

CASE STUDY DATA SHEET

1000V Tunnel Power Distribution



A 4km 1000V IP55 LV / RLV Tunnel Distribution system comprising of a 100kVA step-up transformer, 16 no. 10kVA 1000:400V three-phase step-down transformers and 16 no. 3 kVA 400:110V single-phase RLV transformers

The Blakley team has recently been involved in a project to provide 400V and 110V power and lighting throughout a 4km tunnel, fed from a single supply. In order to avoid the use of cables with a very large cross section (to overcome volt drop), the decision was made to step-up to 1000V at the entrance to the tunnel and to install 1000V to 400V transformers every 250m along the tunnel. The 400V transformers supply specialist three phase plant and compact 110V transformers for temporary lighting and small tools. The system is cost effective, in part, because standard LSZH SWA cable to BS6724 can be installed. In addition, 1000V is classified as Low Voltage (LV) and the standard requirements of BS7671 apply.

The step-up transformer is rated at 100kVA and the 1000V circuit is provided with overcurrent and variable RCD protection. A termination facility is incorporated to allow a 70mm² 4C XLPE SWA cable to be terminated.

In the tunnel, a 10kVA, 1000:400V, IP55 transformer is installed every 250m. An incoming and outgoing termination facility is incorporated to loop-in and loop out a 70mm² feeder. The loop-out feed is controlled by a switch. The supply to the integral transformer is controlled by a second switch, enabling fuses and tappings to be changed. The output is fitted with 2 no. 16A 5P 400V sockets each with MCB and RCD protection. The 1000V and 400V transformers incorporate tappings, which can be adjusted after installation to fine-tune the voltages.

Also supplied are 3kVA, slim line, compact, IP55, 400:110V transformers with 2 no. 110V sockets to feed lighting cicuits, plus an additional socket for power tools. All sockets are individually MCB and RCD protected. The 1000:400V transformers could have incorporated a tertiary winding to supply 110V. However, the use of separate 110V transformers allows them to be used on a wider range of future projects.

If you would like to discuss a tunnel power and lighting project requiring voltages up to 3300V, please contact the Blakley team who will be pleased to be of assistance.



1000:400V 10kVA Step-down transformer, with loop-in and loop-out facility. Part No. A7040207.



400:110V 3kVA IP55 Step-down transformer with MCB and RCD protected sockets. Part No. A7034465.

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