



*Hybrid technology
Irizar i4h and Irizar i3h*

hybrid



The Irizar Group

The Irizar Group is a leader in the bus and coach manufacturing sector and a global benchmark in electromobility for cities, electronics, communications (ITS solutions) and rotating machinery.

With over 2,700 employees, the Irizar Group carries out its bus and coach manufacturing activity in six plants located in Spain, Morocco, Brazil, Mexico and South Africa. As a result of its diversification policy, the group is also comprised of six other companies involved in different sectors with an international presence.

The group's headquarters are located in the town of Ormaiztegui in Gipuzkoa (Spain), which is also home to Creatio, the Irizar Group's Research and Development Centre, which is responsible for applied research processes and the technological development of own-brand products and systems.

Founded in 1889, today, Irizar is a well-established Group with an annual turnover of more than 580 million euros. It is geographically and industrially diversified, continuously growing and firmly committed to the brand, technology and sustainability and to its own-brand products, both in terms of electric buses and coaches and in terms of its other products in the sectors in which it operates.



Irizar Service

Irizar service includes customised solutions, designed and created to offer you the best: finance, repair and maintenance contracts, and buyback of used vehicles, etc.

The availability of a fully guaranteed comprehensive repair, tune-up and maintenance service, operating 24 hours a day, 365 days a year, is still a feature that sets us apart. We are firmly committed to customers having access to an extensive service network, with 1100 official service points on the five continents, including 700 in Europe.

The iService tool is a web platform for vehicle service management (usage, maintenance and repair) that provides convenient access online or via mobile app or tablet to technical documentation relating to your coach, including the service manual, the workshop manual, pneumatic and electrical information, as well as information about the service network to facilitate vehicle repairs.

You can also use it to view the spare parts catalogues for individual vehicles graphically, visually and in detail by families and components and even manage orders, tracking and delivery of spare parts through the Eshop.



Class II hybrid buses and coaches Irizar's new technological solution

Irizar is now going even further in the spirit of innovation and has taken a step forward in its numerous and diverse technological innovations by incorporating hybrid technology into its bus and coach catalogue.

Since the Irizar Group introduced its first integral model, the Group's commitment to technology has been beyond dispute and underpins its commitment to the field of mobility. Today, Irizar offers a wide range of products and technological solutions ranging from integral coaches, 100%

electric class I buses and hybrid technology in class II coaches for urban and intercity services, to conventional buses and coaches. This enables it to cover all segments of public passenger transport, in terms of both occasional transport and public, urban, intercity and long-distance transport and to be leaders in the sustainable mobility sector.

The Irizar Group's technological hub is Creatio, its Research and Development Centre, which drives the Group's applied research capabilities and technological

development, both for its own-brand products and for the main bodywork components. This centre works on long-term innovation, with a view to improving sustainable competitiveness in the future and generating wealth and employment as it grows.

The Group companies provide a comprehensive and independent own-brand technology capable of addressing all those aspects involved in the design and

development of products and systems, in compliance with all European regulations and becoming involved in European projects in order to bring it to the forefront.

Irizar thereby positions itself at the forefront of European technology and offers a sustainable mobility solution to current and future transport needs in large cities, with solutions that lead to a considerable reduction in consumption and emissions.



hybrid

The electric-diesel hybrid

The hybridisation technology developed by Irizar is parallel hybrid technology. It combines a diesel or HVO (biodiesel) propulsion engine with an electric motor that, depending on the requirements, can power the vehicle at the same time or separately, achieving optimum efficiency and performance.

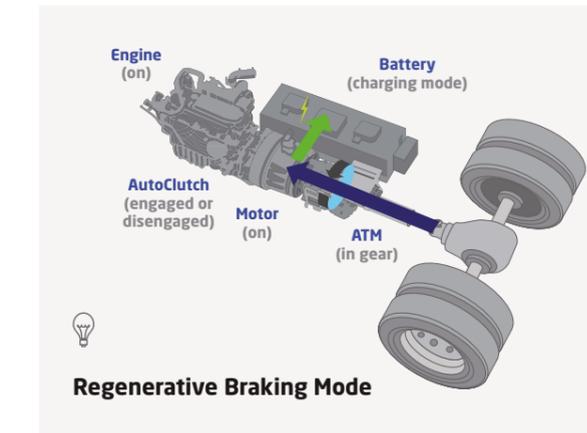
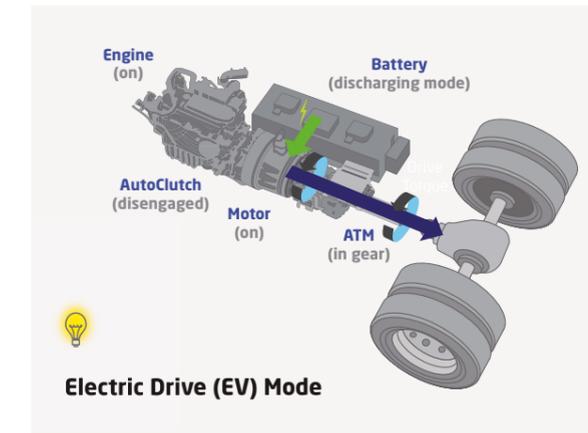
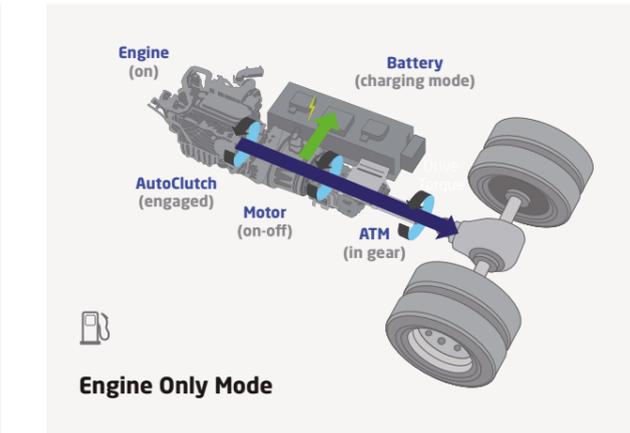
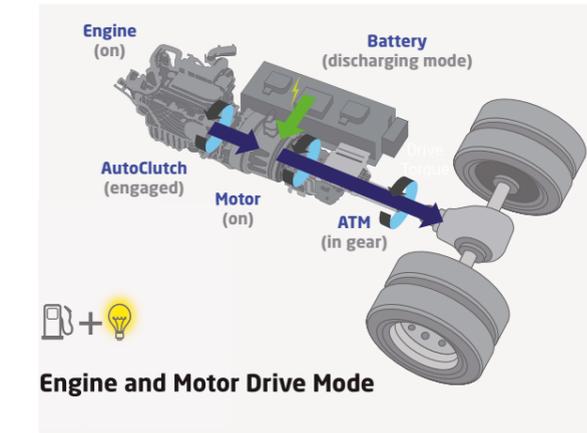
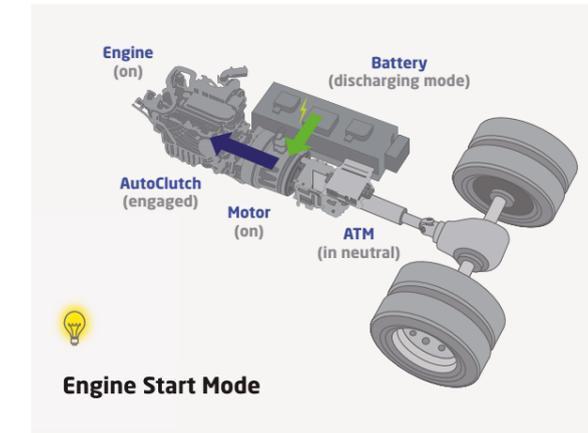
Both the Irizar i4 and i3 models are equipped with a 6.7 litre 300 hp Cummins engine that complies with the Euro 6-OB D regulation, in force as of 1 January

2017. The hybridisation package is the Eaton Fuller 6-speed model with Edrive (44/65 kW) electric motor and MGL batteries.

The vehicle is supplied with ZF independent front axle suspension, VDO-Conti multiplexed electrical system, Alcoa aluminium wheels and 295/80 R22.5" tyres. It complies with the UN ECE R66.02 regulation and the school transportation standard.



Hybrid package operating modes



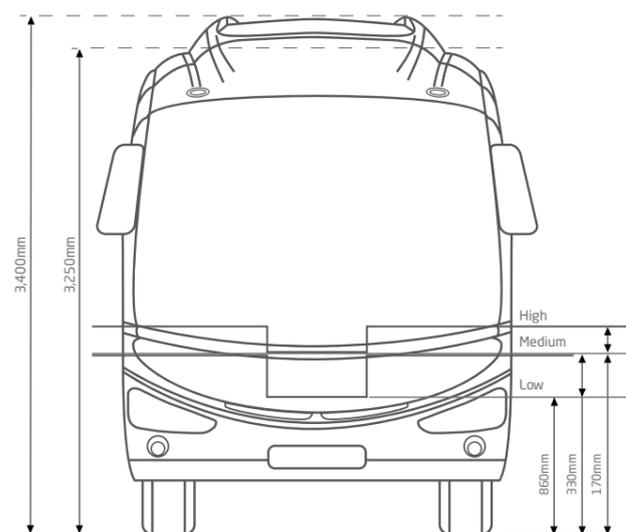
Hybrid coaches and buses

The Irizar i4h First parallel hybrid class II coach

The Irizar i4 hybrid, available in versions from 10.7 m up to 13 m with two axles, is a commuter and suburban coach for short-distance or school transport. The 13-metre version with a PRM platform has 53 seats if the model has a double central passenger door. If a wide single central door is used instead, the seating capacity is 55. In both cases, the vehicle has a PRM space. It also has a luggage compartment that is large enough to provide adequate service on commuter lines. The 15-metre version also has a PRM platform and a 65 -seat capacity with a single wide central passenger door or a double door and at least one PRM space.

The Irizar i4 hybrid therefore becomes the first class II commuter vehicle with hybrid technology for short and medium-distance lines: H, M and L high floor with luggage compartment.

H, M and L versions



The low-entry Irizar i3h

The suburban vehicle is a 13-metre low-entry Irizar i3 with 45 seats and a PRM platform. As this is a short-distance commuter vehicle, it offers modularity that enables the passenger capacity to be adjusted to suit the customer's needs.

It is available in versions from 10.95 m up to 13 m with two axles. The 15-metre version has a 57-seat capacity and one PRM space, and the option also exists to configure it with several PRM spaces.







Sustainability and eco-efficiency

Irizar hybrid coaches and buses offer a sustainable and eco-efficient urban and intercity mobility solution, and address the current and future needs of short-distance commuter and suburban transport and school transport.

With a reduction in CO₂ emissions of around 157 gr/km compared to conventional buses and coaches with combustion engines, it prevents the emission of approximately 2.5 tonnes of CO₂ during its entire service life. (estimated at 100,000 km/year for 15 years).

It also enables the use of latest generation plant-derived biodiesel (HVO) that eliminates sulphide emissions.

The Start & Stop system is activated when the vehicle stops running (when the parking brake is applied or the door is opened). The engine shuts off, reducing fuel consumption, CO₂ emissions and noise pollution.

Lithium-Ion batteries are absolutely reliable and are 99% recyclable.

Maximum profitability

The hybrid buses developed by Irizar reduce fuel consumption by 20%, which enables a saving of 6,000 l of diesel per year. This also impacts on CO₂ emissions, which are reduced by around 170,000 gr/year.

Although the initial outlay on purchasing a hybrid vehicle is higher than that for diesel vehicles and there is a depreciation threshold of eight years, there is no doubt that the Irizar i3 and i4 hybrid buses significantly improve sustainability in cities. Moreover, in many cases, there are tax breaks that reward the lack of pollution and further improve the return on investment.

In this search for maximum profitability, Irizar's hybrid range also emphasises the reduction of consumption by incorporating the most innovative energy technologies, such as Datik's EcoAssist system.

All of this comes with Irizar's warranty coverage.



iPanel connected vehicle Fleet management by Datik

The iPanel fleet manager by Datik offers the most advanced technology to provide customisable solutions according to the needs of the business model. iPanel services are tailored to be integrated into the customer's processes, helping them with decision-making in order to optimise the fleet's performance and profitability.

Thanks to the fleet management system, our customers can optimise the performance and profitability of each fleet, in addition to closely monitoring costs and efficiency and providing safety during operations. Datik's products and services are designed for commercial fleets of all sizes.



Intelligent information enables better planning of driver training, the purchase of vehicles and routes to be operated, thereby reducing energy and improving the competitiveness of the service.

EcoAssist reports system data which can enable energy reductions, helping to identify sections of routes where more instructions are provided to the drivers.

Energy control. Specific data on the exact energy consumption per route which enables future calculations to be made, and automatic reports that identify areas of improvement for reducing consumption.



The manager includes a solution for monitoring driving hours which prevents the risks of fatigue and fines for violations and for monitoring compliance with speed limits along the route.

Furthermore, iPanel enables speed limits to be configured by zones, controlling excess speed violations along the route.



iPanel incorporates a cloud-based ticketing system with state-of-the-art technologies. The integrated solution with Operation Assistance System makes it possible to automate the management of the on-board sale and validation of tickets and RFID cards. The fare rules enable all kinds of fare policies. The passenger counting system accessory enables the manager to identify cases of fraud in real time.



iPanel has on-board video surveillance cameras in permanent operation to record activity both inside and outside the coach with smart tagging for quicker searching of the most relevant moments of the recording.

The anti-theft device warns of any attempt to steal the bus.

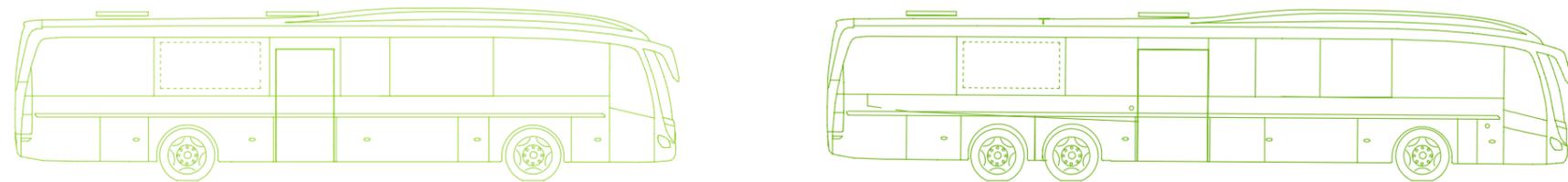


iPanel provides information on routes, punctuality, incidents and advertising both on the mobile phones of the guards themselves, as well as on large anti-vandalism multimedia screens located at stations and multimedia screens located inside the vehicle.



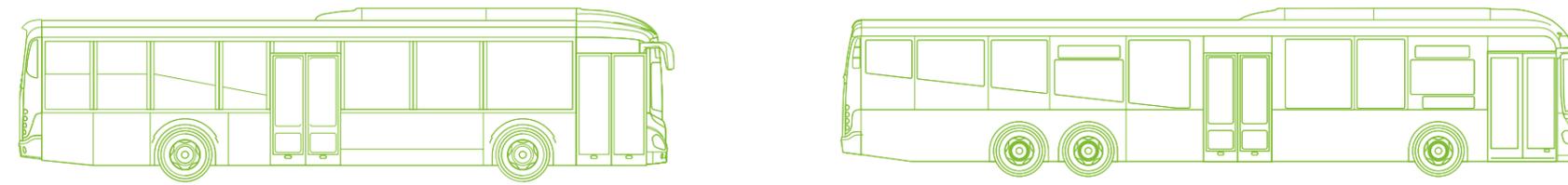
The traffic operator uses the manager to find out the location of the fleet and the incidents that may affect the planning of services, monitoring punctuality in order to support the configuration of the transport offer and exchanging messages between the control centre and drivers, providing relevant information in order to optimise the service.

Irizar i4h technical data



Length	From 10.7m to 15m
Height	3.40m (3.20m + AC)
Width	2.55m
Distance between axles	From 5.28m to 6.82m (2 axles) From 7.44m to 8.79 (3 axles)
Front overhang	2.69m
Rear overhang	3.41m (2 axles) and 3.51m (3 axles)
Front step height	250mm (320mm without kneeling)
Rear step height	270mm (340mm without kneeling)
Aisle height	860mm (L Version) -1190mm (M and H Versions)
Doors	Single front and double central (other configurations available)

Irizar i3h technical data



Length	From 10.95m to 15m
Height	3.39m
Width	2.55m
Distance between axles	From 4.70m to 7.15m (2 axles) 8.55m (3 axles)
Front overhang	2.84m
Rear overhang	3.41m (2 axles) y 3.51m (3 axles)
Double front door width	1104m
Double rear door width	1207m
Free-standing aisle height	2.64m
Doors	Double front and central (other configurations available)

Powertrain

	From 10.7m to 13m		15m
Combustion engine	Cummins ISB6.7L 300H (300 cv /1166 Nm Hybrid version)	/	Cummins 8.9L OBD C (370 cv /1600 Nm Hybrid version)
Electric Motor + Inverter	Edrive (65 kW)	/	Irizar (110 kW)
Transmission	Eaton Fuller 6-speed robotised transmission	/	ZF EcoLife 6-speed automatic transmission
Clutch	Eaton, dry disc	/	ZF torque converter
Batteries	5.5 kWh storage capacity (345 V /16 Ah)	/	5 kWh storage capacity (345 V /16A h)
	Lithium ion technology		
Radiators	Nissens system (Nissens radiators/EMP electric fans)		
Front axle	ZF RL82 (2+2 shock absorbers and air springs)		
Rear axle	ZF A132 (4+4 shock absorbers and air springs)		
Third axle	-	/	ZF RL82 (2+2 shock absorbers and air springs)
Brakes	Wabco pneumatic system Knorr-Bremse ventilated discs		
Electronic Brake System Control	EBS3		
Suspension	Koni Shock Absorbers + Vibracoustic Air Springs		
Electronic Suspension Control	ECAS IV		
Wheels and tyres	8.25x22.5 Alcoa aluminium wheels 295/80 R22.5 tyres		

EQUIPMENT

Start&Stop Function

Masats electric doors

Hispacold dual zone air conditioning system

Pre-installed CCTV

Pre-installed cash register and validating machines

Interior LED lighting

Masats cassette lift (optional)

Rear view camera (optional)

Hill start assist function

Driver's seat



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