



Distribution



Protection



Transformers



Site Lighting

Experts in **high performance**
power and lighting products

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Blakley Electrics are a specialist designer and manufacturer of transformers, distribution and protection equipment for the UK Rail sector and has been a key supplier to the UK Rail Industry since the 1970s. Although there have been many structural changes during this period, with the two biggest end users, Network Rail and London Underground (LUL), undergoing numerous changes, the fundamental requirements have remained the same, which is the need for high performance, reliable, robust electrical equipment, which can operate for long periods in a hostile, challenging environment.

Trackside Transformers

We have made a wide array of transformers for Trackside installation, including over 10,000 Points Heating Transformers for Overground installations and over 5,000 6 kVA Tunnel Power Transformers for installation throughout the LUL tunnel network. We also have Network Rail approval for isolation transformers for signalling and other applications.

Depots and Train Maintenance

Maintaining rolling stock in good working order is a major undertaking and requires a range of specialist plant and equipment. We have supplied distribution equipment to some of the UK's largest Maintenance and Repair Depots, providing supplies at 24V, 110V, 230V and 400V. RCD protection figures widely, and the addition of Earth Continuity Monitoring protection can also be incorporated in areas of particularly high electrical hazard.

Equipment for Station Installations

Overground and Underground Stations have a wide range of electrical requirements. The multiple locations, the restricted working hours for maintenance, the need to provide a safe environment for large numbers of passengers and staff, coupled with different traction systems, has resulted in the development of a variety of specialist Distribution, Transformer and Protection assemblies, some of which are outlined in this publication.

Detailed data sheets are available on our website for many of our "standard" Rail products. In addition, at our Harlow Engineering Centre, we have a Projects Team who are keen to be involved in the early stages of either a new project or the development of a new product. The Projects Team have acquired a wealth of experience in the Rail field and are keen to make a contribution.





Isolation Transformers, 25 kVA and 50 kVA



Tunnel Power Transformer, 10kVA



Points Heating Transformer, 10 kVA, DC



Isolation Transformer with Switchgear

Our range of trackside transformers has been developed over a long period. Today there is wide acceptance that trackside transformers must be capable of performing for a 15 to 25 year period and that the long term cost benefits of minimal maintenance and extended life far outweigh the apparent disadvantage of a higher initial cost. The use of high performance transformer cores with low inrush current can also have an overall cost benefit, enabling transformers to be protected by "C" type MCBs instead of "D" type MCBs, which can allow supply cables with a smaller cross section to be utilised, due to the closer protection afforded by more sensitive MCBs.

Points Heating

We have Network Rail approved Points Heating Transformers to supply heaters with AC or DC. We also have kits enabling AC output transformers to be converted to DC. All Points Heating Transformers have dual secondary windings, which is a requirement to ensure track circuit immunity. For longevity, enclosures are made from mild steel with a hot dip galvanized finish or they can be made from stainless steel, grade 316L; both types are petroleum jelly filled, to protect the windings and to assist with cooling.

Tunnel Power Transformers

Due to the short period available for maintenance on the London Underground tube system, the decision was made to install a 6 kVA three-phase transformer every 60 metres in all tunnels. Exacting demands were made re: the use of fire safe materials; the physical size; and the electrical performance. We were able to meet all of these requirements and deliver to a very tight schedule. The transformers were installed in 1993/4 and still play a vital role in the maintenance of the tube system. Installation of updated 10kVA versions began in 2015, which have the option of a 400V socket to supply heavy plant.

Isolation Transformers

We have Network Rail approval for a range of 1:1 ratio, isolating transformers rated from 1 kVA to 90 kVA, single and three phase. The transformers are installed when there is a need for isolation between DNO and signalling / traction earthing systems. We have also made step-down and step-up variants to the same general specification.

Step-up Step-down Pairs

Long cable runs can be a feature of track installations. To overcome volts drop and minimise the size of cables, there are benefits in stepping-up the voltage at the start of a circuit and stepping-down at the far end. We can either step-up to 1000V, which is still classified as Low Voltage and is compatible with the use of standard mains cable or we can step-up to 3300V, which requires the use of non-standard cable. Tappings can also be incorporated to help ensure equipment is supplied at the intended voltage. Fluctuating loads present specific problems, which need to be factored into the overall design, which we are pleased to discuss.



LV9 and SMB series Platform Sockets



Transformer Distribution Cubicle (TDC), 6 kVA, 6 way



IP55 Distribution Board



Auto Changeover Assembly



Transformer Distribution Rack (TDR), 3 x 6 kVA

The redevelopment of a live station into a modern transport interchange is a complex, demanding undertaking. In recent years not only has there been a move to develop stations into hubs for Overground, Underground, Tram and Light Rail systems but larger Stations have also become “retail destinations”, increasing still further the range of electrical requirements. Whilst our role in the redevelopment of a station is comparatively minor, we design products that make the overall task easier and, importantly, we have a detailed understanding of Network Rail, London Underground and Light Rail standards and procedures, which can be a considerable benefit when producing equipment for these complex installations.

A variety of electrical supplies are required within a Railway Station for: traction and signalling; communications and data; Low Voltage and Reduced Low Voltage for a wide range of applications. In Underground Stations the use of equipment utilising low fire hazard materials is essential and there is also wide use of alternative or back-up supplies for critical safety systems. Standard off the shelf equipment does not meet all critical requirements and we have developed many specialist products to help fill the gap.

Platform Sockets

To provide supplies for cleaners and maintenance crews, Platform Sockets usually operate at 110V, incorporate MCB and RCD protection and are rated at 16A or 32A. A range of finishes is available and all-metal versions are approved for installation in LUL Section 12 locations.

Transformer Distribution Cubicles and Racks

TDCs and TDRs combine single or multiple transformer cores with integral MCB / RCD distribution arrangements. They are factory built assemblies that minimise installation time and space. TDCs and TDRs typically supply Platform Sockets, Unmanned Ticketing Systems and any other 110V loads.

Auto Changeover Assemblies

These assemblies provide alternative supplies for Communication Equipment Rooms, Lighting Systems and any other critical loads. Assemblies are made to order and the design of the changeover circuitry can be configured to meet the requirements of specific locations and alternative back-up sources (mains or generators).

Distribution Boards

We produce a wide range of heavy duty, three-phase, MCB boards rated at IP55 and IP66, incorporating Schneider switchgear. They are available with up to 24 no. TP outgoing ways and incomers are rated from 125A to 250A. Single-phase MCB boards are also available. In addition, we make a specific range of IP55 boards, which are listed on the LUL Approved Products Register (APR). Non-standard enclosures can be produced if there are space constraints and projecting rain canopies can be incorporated for external or exposed locations.

16A and 32A, 110V, IP55 socket assemblies housed in galvanized enclosures.



TH series step-down transformer, 6 kVA rating, galvanized IP55 enclosure



Multi voltage Power Cluster socket assembly with MCB / RCD protection and integral transformer



16A, 110V, IP55 socket assembly with MCB protection, housed in stainless steel enclosure



Interlocked socket, 230V, with integral RCD protection

The routine cleaning, maintenance and repair of locomotives and rolling stock requires a substantial investment in facilities, plant and machinery. Although many activities are carried out in sheds or under cover, the environment is generally harsh. Therefore equipment of rugged construction, with a high IP rating and providing a high level of electrical protection is required.

The nature of the maintenance work undertaken dictates the range of electrical supplies required and the following summarises typical activities and supply voltages.

Supply	Application
24V SELV	Handlamps for use in confined locations
110V RLV	Portable power tools and some cleaning equipment. The addition of 30mA RCD protection is commonplace.
230V LV	Cleaning equipment and specialist tools. Protection via 30mA RCD and the option of Earth Continuity Monitoring.
400V LV	Larger machines and welding sets. Protection via RCD and the option of Earth Continuity Monitoring.

Power Clusters

These are multi-outlet, multi-voltage assemblies, incorporating all of the switchgear, protection and transformers required at one location, fed from a single supply. We have a standard range of Power Clusters featuring 400V, 230V and 110V sockets but most assemblies are built to order and incorporate the exact configuration of sockets required for a specific installation. In addition, loop-in / loop-out termination arrangements can be incorporated, making these assemblies ideal for installation alongside maintenance tracks.

Individual Socket Outlet Assemblies

We have a range of socket assemblies rated from 16A to 125A, in voltages of 24V, 110V, 230V and 400V, with ingress protection of IP44 or IP55. MCB, RCD and Earth Continuity Monitoring protection can be incorporated (as applicable to the voltage) or protection can be provided at the source. Loop-in / loop-out terminals can also be incorporated. Enclosures are usually fabricated from steel and can have a painted or galvanized finish.

Transformers

To feed sockets at 110V and 24V, we can provide step-down transformers with outgoing fuse, MCB or RCD protection. Transformers are typically rated between 1 kVA and 10 kVA but other ratings can be supplied. Transformers with dual voltage secondaries are also available.



110V Temporary Lighting with 6A, plug-in, IP67 connector



DC Immune RCD Protection Assemblies



Distribution Switchboard with 630A Incomer



Terminal Assembly, IP66

In addition to the specialist equipment detailed elsewhere in this publication, we also supply a cross-section of other products, which are widely used in the Rail sector.

Temporary Power and Lighting

From a 110V low energy lamp to a 3200A, Form 4, Mains Distribution Assembly, our extensive range of site electrical equipment simplifies the task of providing power and lighting for any construction works. Whether the project is the refurbishment of a small station or the construction of a transport interchange, we have site distribution and lighting products that will enable the job to be done safely and efficiently. We also have power and lighting products that are designed for temporary works alongside the rail track or in tunnels. There is extensive product information on our website and we are always happy to provide advice on the requirements for temporary electrical installations.

DC Immune RCDs

Traction supplies in some Network Rail areas, particularly in the old Southern Region, are supplied via the Third Rail system. The presence of superimposed DC current can have an adverse impact on the performance of conventional RCDs i.e. they are desensitised and do not provide the required level of protection against electric shock. Our sensor based RCD assemblies are classified by Network Rail as "DC Immune" and are suitable for installation in locations that are within 30 metres of the Third Rail. DC Immune RCD assemblies can either protect a single ring main or radial circuit or they can be multi-way assemblies protecting multiple circuits.

Cubicle Switchboards

We have made permanent switchboards for a variety of Rail applications, including Tunnel Lighting Cubicles for installation in London Underground Section 12 stations and Form 4 panels supplying retail units in main line stations. Our Distribution Switchboards are made to order and there is usually a requirement in the specification for something out of the ordinary, such as a high IP rating, specific cable entry and exit points or special cable termination facilities.

Terminal Assemblies

We have designed and manufactured enclosed terminal assemblies for various rail projects. Although often a simple product in concept, when used in safety critical applications, such as axle counting, we have been able to demonstrate complete compliance with exacting specifications through independent, third party type testing, covering areas such as High and Low Temperature operation, Damp Heat, Shock, Vibration and Ingress Protection to IP66.



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