

Vivid-Grid Solutions LLP

INTRODUCTION

Vivid-Grid Solutions LLP is located at Maharashtra Industrial Development Corporation corridor, Waluj, Aurangabad. The place is very well connected by road and flights to cities like Delhi, Mumbai, Hyderabad, Ahmedabad, Pune & Nasik.

Our offered Instrument Transformers from 12kV to 170 kV which adheres to the requirements of the International test standards and quality management systems certified to ISO 9001:2015, respectively.

INSTRUMENT TRANSFORMERS (OUTDOOR)

Instrument transformers (ITs) are designed to transform high values of voltage or current in the transmission and distribution systems to the low values that can be utilized by low voltage metering devices. There are three principal applications for which ITs are used: metering (for energy billing); protection (for system protection and protective relaying purposes); and load survey (for economic management of industrial loads).

Depending on the requirements of applications, IT design and construction can be quite dissimilar. The metering ITs require high accuracy in the range of normal operating voltage and current. Protection ITs require linearity in a wide range of voltages and currents. During a disturbance, such as system fault or over voltage transients, the output of the IT is used by a protective relay to initiate an appropriate action (open or close a breaker & reconfigure the system, etc.) to mitigate the disturbance and protect the rest of the power system. Instrument transformers are the most preferred and economic way to detect a disturbance. Typical output levels of instrument transformers are 1/5 amperes and 110-120 volts for CTs and VTs respectively. There are several classes of accuracy for instrument transformers defined by the IEC, IEEE, ANSI and IS standards.

CONSTRUCTION

HOUSING

All metal housings and flanges are made from corrosion resistant special aluminium alloy or mild steel. These parts can be painted on request. Two additional lifting lugs are provided to housing for lifting and erection purpose.

CT CORE & SECONDARY WINDINGS

Current Transformers can have several toroidal cores depends upon the application which are independent of each other. Wound cores are accumulated in core housing for protection and uniform high voltage insulation building.

The core housing is fixed with heavy gauge metal pipe inside the insulator which is taken to the base assembly. Adequate cross section and firm connections are provided for fault current path to ground which significantly reduces the probability for a secondary arc within the insulator.

IVT CORE & SECONDARY WINDINGS

Inductive Voltage Transformers can have several secondary windings depends upon the application which are independent of each other with single core. The bottom tank accommodates the core, HV, LV windings and the secondary terminal lead outs.

HV & LV winding is delimited by protection ring with gauge metal pipe inside the insulator.

OIL IMPREGNATED PAPER INSULATION

Insulating paper is applied to the core housing and its supporting pipe by a special paper winding machine to ensure tightness and uniform insulation.

A fine graded bushing with multi-layer aluminium foil in series parallel combination with insulating paper is used to achieve uniform electrical field around to product.

Unused mineral insulating oils with excellent durability and gas - absorbing properties is used. Controlled vacuum and temperature treatments pursued to withdraw humidity and gas from the paper insulation and insulation oil. A well practiced and proved impregnation process results in a high-grade dielectric system.

OIL VOLUME COMPENSATION

Stainless steel bellows provided on the top of the tank to compensate change in oil volume due to change in temperature. The bellows provides oil expansion and pressure compensation, protects the interior from air and moisture and preserves the dielectric strength of the unit. The movements of the bellows assembly are used to an indirect oil level indicator which is visible from the window of bellows cover.

HERMETIC SEALING

The head housing is made of corrosion resistant aluminum alloy or mild steel. Aluminium housing is subjected to vacuum leak test by helium leak detection and MS housing for positive pressure respectively. Overall leak test is performed on every assembled unit before oil impregnation. All oil seals are used of single piece O-Rings in machined grooves.

PRIMARY TERMINALS

Primary terminals consist of aluminium or tinned / nickel plated copper in round and flat shape is provided.

SECONDARY TERMINAL BOX

Secondary leads are brought out through an oil/air seal block assembly and terminated on separate terminal blocks. The munificently designed terminal box is provided with cover which can be opened side wards which facilitates easy connection of secondary. Cable gland and sealing features are provided on request.

EXTERNAL INSULATION

External insulator consists of aluminum oxide porcelain in grey or brown colors. Standard creepage distances are available according to the kV Class. High and extra high creepage distances and composite insulators are available on request.

TESTING

Testing is performed in conformity with national and international standards. Along with the power frequency test, capacitance, dielectric loss factor and inner partial discharges are also measured as routine tests. Tests certificates are issued and supplied with the equipment.

INSTRUMENT TRANSFORMERS (INDOOR)

Current & Voltage Transformers are cast using a liquid resin system with plasticizer processed under vacuum at controlled temperatures. All CT & VTs complies requirement of latest revision of IEC . A variety of different frames cover CTs with primary current ranging from 5 Amp.to 3000 Amp. CT & VT designs are tailor-made to suit customer requirements for specific applications.

For CT, Ring type and Bar primary are offered for higher ratios and wound primary is offered for lower ratios. Indoor CTs uses epoxy as a standard insulating medium. Epoxy casting is done under vacuum and it undergoes rigorous post curing procedure to impart high dielectric and mechanical strength to withstand fault current and avoid partial discharges. Standard designs are available as per Industrial standards.

FEATURES

- Manufactured using high grade epoxy resin system
- Suitable for temperature range -25°C to $+80^{\circ}\text{C}$.
- High mechanical stability of the winding and high strength against impulse and surge voltages.

TECHNICAL DATA

CURRENT TRANSFORMERS (OUTDOOR)

| Description / kV Class | Unit | 11 kV | 22 kV | 33 kV | 66 kV | 110 kV | 132 kV | 150 kV | |
|---|------|--|-------|-------|-----------|--------|--------|--------|--|
| Applicable Standard | -- | IEC / IEEE / ANSI / IS | | | | | | | |
| Construction | -- | Live Tank / Dead Tank | | | Live Tank | | | | |
| Highest System Voltage | kV | 12 | 24 | 36 | 72.5 | 123 | 145 | 170 | |
| One Min. PF Voltage | kV | 28 | 50 | 70 | 140 | 230 | 275 | 325 | |
| Lightning Impulse Voltage | kVP | 75 | 125 | 170 | 325 | 550 | 650 | 750 | |
| Rated Frequency | Hz | 50 / 60 | | | | | | | |
| Ambient Temperature | °C | -50 to +40 | | | | | | | |
| Seismic Level | g | 0.3 | | | | | | | |
| Rated Primary Current | A | 10 to 4000 | | | | | | | |
| Rating Factor | -- | Up to 2.0 | | | | | | | |
| Rated Secondary Current | A | 1 / 5 | | | | | | | |
| Short Time Thermal Current | kA | Up to 50 kA | | | | | | | |
| Creepage Distance | mm | 300 | 600 | 900 | 1812.5 | 3075 | 3625 | 4250 | |
| Accuracy Class | | 0.1, 0.2, 0.2s, 0.5, 0.5s, 1.0, 3.0, 5P, 10P, PX | | | | | | | |
| Maximum No. of Cores | No. | 4 | 4 | 4 | 5 | 7 | 7 | 7 | |
| Oil Level Indicator | -- | Bellows Level Indicator at Top | | | | | | | |
| Pressure Relief Device | -- | Stainless Steel Bellows | | | | | | | |
| Oil Volume Compensation | -- | Stainless Steel Bellows | | | | | | | |
| Separate Secondary Box | -- | Yes | | | | | | | |
| On Request : 0.5 g, High Creepage, High Altitude, Composite Insulator, Primary Changeover etc. | | | | | | | | | |

INDUCTIVE VOLTAGE TRANSFORMERS (OUTDOOR)

| Description / kV Class | Unit | 11 kV | 22 kV | 33 kV | 66 kV | 110 kV | 132 kV | 150 kV |
|---|------|---|-----------|-----------|-----------|-----------|-----------|-----------|
| Applicable Standard | -- | IEC / IEEE / ANSI / IS | | | | | | |
| Construction | -- | Dead Tank | | | | | | |
| Highest System Voltage | kV | 12 | 24 | 36 | 72.5 | 123 | 145 | 170 |
| One Min. PF Voltage | kV | 28 | 50 | 70 | 140 | 230 | 275 | 325 |
| Lightning Impulse Voltage | kVP | 75 | 125 | 170 | 325 | 550 | 650 | 750 |
| Rated Frequency | Hz | 50 / 60 | | | | | | |
| Ambient Temperature | °C | -50 to +40 | | | | | | |
| Seismic Level | g | 0.3 | | | | | | |
| Voltage Factor | -- | 1.2 Cont & 1.5 - 30 Sec. | | | | | | |
| Rated Secondary Current | V | 110, 110 / $\sqrt{3}$, 115, 115 / $\sqrt{3}$, 120, 120 / $\sqrt{3}$ | | | | | | |
| Burden & Accuracy | VA | 100VA/0.5 | 100VA/0.5 | 100VA/0.5 | 200VA/0.5 | 300VA/0.5 | 300VA/0.5 | 300VA/0.5 |
| Creepage Distance | mm | 300 | 600 | 900 | 1812.5 | 3075 | 3625 | 4250 |
| Accuracy Class | | 0.2, 0.5, 1.0, 3.0, 3P, 6P | | | | | | |
| Maximum No. of Windings | No. | 3 | 3 | 3 | 4 | 4 | 4 | 4 |
| Oil Level Indicator | -- | Bellows Level Indicator at Top | | | | | | |
| Pressure Relief Device | -- | Stainless Steel Bellows | | | | | | |
| Oil Volume Compensation | -- | Stainless Steel Bellows | | | | | | |
| Separate Secondary Box | -- | Yes | | | | | | |
| On Request : 0.5 g, High Creepage, High Altitude, Composite Insulator, 1.8 Cont. Vf etc. | | | | | | | | |

CT TECHNICAL SPECIFICATIONS (INDOOR)

- Maximum System Voltage: Up to 36 kV
- Primary Current: Up to 4000 A
- Secondary Current: 0.577A, 1A, 5A
- Rated Burden: 5, 10, 15, 20, 30, 60 VA
- STC Rating: Up to 40 kA for 1 sec
- Class of Accuracy: 0.1, 0.2s, 0.2, 0.5s, 0.5, 1.0, 3.0, 5P, 10P, PS
- Accuracy Limit Factor: 5, 10, 15, 20
- Frequency: 50 / 60 Hz ● Standards: IS-2705, IEC-61869

For VT copper wire is used for both windings. Primary winding is multilayered and is of trapezoidal design. The length of each winding layer is designed such that service and impulse voltage is distributed equally throughout, adequate to prevent inter turn and interlayer shorts. Separate designs are available for both single phase and three Phase VT's and also with provision of fuse.

VT TECHNICAL SPECIFICATIONS (INDOOR)

- Maximum System Voltage: Up to 36 kV
- Secondary Voltage: 110, 110/ $\sqrt{3}$, 110/3, 190 V
- Rated Thermal Burden: Up to 300 VA
- Voltage Factor: 1.2 cont. & 1.5 for 30 sec / 1.9 for 30 sec / 1.9 for 8 hrs.
- Class of Accuracy: 0.2, 0.5, 1.0, 3.0, 3P, 6P
- Frequency: 50/60 Hz ● Standards: IS-3156, IEC-61869

CONDENSER BUSHINGS (OUTDOOR)

The condenser cores are completely dried and impregnated in vacuum drying chambers in various stages such as air heating, rough vacuum, and fine vacuum. After drying cycle, the oil impregnation is carried out at a predetermined rate of flow of oil inlet which is in relation with the capillary rise of the paper insulation.

FEATURES

- Shatterproof lower end insulator
- Partial discharge free performance at power frequency test voltage ● Oil indicator with float for better visibility
- Dielectric loss less than 0.005
- Provision for oil sampling at mounting flange level for health monitoring ● Electrostatic field controlled design
- Suitable for operation under heavily polluted atmosphere
- Space for mounting of ring type CT
- Excellent mechanical strength
- Excellent seismic & short circuit withstand capability

TECHNICAL SPECIFICATIONS

- Maximum System Voltage: Up to 72.5 kV
- Current: 800A / 1250A / 2000A / 3150A
- BCT : 100mm / 300mm / 600mm
- Frequency: 50 / 60 Hz ● Standards: IS-2099, IEC-60137

ALLIED PRODUCTS (OUTDOOR)

METERING UNITS

CT-PT combined unit are also called metering units. These units can be offered as Dry Type or oil Immersed and are generally pole mounted. The units are available in three phase three wire or three phase four wire system. CT-PT unit used for single or double metering with trivector meter and energy meter.

TECHNICAL SPECIFICATIONS

- Max. System Voltage: Up to 36 kV
- CT Primary Current: Up to 800 A
- CT Secondary Current: 1A, 5A

- CT Rated Burden: 5, 10, 15 VA
- STC Rating: Up to 40 kA for 1 Sec.
- CT Accuracy: 0.2s, 0.2, 0.5s, 0.5, 1.0, 5P, 10P
- CT Accuracy Limit Factor: 5, 10, 15, 20
- VT Secondary Voltage: 110, 110/ $\sqrt{3}$ V
- VT Rated Burden: Up to 100 VA
- VT Accuracy: 0.2, 0.5, 1.0, 3P, 6P
- VT Voltage Factor: 1.2 Cont. & 1.5-30 sec
- Frequency: 50/60 Hz ● System Earthing: Earthed /Un-earthed
- Reference Standards: IS-2705, IEC-61869

RESIDUAL VOLTAGE TRANSFORMERS

Residual voltage transformer is used to detect unbalanced voltage in three phase system & to supply voltage to directional earth fault relay. For directional earth - fault relay, It is necessary that the voltage applied to the voltage coil of the relay corresponds in phase to that of the current in current coil such voltage will be the residual voltage of the system & will be the phasor sum of the three line - to - earth voltages. Residual voltage can be achieved by connecting secondary of three single phase VT connected in three different phases, in open delta fashion. It is, however economical to use three phase VT

TECHNICAL SPECIFICATIONS

- Maximum System Voltage: Up to 36 kV
- Secondary Voltage: 110, 110/ $\sqrt{3}$, 110/3, 190 V
- Rated Burden: Up to 200 VA
- Voltage Factor: 1.2 cont. & 1.5 for 30 sec / 1.9 for 30 sec .
- Class of Accuracy: 0.2, 0.5, 1.0, 3P, 6P
- Frequency: 50/60 Hz ● Standards: IS-3156, IEC-61869

SITE SERVICE AND CONDITION MONITORING

There is no model or criteria for estimation / prediction of remaining life of any HV equipment in service. Analysis in true sense consists of the following steps:

- Collection of O&M history of the equipment
- Visual examination of the equipment
- Conducting appropriate diagnostic tests to assess the present status of the equipment
- Analysis of the data to detect the extent of deterioration or to detect the defective component
- Recommendation of appropriate remedial measures to avoid - Forced outages - Extend the residual life
- The diagnostic tests need to be conducted periodically to monitor the trend in the parameters
- Data logged over the years and trend analysis provides useful information to initiate appropriate remedial measures to extend the life of the equipment
- On the basis of analysis of the data, appropriate remedial measures such as run, repair or replacement to extend the remaining life of the equipment shall be recommended



We have our technically competent team for these activities. We have immense resources by which we are able to attend work within stipulated time. We under take the following equipments for site service and condition monitoring.

- Current Transformers ● Ind. Voltage Transformers
- Condenser Bushings ● CT-PT Metering Units
- Residual Voltage Transformers

For More Information Please Contact

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