S.T.E. S.r.l.
Via Cavour, 66 - 20865 Usmate-Velate (MI)
Tel.: 039-68.29.450 - Fax: 039-68.29.455
www.stesrl.it - e-mail: ste@stesrl.it
Cap. Soc. € 110.000 i.v. - Tribunale Monza 21325
C.C.I.A. 1086796 - Meccanogr.MI040903
C. Fisc. 06271510155 - P. IVA IT00821070968

UNI EN ISO
9001:2015

MV VOLTAGE TRANSFORMERS

OUTDOOR INSTALLATION

TYPE

TVM/38-E

Installation and Maintenance Manual

Date	Version	Isued:	Approved:	Nr. Pag.
16/09/2021	4	F.Romanenghi	L.Cesari	1 di 4
20/02/2018	3	L.Cesari	A. Romanenghi	
31/10/2017	2	L.Cesari	A. Romanenghi	
24/10/2017	1	L.Cesari	A. Romanenghi	

SCOPE
This is the user's and maintenance manual for integrators, installer and maintenance personnel of systems based on TVM/38-E voltage transformer. Observe the provisions of local legislation regarding the competence criteria for personnel working with or in vicinity of electrical installations.

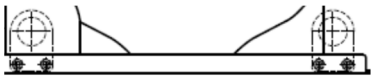
INTRODUCTION:
Our voltage transformers are compliant with IEC 61869-3 and EN 50124-1 Standard
Our product model TVM/38-E is a phase-earth medium voltage transformer for outdoor installation.

RECEIPT OF THE GOODS:
On receipt of the goods, carefully verify the packing conditions and after unpacking verify the integrity of the product. If there are damages, a claim must be raised to the forwarder. S.T.E. must be informed as well.

STORAGE:
TVM/38-E must be stored indoor, in not polluted air and with normal level of humidity between -45°C and +75°C.

INSPECTION BEFORE INSTALLATION
Before installation, transformers should be inspected for physical damage that may have occurred during shipment or handling. Transformers should be dry and the surface of the bushings should be clean.

HANDLING AND MOVING:
Avoid any shocks. Shifting and transport must be done using lifting lugs connected to the M6x16 bolts placed in the side of the plate (maximum torque 6 Nm). **Do not move the transformer using the active parts (like terminals or insulating silicone).**



COMMISSIONING AND INSTALLATION:

SAFETY INTRUCTIONS:
The operations must be done by expert and qualified technicians, respecting the IEC standards and European safety prescription.

ENVIRONMENTHAL CONDITIONS
Installation can be done outdoor, ambient air temperature must be included between -45°C and +75°C.

WARNING

NEVER SHORT CIRCUIT THE SECONDARY TERMINALS

INSTALLATION INSTRUCTION
Before putting in operation the voltage transformer, check the following points:

1. Always consider an instrument transformer as a part of the circuit to which it is connected, and do not touch the leads and terminals or other parts of the transformer unless they are known to be adequately grounded.

2. Always ground the metallic cases, frames, bases, etc., of instrument transformers. One end of the secondary of the VT should be grounded close to the transformers. However, when secondaries of transformers are interconnected, there should be only be one grounded point in this circuit to prevent accidental paralleling with system grounding wires.

3. Check with care if both terminals of the same secondary winding are not grounded by accident. Grounding both terminals of secondary winding can result in damage of voltage transformer over a short period of time. Any claims for resulting transformer damages will be void.

4. Do not short circuit the secondary terminal of a voltage transformer while the transformer is energized. Voltage transformers with secondary terminals short-circuited may be hazardous to personnel or may damage the transformer or equipment connected in the secondary circuit. Any claims for resulting transformer damages will be void.

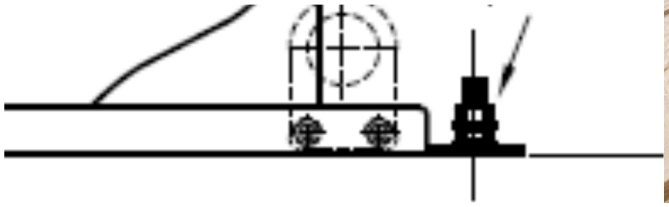
5. Identify the product by the releavnt drawing/datasheet. Check the rating plate and terminal markings on the voltage transformer and properly connect them. Check that all data indicated in the rating plate (rated primary and secondary voltage, rated frequency, rated burden, accuracy class) have been respected.

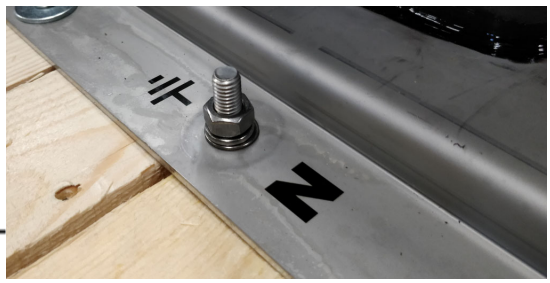
6. Check that connections are properly performed:
   a. Secondary terminals are connected to the rated load or they are not connected (open circuit).
   b. All secondary windings are correctly earthed

FIXING TO THE STRUCTURE
Use the four holes on the base plate: please see the relevant drawing.
TVM/38-E voltage transformer may be mounted in vertical position only (with HV terminal of primary winding facing the top). Other mounting positions are not allowed.

CONNECTION OF EARTH CABLE
The earth cable must be tightened up to 20 Nm between the base plate and the M8 nut placed in the base of the transformer. The earth screw is properly marked. Remove nuts and washers, put the cable lug of the earth cable in the screw and close by means of provided washers and nuts.

FOR SAFETY REASONS, EARTH CONNECTION MUST ALWAYS BE CONNECTED FIRST.



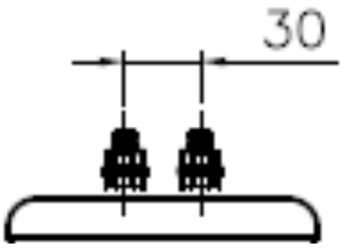


CONNECTION OF SECONDARY CABLE
The secondary cables must be connected to the secondary M6 terminals nuts tightening up to 2,5 Nm.
After connection of secondary cable, close the secondary terminal box with the proper red gasket and the steel plate. The four screws must be tightened to 3Nm.
The marking of the secondary terminal is engraved inside the cover plate of secondary terminal box.

IMPORTANT: n *terminal of every secondary winding must be connected to ground.*
The voltage transfomer must work with secondary circuit opened or loaded maximum with the rated burden indicated on the rating plate.

CONNECTION OF PRIMARY BUSBAR

The primary phase cable must be tightened up to 20 Nm between the steel plate and the two M8 upper nuts placed in the top of the transformer. Remove all nuts and washers, put the cable lug or the bar in touch with the steel plate and close by provided washers and nuts. On the second nut, thread locking fluid (suggested Loctite 243 or Loctite 2400, or other approved by the train builder) may be applied.



Note: The voltage transformer TVM/38-E needs the flowing of only a few milliAmps of current to read the voltage value of the primary circuit. For this reason it is designed to withstand only the static and dynamic load of an HV flexible connection.
In case of use of a solid busbar to connect the VT to the 25 kV line, supporting insulators should be used.

POLARITY

When wiring instrument transformer circuits, it is necessary to maintain the correct polarity relationship between the line and the devices connected to the secondaries. For this reason, the relative instantaneous polarity of each winding of a transformer is indicated by a marker.
The primary terminals are “A” and “N” (capital letter). The secondary terminals are “a”, “n” (lowercase). The marker “A” always indicates the same instantaneous polarity as “a”.
When connecting instrument transformers with meters, relays or other devices, refer to the instructions furnished with the device involved.

VOLTAGE TRANSFORMER REMOVAL

In order to remove the voltage transfomer, please proceed as follows:

- ***Make sure that the primary circuit is disconnected from the network, and, effectively grounded***
- Disconnect the the primary busbar
- Disconnect the secondary lead from the secondary terminals of voltage transformer
- Disconnect the the earthing cable
- Remove the fixing screws from the voltage transfomer plate
- Remove the voltage transformer

MAINTENANCE:

Annual check of:

- the external aspect of the voltage transformer,
- the tighten of terminals and connections
- normal cleaning of the external surface