

## Ultra Low Emission Bus Scheme Certificate

Customer:	Belkommunmash			<b>DYNAMOMETER SETTINGS</b>		
Customer Address:	Belkommunmash (OJSC Holding Management Company), Str. Perekhodnaya 64, Building 645-2, Minsk			Measured Kerb Weight (kg)	12080	
Test Purpose:	BKM LCEB Test			Equivalent test passengers	21.75	
Vehicle Manufacturer:	BKM	Seated Capacity	25	Test Weight		
Vehicle Type & Number:	Bus Single Decker M3	Passenger Capacity	87	F°	N/A N	
Engine:	N/A	Declared Kerb Weight (kg)	12080	F <sup>1</sup>	N/A N/kmh	
Transmission:	N/A	Gross Vehicle Weight (kg)	18000	F <sup>2</sup>	N/A N/kmh <sup>2</sup>	
Euro VI certificate Y/N	Manufacturer Certified	GVW CHECK	OK	F <sup>3</sup>	N/A 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	17.02	g CO <sub>2</sub> e / MJ	WTT evidence	UK GHG reporting factors 2020
Well-to-Tank Factor: Electricity	80.04	g CO <sub>2</sub> e / 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 <sub>2</sub> (g/km) *	CH <sub>4</sub> (g/km)	N <sub>2</sub> O (g/km)	Energy Consumption (kWh/km)	Energy Consumption (kWh)	Energy used over phase/cycle (kWh/100km)
Outer Urban	0.000	0.000	0.000	0.00	0.0	0.000	0.000	0.97	6.23	106.809
Inner Urban	0.000	0.000	0.000	0.00	0.0	0.000	0.000	1.16	3.13	126.631
Rural	0.000	0.000	0.000	0.00	0.0	0.000	0.000	0.99	7.05	108.531
LBC Average	0.000	0.000	0.000	0.00000	0.0	0.000	0.000	1.03	9.36	93.281
UKBC Average	0.000	0.000	0.000	0.0000	170.5	0.000	0.000	1.01	16.41	110.946

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

Total measured energy consumed on vehicle (kWh)	66	Distance in Z.E. mode (km)	65	Usable Battery Capacity (kWh)	29
Measured grid energy during charging (kWh)*	72	Charging efficiency (%)	91%	Max Theoretical Z.E. Range (km)	29

### 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)
Outer Urban	0.0	0.000	0.000	0.0
Inner Urban	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	170.5	0.000	0.000	170.5

### 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)
Outer Urban	N/A	N/A	3.85	307.76	0.0	307.8
Inner Urban	N/A	N/A	4.56	364.88	0.0	364.9
Rural	N/A	N/A	3.91	312.72	0.0	312.7
LBC Average	N/A	N/A	3.36	268.78	0.0	268.8
UKBC Average	N/A	N/A	3.99	319.69	170.5	490.2

Data Generated by (On behalf of Test facility):	Date: 14-01-20	Data Approved by:	Date: 14-01-20
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### Ultra Low Emission Bus Certificate Summary

GHG Well-to-Wheel	490.2	g CO <sub>2</sub> e / km
Euro VI Average Diesel Equivalent	1325.5	g CO <sub>2</sub> e / km
WTW GHG saving (compared with Euro VI diesel equivalent)	835.3	g CO <sub>2</sub> e / km
% WTW GHG saving (compared with Euro VI diesel equivalent)	63%	g CO <sub>2</sub> e / km
Max Theoretical Zero Emission Operating Range (km)	29.2	km
WTW CO <sub>2</sub> per passenger km (@ Max Pass Capacity)	5.6	g CO <sub>2</sub> 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: 4 Tests carried out on 11/12/19. *HVAC Not installed. Diesel Heater factor (170.5 g CO <sub>2</sub> e / km) added to final test results. **All testing performed on Millbrook's High Speed Circuit track facility.		Cell	Lower Saloon	Upper Saloon
	Target Temperatures ±2 (°C) :	10	17	17
	Average Temperatures across testing (°C)	6.3**	13.6*	-

**Test Numbers:** PTT000547/549/550/552

Certificate approved by:	Certificate Approved by: Daniel Hayes
On behalf of Bus manufacturer	on behalf of DfT/Zemo Partnership      21/01/2020