

Zero Emission Bus Certificate

| | | | | | |
|---|--|---|-------------|--|----------------|
| Customer: | Pelican Bus and Coach | | | DYNAMOMETER SETTINGS | |
| Customer Address: | Wakefield Europort, Alofts Lane, Wakefield | Telematics Capability | Yes | Test Weight | 15110** kg |
| Test Purpose: | Zero Emission Bus Testing | Maximum Speed (km/h) | 80 km/h | F° | -335.26 N |
| Vehicle Manufacturer: | Yutong | Seated Capacity | 23 | F¹ | -2.5310 N/kmh |
| Vehicle Model Name: | E9 / E9L | Passenger Capacity | 62 | F² | 0.15277 N/kmh² |
| Powertrain Technology | Battery Electric | Declared Unladen Weight (kg) | 9750 | Equivalent test passengers | 18.5** |
| Powertrain Configuration | Direct Drive | Gross Weight (kg) | 14300 | Measured Unladen Weight (kg) | 13852** |
| Zero Emission Heating | Electric Cooling and Heating A/C | GVW Check | OK | Number of consecutive tests completed | 4 |
| Battery Specification | | Charging and Refuelling Capability | | Hydrogen Specification | |
| Battery Manufacturer | CATL | Plug Type | DC CCS 2 | Fuel Cell Manufacturer | N/A |
| Battery Chemistry | LFP | Max Charge Capability (kW) | Up to 150kW | Fuel Cell Power Rating (kW) | N/A |
| Battery Installed Capacity (kWh) | 255 | Charger Compatibility | DC | Hydrogen Storage Capacity (kg) | N/A |
| Battery Usable Capacity (kWh)* | 224 | Charge time from 20-80% SOC | 1 - 2 hour | Hydrogen Storage Pressure (bar) | N/A |

* Recommended manufacturer guideline, subject to warranty

** Taken from Yutong E10 / E12 test.

Declared fuel, properties and source plus carbon conversion factors

| | | | | | | |
|---|-------|-------------|--|--------------------|--|-----------------------|
| Well-to-Tank Factor: Electricity | 72.65 | g CO2e / MJ | Fuel Provider | UK market standard | WTT evidence | DBEIS Conversion 2022 |
| Well-to-Tank Factor: Hydrogen | N/A | g CO2e / MJ | Capacity of Tanker (kg) | N/A | Fuel Type / Pathway | UK Grid Electricity |
| Energy Density Hydrogen | 120 | MJ / kg | Transport Distance of Hydrogen (km) | N/A | Hydrogen Production Energy Source | UK Grid |

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)* | Vehicle Energy Consumption (kWh) | Vehicle Energy Consumption (kWh/km) | Grid Electrical Energy Consumption (kWh/100km) |
|-----------------------|-----------|-----------|------------|-----------|------------------------|-------------------------|--------------------------|----------------------------------|-------------------------------------|--|
| Outer Urban | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 5.86 | 0.91 | 99.11 |
| Inner Urban | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.54 | 1.01 | 110.37 |
| Rural | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 5.26 | 0.71 | 77.54 |
| LBC Average | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 8.40 | 0.94 | 102.26 |
| UK BUS Average | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 13.65 | 0.84 | 91.07 |

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

| | | | | | |
|---|-------|---|-------|--------------------------------------|-----|
| Test Charger Used | 22 kW | Total measured energy consumed on vehicle (kWh)¹ | 55.00 | Max ZE Range at 100% SOC (km) | 268 |
| Hydrogen Energy Over Test (kWh) | N/A | Measured grid energy during charging (kWh) | 60.00 | Max ZE Range at 80% SOC (km) | 214 |
| Hydrogen Delivered to Vehicle (kg) | N/A | Grid-to-Wheel efficiency (%)² | 92% | Test Distance Travelled (km) | 65 |

¹ Total measured energy includes energy used during the 23 minute warmup, this is needed for charge efficiency calculation.

² Grid to Wheel efficiency represents the total energy losses between the grid and the wheels of the bus.

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) |
|-----------------------|-----------------------|---|-----------------------------|---|
| Outer Urban | N/A | N/A | 3.57 | 259.21 |
| Inner Urban | N/A | N/A | 3.97 | 288.66 |
| Rural | N/A | N/A | 2.79 | 202.79 |
| LBC Average | N/A | N/A | 3.68 | 267.45 |
| UK BUS Average | N/A | N/A | 3.28 | 238.19 |

Data Generated by (On behalf of Test facility):

Date:

Data Approved by:

Date:

Zero Emission Bus Certificate Summary

| Test Vehicle | | Average Euro VI Diesel Equivalent | | |
|--|-------|-----------------------------------|--|-------|
| GHG Well-to-Wheel | 238.2 | g CO ₂ e / km | Average Diesel Equivalent | 1064 |
| WTW CO₂ per passenger km (@ Max Pass Capacity) | 3.8 | g CO ₂ e/pass km | WTW CO₂ per passenger km (@ Max Pass Capacity) | 17.2 |
| Overall Zero Emission Bus Performance | | | | |
| WTW GHG saving | 825.8 | g CO ₂ e / km | Maximum Theoretical Zero Emission Range (km) | 267.8 |
| % WTW GHG saving | 78% | g CO ₂ e / km | Vehicle Energy Consumption (kWh/ km) | 0.84 |
| Approved as Zero Emission Bus? (50% GHG saving or more) | | | YES | |

* WTT : Well-to-Tank

** TTW : Tank-to-Wheel

*** WTW : Well-to Wheel

COMMENTS: Emission results marked in red are below detection levels.

LBC = London Bus Cycle - Inner & Outer Urban phases of UKBC only.

Certification based on previous Yutong E12 / E10 test results, with updated weight and battery capacity.

Test Numbers: 20220311_1522, 20220311_1655, 20220311_1812, 20220311_1921

Certificate approved by:

On behalf of Bus manufacturer

Certificate Approved by:

On behalf of DfT / Zemo Partnership

Tim Griffen

20.03.2023

| | Cell | Lower Saloon | Upper Saloon |
|---|------|--------------|--------------|
| Target Temperatures ±2 (°C) : | 10 | 17 | N/A |
| Average Temperatures across testing (°C) | 9.98 | 19.67 | N/A |