

VOLT^{EV}
THE FUTURE IS NOW



Green Technology
Drives the Future

EV bus



ANKAI Ev bus

Ankai New Energy

As one subsidiary company to Anhui Jianghuai Automobile (Group) Co., Ltd., Anhui Ankai Automobile Co., Ltd. (Hereafter referred to as Ankai) is a publicly listed company for specialized production of series buses and automotive parts. As one China's Torch Program Key Hi-Tech Enterprise and one China's National Innovative Experimental Enterprise, Ankai owns state-level electric bus system integration engineering R&D center and national post-doctoral workstation.

After the completion of the new energy production base with a total investment amount of RMB 670 million and an occupation area of 249,333m² in 2015, Ankai formed an additional yearly production capacity of 6,000 new energy buses.

As one China's earliest bus manufacturer for R&D of new energy vehicles, Ankai focused on the development of new energy buses as early as 2003 and presently has formed 6~12m pure-electric bus, touring bus, and commuting bus series platform products. Its 5th generation new energy bus with "e-Control" system achieves >350km driving range and reduces the composite energy consumption by >10% than the previous generation product. It's presently the pure-electric bus of China's highest composite performance indicators. Ankai's latest 6th generation pure-electric bus closely follows the international development trend, applies the China's latest pure-electric bus development technology, and realizes comprehensive surpasses in terms of operating efficiency, body structure, energy consumption, driving range, lightweight, and vehicle cost to build the new generation electric bus of lightest mass, longest driving range, and highest lifecycle cost-performance in the industry.



As one pioneer of China's new energy vehicles, Ankai spares no effort in terms of the R&D and industrialization to strive for the realization of the corner overtaking for China's automotive industry. From the world's first pure-electric bus route to the industry's first new energy intelligent management system (Ankai "e-Control" system) and to the China's sole "National Electric Bus System Integration Engineering R&D Center" and "National and Local United Engineering R&D Center for Electric Bus System Development and Application", Ankai closely follows the national new energy vehicle development strategy, sticks to the technologic route of primary pure-electric vehicle and auxiliary plug-in hybrid vehicle, tracks the latest technologies for development of fuel cell buses, and insists on independent R&D of vehicle control systems and asynchronous motors, the independent development of permanent motors, the integration and application of power batteries, and the product technologic development route of weight-reduction and cost-reduction.

As a contractor for national electric bus system engineering R&D center and based on the construction objectives of engineering R&D center and the technologic development needs of Ankai, Ankai set up the China's leading Ankai engineering center lab, which incorporates 5 main labs and 18 sub-labs.

R&D
Strength



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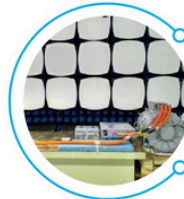
High Safety And Reliability

For Guarantee Of Vehicle Operations



Highly integrated controllers

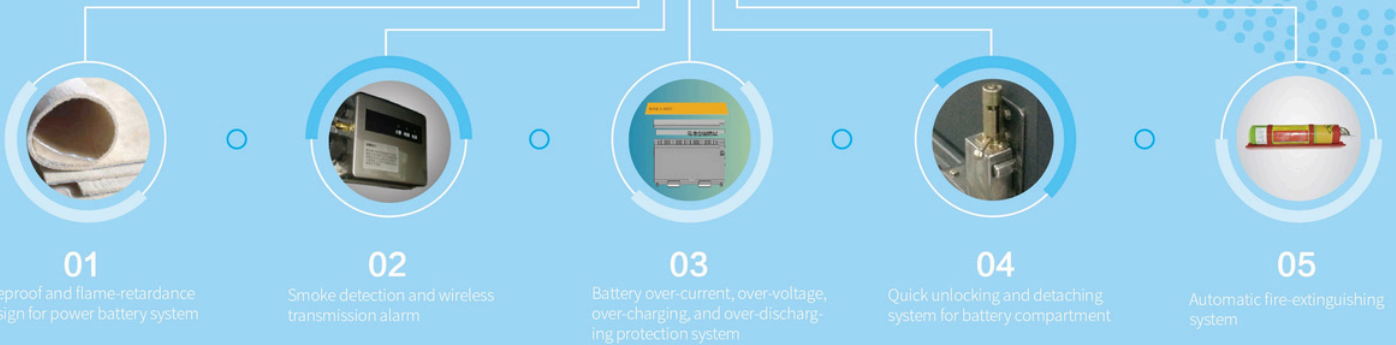
The integrated 5-in-1 controller integrates the drive motor controller, electronic power steering motor controller, air compressor motor controller, DC/DC, and high-voltage distribution, which is developed to realize high efficiency, energy-saving, and higher safety and reliability.



Vehicle system-level EMC design

The design rules of body framework, electric parts, and connecting cables are defined, the design specifications are prepared centering on the EMC ground, shielding, and filtering, and the vehicle is verified in accordance with GB/T18387 and GB14023.

5-level safety protection for power battery system



6-level protection design for high voltage system of vehicle



Complete IP67 protection standard compliance and high wading safety



Wading depth protection

Battery compartment water-proof design + IP67 protection standard compliance for electric steering pump, drive motors, and electric inflation pump

◀ Wading test at 5-10km/h in 30cm deep water



Charging contactor seizure protection and temperature control

In event of seizure of the contactor, the vehicle controller sends via communication control a signal to the battery management system to restrain the charging. During the charging, the battery management system real-time monitors the information of temperature sensor at the charging socket connection. Upon detection of over-temperature at the connection, a signal is sent via communication network to restrain the charging and a warning is shown on the instrument.



IP67 high protection grade design

>500mm wading depth and -40-60°C environmental adaptability of vehicle

◀ 500mm water immersion test for 24h



Vehicle brake override system

Even if the accelerator pedal is depressed, the driver can still stop the vehicle by depressing the brake pedal.



Isolation between battery and passenger compartment

The battery for a pure-electric bus is installed on the side or the roof to completely isolate from the passenger compartment so that the battery is beyond the access of the passengers and the standard requirements are met.



Vehicle steering priority system

Upon detection of any abnormal online status such as electronic accelerator, electronic brake, and air pressure sensor, the vehicle real-time activates the graded safety control status, such as status warning, system power reduction, and active stop. The high pressure oil supply is maintained for the steering circuit to realize the 30s delayed steering function.



All-terrain reliability test and high environmental adaptability

The special environmental verifications, including high temperature, low temperature, highland, high humidity, and mountainous region, are taken for whole series platform vehicles.

Low temperature adaptability intelligent solution

Upon detection of under-low temperature of battery module, the battery management system will activate the heating control device. The charging heating mode and the driving heating mode are provided. The new low temperature power battery (Low temperature resistant battery cell material and new low temperature electrolyte) + Anka's innovative built-in constant temperature control system can realize 90% of normal temperature discharging capacity under -40°C to effectively prevent the accidents (Such as failure) of battery under low temperature environment and solve the charging and discharging problem of power battery under extremely cold environment. The low temperature performance reaches the world's advanced level.

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Advanced process equipment and

U-shaped production line

Ankai owns modern production workshop and scientifically reasonable U-shaped production line. By means of the mechanized automatic transport system and reasonable process arrangement, the advanced TPS production management system can realize the rapid and efficient streamline production to remarkably improve the productivity.



Intelligent robot welding

The robot welding equipment for small assemblies are mainly utilized for welding the small assemblies of framework and, with automatic overturning mechanism, can realize the synchronization of welding, change of mold, and loading and unloading of workpiece to complete the integral welding of workpieces under clamped state and reduce the welding deformation. Welding accuracy: $\pm 1\text{mm}$; Production takt: 18min/piece.



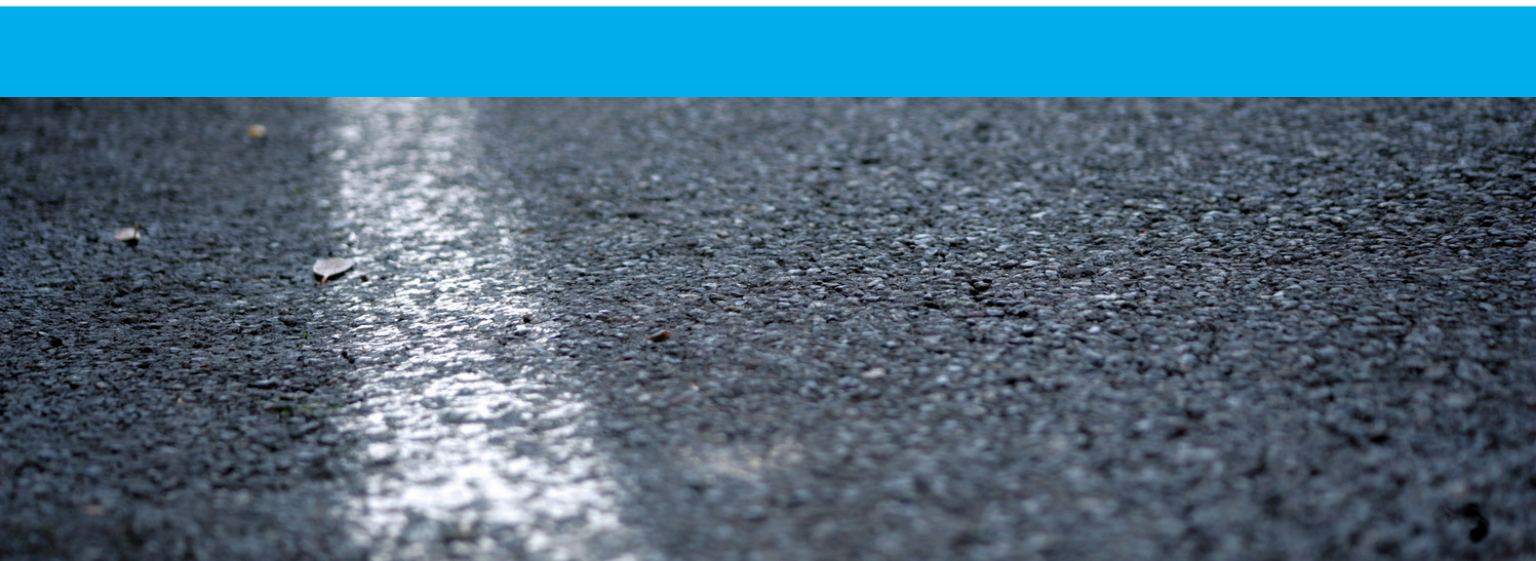
Ankai's full-immersed cathode electrophoresis

The electrophoresis technology for whole vehicle can realize super-strong salt fog resistance and damp-heat resistance to adapt to diversified weather environments and longer and more durable vehicle life.



Automatic coating processes for whole vehicle

The coating processes for the whole vehicle can guarantee the uniformity, gloss finish, and adhesion of paint to realize higher environmental-friendliness and better paint film performance.



Complete inspection capability and more reliable quality

Ankai boasts the performance test capability for the prototyping of vehicle, road reliability and performance test of vehicle, and performance, strength, life, and environment of main parts and power assemblies, including motors, electronic control, and battery.



All pure-electric vehicles passed the battery impact test to improve the safety performance

The whole series pure-electric vehicles passed the battery impact test and the anti-collision beams are added and the side wall framework strength is enhanced to meet the safety inspection standard impact test requirements. At present, all vehicles in the bulletin and recommended directory meet the requirements. The weakest location of the vehicle is tested at 50km/h by a 950kg deformable moving barrier. After the impact test, the vehicle shall meet the requirements of 4.2-4.4 of GB/T31498, without fire, explosion, or >5L electrolyte leakage.

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Energy-saving And Environmental-friendliness For Improvement Of Environmental-friendly Benefits



Independent permanent magnet synchronous drive motor

The independent permanent magnet synchronous drive motor realizes iterative development and mass production and application, with the performance indicators leading the industry. The stepless speed change characteristic of the drive motor is sufficiently utilized and the braking and drive torque control strategy is precisely tuned to realize the effective balance between power performance and economy of the vehicle and further improve the riding comfort of the passengers at the instants of vehicle haste acceleration and braking energy recovery.



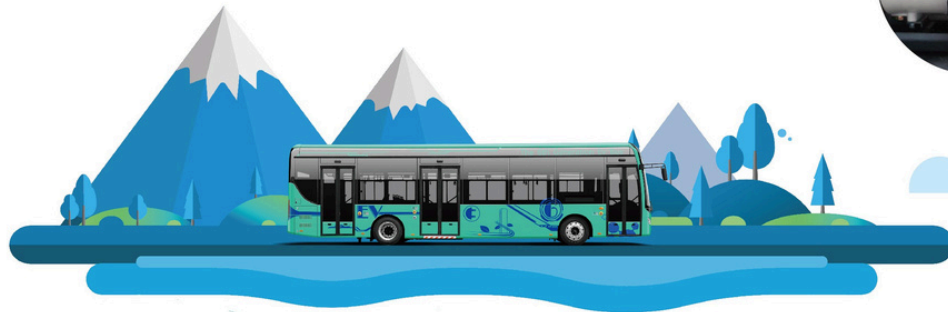
Permanent magnet synchronous steering system

The permanent magnet synchronous steering system features high efficiency, small volume, and light weight compared with AC asynchronous steering pump under same power condition.



Permanent magnet synchronous inflation pump system

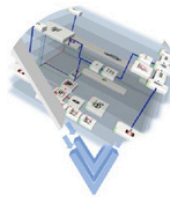
The permanent magnet synchronous inflation pump system is applied. The inflation pump is arranged behind the rear wheels of the vehicle to reduce the noise of driver zone.



EBS braking energy recovery control system



The central processing module acquires the signal of brake travel sensor to learn the driver behavior information and, based on the permissible energy recovery status of vehicle, utilize the recovered braking energy to the maximum extent. Under different loads and acceleration/deceleration controls, it intelligently distributes the energy recovery and dynamic braking proportion to realize comfortable braking. EBS intelligent control realizes the ABS distributed torque control and solve the variation problem of braking force due to deactivation of motor braking triggered by ABS.



Cruise vehicle power system optimization and matching

Based on the system structure of vehicle, the vehicle simulation model is built by AVLcruise for simulation of vehicle performances, including acceleration performance, gradeability, top traveling speed, energy consumption economy. In addition, the wheel hub test data is combined to benchmark the differences of analysis data and test data to continuously improve the power performance, economy, and effectiveness of simulation technology.

All-round lightweight design for improvement of energy-saving performance



Ankai full-integral structure body is made of Baosteel 16Mn sectional steel. The vehicle structure is mechanically analyzed and optimized to realize high lightweight extent and reduce the weight by 200kg than traditional vehicles. In event of an external force impact at any point of body, the impact force is distributed to all places of the body. The torsional strength of the steel parts is 3-6 times of that for other common buses.



The new high-energy density lithium iron phosphate battery is applied to improve the group energy density from 120Wh/Kg to 153Wh/Kg and reduce the power battery weight by 800kg.



The lightweight parts, including seats, PVC floor, A/C, and aluminum alloy wheel rims, reduce the vehicle weight by 2% and improve the driving range.



High intelligence and comfort for improvement of vehicle operation experience



Intelligent control system



Ankai "e-Control" system is the comprehensive upgrade of Ankai electric excellence management system (I-EMS). On the basis of "Vehicle Control System", "Motor Drive System", and "Energy Management System", it integrates three characteristics, namely humanized control, multi-level safety, and intelligent function, to bring about a technologic and comfortable driving/riding experience and lead the comprehensive entry of China's new energy buses into intelligent large-screen age.





Intelligent environment perception and pre-warning system

Pedestrian Collision Warning (PCW): The system detects the orientation of pedestrian, the severity of danger, and the possible collision with pedestrian and displays an icon on the instrument and issues a continuous warning tone.

Vehicle Distance Monitoring Warning (HMW): Upon detection of a vehicle ahead, the instrument displays a vehicle icon and the distance to the vehicle ahead. When the preset distance is approached, the system displays an icon on the instrument and issues a continuous warning tone.

Frontal Collision Warning (FCW): Upon detection of possible collision with vehicle ahead, the system will alarm up to 2.7s prior to the collision.

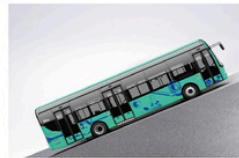
Lane Departure Warning (LDW): Upon detection of unconscious lane departure, the system issues a continuous tone and displays a warning sign to the driver.

Speed Limit Indication (SLI): The system issues a continuous warning tone and displays a warning sign in event of speeding.



Ankai anhui vehicle networking monitoring platform

The vehicle safety control strategy performs the all-weather and full-condition real-time scanning and monitoring to guarantee the system safety and driving safety. The vehicle networking technology is utilized to remotely real-time monitor the driving status of vehicle and realize the intelligent operations. The electromagnetically compatible vehicle and electronic parts guarantee the high-reliability communication of vehicle local area network and realize the multi-terminal monitoring by computer and mobile phone.



Intelligent hill-start assist system

When the creeper function is activated, by means of the braking control, the braking pressure for four wheels is maintained, until the drive system has sufficient drive force for forward driving. It can effectively prevent the backward gliding danger due to startup failure of motor, reduce the frequent uses of parking brake and foot brake during traffic jam on slopes, and lower the driver's fatigue strength.



Noise Veducation Technology

The CAE software analysis and new drive motor technology are applied to ensure steady low-speed driving, reduce the noise, and improve the comfort of the vehicle. The permanent magnet drives for the auxiliary systems, including permanent magnet steering motor and inflation pump motor, effectively reduce the noise and vibration and improve the riding comfort.



Openable front face design

The lower edge of the front windshield is designed into four parts, which can be unfolded in three directions. The split bumper adopts tiltable and detachable structure to ease the checking and services of lamps, wiper, defroster, and brake master cylinder and bring about remarkable conveniences for the customer's maintenances. The telescopic towing hook and the external air charging port are provided in the front middle portion to ease the towing of vehicle.



Design upgrade of driver zone

The driver zone is independently designed to realize safe, sweet, and ergonomic layout and higher operation convenience. The large touchscreen design is leading the industry application and is upgraded in intelligent level.



Comfortable riding space

The low floor, whole passage, and large space of the vehicle and the beautiful and neat interior upholstery matching bring about a fresh and comfortable vehicle space and the concise design style and matching make the optimized interior space broader. The multiple humanized detail treatments on Ankai bus provide more comfortable space for the passengers.



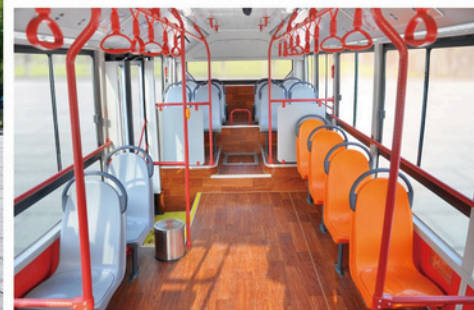


G6

6.5m Electric Bus

Model	Dimensions	Seats	Drive motor rated power (kw)	Electricity (kwh)	Energy Density (Wh/kg)	Ekg (wh/km · kg)	Power consumption kwh/km		Recharge mileage (km)		Charging type KW/charging time Battery temperature 25°C (soc from 20% to 100%)	Half an hour recharge the battery (±5kwh)
							(Turn off A/C)	(Turn on A/C)	(Turn off A/C)	(Turn on A/C)		
HFF6650GEV1	6540 × 2100 × 2870,2970	45/10-17	50 (Permanent magnet synchronization)	96	143	0.177	0.35-0.4	0.5-0.55	200-220	140-160	120kw/1h	37
HFF6650GEV2				65	140	Less than 0.15			140-160	90-110	60kw/1.5h	18
HFF6650GEV3				89	More than 140	Less than 0.15			190-210	130-150	60kw/1.8h	20





G9

8-8.5m Electric Bus

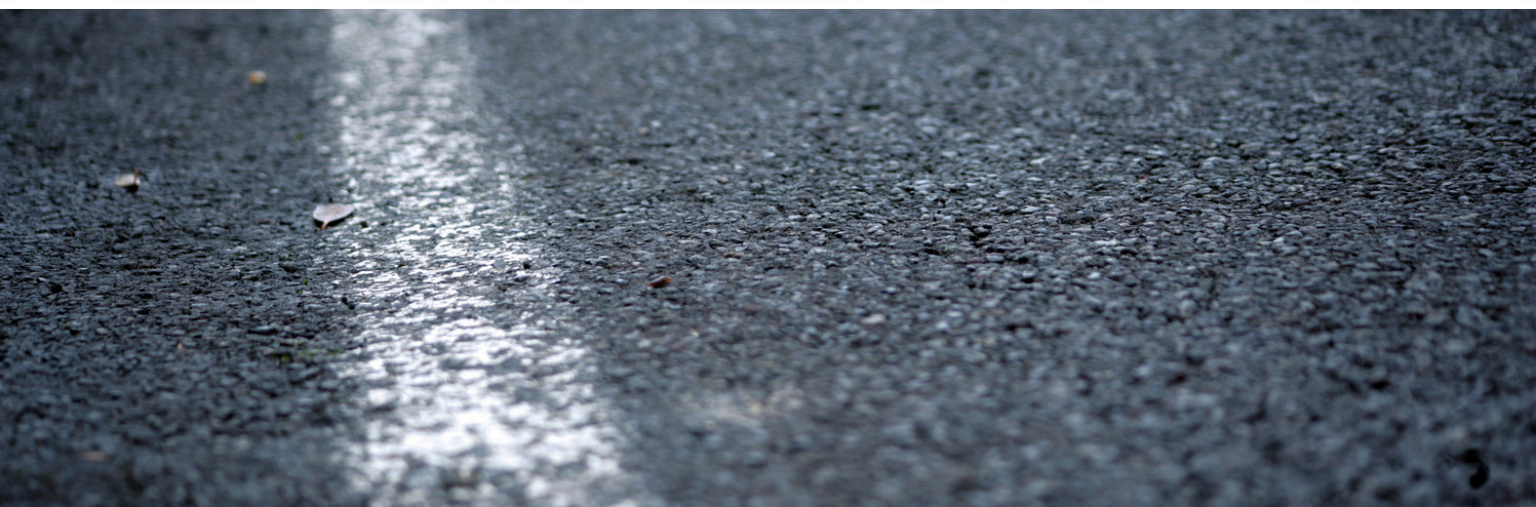
Model	Dimensions	Seats	Drive motor rated power (KW)	Electricity (kwh)	Energy Density (Wh/kg)	Ekg(wh/k m · kg)	Power consumption kwh/km		Recharge mileage (km)		Charging type / charging time	Charger power KW / Battery temperature 25 ° C (soc from 20% to 100%)	Half an hour to recharge the battery (±5kwh)	
							(Turn off A/C)	(Turn on A/C)	(Turn off A/C)	(Turn on A/C)				
HFF6800G03EV63	8005 × 2350 × 3000,3100	51/13-24,45/13-24	80	110.88	140.34	0.176	0.45-0.5	0.65-0.7	180-200	120-140	120kw/1.2h		35	
HFF6800G03EV64				110.88	140.34	Less than 0.15			180-200	120-140				
HFF6800G03EV75				124.88	141.5	0.178			200-220	140-160				120kw/1h
HFF6800G03EV77				144	141.5	Less than 0.15			240-260	160-180				120kw/1.2h
HFF6800G03EV81				110.35	145.9	0.175			180-200	120-140				120kw/1.2h
HFF6800G03EV82				110.35	145.9	Less than 0.15			180-200	120-140				120kw/1.2h
HFF6800G03EV76				93.7	141.5	0.149			140-160	100-120				120kw/0.8h
HFF6853G03EV1	8510 × 2420 × 3120,3270	72/15-31,66/15-31	80	129	130.17	0.177	0.55-0.6	0.75-0.8	190-210	130-150	120kw/1h		50	
HFF6854G03EV	8510 × 2350 × 3000,3100	67/15-30,61/15-30		163.3	140.31	0.149			220-240	160-180	150kw/1.8h			
HFF6855G03EV	8510 × 2550 × 3000,3100	67/15-30,61/15-30		187	More than 140	Less than 0.15			250-270	200-220	150kw/1.5h			

ANKAI Ev bus



10.5m Electric Bus

Model	Dimensions	Seats	Drive motor rated	Electricity (kwh)	Energy Density (Wh/kg)	Ekg (wh/km·kg)	Power consumption kwh/km		Recharge mileage (km)		Charging type	Charger power KW / charging time Battery temperature 25 °C (soc from 20% to 100%)	Half an hour to recharge the battery (±5kwh)			
							(Turn off A/C)	(Turn on A/C)	(Turn off A/C)	(Turn on A/C)						
HFF6104G03EV6	10010 × 2350 × 3000,3100 10450 × 2550 × 3150,3250	66/17-39,58/17-39	100	141.31	127.6, 123.6	0.199	0.65-0.7	0.9-1.0	170-190	120-140	120kw/1.5h	37				
HFF6100G03EV-61		67/10-39		290.3	119.3	0.212/0.189			290-310	200-220			150kw/3.2h(Single socket)	300kw/1.6h(Double socket)	35(Single socket)	70(Double socket)
HFF6109G03EV2		95/19-39,86/19-39		138.2	115.9	0.19			130-150	90-110			250kw/0.6h			90
HFF6109G03EV31		89/19-39,80/19-39		241.92	140.34	0.163			240-260	160-180			150kw/2.8(Single socket)	300kw/1.4h(Double socket)	35(Single socket)	70(Double socket)
HFF6109G03EV32		92/19-39,78/19-39		241.92	140.34	Less than 0.15			240-260	160-180			150kw/2.8(Single socket)	300kw/1.4h(Double socket)	35(Single socket)	70(Double socket)
HFF6100G03EV-9		95/19-39,78/19-39		315.3	More than 140	Less than 0.15			320-340	220-240			150kw/3h(Single socket)	300kw/1.5h(Double socket)	42(Single socket)	85(Double socket)
HFF6109G03EV22		95/19-39,86/19-39		151	To be determined	Less than 0.15			150-170	100-120			300kw/0.75			80
HFF6109G03EV13		94/19-39,85/19-39		218.54	140.13	0.173			210-230	140-160			150kw/1.5(Single socket)	300kw/0.75(Double socket)	55(Single socket)	110(Double socket)
HFF6109G03EV14		92/19-39,78/19-39		218.54	140.13	Less than 0.15			210-230	140-160			150kw/1.5(Single socket)	300kw/0.75(Double socket)	55(Single socket)	110(Double socket)





12m Electric Bus

Model	Dimensions	Seats	Drive motor rated power (kw)	Electricity (kwh)	Energy Density (Wh/kg)	Ekg(wh/k m · kg)	Power consumption kwh/km		Recharge mileage (km)		Charging type / charging time / Battery temperature 25 ° C (soc from 20% to 100%)	Half an hour to recharge the battery (±5kwh)
							(Turn off A/C)	(Turn on A/C)	(Turn off A/C)	(Turn on A/C)		
HFF6129G03EV -43	12000 × 2550 × 3150,3250	99/20 -45,89/20 -45	100	138.2	117.1/115.9	0.194	0.85-0.9	1.25-1.35	110-130	80-100	300kw/0.7	80
HFF6129G03EV1		79/20 -45,79/20 -35		362	140.31	0.186			320-340	220-240	150kw/4 (Single socket) 300kw/2 (Double socket)	35 (Single socket) 70 (Double socket)



ANKAI Ev bus



G9

12m Double Layer Electric Bus

Model	Dimensions	Seats	Drive motor rated power (kw)	Electricity (kwh)	Energy Density (Wh/kg)	Ekg (wh/km · kg)	Power consumption kwh/km		Recharge mileage (km)		Charging type Charger power KW / charging time Battery temperature 25 °C (soc from 20% to 100%)	Half an hour to recharge the battery (±5kwh)
							(Turn off A/C)	(Turn on A/C)	(Turn off A/C)	(Turn on A/C)		
HFF6124G503EV	12000×2550×4200	90/40-54	130	304	136.05	0.2	1.2-1.25	1.7-1.8	190-210	130-150	150kw/2.2 (Single socket) 300kw/1 (Double socket)	55 (Single socket) 110 (Double socket)





6代

Sixth Generation Electric Bus

Model	Dimensions	Seats	Drive motor rated power (kw)	Electricity (kwh)	Energy Density (Wh/kg)	Ekg (wh/km·kg)	Power consumption kwh/km		Recharge mileage (km)		Charging type Charger power KW / charging time Battery temperature 25 ° C (soc from 20% to 100%)	Half an hour to recharge the battery (±5kwh)
							(Turn off A/C)	(Turn on A/C)	(Turn off A/C)	(Turn on A/C)		
HFF6129G03EV1	12000×2550×3150,3250	79/20-45,79/20-35	100	362	140.31	0.186	0.85-0.9	1.25-1.35	320-340	220-240	150kw/4 (Single socket) 300kw/2 (Double socket)	35 (Single socket) 70 (Double socket)



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F7

8m Electric Bus

Model	Dimensions	Seats	Drive motor rated power (kw)	Electricity (kwh)	Energy Density (Wh/kg)	Ekg (wh/km - kg)	Power consumption kwh/km		Recharge mileage (km)		Charging type Charger power KW / charging time Battery temperature 25 ° C (soc from 20% to 100%)	Half an hour to recharge the battery (±5kwh)
							(Turn off A/C)	(Turn on A/C)	(Turn off A/C)	(Turn on A/C)		
HFF6803GEVB	8010×2280×2750,2980	45/14-25,45/14-27	80	92.16	126.6, 122.9	0.194	0.45-0.5	0.65-0.7	140-160	100-120	120kw/1h	35





F7

Electric Bus

Model	Dimensions	Seats	Drive motor rated power (kw)	Electricity (kwh)	Battery system energy density (Wh/kg)	Ekg (wh/km · kg)	Power consumption kwh/km		Recharge mileage (km)		Charging type / charging time	Charger power KW / Battery temperature 25 ° C (soc from 20% to 100%)	Half an hour to recharge the battery (±5kwh)
							(Turn off A/C)	(Turn on A/C)	(Turn off A/C)	(Turn on A/C)			
HFF6803KEVB1	8010 × 2280 × 2750,2980	24-33	80	92.16	122.9	0.206	0.4-0.45	0.55-0.6	160-180	110-130	120kw/1h	37	
HFF6803KEVB1		24-28		124.4	130.17	0.216/0.191			220-240	160-180			120kw/0.9h



ANKAI Ev bus



7m Public & Business Electric Bus

Model	Dimensions	Seats	Drive motor rated power (kw)	Electricity (kwh)	Battery system energy density (Wh/kg)	Ekg (wh/km · kg)	Power consumption kwh/km		Recharge mileage (km)		Charging type Charger power KW / charging time Battery temperature 25 ° C (soc from 20% to 100%)	Half an hour to recharge the battery (±5kwh)
							(Turn off A/C)	(Turn on A/C)	(Turn off A/C)	(Turn on A/C)		
HFF6707BEV2	7035×2040×2645,2725,2785	10-17	50	117.07	141.5	0.208	0.3-0.35	0.4-0.45	270-290	210-230	120kw/1h	55





A6

8.2-12m Group & Commute & Operating Bus Electric Bus

Model	Dimensions	Seats	Drive motor rated power (kw)	Electricity (kwh)	Battery system energy density (Wh/kg)	Ekg (wh/km · kg)	Power consumption kwh/km		Recharge mileage (km)		Charging type Charger power KW / charging time Battery temperature 25 ° C (soc from 20% to 100%)	Half an hour to recharge the battery (±5kwh)
							(Turn off A/C)	(Turn on A/C)	(Turn off A/C)	(Turn on A/C)		
HFF6109K10EV31	10490×2500×3430	24-51,24-47	100	141.31	123.6	0.195	0.7-0.75	0.9-0.95	150-170	110-130	120kw/1.5h	37
HFF6829GEV	8245×2500×3290,3430	46/16-34,44/16-32		124.88	141.5	0.148	0.5-0.55	0.65-0.7	190-210	140-160	120kw/0.9h	50
HFF6119GEV2	10990×2500×3285,3430	70/24-48		249.8	More than 140	Less than 0.15	0.75-0.8	1-1.05	240-260	190-210	150kw/2 (Single socket) 300kw/0.9 (Double socket)	50 (Single socket) 100 (Double socket)
HFF6119KEV2	10990×2500×3285,3405	24-49,24-51		167	More than 140	Less than 0.15			160-180	110-130	120kw/1.2h	55



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