conditions.

1.12.8 The risk caused by equipment with strong magnetic field will be fully taken into consideration and avoided.

1.13 Reliability

The design of the vehicle, system, equipment and component will be designed based on safety, reliability, maintainability, availability and testability, with feasibility and accessibility during production and operation fully taken into consideration. The reliability of all the onboard equipment is clearly specified in the design.

1.13.1 Reliability Index

The MDBF (mean distance between failure) demanded for the whole train formation, both 6-car and 9-car, in service should be ≥ 200,000 car-km (service failure) according to EN50126.

1.14 Interchangeability

The vehicle and the various main systems will adopt modularized design, and the installation of the various equipment (including slot, pipes, junction box and equipment box etc.) will be designed to be with modularized structure with independent function. The various modules are easy to be pre-made, with easy maintenance taken into consideration.

1.15 Unit System

The design and production of the vehicle and components will adopt international (metric) system except the pipe thread for sealing that will adopt English system.

1.16 Marks and Levels

1.16.1 The vehicle and the various onboard equipment are provided with product marks, including product name, No., type, basic data, ex-works date and manufacturer name etc.

1.16.2 The equipment that may cause human injure is provided with clear safety marks to guarantee human safety.

1.16.3 The content of safety & service marks (mode, size, color and position etc.) will be provided as required by the Buyer. The equipment that may need passenger's operation (extinguisher and alarm etc.) will be provided with simple and concise operation description.

Inside the passenger saloon, marks such as vehicle No. and rated capacity are provided.

The front end of the train is provided with a train set No. and either side is provided with
vehicle No.

The exterior of the vehicle is provided with lifting seat mark. Both ends are provided with marks of end I and end II.

The related area inside is provided with wheelchair mark.

Related notice marks are provided at necessary positions.

All the marks will adopt Chinese GB standard, TB/T standard or international standard.

1.16.4 All the marking letters (manufacturer name not included) will adopt Spanish, waterproof and corrosion resistant, which can withstand any technical cleaning.

1.17 Norms and Standards Adopted in Design

1.17.1 The vehicle will satisfy standard such as GB/T7928-2003 General Technical Specifications of Underground Railway Vehicles of the People’s Republic of China. As will fulfill EN12663 PIII (800kN) and EN 15227 CI Standard, the Seller will send a computer simulation report by data archive to prove the standard achievement.

1.17.2 Design, production, test and adopted material of the vehicle will all satisfy Chinese GB standard and TB/T standard and the imported component will also satisfy the standard of the supplier’s country approved by the Buyer.

1.17.3 The measures focusing on environment friendliness and occupational safety and health will be taken into consideration in the design; The environment friendly product and material will be adopted to save resources and energy and to reduce pollution.

2. GENERAL LAYOUT OF TRAIN AND VEHICLE

2.1 General Layout of Train

The train formation is 9-car (5M4T or 6M3T) and 6-car (3M3T or 4M2T), with composition of

\[= TC - M - M - T1 - M - T2 - M - M - TC = \] and

\[= TC - M - M - T2 - M - TC = \]

In order to make full use of the capacity of the electrical brake of the EMU and to reduce the consumption of the brake discs and pieces by the pneumatic brake, it is proposed by CSR Sifang to adopt the above-mentioned composition proposal. This detailed train formation will be decided at design phase.

Balanced equipment layout of the whole train will be fully taken into consideration in the layout of the equipment under the floor. The equipment will be divided into several areas according to different functions. Enough maintenance space will be spared between parts and areas.
The safety clearance between the moveable parts such as carbody, equipment, pipe, wire and bogie etc. will be fully paid attention to and checked.

The parts such as gangway, coupler and end connector will be adapted to the operation of the train under the various track conditions.

Each middle car will be provided with wheelchair area in one end of saloon. On the side wall above wheelchair area may have bike hook to holding bike. If customs want to have a dedicate car for more bikes, this car will be T2 and a few seats should be removed to make space for bikes. Detail design will be discussed in design stage.

2.2 General Layout of TC

The general layout of TC includes upper part and lower part, in which the former consists of cab and passenger saloon and the latter includes bogie and the suspended equipment (end connector included).

2.2.1 Cab

The front of the cab is provided with the driver's console, which is equipped with control handles for traction/brake, various indication, meters, display of monitoring system, broadcasting, air conditioner. Radio and operation and indication of ATP are not supplied by Seller but it should be ready to receive, install the equipments of signal system according to ETCS level 1 standard. and radio communication system. The Buyer responsible for the installation equipments and wires, cables that within and connected to these signal equipments. Buyer responsible for make signal system and radio communication system, that's not the supply scope of Seller, full function. The Seller will offer necessary help for these works. Inside the cab, an electric heating device with air supplying device is provided.

The cab is provided with a laterally and longitudinally adjustable seat, with folding back.

Either side of the rear of the cab is provided with an electric equipment cabinet. The left side (side II) is provided with equipment cabinet of the signal system (hereafter called signal cabinet), whose side is provided with fire extinguisher. The right side is provided with electric equipment cabinet for the driver. The appearance of the two cabinets is harmonic with the interior lining of the cab.

Either side of the cab is provided with a door for driver.

The front window of the cab adopts monobloc safety glass, with inserted electric heating device to avoid frosting to guarantee the safety of the operation. The glass is mounted through pasting. The two sided of the lower part of the front window are respectively provided with a front lighting lamp and a marking lamp, with adjustable luminance. The exterior side of the front window is provided with one electric wiper with injection function. The interior side of the front window is provided with manual retractable sunshade.

The cooling wind of TC cab is provided by air conditioner of saloon through branch of air duct.

2.2.2 Passenger saloon
The hard cushioned seats of the passenger saloon of the car adopt 2+2 arrangement, with textile cover, with cushion and back inserted with polyurethane high-resilience foam material; The middle ceiling panel and side ceiling panel adopt GRP or aluminum plate and unit modularized design, without exposed nut.

The illumination at point of 1000mm above the floor should be at least 250 Lux. The air delivery from ceiling is side way air delivery method through concealed air grille port. The side wall is combined module structure made by FRP or aluminum panel. On the corridor side, one handrail is set above the seat back. Each side of middle corridor, longitudinal handrail is set according to the position of seats. Base on the same method, similar equipment is set at the entrance door area. The handrail and other entrance facilities are designed with touching and visual features to facilitate the visual disordered passengers. Each car is provided with two areas for wheelchairs.

The passenger saloon is provided with 6 pairs of side doors, 3 for either side. The side door of the passenger saloon in the middle is provided with exterior switch and interior emergency unlocking device.

The side wall is provided with unit fixed side window. The upper part of either side of either end is provided with two internally turnover moveable window for emergency ventilation. Safety glass of windows is double layer hollowed type with dark color polycarbonate plate outside, to reduce the radiation from sunshine.

The passenger saloon of TC is provided with 60 seats. The lower part of the AC electric equipment cabinet is provided with two 4L fire extinguishers. The installation of the fire extinguishers will satisfy related installation specifications, no abnormal conditions will occur under any working conditions of the train.

Side I of the tail end of the passenger saloon of TC is provided with DC electric equipment cabinet, and side II is provided with AC electric equipment cabinet. These two electric cabinets in saloon have strong outside cover and tightly locked, only authorized person, such as train driver and maintenance employ, can open it by key. The exterior of the electric equipment cabinet is harmonic with the interior lining of the passenger saloon to guarantee the integrity and elegance of the passenger saloon.

Through lighting lamp is adopted for the passenger saloon and the door area is provided with emergency lighting lamp to guarantee the lighting in the passenger saloon under emergency.

The upper parts of the both end walls inside the passenger saloon are respectively provided with a LED passenger information display, which can indicate the service information synchronous with the broadcasting system.

The upper part of the side door of each passenger saloon is provided with electronic map.

2.2.3 Roof and exterior

Each car is provided with two sets of roof mounted unit cooling and heating air conditioner set.

The exterior of the side walls are respectively provided with door-closing-finished
indicators.

2.2.4 Underframe

The equipment provided under the underframe includes equipment of brake system (air compressor included), auxiliary power supply equipments etc., and related pipes, wires and slots etc. The cowcatcher provided in the front of the bogie at end l.

The bogie is also provided with earthing device, speed sensor and its wires and pipes.

2.3 General Layout of M

The general layout of M includes upper part and lower part, in which the former consists of passenger saloon and exterior equipment, and the latter includes bogie and the suspended equipment (end connection included).

2.3.1 Passenger saloon

The passenger saloon layout of M is basically same to that of TC. The difference is: The quantity of the seats is 12 more than that of TC; Folding seats will not installed in wheelchair area, and when the space is not occupied by the wheelchair can standing more passengers.

2.3.2 Roof and exterior

Each M car is provided with two sets of roof mounted unit cooling and heating air conditioner set.

The exterior of the side walls are respectively provided with door-closing-finished indicators.

2.3.3 Underframe

The equipment provided under the underframe includes equipment of brake system, equipment of the traction system, and related pipes, wires and slots etc.

The running gears of M car are two 2-axle motor bogies.

The bogie is also provided with earthing device, speed sensor and its wires and pipes.

2.4 General Layout of T

The general layout of T includes upper part and lower part. Upper part consists of passenger saloon and exterior equipment, as same as M cars. Lower part includes trailer bogies and the suspended equipment (end connection included).

The suspended equipment under T mainly included equipment of the brake system, in which, as for the pipes and wires, the train line is necessary to get crossing treatment.

2.4.1 Passenger saloon

The passenger saloon layout of T car is as same as M car.
2.4.2 Roof and exterior

Each car is provided with two sets of roof mounted unit cooling and heating air conditioner set.

The exterior of the side walls are respectively provided with door-closing-finished indicators.

2.4.3 Underframe

The difference between T1 and T2 is that T1 car has auxiliary power converter(SIV) like TC but have no battery charger, and T2 car has battery box.

The equipment provided under the underframe mainly includes related equipment of brake system and related pipes, wires and slots etc..

The bogies of T1 and T2 cars are two 2-axle trailer bogies.

The bogie is also provided with earthing device, speed sensor and its wires and pipes.

3. GENERAL STRUCTURE AND EQUIPMENT LAYOUT

3.1 Carbody Steel Structure

The side wall plate adopts flat steel plate. The flat roof at air conditioner seat adopts stainless steel. All the plates will have good weldability. Materials for steel plate, steel sheet and steel profile are as follows:

- Atmospheric corrosion resisting structural steel for those with thickness not more than 10mm;
- Q310GNH for those with thickness not more than 2.5mm;
- Q355GNH for those with thickness of 3~10mm;
- Q345C for those with thickness more than 10mm;
- Q235 steel is permissible for steel profile

The carbody can withstand longitudinal compression load of 800kN (EN12663 PIII). Both ends of each car of train equipment with anti-climber devices.

Anti-climb device is set at car end.

3.1.1 Either side of the roof is provided with eave.

3.1.2 Traction and buffer device

The front end of TC car is provided with semi-Automatic coupler with buffer. Semi-permanent draw bars are provided in-between cars.

3.1.3 Tightlock folding diagphragm is adopted , with width of gangway of 1300mm.
Monobloc gangway is adopted, which is the part with flexibility, permitting the relative movement between cars and providing passengers a safe and comfortable passage.

Thanks to the structure and the design, the gangway is almost maintenance free and with long service life.

3.1.4 Either side of the car is provided with three electrically controlled pocket doors.

Main data of door:

Net opening width: 1400±4mm

Net opening height: 1860±10mm

Working voltage: DC110V

Opening time: 3±0.5s (adjustable)

Closing time: 3±0.5s (adjustable)

Adjusting range of opening and closing: 2.5s ~ 4.0s (adjustable)

Min. detectable objective: 30×60 mm (width x height)

Aluminum honeycomb structure is adopted for door panels, with aluminum frame, cover and aluminum honeycomb core, heat solidification adopted. To strengthen the mechanical strength, the surrounding of the cover are all wrapped on the aluminum frame.

Screw is adopted for the transmission. The drive mechanism integrates the guiding device, drive device and locking device into one compact function unit, with features of safety, reliability, easy installation and maintenance.

The side door of the passenger saloon is provided with safety measures such as reliable mechanical locking mechanism, fault isolation device, emergency unlocking device and re-opening, which guarantee the safety of the door.

The door has self-diagnosis function and fault recording function. The microprocessor has the function to communicate with the train bus. The control of the door is carried out through hard connected wire. Besides, the capacity of controlling the door through the train bus is reserved.

3.1.5 Structure and Material of Interior Lining

Foil covered fiberglass plate is adopted for heat insulation material for the carbody. Self-extinguishing polythene foam plastics is adopted for bent beam of the roof, upright sill of the side wall and end electrical coupler socket, and self-adhesive material is adopted for sealing.

Aluminum profile is adopted for wall and roof inside. Wall plate and roof plate adopt FRP material. Veneer is adopted for the floor, covered with retardant PVC floor cover. The end partition wall plate adopts veneer, covered with anti-flame cover. Floor coverings welded seamlessly, and tightly connected to the saloon side wall. When clean saloon with lot of...
water, it will not injected into structures and keep dry inside.

3.1.6 Window of passenger saloon

Two types of passenger saloon windows are adopted: unit integrated fixed window and unit integrated moveable window.

Double-layer safety glass is adopted for the window, with dark color polycarbonate plate outside, to reduce the radiation from sunshine. This safety glass can satisfy GB18045. The safety glass is stamped with qualified marks, which can be seen from inside the car. The window frame adopts extruded aluminium alloy profile, which can satisfy GB6892-2006 Extruded Aluminum and Aluminum Alloy Profile, and produced as per realted accuracy level. The profile will get manual aging treatment and oxidation treatment.

3.1.7 Stainless steel is adopted for underframe brake pipes and pipe connectors.

3.2 Structure of main circuit

The traction system will be one of these following brands named by the Buyer: Alstom, Siemens, Toshiba, Bombardier, ABB, Mitsubishi Electric/Times Electric, TOYO Denki, Mitsubishi Electric/Fujitsu or its' Joint Venture in China.

The Seller will make his best efforts for both line having same brand, by being not possible, it will be allowed for each line having one brand, that will be different from each other. The Seller shall be free of any liability of delivery delay of EMU(s) caused by the supply delay of the traction system named by the Buyer here above.

Voltage source inverting circuit is adopted for the main circuit. The DC800V current input by the current collector is converted to 3-phase AC power, frequency and voltage variable, by the traction inverter (VVVF) to feed the 4 asynchronous traction motors. Each VVVF inverter unit feeds the 4 paralleled traction motors on the two bogies of a car. When the voltage of power supply is in the range of 560V~960V, the main circuit can work normally, and contactless traction-brake changeover can be conveniently realized.

The main circuit consists of high-voltage electric appliances and energy releasing unit, charging & discharging unit of capacitor, filtering unit, resistance brake chopper and overvoltage suppressor, inverter unit, asynchronous traction motor and checking unit etc. The components of the main circuit can all satisfy traction and brake of the train.

3.2.1 Main circuit device

The device of the whole main circuit consists of: high speed circuit breaker (HSCB1), traction inverter box (INV, circuit resistor L1 included), brake resistance (RB), traction motor (M1~M4) and current collector (CCD) and earthing brush etc.

The traction inverter box (INV) consists of differential current sensor, charging & discharging contactor, checking sensor, inverting module and control device of traction inverter (DCU) etc.

3.2.2 Resistance brake chopper and overvoltage suppressor
The resistance brake chopper and overvoltage suppressor consists of IGBT chopping module and brake resistance (RB) etc., with protection for over current of brake resistance circuit under resistance brake conditions, failure of IGBT element and overheat of brake resistance etc.. IGBT module and inverting module, integrated together, form the inverter module.

Under generative brake, when the voltage of both ends of the capacitance rises to a certain value, then the chopping module of the resistance brake will be triggered to regulate the operating angle of the switch element to control the voltage of both ends of the capacitance to a certain value, when generative brake and resistance brake are blended. In case that voltage of both ends of the capacitance or the voltage drops of third rail, then the generative brake will work instead of resistance brake. Under traction, the transient overvoltage will be restrained. Under AW2 conditions, the rheostatic brake can be blended into the service brake to the max level.

3.2.3 Inverter

IGBT module is adopted for the inverter, which is a 2-point inverting circuit. A traction inverter drives 4 motors.

The general structure of the inverter, with principle of modularization and easy check, is integrated in a traction inverter box. IGBT element is adopted for the inverter, whose control device is set in a box for easy control and reduction of interference. Modular design is adopted for every inverter component, with simple structure, small volume, light weight and easy maintenance. The inverter adopts radiator and natural air cooling, with inverter conforming to IEC61287-1 and IEC61377 etc.. The main technical features are as follows:

The module integrates the 3-phase bridge arm and brake phase bridge arm, and includes radiator, temperature sensor, gate control unit, gate control power supply, impulse distribution unit, support capacitor (filter capacitor) and low induction bus bar etc., with high integration;

The adoption of module greatly reduces external wiring, with simple assembling (disassembling) and easy maintenance;

Optical fiber transmission technology is adopted for gate drive, with strong anti-interference capacity;

Low induction bus bar is adopted for connection, without absorption circuit. The circuit is concise, with high efficiency and reliability;

3.2.4 Traction inverter control device

The traction inverter control unit means drive control unit, with vector control adopted, which mainly carries out timely control of IGBT inverter and AC asynchronous traction motor, adhesion control and brake chopping control, and it also has the functions such as complete traction conversion system protection, fault diagnosis of module level, certain self_restore, fault record and some control of car level, such as traction/brake characteristics and unlocking logic control of main circuit.
3.2.5 Traction motor

3-phase AC asynchronous traction motor is adopted, which can satisfy the traction/brake performance and the service of the train. The traction motor conforms to IEC60349-2 and IEC61377 etc., with existing product to be applied.

Basic technical data of the traction motor are as follows:

Rated power: 180kW (temporarily determined)
Voltage of motor: 550V
Efficiency: 92%
Power factor: 0.86
Number of poles: 4
Insulation grade: 200

3.2.6 Current collector

Main technical data
Rated working voltage: DC800V
Range of voltage: DC560 ~ 960V
Max. voltage: DC1000V
Rated working current: 800A (temporarily determined)
Contact pressure: 120N (Standard static)
Working pressure: 96N-144N
Current collection: current collection through lower contact of third rail
Current collector shoe: The material is to be determined by material of third rail.
Current collector shoe extraction: manual
Vertical displacement: 40mm (4mm for each tooth)

Structure of Current collector

Under any track conditions, the current collector can guarantee good contacting conditions and contacting stability with the third rail. Through the elastic bearing, under the application of the spring, the current collector shoe of each bogie can contact the third rail smoothly to collect current. Each bogie of each car shall be equipped with current collectors.

Mechanical stop is provided to prevent the vertical movement of the current collector in the...
The current collector will have good dynamic performance in the whole speed range of the train.

The current collector adopts simple flexible structure with self-adapting swing bar, with good flexibility;

Under any track conditions, the current collector can guarantee good contacting conditions and contacting stability with the third rail. The contacting pressure, rotating angle and contacting surface can all satisfy the service of the train.

Easy Check and Replacement

The current collector is directly connected to the bogie via insulation base, insulator unnecessary, with compact structure, small volume, light weight, easy maintenance and replacement.

The fuse is the electric protection element in the fuse box of the current collector; The box has transparent check window, through which, the change of the red mark on the fuse, with working state indication, can be clearly seen.

3.3 Auxiliary Power System

The auxiliary inverter is mainly used to supply power for the air conditioning, lighting, public address, and passenger information display system, air compressors, control circuits of all the sub-systems and the TMS, on-board signal system, and communication equipments. Auxiliary isolation switch and earthing switch are provided in the circuit of the auxiliary inverter. The auxiliary inverter is connected to the high voltage bus/external power supply device via auxiliary isolation switch. The main features of the auxiliary inverter are as follows:

Each auxiliary inverter of TC car consists of one underframe mounted box containing mainly one DC/AC inverter and one battery charger (AC/DC converter). The auxiliary inverter of T1 car without battery charger.

Each train is equipped with 3 auxiliary inverters.

This auxiliary inverter outputs 3-phase AC380V 50Hz power with neutral point and DC110V power.

The capacity of the auxiliary inverter is temporarily determined as 145kVA. Each train is equipped with 3 auxiliary inverters, which are set under the two TC car and one T1 car.

The calculation report of auxiliary load will be submitted during design phase.

3.3.1 The major functional module of the auxiliary inverter are as follows:

Input circuit
3-phase inverter: 3-phase PWM-controlled IGBT inverter inverts the power of the circuit to the regular AC 380V 50 Hz output power.

Output isolation transformer and AC wave filter for inverter output

Cooling system

battery charger

3.3.2 Trouble shooting

Under normal conditions, the 3 static inverters (SIV) in a 9-car composition train supply the auxiliary loadings of the whole train. In case that 1 SIV fails, the other 2 SIVs are able to take over the basic loadings of the 9 cars and guarantee the normal operation of the train, and under this condition, the loadings of the fault SIV is supplied via extension power supply circuit. The fault information will be displayed on the TMS monitor via the train network and therefore the driver will be informed. The details will be submitted during design phase.

Under normal conditions, the 2 static inverter (SIV) of each train supply the auxiliary loadings of the whole 6-car train. In case that 1 SIV fails, the other 1 SIV is able to take over the basic loadings of 6 cars and guarantee the normal operation of the train, and under this condition, the loading of the fault SIV is supplied via extension power supply circuit. The fault information will be displayed on the TMS monitor via the train network and therefore the driver will be informed. The details will be submitted during design phase.

3.3.3 Battery set

Each train is provided with 2 DC110V battery set.

Recommendation: 60Ah sealed lead-acid jell battery.

The service life is not less than 10 years.

The casing of the battery adopts flame retardant material.

The battery box is designed with ventilation and draining holes, and the batteries are installed on the anti-corrosion trays with rollers. The design of the battery box can ensure the proper temperature for operation and the ease for inspection and maintenance.

3.4 Train Control and Management System (TMS)

3.4.1 System characteristics and objects to be monitored

The system features the following characteristics:

If the main on-board equipments are provide with serial communication interface, the system is able to enhance the performance of monitoring over the components by collecting the self inspection data of these on-board equipments via the serial communication interfaces.
The system adopts high resolution graphic alphanumeric display with high performance and touching input.

The data recorded can be downloaded to the ground equipments via the RS232 cable connected to the maintenance serial port of the TMS.

Object to be monitored (includes but not limited to):

Traction inverter
Auxiliary inverter
Brake system
Air conditioning system
Door system
Public address and information display system
CCTV monitoring system

3.4.2 General description on train control

The traction control, train control, train operation information, monitoring over the major equipments, and train diagnose adopts the control mode of bus. The train bus system complies with IEC61375 or other related standards. The bus control system is proven and reliable.

3.4.3 Redundancy of the train bus

The train bus system is composed of train bus and car bus with redundancy structure, providing redundancy to the relevant critical parts, namely, a single node failure in the train bus or the car bus will not lead to the halt of the traction. The train-control level train bus is connected to the local multi-function car bus via CCU/LU, with which, the train bus connect all the control units and transfer the train-level data to realize data exchange, and the car bus connect itself to the various sub-systems via bus connector or I/O to transfer control data, information data, etc. to control and realize the corresponding functions of the sub-systems.

The following data transmission is permissible in the two bus system:

Process data
Communication data

3.4.4 Control level

The control of the train and car is divided into three levels: train control level, car control level, and sub-system control level (including traction/brake control, air brake, auxiliary power, door control, auxiliary AC system control, passenger information system, etc.), and each control level is provided with redundancy structure.
The train control unit (CCU/LU) and car control unit integrate with each other to realize the following major functions:

Train control via train bus (excluding emergency brake)

Bus management and process data communication

Monitoring

Fault diagnose

Communication with sub-systems via multi-function car bus

Service interface to the exterior PC

The structure of the CCU ensures the reliable operation of the above functions and it includes the elements with proper functions to realize the corresponding targets.

Main technical data;

32 bite processor 32

Serial port

Clock

Each CCU is provided with individual power source

Any min. replaceable unit can be detected

The train control level provides the control signals of the whole train and fault information, and the train bus has enough redundancy to the train level. The permissible communication rate of the train bus is not less than 1 Mbit/s.

The car control level provides local control signals to the local car, the distributes the signals to the various units of the whole car via car bus.

The sub-system control is the lowest level, and it provides control to the various sub-systems. Each sub-system of the local car has its own control system, such as traction/brake system, air conditioning system, public address and information display system, saloon video monitoring system (CCTV), etc..

3.5 Public Address and Information Display System

3.5.1 Composition of system equipments

Each train is provided with 2 sets of public address equipments (including information display device), and each set of public address equipment is mainly composed of the cab equipments, saloon equipments, and auxiliary equipments. Each cab is provided with 1 set of equipment, being hot backup for each other. The public address system can also work normally with the power supply only from the batteries.
The whole system features the following characteristics:

Modularized

Suitable for on-board application

High reliability

Maintainability

High redundancy

Both software and hardware have self inspection function

Can be customized

3.5.2 Cab equipments

1. Public address system controller 1/cab;

2. Audio processor (integrated in the public address system controller)

3. Driver control unit 1/cab;

4. Intercom device of cab (integrated in the driver control unit)

5. Terminal station display device (LED) 1/cab;

Public address system controller

The public address system controller is the core component of the public address system. The controllers in the rear and front cab work under master mode (activated mode) or slave mode (standing by mode) according to the activation orders and work as hot backups for each other. The activated controller is responsible for the management and control of the whole system, and with the cooperation form the other equipments, realize all the functions such as audio play and intercom.

Cab control unit

The cab control unit provides good human machine interface for the operators. The main functions include public address control, system control, public address monitor, cab intercom and display. The driver can set and update the operation chart of the train via the control buttons on the panel.

Terminal station display device

The LED terminal station display adopts ultra-high illumination module providing clear display and far visible distance without any joint seam. The terminal station can be preset on the LED display according to the operating requirements of the train, the current terminal station can be displayed in real time, and the language displayed can be adjusted by the client.