

How it works.

Xcelcior CHARGE™ is propelled by a high-efficiency electric motor with energy stored in re-chargeable lithium-ion batteries manufactured in the USA. Utilizing regenerative braking and direct drive from the axle to the wheels (no transmission required), Xcelcior CHARGE™ can achieve over 20 mpg diesel equivalent with zero emissions.



- BATTERIES ENERGY STORAGE SYSTEM (ESS)
- DRIVE AUXILIARY SYSTEM/ POWER ELECTRONICS
- BATTERY COOLING SYSTEM
- ELECTRIC HEATING, VENTING AND AIR CONDITIONING (HVAC)
- TRACTION MOTOR (NO TRANSMISSION REQUIRED)
- ELECTRIC POWER STEERING UNIT



CHARGING OPTIONS

- The batteries can be charged with either a on-route rapid charger with a rooftop connection or with a plug-in charger at the transit depot
- On-route rapid charging can provide unlimited range without returning to the depot. Extended range configurations can achieve over 200 miles on a single charge



BATTERIES

- Up to 480 kWh (equivalent to 168,000 AA batteries) of electricity is stored in high voltage lithium ion batteries on the roof and at the rear of the bus
- Monitored by a sophisticated battery management system for added protection, longevity and charging efficiency



AUXILIARY SYSTEMS

- High-voltage DC electricity converted to AC electricity powers the air compressor and HVAC systems, allowing each system to operate efficiently, with minimum power consumption
- A high-voltage converter supplies 24-volt DC power for interior fans, lights, power steering and electric doors (optional)



ELECTRIC DRIVE

- Direct current (DC) power from the batteries is converted to three-phase alternating current (AC) power to drive the high-efficiency traction motor
- Energy from deceleration is converted from mechanical energy to electricity to recharge the batteries and extend range



HEATING, VENTILATION, AND AIR CONDITIONING

- An electrically-driven air conditioning system is used to cool the bus when needed
- For moderately cold temperatures, the bus uses electric heating
- For very cold conditions, an optional liquid-fuel heater warms the passenger cabin using a small amount of renewable biodiesel which helps maintain bus range

Frequently asked questions

What range can the bus travel on a single charge? *(full to empty)*

According to Altoona AVG duty-cycle results*, the bus can travel 65 miles with 150 kWh, 87 miles with 200 kWh, 157 miles with 320 kWh, & up to 234 miles with 480 kWh.

What is the typical charge time for the batteries?

The typical charge time for the batteries with depot charging is 1.6 hours for a full charge with a 480 kWh pack. With on-route rapid charging, the typical charge time is 32 minutes for a full charge with a 200 kWh pack.

What is the range using an on-route charger?

With an on-route charger, a 5 to 6 minute charge per hour of operation allows the bus to run continuously throughout the day without returning to the depot.

How many passenger miles per gallon (PMPGe) can the bus achieve?

According to Altoona testing, the Xcelcior CHARGE™ achieves 1702 PMPGe (83 passengers x 20.5 MPGe), making it the most cost-effective and fuel-efficient option.

How have you maximized passenger carrying capability?

New Flyer has the highest Gross Vehicle Weight Rating of any electric bus in North America and we have distributed the battery weight so the load does not exceed the gross axle weight ratings with normal standee passenger loads.

*Range per FTA Altoona test protocol - HVAC off

Charging Solutions

New Flyer offers multiple Energy Storage Systems (ESS) and charging solutions to optimize Xcelstor CHARGE™ with infrastructure to meet the diverse needs of bus operations and the community.

ELECTRIC BUS PLUG-IN CHARGER

- Plug-in chargers are available as a supplement or alternative to on-route rapid chargers and can be used for overnight, mid-day and off-route charging.
- Charging can be initiated from either the charger user panel or the bus, but will only begin once all programmed safety conditions are met.
- The bus monitors battery State of Charge (SOC), temperature and other parameters during charging and determines the maximum charge rate to be pulled from the charger. Alternatively, a low power charge can be selected at the charger panel.



PLUG-IN CHARGER SPECIFICATIONS	
OEM	Siemens
Power Available	150 KW, 3-phase 480 VAC
Maximum Output Current	200 A
Voltage Supplied to Vehicle Receptacle	Regulated DC
Vehicle Receptacle Type	CCS Type 1
SAE Standard	SAE J1772
Enclosure	IP54
Isolation Transformer	Included
Fault Monitoring	Yes
Emergency Stop	Button mounted on panel
Operating Temp	-35°C to +55°C (-31°F to 131°F)
Certification	Full UL and CSA certification
User Interface	7" color touch screen
Charge Controller	Pre-programmed to CCS Type 1 or CCS Type 2
PLUG-IN CHARGING TIMES	
<i>100 kW Charge Times -10% State of Charge (SOC) to 90% SOC</i>	
100 kWh ESS	48 Minutes
150 kWh ESS	72 Minutes
200 kWh ESS	96 Minutes
320 kWh ESS	173 Minutes
400 kWh ESS	216 Minutes
480 kWh ESS	259 Minutes

ON-ROUTE RAPID CHARGER

- The on-route rapid charger provides the means for the electric bus to remain in-service 24 hours daily.
- The charger features an inverted 4-pole pantograph mounted on a mast cantilevered over a road surface.
- To charge, the bus is parked beneath the pantograph and following association checks, connects to the bus by lowering the pantograph onto the bus roof, connecting to the corresponding on-vehicle roof rails and controller. A variety of charging parameters are monitored on the bus to ensure a safe and effective charge.
- The use and placement of on-route rapid chargers depends on many factors such as range requirements, route profile and topography, Energy Storage System (ESS) battery capacity (kWh), and seasonal HVAC power demands. New Flyer offers technical assistance to help optimize the complete electric bus system solution.

ON-ROUTE RAPID CHARGER	
OEM	Siemens
Power Output	300kW/450kW
Current Output	400A/600A
Voltage Supplied to Vehicle	Regulated DC
Enclosure	Nema Type 3R (outdoor)
Charging Protocol	OppCharge
Fault Monitoring	Yes
Efficiency	Greater than 91% efficiency in power transfer
Operating Temperature	-25°C to + 45°C (-13°F to 113°F)
Certification	Full UL and CSA certification
ON-ROUTE CHARGING TIMES	
<i>300 kW Charge Times - 10% State of Charge (SOC) to 90% SOC</i>	
100 kWh ESS	16 Minutes
150 kWh ESS	24 Minutes
200 kWh ESS	32 Minutes