

## Low Emission Bus Scheme Certificate

Customer:	LowCVP				
Customer Address:	3 Bridcage Walk, London, SW1H 9JJ				
Test Purpose:	LEB TEST CYCLE ASSESSMENT			DYNAMOMETER SETTINGS	
Vehicle Manufacturer:	Optare Solo Full Electric	Unladen weight (kg)	6256.0	Test Weight	7419 kg
Vehicle Type & Number:	YJ13HKY	Gross Weight (kg)	11300.0	F <sup>0</sup>	203.50 N
Engine:	Electric	Seated Capacity	32	F <sup>1</sup>	-4.8597 N/kmh
Transmission:	N/A	Passenger Capacity	55	F <sup>2</sup>	0.24671 N/kmh <sup>2</sup>
Euro VI certificate Y/N	Electric only - Zero emissions	GVW CHECK	OK	F <sup>3</sup>	-0.001156 N/kmh <sup>3</sup>

### Declared fuel, properties and source plus carbon conversion factors

Net Heating Value:	Diesel	N/A	MJ / Litre	Fuel Provider	UK market standard
Well-to-Tank Factor:	Diesel	N/A	g CO <sub>2</sub> e / MJ	WTT evidence	UK GHG reporting factors 2016
Well-to-Tank Factor:	Electricity	143.50	g CO <sub>2</sub> e / MJ	Fuel Type*	UK Grid Electricity inc. WTT + T&D

### 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)*	Energy Consumption (KWhr)	Electrical Energy Consumption (kWh/ 100 km)
Rural	0.00	0.00	0.00	0.000	0.00	0.000	0.000	3.348	45.45
Outer London	0.00	0.00	0.00	0.000	0.00	0.000	0.000	3.300	51.13
Inner London	0.00	0.00	0.00	0.000	0.00	0.000	0.000	1.614	64.00
MLTB Average	0.00	0.00	0.00	0.0000	0.00	0.000	0.000	4.914	54.75
<b>LUB Average</b>	0.00	0.00	0.00	0.0000	0.00	0.000	0.000	8.261	<b>50.07</b>

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

Total measured energy consumed on vehicle (kWh) - ESTIMATE	33.05	Distance in Z.E. mode (km)	66.00	Usable Battery Capacity (kWh)	92.0
Measured grid energy during charging (kWh) - ESTIMATE	38.88	Charging efficiency (%)	85%	Max Theoretical Z.E. Range (km)	183.7

### 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	0.00	0.000	0.00	0.00
Outer London	0.00	0.000	0.00	0.00
Inner London	0.00	0.000	0.00	0.00
MLTB	0.00	0.000	0.00	0.00
<b>LUB Total Average</b>	<b>0.00</b>	<b>0.000</b>	<b>0.00</b>	<b>0.00</b>

### 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	N/A	N/A	1.93	276.24	0.00	276.24
Outer London	N/A	N/A	2.17	310.77	0.00	310.77
Inner London	N/A	N/A	2.71	388.94	0.00	388.94
MLTB	N/A	N/A	2.32	332.73	0.00	332.73
<b>LUB Total Average</b>	<b>N/A</b>	<b>N/A</b>	<b>2.12</b>	<b>304.30</b>	<b>0.00</b>	<b>304.30</b>

Data Generated by (On behalf of Test facility):	14 Sept 2015	Data Approved by:	14 Sept 2015
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### Low Emission Bus Certificate Summary

GHG Well-to-Wheel	<b>304.3</b>	g CO <sub>2</sub> e / km
Euro V Average Diesel Equivalent	<b>998.1</b>	g CO <sub>2</sub> e / km
WTW GHG saving (compared with Euro V diesel equivalent)	<b>693.8</b>	g CO <sub>2</sub> e / km
% WTW GHG saving (compared with Euro V diesel equivalent)	<b>70%</b>	g CO <sub>2</sub> e / km
Max Theoretical Zero Emission Operating Range (km)	<b>183.7</b>	km
WTW CO <sub>2</sub> per passenger km (@ Max Pass Capacity)	<b>5.5</b>	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:** Total energy consumption on vehicle has been estimated based on LUB average energy consumption. Vehicle and Grid energy were not measured but calculated based on assumed charging efficiency of 85% and a distance of 4 LUB cycles totalling 66.0km.

Test Numbers:	15R424-426 (27.11), 15R427-429 (27.11), 15R430-432 (27.11).	WTT Factors Published:	6th June 2016
Certificate approved by:	On behalf of Bus manufacturer	Certificate Approved by:	On behalf of LowCVP/DFJ