

W Class Tram Modernisation

TTM Rail was chosen to be the main supplier of the electrical equipment and systems for the restoration and modernisation of Melbourne's historically significant W class trams, named the new 'W8 class' tram.

We have designed and supplied complete systems for the modernisation project which includes the following systems.

DC Traction Chopper System

The traction chopper system was designed in such a way to provide increased reliability, redundancy and maintainability for the life of the restored W8 class trams. A completely customised housing was designed to fit the system within the available tram structure and kinematic envelope. The system included an LCD message display installed in the driver's cabin to provide real time status and fault data to the drivers. A maintenance access panel was also incorporated into the design at the customer's request to allow ease of access to such data as voltage and current monitoring of the system. The traction system was also subjected to complete shock and vibration testing to the latest rolling stock standards. Installation and commissioning services of the complete system were also provided by TTM Rail. The overall result of this system was an increase in the safety, reliability, efficiency and maintainability of the traction system, while providing a smoother ride for drivers and customers.

Modernisation of the Driver's Master Controllers

The objective of this modification was to provide a safer, more reliable and much smaller system to install within the master controllers, while maintaining a similar tactile feedback and heritage visual look. As the existing parts were required to be used and no original drawings existed for any components of this controller, our 3D scanning capabilities were utilised to obtain accurate models of the existing components, which were then modified in our 3D CAD software, and redesigned to incorporate a modern control system. The new design comprised of contactless potentiometers coupled to a modified existing main acceleration shaft, and a series of inductive proximity sensors mounted around the modified forward/reverse and acceleration shaft for other feedback signals required.

Supply of two 13kVA Vossloh Kiepe KGU 3-phase Inverters per Tram

Two inverters were required for the supply of auxiliary power in each tram. One inverter was used to supply 230VAC, 3 phase power to the braking compressor only. The other inverter was required to supply the 3 phase 400VAC driver's cab air conditioning system, and the modified single phase 230VAC driver and saloon heaters.

Design and Manufacture of the Driver's Console and Offside Cabinet Panels

Over the many years of service, the W class drivers console gradually expanded with the addition of boxes and buttons mounted to the side of the existing equipment as required. This resulted in a much larger than desired drivers console assembly. Our customer requested TTM Rail design a new driver's console and offside panel assembly, with consideration for improving the aesthetics, reducing the size, increasing the driver's visibility, including a high mounted brake light, and most importantly improving the ergonomics and function of the design. All of these targets were achieved, with a simple, robust, plug and play box. The interfaces and controls required while driving the tram were included on the driver's console to minimise the time the driver needs to take their eyes off the road, while the less frequently used controls were shifted to an offside panel.

Design and Supply of 24VDC LED 'Heritage Look' Saloon Lighting

As part of the overall target to increase the safety of the vehicle by removing the 600VDC from the drivers cabin and saloon, our customer requested that TTM Rail design and supply an efficient 24VDC LED saloon light to replace the original 600VDC lighting system. While simple on their own, a challenging task was created when the following requirements were put together. The lights were required to:

Utilise efficient 24VDC LED lights;

Maintain the same light colour as the original globes, while increasing the luminosity to meet current rolling stock standards for vehicle lighting;

Use the same mounting points and maintain the same external heritage look and glow of the original lights.

Overhaul and Modification of the existing Driver's and Saloon Heaters

The existing heaters were originally operated by a 600VDC supply. To increase the safety of the vehicle, an overall requirement of removing the 600VDC supply from the driver's cabin and saloon was targeted. This involved modifying the existing heaters to operate from a combination of 240VAC (saloon heaters), and 240VAC/24VDC (Driver's Heaters).