assessment date:	29th of September 2021	Embodied Carbon Result with 'Mid-level TM65 Calculation' Method: 1,758 (kg CO ₂ e)	Operational Carbon Result: 10,398 (kg CO ₂ e)
Assessor:	Residential Product Marketing		
Organisation:	Mitsubishi Electric		
Contact:	embodied.carbon@meuk.mee.com		
		Total = 12,156 (kg CO ₂ 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 CO₂e, 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 CO₂](#)). Gas network according to SAP 10.1 carbon emissions factor (source: [BRE Group, SAP-10.1-01-10-2019, Page 171](#)).

PUZ-HWM140VHA - Product Information

Type of product	A2W Heat pump
Capacity of equipment (kW)	14
Product weight (kg)	128.7
Material breakdown for at least 95% of the product weight? (Y/N)	Y
Service life of the product (years)	15
Type of refrigerant	R32
Refrigerant GWP	675
Refrigerant charge (kg)	3.3
Energy consumption of the factory per unit of product (kWh)	14.08
Location of manufacture	Asia
Product Complexity	Category 3: High





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Embodied Carbon Results Breakdown (kg CO₂e)

A1: Material extraction	563
A2: Transport	102
A3: Manufacturing	47
A4: Transport to Site	28
B1: Use	668
B3: Repair	75
C1: Deconstruction	22
C2: Transport	2
C3: Waste Processing	4
C4: Disposal	0

Embodied Carbon Results - without Refrigerant Leakage (kg CO₂e)

A1-C4 (excluding B1,C1)	821
A1-C4 with Buffer Factor (excluding B1, C1)	1,067

Embodied Carbon Result - Refrigerant Leakage Only (kg CO₂e)

B1 (Refrigerant leakage during use) + C1 (Refrigerant leakage end of life)	691
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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 ^{*1}	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Cumulative Total
Heat Pump (kg CO ₂ e)	906	947	882	891	835	891	843	777	700	616	518	481	418	346	346	10,398

Note: kg CO₂e 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

