



First Capital Connect

Brake Code Conversion Unit

Obsolete part replaced with more reliable products

The Challenge

The brake code conversion unit (CCU) originally installed onto the Class 313, 507 and 508 EMUs is obsolete and no longer supported by the original manufacturer. This is due to obsolete hardware fitted to the original design.

The Westcode 2M CCU converts the Gray code signal provided by the cab brake controller into a two-wire binary signal which controls the Electro-pneumatic (EP) brake valves. The brake controller provides information on brake demand in the form of three wire inputs.

The replacement design needs to be functionally identical to the existing item, but to utilise modern relay components in place of the original contactors.

The Solution

Unipart Rail redesigned the code conversion unit (CCU) to be a direct replacement for the original unit as it occupies the same space envelope and mounting locations. The replacement product incorporates modern relay components that are more reliable and require lower power consumption than the original unit.

Unipart Rail subjected the new unit to all relevant shock and vibration and over voltage tests, both of which the unit successfully passed. Additionally, simulated life service testing was carried out to ensure that the reliability of the system is improved over the original design.

Throughout the development of the product, Unipart Rail worked closely with First Capital Connect (FCC) to ensure that the final design met the expectations and specification required by the train operator. Alongside addressing the concern over obsolescence, the new units show improvements in terms of reduced power consumption, reduced mass and reduced failure modes which could result in wrong side failure.

"The fit and performance of the CCUs has been exactly as expected with no increase in labour or difficulty and as a result FCC have placed an order to fleet fit the new components".

Mark Sharman, Asset Engineer from First Capital Connect



The Result

The new Unipart Rail CCU product has been proved in service to have:

- Less power consumption than the original unit,
- Reduction in potential failure modes resulting in a wrong side failure
- Reduced mass
- Added provision for equipotential bonding
- Improved reliability
- Certified product conforming to all relevant safety standards
- Can be fitted as a replacement unit in less than 30 minutes

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