

Irizar e-mobility: Ready for the electrification of cities with their own reliable and proven technology

Our commitment to the sustainability and well-being of our customers and citizens leads us to go much further.

Three years after the delivery of the first 100% zero emissions electric buses to the cities of San Sebastian and Barcelona, we can now proudly say that we are fully prepared for the electrification of the public transport service in European cities with a wide range of comprehensive mobility solutions tailored to the needs of each customer, with products and services that have state-of-the-art technology developed entirely in the Irizar Group.

The first 25 units are running at full capacity in a dozen European cities with proven battery range, efficiency and reliability.

The current portfolio of orders and the high demand for zero emissions products that is shortly expected to materialize has spurred the Irizar Group to begin serial production at the new Aduna plant which is geared exclusively towards the development and manufacture of electric mobility solutions for cities.

The first hundred direct and indirect jobs have already been created and we are starting our journey in this area by producing and offering advanced technology products that mean that we can be competitive from Europe.

At this year's Busworld fair we are featuring the world premiere of our articulated 18 metre Irizar ie Tram which extends the current supply of electric vehicles to articulated vehicles with opportunity charging; next to it will be the well-known, tried and tested sector benchmark, the Irizar ie bus.

The Irizar ie tram - A tram on the tarmac

The Irizar ie tram is an articulated 18 metre bus. It is a vehicle with the aesthetic attributes of a tram, developed based on the idea that the design participates in the attractiveness of the service and in the development of comfort for the citizen.

The combination of flexibility regarding the mobility of an urban bus and the large capacity, easy access and interior spatial organization of a tram, with zero emissions, define the DNA of this new vehicle. The Irizar ie tram offers a design that starts from a minimalist aesthetic language, without ornaments, with all of its features responding to specific functional aspects allowing it to create an identity and an image that are easily recognisable to its users.

One of the most significant features of its design is the chrome edging that flows around the body of the vehicle. It makes for immediate identification and creates an appearance that is



different to other similar vehicles. This edging, like an icon, is an identifying feature associated with the brand.

The chrome edging runs around the large glass surface of the sides, which becomes a canvas on which the environment through which the vehicle travels is reflected.

The front of the vehicle reflects fluidity and style and with a large glazed surface it evokes the heritage of the tram, which together with the full led optics integrated in the edging rings, creates a composite appearance that is avant-garde but technological and rational at the same time. The rear section, breaking away from the cubism of the bus, is our big aesthetic commitment.

Care has been taken with the most minor details to achieve the aesthetics of the tram, for example the hubcaps, as well as the wing mirrors, have been replaced by cameras that project their images onto two displays located in the interior of the vehicle either side of the driver.

The innovative, inspiring design of the Irizar ie tram breaks with the classic transport codes and enhances the charm of the city by reflecting urban cultural diversity.

The interior: The search for a unique space

Irizar e-mobility has designed the passenger interior with consideration for traveller behaviour and interaction with the urban vehicle and also based on different lifestyles and future trends, therefore the seat layout attempts to encourage social cohesion. It offers seats with a high level of comfort and the integration of essential features like comfort and safety.

Accessibility, safety, movement flow and passenger comfort inspire the interior design architecture. The arrangement of the interior spaces enables the adaptation of the different types of users, offering them all a comfortable solution. Thus, the spaces offered are bright and pleasant, designed for students, because it has been observed that on all public transport networks, they prefer to sit at the back.

The interior design seeks to offer the user a feeling of openness and light, where the transition between inside and outside is minimized through the transparency of the windows, so the passenger becomes observer of what happens outside the vehicle. The large side windows, together with the LED interior lighting and its central "open air" vault, provide brightness that transfers the user to a safe and pleasant environment.

In the inter circulation area, a system with very low lateral inclinations has been designed to provide an open space towards the rear trailer. The system is translucent and avoids the separation of the two passenger areas. Furthermore, it is equipped with LED lighting.

These 18-metre vehicles have capacity for 155 people, making them unique among electric buses. They allow the installation of four sliding doors to facilitate the exchange of passengers with a reduction in waiting time at the station, which is indispensable in reducing journey time and increasing the punctuality of high level service lines.



The integral low floor and arrangement of the seats inside the vehicle ensure that passenger entrances and exits in stations and movement inside the vehicle proceed smoothly.

We think of everything and everyone

Furthermore, it offers the mass transit seat configuration that is ideal for improving the flow of passengers in the rear passenger compartment of the vehicle, allowing for improved access to the articulation.

The vehicle can accommodate 2 areas for folded pushchairs and wheelchairs and 2 seats for people with reduced mobility. The fitting of these areas consists of a stop request button in Braille, signs for the reserved seats (size and colour of the seats), a buzzer indicating the stop request and approved signs in the wheelchair space. In summary, it is a vehicle that is accessible for all.

Accessibility is further enhanced by the installation of ticket validation devices near all doors, the design of the driving position, the interior layout with large internal movement aisles and improved manoeuvrability of people in wheelchairs and others with reduced mobility.

These Irizar vehicles offer the same degree of thermal comfort as the rest of the Irizar range, and they contribute to the creation of a noise-free atmosphere.

The “kneeling” function, with heights of between 250-270 mm, enables comfortable and effortless access to the bus.

For your entertainment, Irizar enables the installation of a wide range of solutions: USB chargers, WiFi, Braille buttons, luggage racks, passenger information, interior vinyls, etc.



The Irizar Hallmark: Pioneering Technology

The Irizar ie tram comes complete with own-brand technology. It is technology that has been tested in Irizar's laboratories and test benches, and in the vehicle itself. It is technology that optimises the flow of energy between the different systems involved in electrification, such as the traction chain, the battery storage, the Wabco EBS and auxiliary equipment.

Energy management and storage system

The high-power density and long-life batteries are lithium Ion of the LTO family (Lithium Titanate Oxide).

The Irizar battery system responds to a modular concept, designed to meet the needs of any operator. It also allows easy isolation and fast replacement in the event of an error in one of the modules, without affecting the operation of the rest.

The estimated useful life of the batteries depends to a large extent on the operating and consumption conditions, especially mileage, operating hours, recharge cycles, bus occupancy and weather. Irizar offers an optimised solution for maximum life.

Safety in use

The temperature stabilisation of the batteries is done independently and their management system is integrated into the vehicle's circuits, so there is no fire or explosion risk. Moreover, they do not need preventive maintenance.

The system is as solid and safe as required by the latest European regulations: R100, R10 and UN38.3.

Recyclability

Once the battery reaches 80% of its working charge capacity, Irizar will change the battery and give it a second life by using it in static up to 50% of its working charge capacity. The recycling process can then take place.

Irizar electric motor:

Unlike other projects, constrained by more standardised motors, the motorisation of the Irizar ie tram also responds to technologies designed and developed exclusively by the Irizar Group that adapt perfectly to the vehicles' requirements.



The engine, manufactured by Alconza, a group company, a permanent magnet synchronous motor with capacity of 230 Kw, sufficient to respond to the required operations.

Air conditioning system

The Hispacold air conditioning system, designed specifically for zero emissions electric vehicles, offers a perfect balance between the thermal comfort of passengers and energy optimization obtained by Irizar for its electric vehicle.

Electric doors

The doors installed in the Irizar ie tram are electric doors developed by Masats; the single front door, swinging with a safety sensor and the others, also double doors, are metre with sensor. They include a management control system with manual, automatic and shuttle modes.

The electric and manual ramp is Masats model RT1 1300.

The Irizar Pantograph

The new Irizar pantograph allows the vehicle to be charged in just a few minutes during its journey. Its modern and minimalist design offers easy integration into the urban landscape.

This charger is a system for conversion of energy from a three-phase power network - rated power of 600 KW, and has been approved by ENEDIS, a French company that manages the state electrical network, therefore Irizar has become the first manufacturer of systems to obtain this validation.

The system allows automatic or manual connection of the charger to bus batteries. It is an articulated mechanism installed in the roof of the vehicle and a vault connected to the charger and located in a structure or adapted pole. When the bus needs its batteries charging, the pantograph arm extends and establishes timely connections.

The operator can choose from different protocols related to the opportunity charging procedure (automatic mode or manual mode).

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