

Multiway DC Immune RCD Assemblies for Network Rail Installations

Trains on the UK rail network use a variety of traction systems: about 30% are diesel electric and the rest are directly powered from 25kV overhead lines or the 750V DC “third rail” system. The third rail system is limited to the South-East of the country (the old Southern Region) and to Merseyrail in the North-West. The third rail system is ideally suited to providing power in congested areas where the installation of overhead lines is impractical.

A problem associated with the third rail system is that the performance of standard RCDs installed within 30 metres of the running rail can be adversely affected by the presence of stray DC currents. Unlike many RCD related issues, the problem isn't one of nuisance tripping. Instead the problem is that the presence of high DC currents cause standard RCDs to desensitise i.e. they require an earth leakage of more than 30mA to make them operate. The presence of a superimposed DC current of 100mA can require an earth leakage current of 120mA to trip a 30mA Type AC RCD. A superimposed DC current of 200mA can require an earth leakage current of 60mA to trip a 30mA Type A RCD to operate. In both instances a standard Type A or Type AC RCD does not provide users with the level of protection expected from a device with a 30mA sensitivity.

For nearly 50 years Blakley Electrics has supplied “DC Immune” RCD equipment for installation in Network Rail third rail areas i.e. a superimposed DC current of 1 amp has no discernible effect on the operating performance of our 30mA Type A RCD. Data Sheet PDS024 contains further information on DC Immunity.

Network Rail installations are often designed around standard MCB distribution boards with individual DC Immune RCDs protecting socket circuits (our ELE series). We are also able to supply multi-way boards, which receive multiple MCB protected circuits (from a local MCB board) and provide in-line DC Immune RCD protection for each circuit. On a recent project we supplied a number of boards that could receive up to 20 single-phase circuits (without RCD protection) and provide each with 30mA DC Immune RCD protection. The RCD assemblies were housed in robust, wall mounting enclosures with top and bottom cable entry and exit. The individual circuits were typically single-phase 32A, although circuits can be TP&N rated up to 63A. We are also able to make conventional MCB boards with a 100A incoming isolator and outgoing circuits protected by DP or 4P MCBs with individual DC Immune RCDs.

If you would like to discuss multi-way in-line DC Immune assemblies, or MCB boards with built-in DC Immune RCD protection, please contact our Projects Team who would be pleased to help.



A7183479 4 way DC Immune RCD Assembly



A7183477 8 way DC Immune RCD Assembly



A7183480 14 way DC Immune RCD Assembly



14 way DC Immune Assembly, Shield Plate Removed