

Ultra Low Emission Bus Scheme Certificate

Customer:	Alexander Dennis			DYNAMOMETER SETTINGS		
Customer Address:	Cameron House, Priorswood Place, East Pimbo, Skelmersdale, West Lancashire			Measured Kerb Weight (kg)	11793	
Test Purpose:	ULEB Testing			Equivalent test passengers	17	
Vehicle Manufacturer:	Alexander Dennis	Seated Capacity	34	Test Weight		12777
Vehicle Type & Number:	Alexander Dennis E200 EV	Passenger Capacity	65	F°	217.80	N
Engine:	EV	Declared Kerb Weight (kg)	12246	F ¹	-5.3817	N/kmh
Transmission:	BYD E200 gen 3	Gross Vehicle Weight (kg)	18000	F ²	0.32413	N/kmh ²
Euro VI certificate Y/N	Manufacturer Certified	GVW CHECK	OK	F ³	-0.0018330	N/kmh ³

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	17.02	g CO _{2e} / MJ	WTT evidence	UK GHG reporting factors 2020
Well-to-Tank Factor: Electricity	80.04	g CO _{2e} / 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	1.22	7.78	153.840
Inner London	0.000	0.000	0.000	0.00	0.0	0.000	0.000	1.68	4.12	211.249
Rural	0.000	0.000	0.000	0.00	0.0	0.000	0.000	0.89	6.52	111.691
LBC Average	0.000	0.000	0.000	0.00000	0.0	0.000	0.000	1.35	11.90	169.819
UKBC Average	0.000	0.000	0.000	0.0000	0.0	0.000	0.000	1.14	18.42	143.402

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

Total measured energy consumed on vehicle (kWh)	73.7	Distance in Z.E. mode (km)	64.8	Usable Battery Capacity (kWh)	330
Measured grid energy during charging (kWh)*	N/A	Charging efficiency (%)	79%	Max Theoretical Z.E. Range (km)	290

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 _{2e} / km)	Electrical Energy (MJ / km)	Electricity WTT* GHG Emissions (g CO _{2e} / km)	Measured Fuel TTW** GHG Emissions (g CO _{2e} / km)	Total WTW*** GHG Emissions (g CO _{2e} / km)
Outer London	N/A	N/A	5.54	443.28	0.0	443.3
Inner London	N/A	N/A	7.60	608.70	0.0	608.7
Rural	N/A	N/A	4.02	321.83	0.0	321.8
LBC Average	N/A	N/A	6.11	489.32	0.0	489.3
UKBC Average	N/A	N/A	5.16	413.20	0.0	413.2

Data Generated by (On behalf of Test facility):

Date: 12/11/2019

Data Approved by:

Date: 12/11/2019

Ultra Low Emission Bus Certificate Summary

GHG Well-to-Wheel	413.2	g CO _{2e} / km
Euro VI Average Diesel Equivalent	1114.1	g CO _{2e} / km
WTW GHG saving (compared with Euro VI diesel equivalent)	700.9	g CO _{2e} / km
% WTW GHG saving (compared with Euro VI diesel equivalent)	63%	g CO _{2e} / km
Max Theoretical Zero Emission Operating Range (km)	290.2	km
WTW CO ₂ per passenger km (@ Max Pass Capacity)	6.4	g CO _{2e} /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:

Charge efficiency could not be measured, a value from H293 tested previously has been used. Electrical and Air demister on for testing.

	Cell	Lower Saloon	Upper Saloon
Target Temperatures ±2 (°C) :	10	17	17
Average Temperatures across testing (°C)	9.40	18.58	N/A

Test Numbers: ML02018958 (07-Nov-19), ML02018959 (07-Nov-19), ML02018960 (07-Nov-19), ML02018961 (07-Nov-19).

Certificate Approved by:	Matthew Lawrence	01/03/2021	Certificate Approved by:	Dan Hayes	01/03/2021
On behalf of Bus manufacturer	Alexander Dennis		On behalf of LowCVP/DfT	LowCVP	