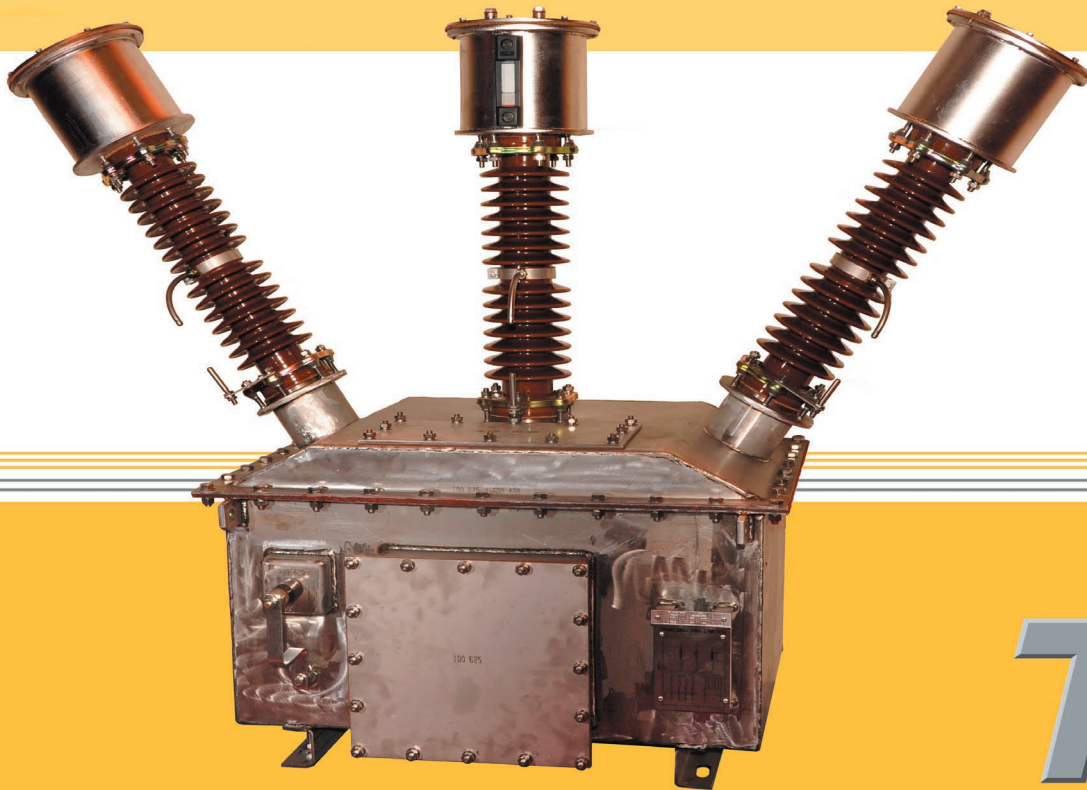




Transmag (UK) Ltd

Installation & Maintenance Manual



33KV Outdoor Voltage Transformers

INSTALLATION AND MAINTENANCE MANUAL

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Instrument Transformers Solution & Technology



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INSTALLATION AND MAINTENANCE MANUAL

TRIDENT 3 PHASE 5 LIMB, 33KV OUTDOOR OIL-FILLED VOLTAGE TRANSFORMER

DESCRIPTION

General

The voltage transformer is as shown on the outline drawing and comprises windings enclosed in a steel housing, filled with uninhibited mineral oil to BS148.

Windings

The core material comprises high-grade silicon steel laminations.

Housing

The windings are mounted in a weatherproof oil tight enclosure, attached to base internally via locating studs.

Terminals

The primary terminals are arranged as shown on the outline drawing. The insulated secondary leads from the windings are brought out through a cast resin, oil-tight terminal block into a weatherproof secondary terminal box situated on the side of the housing. The secondary junction box has a detachable, undrilled gland plate on the underside, for drilling on site to suit cable gland / conduit entry.

Oil Expansion

Each bushing is complete with an oil expansion chamber, or conservator. The central bushing contains the oil level gauge.

Fuses

The primary fuses are situated within the porcelain insulators / bushings, held in place by a spring-loaded contact. The secondary fuses are housed in a separate low level stainless steel enclosure.





SITE ERECTION

The Voltage Transformer will be despatched from the Works in the vertical position.

On arrival at site, the transformer condition should be checked / inspected for any sign of damage that may have been incurred during transit. If any damage is discovered please contact The Manufacturer immediately.

IMPORTANT

Before starting work on the transformer unit for commissioning, maintenance, or repair purposes refer to site safety management to ensure that all necessary permits to work have been issued and that the unit has been isolated with the current switched off.

Primary Connections

When making connections it is essential that both faces are clean and free from oxide and dirt. If cleaning is necessary it should be carried out using nylon scourers, brushes or similar non-metallic pads. The contact resistance between the primary terminal and the connector should not exceed $5\mu\Omega$. Jointing compound such as Shell Ensis or Castrol Rustillo 431 are recommended for use.

Secondary Connections

Appropriate cabling should be used to connect the secondaries on the transformer housing, to the low level fuse box.

Earthing

Check that the transformer is correctly earthed. Primary Neutral terminal is connected to earth via bolted link.

Oil

Before the unit left our works the oil was carefully checked on completion with the level normally showing some 20-25mm above the line towards the bottom of the sight glass. The unit was then left to stand for several days to allow any trapped air to percolate to the surface. If necessary the oil would then have been topped before despatching the unit. During transit it is possible to disturb the oil so that the level has apparently fallen below the mark on the gauge.

The first thing to do is to check the unit to confirm the

absence of any oil leak. If by some mischance a leak is detected refer immediately to Transmag (UK) limited for instructions which will normally be to return the unit for any necessary rectification.

In the absence of any leak adopt the following procedure to balance the oil in the bushings.

Remove the M10 bleed bolts from the conservator lids on all three bushings. This should shortly result in the oil level re-appearing in the sight gauge on the centre bushing. After standing for a few minutes the oil level will have stabilised. Replace the bleed bolts and tighten fully before commissioning.

If this fails to remedy the oil level follow the procedure for bleeding the centre phase bushing.

It must be emphasised that in the absence of any oil leak there will always be sufficient oil in the unit for safe working even if it is not always visible in the sight gauge.

Bleeding the centre phase bushing

1. Insert Allen key into grub screw in stainless steel ring at base of central bushing.
2. Turn anti-clockwise SLOWLY making sure Allen key remains in the socket until you hear a hissing noise – STOP TURNING THE KEY AT THIS POINT.
3. The hissing noise will be air escaping from the porcelain and should continue for only a few seconds until oil begins to seep out. WHEN THIS HAPPENS TIGHTEN THE GRUB SCREW IMMEDIATELY – wipe off any excess oil.
4. Check the oil gauge on the centre bushing- oil should now be clearly visible.. If oil is still not visible after bleeding the oil level may require topping up. The procedure for this operation can be found in the Maintenance section following this. If problems still persist with the oil level contact the Manufacturer.

Arcing Horns (Where fitted)

Each bushing is fitted with a duplex set of arcing horns and the gap between each is set at 90-92mm in the factory. If any adjustment is necessary a qualified engineer should adjust the twin arcing horns appropriately using the adjustable top and bottom pins attached to the conservator at the top and the bushing ring at the bottom to achieve the required gaps.





MAINTENANCE

The following inspections are to be carried out at least once annually or according to local conditions.

Housing

The porcelains should be kept clean, using Lint free cloth, and all metal parts likely to corrode should be repainted.

Connections

All electrical connections should be checked and where necessary, remade or tightened to comply with initial installation conditions.

Oil

If the sight glass is not showing oil inside, then it could need topping up. In order to establish this, the conservator lids must first be removed, to equalise the pressure, then add accordingly via the central conservator, until it appears in the sight glass. Replace gaskets, lids, and secure via M6 pins, washers and nuts provided.

Oil sampling should be carried out by suitably trained personnel in strict accordance with approved procedures

No more than a total of one litre of oil should be removed from any one transformer without consideration to replace the removed oil in consultation with The Manufacturer.

Failure to carry out sampling correctly may result in catastrophic failure of the unit.

Fuses

If the fuses are to be replaced, the transformer should be isolated from the supply, and the oil level dropped to below the bushing height. The dome nuts around the conservator lids should be removed, and the lid pulled out. Underneath the plate attached to the lid is the 36Kv primary fuse.

Torque Settings

If it is necessary to remove the tank lid or a bushing ring for any reason the bolts on the lid should be tightened to 30Nm and those on the bushing ring to 13NM when they are replaced.





HEALTH AND SAFETY AT WORK ACT 1974

All reasonable care has been taken to ensure that the information contained in this publication is accurate at the date of printing.

The aforementioned Act forms the principal EEC and UK legislation applicable to Health and Safety at Work. Every effort has been made to observe both the spirit and the letter of the Health and Safety at Work Act 1974 in the design and manufacture of this transformer as far as is reasonably practicable.

Attention is directed to the User's responsibilities in connection with the Act and in particular to the following clauses:

1. To be aware of Local Statutory Regulations for the operation of Electrical Equipment.
2. To take all necessary measures to prevent contamination of the environment.

Possible sources of pollution are:

- (a) Insulating medium liquid
- (b) Objectionable noise
- (c) Interference with communication networks due to unsatisfactory external connections.

The spread of insulation liquid from a spillage or leak from the transformer can be limited by the use of bund walls

3. To prevent access to live terminals

To operate a 'Permit to Work' or other similar safeguard which will ensure that isolation of the appropriate equipment from the supply during maintenance work is effected, whilst providing electrical and physical isolation from other live equipment.

4. To ensure that the equipment is operated only within the designed limits.





PRODUCT SAFETY

Equipment supplied by Transmag (UK) Limited is designed and manufactured to give efficient and reliable service. To ensure satisfactory operation and in order to avoid damage to the transformer, the following points should be observed.

- (i) The equipment must be installed correctly by suitably qualified and experienced personnel, who should carefully read this Manual prior to commencing work on the equipment.
- (ii) The appropriate pre-commissioning checks must be carried out before energising the transformer.
- (iii) Inspection and maintenance as described in the Installation and Maintenance Instructions must be carried out regularly.
- (iv) The transformer, its components and its insulating medium should be disposed of with caution by experienced personnel.

Internal inspection and remedial work must only be carried out by suitably qualified and experienced personnel. If there is any doubt, please contact The Manufacturer.

Attention is drawn to the following important recommendations and warnings

Fire Fighting Equipment – The transformer contains insulating medium and suitable fire fighting equipment should be provided for emergency use.

Climbing Aids – During erection, precautions must be taken to ensure the safety of personnel. Safe climbing aids and scaffolding must be provided to avoid the danger of a fall.

Supply Isolation – Work should not be carried out on any part of the transformer and for auxiliary equipment unless the local supplies are isolated, terminals earthed, and protection of other personnel from other live equipment is provided.

Heavy Lifts – Most items attached to the transformer are heavier than can be easily and safely lifted by hand. Before any item is lifted its weight should be established and the appropriate lifting equipment should be used.

