

## Low Emission Bus Scheme Certificate

Customer:	Alexander Dennis Ltd.				
Customer Address:	Dennis Way, Guildford, Surrey, GU1 1AF				
Test Purpose:	LEB Testing			DYNAMOMETER SETTINGS	
Vehicle Manufacturer:	Alexander Dennis Ltd.	Unladen weight (kg)	11906	Test Weight	14361 kg
Vehicle Type & Number:	E400H EH74	Gross Weight (kg)	18000	F°	455.46 N
Engine:	Euro 6	Seated Capacity	70	F <sup>1</sup>	-1.8600 N/kmh
Transmission:	Auto	Passenger Capacity	89	F <sup>2</sup>	0.22547 N/kmh <sup>2</sup>
Euro VI certificate Y/N	Manufacturer Certified	GVW Check	OK	F <sup>3</sup>	-0.000149 N/kmh <sup>3</sup>

### 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	15.42	g CO2e / MJ	WTT evidence	UK GHG reporting factors 2016
Well-to-Tank Factor: Electricity	143.50	g CO2e / MJ	Fuel Type	UK Pump Diesel, UK Grid Electricity

### Emissions and Energy consumption results from approved test facility - Average 3 tests

Test Phase	HC (g/km)	CO (g/km)	NOx (g/km)	PM (g/km)	CO <sub>2</sub> (g/km)	CH <sub>4</sub> (g/km)*	N <sub>2</sub> O (g/km)*	Fuel Consumption (l/100 km)	Fuel used over cycle (litres)
Rural	0.002	0.016	0.010	N/A	625.0	0.000	0.108	23.60	0.236
Outer London	0.004	0.027	0.026	N/A	666.8	0.000	0.103	25.18	0.252
Inner London	0.005	0.033	0.039	N/A	960.3	0.000	0.106	36.26	0.363
MLTB Average	0.004	0.029	0.030	N/A	748.9	0.000	0.104	28.28	0.283
LUB Average	0.003	0.023	0.021	0.0086	693.2	0.000	0.105	26.17	0.262

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



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

### Total Tank-to-Wheel GHG CO<sub>2</sub> equivalent

Test Phase	CO <sub>2</sub> (g/km)	CH <sub>4</sub> (g/km x 25)*	N <sub>2</sub> O (g/km x 298)*	Fuel TTW** GHG (CO <sub>2</sub> Equivalent g/km)
Rural	625.0	0.000	32.075	657.1
Outer London	666.8	0.000	30.587	697.4
Inner London	960.3	0.000	31.671	992.0
MLTB Average	748.9	0.000	30.888	779.8
LUB Average	693.2	0.000	31.421	724.6

### Calculated total Well-to-Wheel GHG CO<sub>2</sub> equivalent emissions over test

Test Phase	Fuel Energy (MJ / km)	Fuel WTT*GHG Emissions (g CO <sub>2</sub> e / km)	Electrical Energy (MJ / km)	Electricity WTT* GHG Emissions (g CO <sub>2</sub> e / km)	Measured Fuel TTW** GHG Emissions (g CO <sub>2</sub> e / km)	Total WTW*** GHG Emissions (g CO <sub>2</sub> e / km)
Rural	8.50	131.0	N/A	N/A	657.1	788.1
Outer London	9.06	139.8	N/A	N/A	697.4	837.2
Inner London	13.05	201.3	N/A	N/A	992.0	1193.3
MLTB Average	10.18	157.0	N/A	N/A	779.8	936.8
LUB Average	9.42	145.3	N/A	N/A	724.6	869.9

Data Generated by (On behalf of Test facility):		Date: 10/10/2017	Data Approved by:		Date: 10.10.2017
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### Low Emission Bus Certificate Summary

GHG Well-to-Wheel	869.9	g CO <sub>2</sub> e / km
Euro V Average Diesel Equivalent	1318.4	g CO <sub>2</sub> e / km
WTW GHG saving (compared with Euro V diesel equivalent)	448.5	g CO <sub>2</sub> e / km
% WTW GHG saving (compared with Euro V diesel equivalent)	34%	g CO <sub>2</sub> e / km
Zero Emission operating range (km)	N/A	km
WTW CO <sub>2</sub> per passenger km (@ Max Pass Capacity)	9.8	g CO <sub>2</sub> e/pass km
Approved as Low Emission Bus? (15% saving or more)	<b>YES</b>	

\* WTT : Well-to-Tank

\*\* TTW : Tank-to-Wheel

\*\*\* WTW : Well-to Wheel

#### COMMENTS:

Emission results marked in red are below detection levels.

Vehicle tested at 66 seated passengers, Unladen weight 12042Kg. Certificated updated post test to reflect 70 seated passengers and Unladen weight 11906Kg.

CO<sub>2</sub>, N<sub>2</sub>O and Fuel Consumption not adjusted for average NEC of -5.61% (Negative NEC signifies electrical energy harvested into the vehicle battery rather than being discharged).

Test Numbers: ML02017332 (14-Sep-17), ML02017333 (14-Sep-17), ML02017334 (14-Sep-17).

Certificate approved by:

Certificate Approved by:

On behalf of Bus manufacturer

On behalf of LowCVP/DfT