

VT Guard Solution for Ferroresonance Elimination

1. Description

VT guard is a low voltage indoor switchgear device for elimination of ferroresonance phenomenon. Ferroresonance can arise in ungrounded power networks or in the network where is not directly grounded neutral point. Ferroresonance oscillation might be initiated in such networks by switching or other transition and might cause a significant damage to phase-to-ground connected inductive voltage transformers. VT guard protects voltage transformers against potential ferroresonance overcurrent by prompt damping action (fig. 1). In comparison with other antiferroresonance devices, VT guard is designed to be active when ferroresonance oscillation appears and to be inactive for natural system asymmetry rising up from phase imbalance.

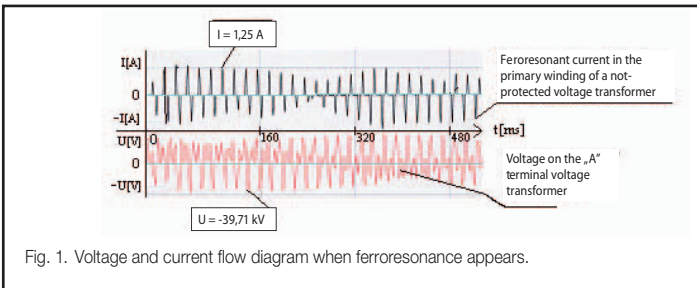


Fig. 1. Voltage and current flow diagram when ferroresonance appears.

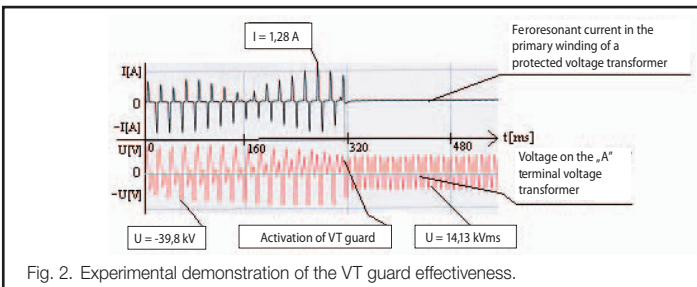


Fig. 2. Experimental demonstration of the VT guard effectiveness.

2. Advantages

- 1) Lower resistance than in standard damping resistor (provides better resonance oscillation damping)
- 2) High resistance during earth fault (provides power safety, when one phase is grounded).
- 3) Mounted in the low-voltage part on DIN-rail.
- 4) Small size.
- 5) Applicable to any type of voltage transformers equipped with residual windings.
- 6) One VT guard protects all 3 voltage transformers in open delta connection.
- 7) Reliable and safety ferroresonance security device.



3. Applications

VT Guard is determined to be used in cooperation with voltage transformers connected in open delta (with VT's residual windings) configuration as it is shown in the fig. 1. It is possible to use VT guard when earth-fault protection is connected. (VT guard is parallel connected with earth-fault protection in transformers open delta winding). That kind of connection does not have any negative effects on the earth-fault protection device functioning.

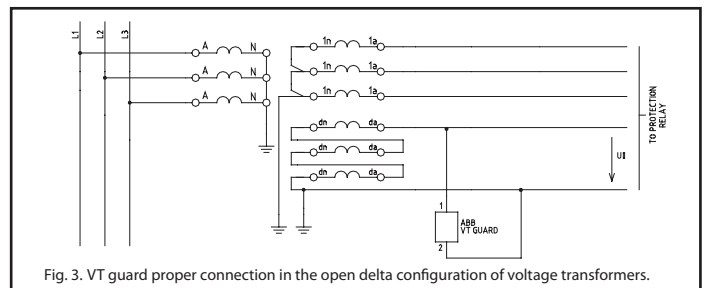


Fig. 3. VT guard proper connection in the open delta configuration of voltage transformers.

4. Electrical and technical parameters

Rated voltage100 – 200 V
VInsensitivity zone0 – 20 V
Damping time at 100V1 s
Ambient temperature-10 °C to +55 °C
Humidityup to 90%
The lowest allowed temperature for the transportation and storage-30°C
Red LED diodeearth fault

5. Dimensional drawing

Dimensions (in mm) are shown on the fig. 4.

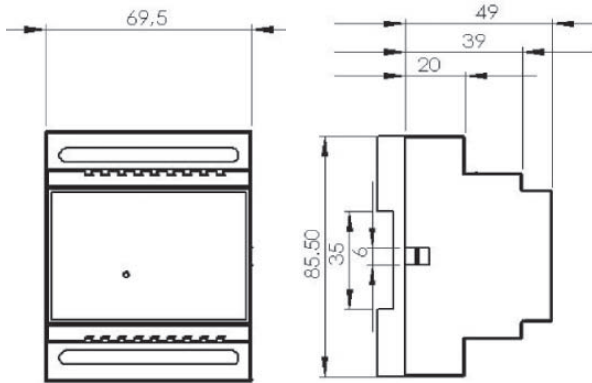


Fig. 4. Dimensions

6. Connection dimensions

VT guard is constructed to be fixed at the rail DIN – TS 35. Connection in the low voltage part of cubicle is shown on the fig. 5.



Fig. 5. Connection in the low voltage part of cubicle.

7. Warranty

The manufacturer warranty is 24 months since the day of putting the apparatus into operation but not longer than 36 months since the day of purchase.

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The engineering data and dimensions are true at the moment of their publication in this document. The manufacturer reserves for himself the right for making subsequent changes and modifications to the product.