

Ultra Low Emission Bus Scheme Certificate

Customer:	Volvo Bus Corporation	DYNAMOMETER SETTINGS		
Customer Address:	Dept 86100, ARAK3S, SE-405 08, Gothenburg	Measured Kerb Weight (kg)		13167
Test Purpose:	ULEB Testing	Equivalent test passengers		21.75
Vehicle Manufacturer:	Volvo	Seated Capacity	40	
Vehicle Type & Number:	Volvo 7900E	Passenger Capacity	87	
Engine:	Volvo EV	Declared Kerb Weight (kg)	12095	
Transmission:	Volvo Automatic	Gross Vehicle Weight (kg)	19000	
Euro VI certificate Y/N	Manufacturer Certified	GVW CHECK	OK	

Declared fuel, properties and source plus carbon conversion factors

Net Heating Value: Diesel	36.00	MJ / Litre	Fuel Provider	UK market standard
Well-to-Tank Factor: Diesel	17.23	g CO2e / MJ	WTT evidence	UK GHG reporting factors 2019
Well-to-Tank Factor: Electricity	87.77	g CO2e / MJ	Fuel Type	UK Grid Electricity

Emissions and Energy consumption results from approved test facility - Average 4 tests

Test Phase	HC (g/km)	CO (g/km)	NOx (g/km)	PM (g/km)	CO ₂ (g/km)	CH ₄ (g/km)	N ₂ O (g/km)	Energy Consumption (kWh/km)	Energy Consumption (kWh)	Energy used over phase/cycle (kWh/100km)
Outer London	0.000	0.000	0.000	0.00	0.0	0.000	0.000	1.23	7.93	143.541
Inner London	0.000	0.000	0.000	0.00	0.0	0.000	0.000	1.12	2.79	130.997
Rural	0.000	0.000	0.000	0.00	0.0	0.000	0.000	0.93	6.88	109.193
LBC Average	0.000	0.000	0.000	0.00000	0.0	0.000	0.000	1.20	10.71	140.012
UKBC Average	0.000	0.000	0.000	0.0000	0.0	0.000	0.000	1.08	17.59	126.097

Zero Emissions (Z.E.) Range: Energy consumption and charging efficiency

Total measured energy consumed on vehicle (kWh)	106	Distance in Z.E. mode (km)	98	Usable Battery Capacity (kWh)	157
Measured grid energy during charging (kWh)*	123	Charging efficiency (%) ¹	85%	Max Theoretical Z.E. Range (km)	146

Total Tank-to-Wheel GHG CO₂ equivalent

Test Phase	CO ₂ (g/km)	CH ₄ (g/km x 25)	N ₂ O (g/km x 298)	Fuel TTW** GHG (CO ₂ Equivalent g/km)
Outer London	0.0	0.000	0.000	0.0
Inner London	0.0	0.000	0.000	0.0
Rural	0.0	0.000	0.000	0.0
LBC Average	0.0	0.000	0.000	0.0
UKBC Average	0.0	0.000	0.000	0.0

Calculated total Well-to-Wheel GHG CO₂ equivalent emissions over test

Test Phase	Fuel Energy (MJ / km)	Fuel WTT*GHG Emissions (g CO ₂ e / km)	Electrical Energy (MJ / km)	Electricity WTT* GHG Emissions (g CO ₂ e / km)	Measured Fuel TTW** GHG Emissions (g CO ₂ e / km)	Total WTW*** GHG Emissions (g CO ₂ e / km)
Outer London	N/A	N/A	5.17	453.55	0.0	453.6
Inner London	N/A	N/A	4.72	413.91	0.0	413.9
Rural	N/A	N/A	3.93	345.02	0.0	345.0
LBC Average	N/A	N/A	5.04	442.40	0.0	442.4
UKBC Average	N/A	N/A	4.54	398.43	0.0	398.4

Data Generated by (On behalf of Test facility):	Date: 11/10/2019	Data Approved by:	Date: 28/11/2019
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Ultra Low Emission Bus Certificate Summary

GHG Well-to-Wheel	398.4	g CO ₂ e / km
Euro VI Average Diesel Equivalent	1325.5	g CO ₂ e / km
WTW GHG saving (compared with Euro VI diesel equivalent)	927.1	g CO ₂ e / km
% WTW GHG saving (compared with Euro VI diesel equivalent)	70%	g CO ₂ e / km
Max Theoretical Zero Emission Operating Range (km)	145.7	km
WTW CO ₂ per passenger km (@ Max Pass Capacity)	4.6	g CO ₂ e/pass km
Approved as Ultra-Low Emission Bus? (30% saving or more)	YES	

* WTT : Well-to-Tank

** TTW : Tank-to-Wheel

*** WTW : Well-to Wheel

WTT Factors Published: 7th June 2019

Comments: This certificate is valid for both 1 door and 2 door variants of this vehicle, this conclusion was reached by observing 106kWh energy consumption during the 2-day testing. ¹ The charger used during testing was the Heliox Fast DC 40 mobile which had a calculated efficiency of 91% using recorded "post-charger" energy consumption.	Cell	Lower Saloon	Upper Saloon
	Target Temperatures ±2 (°C) :		
	10	17	N/A
Average Temperatures across testing (°C)			N/A
9.41			16.05

Test Numbers: ML02018887 (10-Oct-19), ML02018888 (10-Oct-19), ML02018889 (10-Oct-19), ML02018890 (10-Oct-19), ML02018891 (10-Oct-19), ML02018892 (10-Oct-19).

Certificate approved by:	Certificate Approved by: Daniel Hayes
On behalf of Bus manufacturer	On behalf of LowCVP/DfT
	02/01/2020