BLAKLEY ELECTRICS

TRANSFORMER DATA SHEET

New Generation Tunnel Power Transformer, APR 2680

Tunnel Power Transformers (TPTs) are approved for installation in London Underground (LUL) Tunnels, APR 2680 refers. TPTs consist of a double wound, three-phase, 415V to 110V transformer, feeding 110V metal clad sockets. The transformer provides a Reduced Low Voltage supply in accordance with BS7671. 32A sockets are provided with MCB protection and 16A sockets with RCBO protection. Versions are available with an optional 32A 400V interlocked socket with integral MCB / RCD protection.

Design

TPTs are designed to withstand the harsh environment of LUL tube tunnels, where the high level of brake dust is a particular concern. The restricted space, coupled with LUL Section 12 requirements relating to fire safety, has resulted in the development of slim, robust, enclosures with an LUL approved paint finish. The assemblies have no external parts made from combustible materials and they are approved for installtion in all LUL tunnels. To suit the different tunnel designs across the system, TPTs can be supplied with a vertical or horizontal configuration.

S210347 Vertical Tunnel Power Transformer, covers on

Operation

TPTs are manually energised via an integral contactor operated by robust metal clad ON and OFF push buttons. LEDs provide “Supply Present”, “Power on” and “Tripped” indicators. To ensure assemblies are not left permanently energised, the contactor opens upon loss of supply, which occurs at the end of every shift prior to track power being restored. Assemblies are also protected by a thermal sensor, which opens the contactor if the case temperature exceeds 60°C.

Enclosure

All TPT enclosures are fabricated from heavy gauges of sheet steel and are non-vented, providing ingress protection to IP55 (although metal sockets are only available with an IP44 rating). Enclosures have a Jet Black, LUL approved paint finish. Hanging brackets are incorporated for fixing to existing or new tunnel bracketry.

Incoming Terminals

TPTs incoporate loop-in and loop-out terminals capable of accepting 35mm^2 SWA cables via pre-punched entry holes.

Transformer

Transformers are three-phase, double wound and have a voltage ratio of 415:110NE. The primary windings are tapped at -5% and -10%.
Transformer cores are manufactured in accordance with BS EN 61558 parts 1 and 2-4 and are constructed from Class F insulation materials. The standard unit is rated at 10kVA for 2 hours continuous operation and at 7.5kVA for 8 hours operation. Versions rated at 6kVA and 8.5kVA are also available.

S210347 Vertical Tunnel Power Transformer, cover off

Distribution

Standard TPTs (vertical or horizontal orientation) are equipped with 2 no. 32A, 3P+E, 110V metal clad sockets, MCB protected. A 16A, 2P+E, 110V metal clad socket is also fitted and is protected by a DP RCBO. Versions are also available with 32A 400V sockets.

Please see over the page for Part Numbers of the standard TPTs and for further information on the product.

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New Generation of Tunnel Power Transformers, 10kVA three-phase with optional 400V interlocked socket			
Part No.	Type	Orientation	Metal Clad Sockets to BS EN 60309-2
S210347	TPT/V/10/S3-110/LUL	Vertical	2 x 32A 4P 110V and 1 x 16A 3P 110V
S211122	TPT/H/10/S3-110/LUL	Horizontal	2 x 32A 4P 110V and 1 x 16A 3P 110V
S210346	TPT/H/SI1-400/10/S3-110/LUL	Horizontal	1 x 32A 5P 400V; 2 x 32A 4P 110V, 1 x 16A 3P 110V

Blakley Electrics 6 kVA, 415:110V, three-phase Tunnel Power Transformers (TPT) are installed throughout the London Underground tube system. Over 5,000 transformers were installed between 1993 and 1995 and they are still in day to day use. However, due to the increased power requirements of the track renewals teams and in order to address the non-availability of some spares due to component obsolescence, a new generation of tunnel power transformer has been developed rated at up to 10 kVA three-phase. In addition to the standard models above, versions have also been developed incorporating transformers with a lower power rating (6kVA and 8.5kVA). Please contact us for further details.

Below are images of the installation trials being carried out as part of the LUL evaluation and approval process, including gauging, which ensures safe clearance distances between equipment installed in tunnels and the tube trains. The images also show Vertical and Horizontal oriented TPTs. The vertical configuration is typically used in tunnels with cast iron sections and the horizontal in tunnels with concrete sections.

S210347 Tunnel Power Transformer with a vertical orientation

S210346 - Horizontal TPT with the addition of a 32A, 400V, 3P+N+E, metal clad, interlocked socket with a grey socket cover instead of the usual red.

S210346 - Horizontal TPT with LUL gauge alongside to ensure safe clearance distances.