

Iranian Rail Industries development Co.

IRICO

Metro car Catalog



Head Quarter: 4th Flr., No. 8, E. Taban Al, Alborz St, Mirdamad Blvd., Tehran, Iran.

Tel: +98 21 26409564,69

fax: +98 21 26409554

Factory: Alley IRICO , Qazvin - Zanjan Express Road (17 km to Abhar),Iran

Tel: +98 243 5362770-8

Fax: +98 243 5362787



WWW.IRI.CO.IR

Email: export@iri.co.ir

Email: info@iri.co.ir



IRICO metro product is a metro train for Tabriz, Isfahan and Shiraz



IRICO metro product is a metro train for Iran Major cities (Tabriz, Isfahan and Shiraz) and complies with the gauge requirements of Iran metropolises. The vehicles can meet the gauge requirements of kinetic envelope when the vehicles run on the straight and curve lines in overhead section, tunnel and yard tracks. Design of interior and exterior of the train presents the modernization, in relation with the local culture and comfort riding.



The vehicles of IRICO metro train adopts carbon steel car-body structure and train configuration is shown as follows:

+Tc – Mp – M – Mp – Tc +

Where:

Tc: Trailer car with cab

M: Motor car

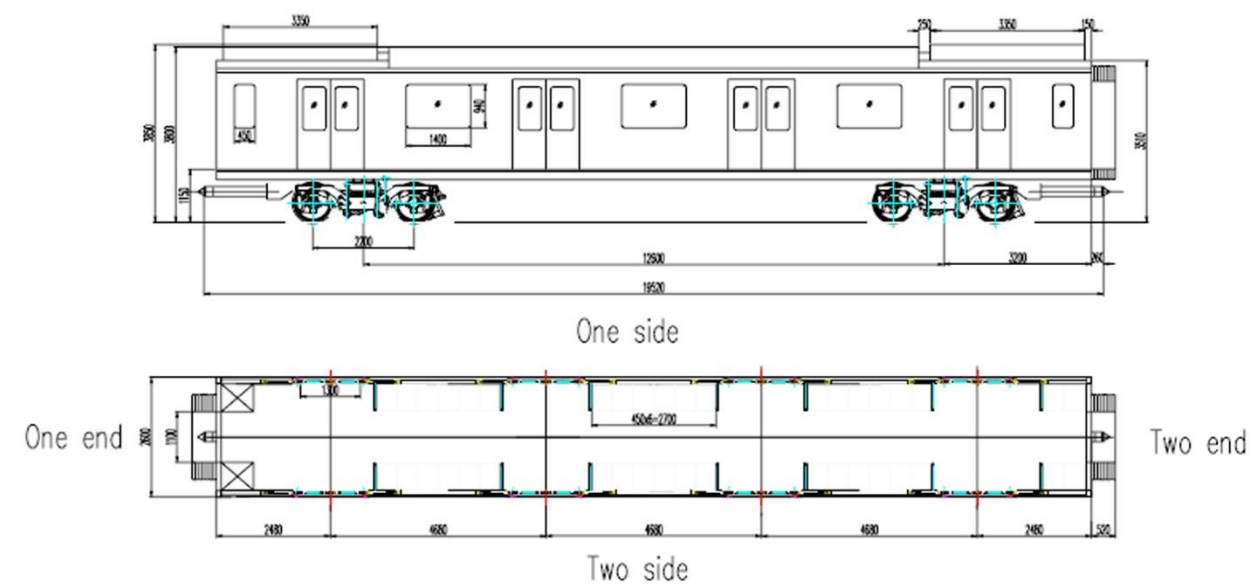
Mp: Motor car with pantograph

+: Semi-automatic coupler

–: Semi-permanent bar

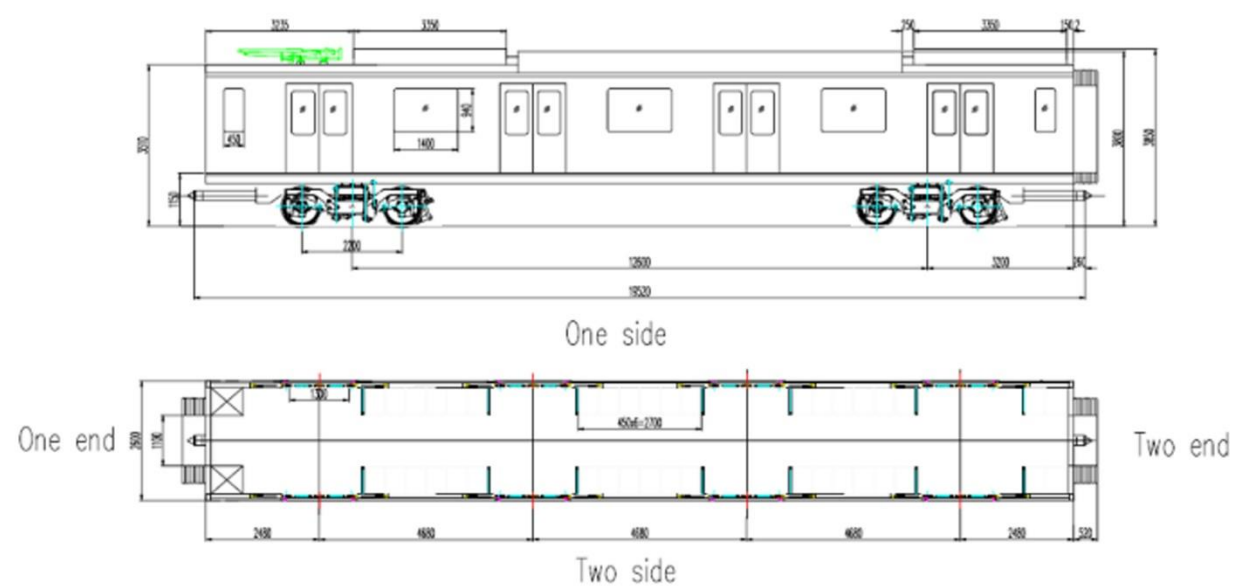
Each Motor Car has two motor bogies, while all Trailer Cars have trailer bogies only. Intermediate cars are connected with semi-permanent couplers and the end cars are equipped with semi-automatic couplers allowing coupling for rescue and towing of the train. Max traveling speed of train is 80 km/h and design speed is 90 km/h. Electric power from the line DC1,500V is supplied to the electrical circuits of each motor car via overhead catenary system on Mp cars. Height of the contact lines is allowed in range of 4.04m ~ 5.7m. The maximum axle load in the train is less than 14 tons.



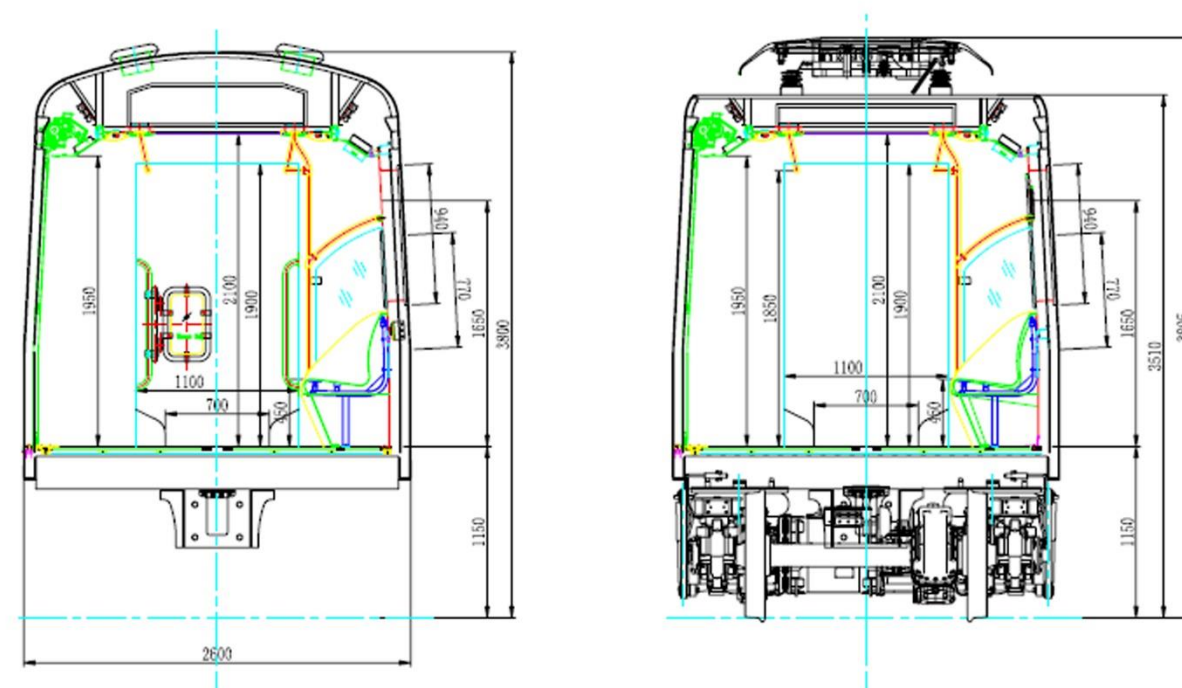


► **Figure 1 Layout of the Tc car**

► **Figure 3 Layout of the M car**



► **Figure 2 Layout of the MP car**



► **Figure 2 Layout of the MP car**

The vehicles can endure the effect of wind, rain, fog, frost, sand, corrosion of acid rain, salt fog, dust, sulfur dioxide and ozone as well in the air. The whole system will be in the air containing large number of moisture, so, all equipment is adapted to the climatic conditions in Iran cities, and can endure strong winds, high temperature, high humidity, vibration, noise and the pollution of cleaner.

» TRAIN MAIN CHARACTERISTICS

Line parameters

- Track gauge: 1,435 mm
- Minimum radius of horizontal curve as per city requirements
Main track: 185 m / 205 m
Yard track: 50 m / 100 m
- Minimum radius of vertical curve as per city requirements
Main track: 2,000 m / 1,700 m
Yard track: 1,000 m / 1,000 m
- Maximum gradient: up to 50‰
- Type of rail (main line): S49, rail material: CS, Grade: 700
- Platform parameters
Height 1,100 mm
Effective length 100 m
Distance from platform edge to track central line 1,460 mm



» Train traction performance

Traction system is supplied by Bombardier Company and its performance are as follows:

- Max traveling speed 80 km/h
- Design speed 90 km/h
- Jerk limit 0.75 m/s³
- Travelling speed under rated load ≥ 32 km/h
- Traveling speed when passing mechanical washing car 3km/h
- Max. Train coupling speed ≤ 5 km/h
- Reversing speed 10 km/h

With train running on dry, clean, flat and straight tracks, under crush load (EL6), rated line voltage, and under all wheel conditions:

- Average start acceleration(0~32km/h) ~ 1 m/s²

» Train braking performance

When the train runs on a flat and straight line with EL6 capacity, moderately worn wheels the average deceleration from the issuance of brake command to stop are as follows:

- Average service braking deceleration ~ 1 m/s²
- Mean Emergency brake deceleration 1.2 m/s²

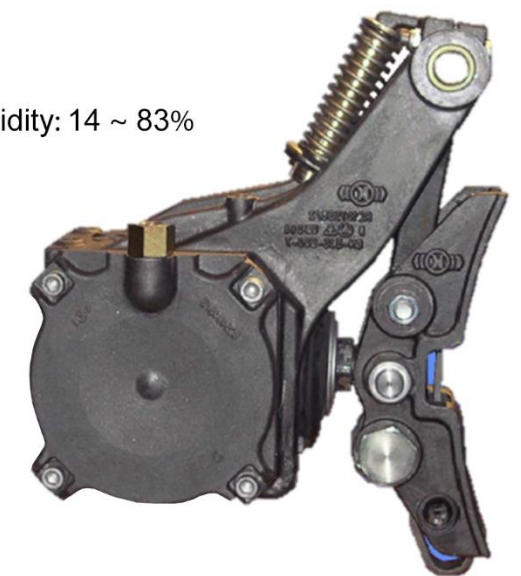
Vehicle profile dimension

- Length of car body 19,520 mm (Tc car with extra length of 1,200 mm)
- Width of car body 2,600 mm
- Height of the vehicle 3,800 mm
- Floor height 1,150 mm
- Coupler height 660 mm

Climatic conditions

- Design altitude: ≤ 1700 m
- Ambient temperature: $-25^{\circ}\text{C} \sim +43.2^{\circ}\text{C}$
- Average relative humidity: 32 ~ 54% ; Relative humidity: 14 ~ 83%

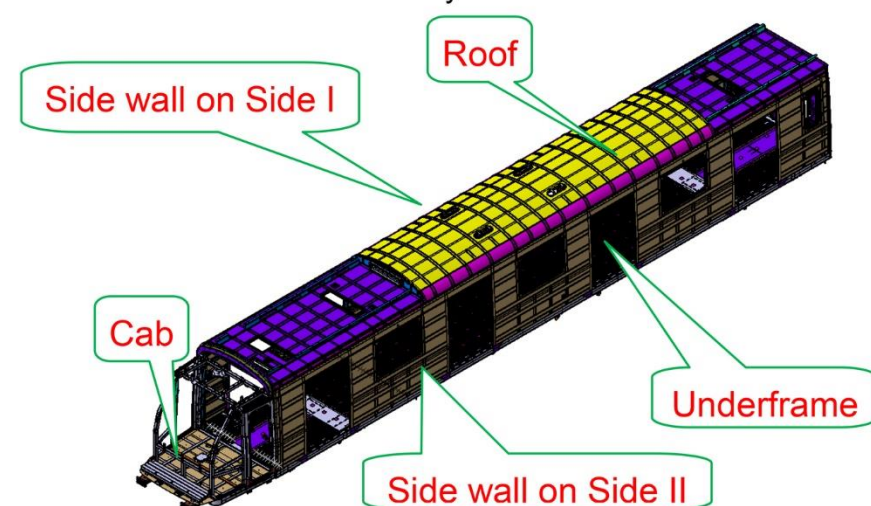
Mechanical Brake system of Metro cars



» Main component of car:

1- Carbody

The carbody adopts drum shaped structure using carbon steel profiles. The carbody is modularized structure. Welding is fully adopted between the modules except the connection between the cab and the carbody.



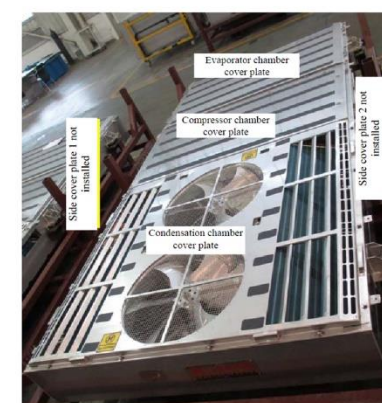
2- Windows

- Tempered glass is adopted for both layers of the window glass. The 5 mm thick outer layer is green; the 6 mm thick inner layer is colorless; the hollow layer is 14 mm thick.
- The light transmittance of a single layer glass will not exceed 56%. The light transmittance of the whole glass block will be between 60% and 65%. The optical coefficient FS will not be less than 50%.
- The diagonal difference of the glass is $\leq \pm 1$ mm and surface flatness ≤ 1 mm/m;
- The hollow layer is filled with argon;

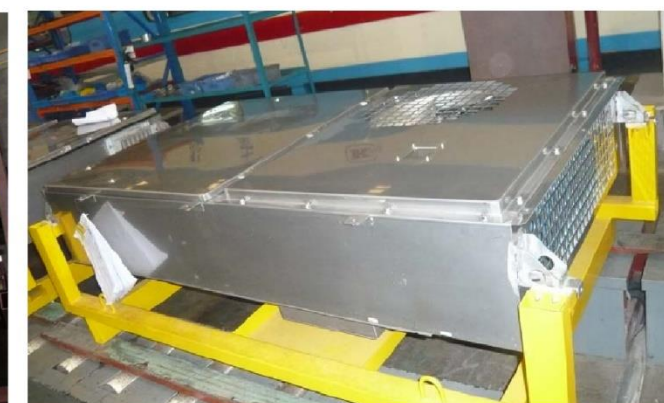


3- HVAC

- An air conditioning unit is respectively set at both ends of each vehicle. The cooling capacity of each unit is 29 kW; the air output is 4,000 m³/h (1,150m³/h of fresh air). Environmental friendly refrigerant R407C is adopted. Two independent cooling circuits are adopted inside each unit, featuring good energy saving and adjusting functions.
- Roof mounted structure is adopted by the saloon units.
- An independent unit is set for the cab. The cooling capacity is 4.5 kW; the overall air volume is 800 m³/h and the fresh air volume is 150 m³/h. Environmental friendly refrigerant R407C is adopted.
- To ensure the smooth fresh air transmission, 4 exhaust outlets are set in the middle of each vehicle roof; natural exhaust is adopted to exhaust using the positive pressure inside the vehicle, so as to ensure a positive pressure of 30~50 Pa inside the vehicle.
- The main air ducts of the saloon adopt static ones made of aluminum and heat insulated; even air output is ensured for the saloons.
- Two 500 W electric heaters are set under the 6-person seats. The total power of every vehicle is 6 kW. So as to ensure the heating demands in winter.



▶ Saloon air conditioning unit



▶ Cab air conditioning unit

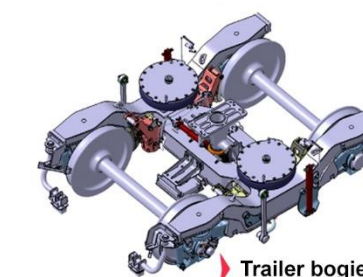
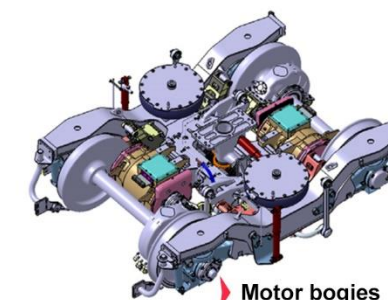
4- Bogies

The bogies can be divided into motor bogies and trailer bogies. The bogies on the Tc cars are Trailer bogies; the bogies on the Mp and M cars are Motor bogies.

- Distance between bogie pivot centers 12,600 mm
- Diameter of mono-bloc rolled steel wheel

New wheel	Φ840 mm
Max wear	Φ770 mm
- Axle load ≤ 14 t
- Weight

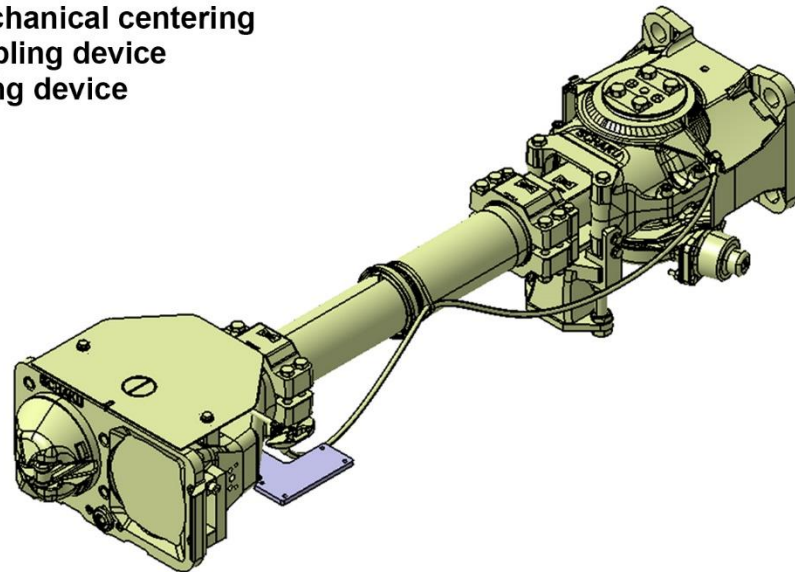
Motor car	~ 7 t
Trailer	~ 5 t



5- Semi-automatic coupler

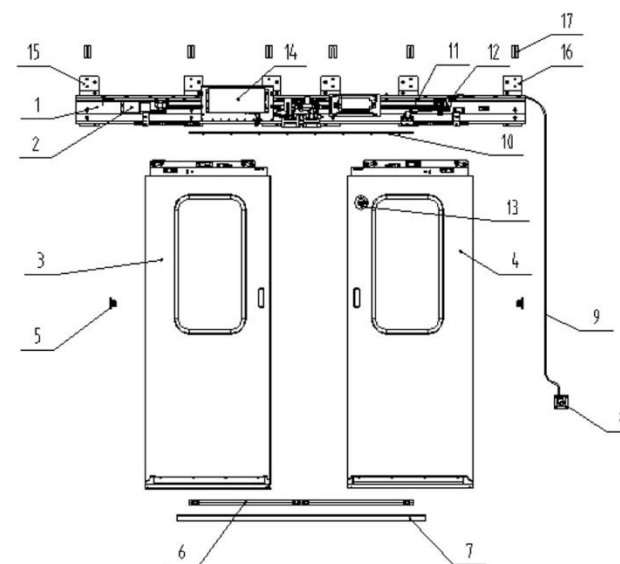
Semi-automatic coupler is supplied by Voith Company and its main characteristics are as follows:

- Automatic mechanical and pneumatic connection
- Manual electric connection
- Automatic mechanical centering
- Manual uncoupling device
- Height adjusting device



6- Door System

Door system is supplied by Kangni and Main Parameters of the Saloon Doors are as below table:



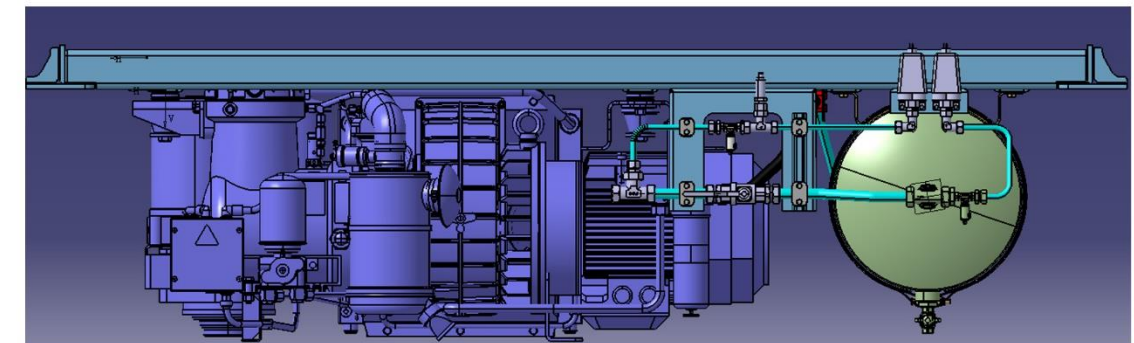
Main Parameters of the Saloon Doors	
Free passage width	1300 mm
Free passage height	1950 mm
Supply voltage	110 V (77~121V)
Door opening/closing time	3.0±0.5sec.

7- Brake

- The brake system is supplied by Knorr and made up of independent brake modules called EBCU. Each EBCU controls the execution of the brake of a single vehicle.
- The brake system is based on the control of brake application on every bogie. And the wheel slide protection (WSP) is realized via every axle.
- The communications between the EBCU and the train control system is realized via the MVB and hardwired signals.

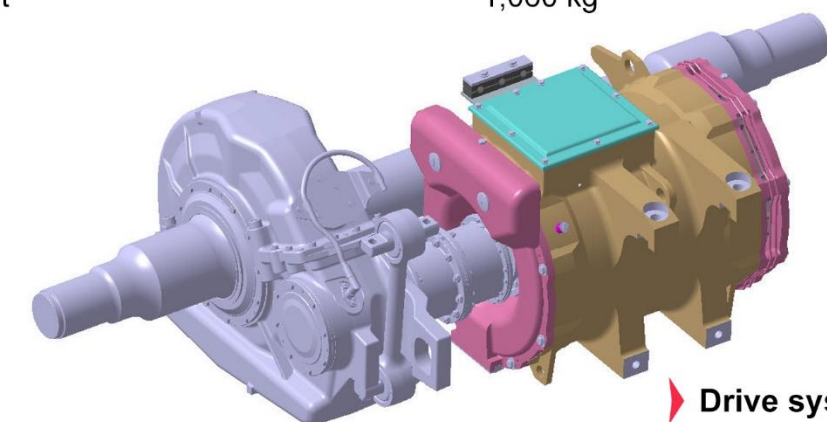
Main functions:

- Service brake;
- Fast brake;
- Hold brake;
- Emergency brake;
- Parking brake.



8- Drive system

- Rated power (continuously) 250 kW
- Starting torque 1,570 Nm
- Gearbox ratio 6,68
- Wheel diameter (new/worn) 840/770 mm
- Top of rail clearance 60 mm
- Weight 1,060 kg



► Drive system data