

USHA TRANSFORMERS

Committed to Customer Satisfaction



- Power and Distribution Transformers
- Furnace and Special Transformers
- Dry Type Transformers
- Servo Voltage Regulators
- Current and Voltage Transformers

An ISO : 9001 Quality Certified

OUR PRODUCTS RANGE

Power and Distribution Transformers

- Power Transformer upto 5 MVA & 33 KV class
- Distribution Transformer upto 3 MVA & 33/11 KV class
- Aluminium Wound Distribution Transformer upto 250 KVA
- Star Rated Transformer of All applicable Capacity upto 5 Star Rating
- Hermetically sealed Transformer
- Dry Type Air Cooled Transformers
- Furnace Transformers
- Isolation Transformers
- Special Transformers
- Current and Voltage Transformers

Servo Voltage Controllers

- Customized Servo Voltage Controllers
- Oil Immersed Servo Voltage Controllers

Current and Voltage Transformers

- CT-PT Units upto 33 KV class

Unitized Substation

Applicable Standards

- ISS
- IEC
- ANSI
- BS

SOME OF OUR VALUED CUSTOMERS...



DISTRIBUTION TRANSFORMER

Our technologically advanced distribution transformers incorporate state latest high tension engineering, optimally designed to give long life with high efficiency & reliability.

Our transformers are manufactured in strict quality control of raw-material, design & manufacturing.

We are also registered in Bureau of Energy Efficiency as a manufacturer of star rated transformers.

FEATURES

- Designed for 25 years of trouble-free performance
- Design conforms to IS 2026, BS 171, IEC 76 and other relevant standards
- Low power loss and low noise
- Designed to withstand electrical impulses, thermal and dynamic stresses
- Optimum utilization of active materials for compactness
- Modern manufacturing techniques ensure cost effectiveness and reliability

OPTIONAL ACCESSORIES

- Pressure relief valve without contact/with contact
- Buchholz relay with alarm and trip contact
- Oil temperature indicator with alarm and trip contact
- Winding temperature indicator with alarm and trip contact
- Magnetic oil level gauge with alarm contact
- Marshalling box to house oil temperature indicator and winding temperature indicator
- Neutral current transformer



SPECIFICATIONS

- 3 phase, 50 Hz in voltages of 11kV, 22kV and 33kV
- Off-circuit tap changer to provide +5% to -15% taps in steps of 2.5%
- On-load tap changer to provide +7% to -21% taps in steps of 1.75%
- Class A insulated
- Vector group Dyn11
- Continuous duty
- Copper wound
- Painting as per IS/IEC standards
- HV side cable box
- LV side cable box/bus duct
- Standard fittings as per IS 2026/IEC 76

DISTRIBUTION TRANSFORMER

S. No.	Rating KVA	Overall Dimensions (mm)			Oil		% Z
		length (L)	Breadth (B)	Height (H)	Litres	Kgs	
1	160	2210	1540	1990	350	1500	4.50
2	200	2230	1540	1990	400	1700	4.50
3	250	2150	1660	2120	430	1900	4.50
4	315	2250	1690	2170	500	2200	4.50
5	400	2400	1700	2220	600	2600	4.50
6	500	2500	2360	2360	600	2950	4.50
7	630	2370	2360	2400	600	3300	4.50
8	800	2430	2540	2420	700	3700	5.00
9	1000	2650	2900	2550	1000	4500	5.00
10	1250	3050	2800	2650	1000	5000	5.00
11	1600	3100	2950	2800	1300	6000	6.25
12	2000	3100	3100	2950	1600	7400	6.25
13	2500	3300	3200	3150	1700	8300	6.25



Note: Due to constant improvement in the product, Usha Transformers & Controls Pvt. Ltd., reserves the right to change specifications and details mentioned in this brochure

TABLE OF LOSSES FOR 11 KV CLASS TRANSFORMER

KVA	No. of Phases	% Z	IS: 2026		IS:1180 (Part 1) : 2014					
			No Load Losses	Load Losses at 75°C	Energy Efficiency Level-1, (3 Star)		Energy Efficiency Level-2, (4 Star)		Energy Efficiency Level-3, (5 Star)	
					Total Losses at 50 % Load	Total Losses at 100 % Load	Total Losses at 50 % Load	Total Losses at 100 % Load	Total Losses at 50 % Load	Total Losses at 100 % Load
5	1	2.5	---	---	40	115	35	95	30	75
10	1	4	---	---	70	190	60	170	55	150
16	1	4	---	---	95	265	82	224	63	190
25	1	4	---	---	125	340	110	300	95	260
16	3	4.5	75	420	150	480	135	440	120	400
25	3	4.5	100	685	210	695	190	635	175	595
63	3	4.5	180	1235	380	1250	340	1140	300	1050
100	3	4.5	260	1760	520	1800	475	1650	435	1500
160	3	4.5	400	2500	770	2200	670	1950	570	1700
200	3	4.5	475	3000	890	2700	780	2300	670	2100
250	3	4.5	550	3600	1050	3150	980	2930	920	2700
315	3	4.5	600	4400	1100	3275	1025	3100	955	2750
400	3	4.5	690	5100	1300	3875	1225	3450	1150	3330
500	3	4.5	850	6500	1600	4750	1510	4300	1430	4100
630	3	4.5	1000	7300	2000	5855	1860	5300	1745	4850
1000	3	5	1400	10500	3000	9000	2790	7700	2620	7000
1250	3	5			3600	10750	3300	9200	3220	8400
1600	3	6.25			4500	13500	4200	11800	3970	11300
2000	3	6.25			5400	17000	5050	15000	4790	14100
2500	3	6.25			6500	20000	6150	18500	5900	17500

DRY TYPE TRANSFORMERS

ADVANTAGES

- Maintenance Free, Non Toxic
- Non Inflammable, Non Hygroscopic
- High Reliability, High Surge Voltage withstand
- High Short Circuit Strength
- High Overload Capacity
- Low Partial Discharge
- Smaller Size & Weight, Cost Effective
- Low Noise Level & Weight, Cost Effective
- Low Noise Level & Operating Cost



MAIN FEATURES

- Magnetic circuit: with CRGO lamination M3 to M5, MOH and ZDKH types
- Electric circuit: copper 99.9% pure electric grade, foil for LV and strip for HV, duly casted with resin under vacuum
- Dielectric circuits: Nomex glass fibre components along with resin casted components
- Thermal Circuit: natural cooling through effective axial and radial ducts and air vent between LV to HV and LV to Core

SPECIFIC FEATURES

- Design conforms to relevant standards IEC 76, IEC 726, IS 11171, IS 2026 and as per any other international standards
- Designed to withstand short circuit forces, thermal stresses and electrical impulses. Low partial discharge
- Low load power losses and low noise
- Fire retardant, compact and best suited for indoor installations
- Installation can be very close to load center thereby LT cable cost saving
- Advanced manufacturing techniques to ensure cost effectiveness
- Reliable, user friendly, easy to install and occupies less space

SPECIFICATION

- Cast resin dry type transformer 11kV/433V, 3phase, 50 Hz
- Off circuit tap links $\pm 5\%$ in steps of 2.5%
- Class F and H insulation
- HV Delta connected, LV Star connected with Dyn 11 vector group
- Natural air cooling and forced air cooling
- Duty cycle – continuous
- Winding material - copper
- Enclosure - IP 23 to IP 33 and as per customer specifications
- Cable boxes on HV and LV
- Painting shades as per IS and IEC standards

STANDARD FITTINGS

- Rating and diagram plate
- Earthing terminals - 2
- Off-circuit tap links
- Enclosure - IP 23 with cooling louvers
- Lifting lugs
- Jacking lugs

OPTIONAL ACCESSORIES

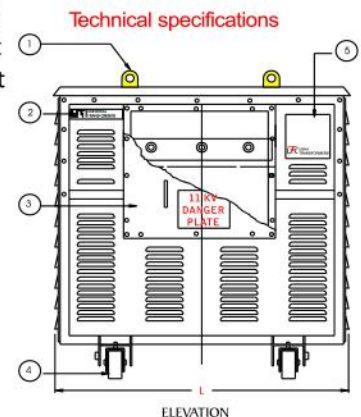
- PT-100 sensors in each coil
- Winding temperature scanner with alarm and trip coil

INSPECTION AND TESTING

- Incoming material inspection at vendors place
- Stage inspections at end of each process
- Identification and traceability

Final routine tests as per IS and IEC standards conducted as follows

- Voltage ratio
- Winding resistance
- Impedance voltage
- No load current with losses and load losses
- Separate source voltage withstand test
- Insulation measurement
- Induced over voltage test
- Noise level measurement



SERVO VOLTAGE REGULATORS

Voltage fluctuations & phase unbalance cause several problems in industrial, commercial & residential sectors, such as :

- Reduction in motor efficiency, overheating and fast ageing of motors and switchgears
- Stoppage of production, inconsistent product quality and increase in wastage
- Malfunctioning & data loss in electric / CNC equipments
- Quick burn out of light fittings, bulbs & lamps
- Higher consumption by lighting load
- Higher demand & higher energy bill
- Loss of competitive position

ENERGY ENHANCEMENT BY USING UTC SERVO VOLTAGE REGULATORS :

You can now enhance the quality of power, as well as save power, by using UTC servo voltage regulator. It is a distortion less, servo controlled stabilizer available up to 2500 KVA capacity. It works on the principle of sine-wave superimposition. It buck or boost the incoming voltage by superimposing a variable voltage having the same waveform.

UTC servo voltage regulator is the proven solution to all above problems caused by voltage fluctuations & unbalance. It saves your costly equipments & processes from detrimental effects of fluctuating & unbalanced voltage & gives you mental peace to concentrate on more important business issues.

Above all, UTC servo voltage regulator can substantially add to your bottom-line by saving up to 20% power, depending on the incoming power quality.

WORKING PRINCIPLE OF UTC SERVO VOLTAGE REGULATOR :

Constructionally, it consists of two transformers, one is a variable autotransformer (dimmer) and the other is a buck-boost transformer, as shown in the single line diagram. In case there is a voltage fluctuation, the microprocessor based controller moves the carbon brushes on the dimmer unit to tap the equivalent of voltage to be added or subtracted to the mains voltage.

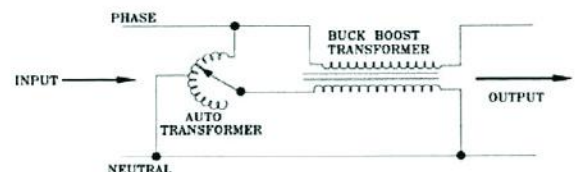
This voltage is then fed to the primary of the buck-boost transformer which, adds or subtracts it from incoming voltage, so that output voltage is always maintained at its set value.

Since the control of voltage is carried out independently for each phase, therefore any voltage unbalance also gets corrected. Furthermore, each phase can be loaded independently, therefore our servo voltage regulator is suitable for unbalanced load conditions as well.

UTC VERSATILITY TO OFFER CUSTOMIZED SOLUTIONS :

We do not thrust a standard model on customers. With a team of well-trained applications engineers, we offer customized servo voltage regulators to meet your specific voltage needs and power conditions. As a result wide choices are available to suit specific site conditions, such as :

- Indoor or outdoor models
- Units with inbuilt isolation transformer
- Single or three phase options
- Air-cooled or oil-cooled models
- Copper and Aluminium wound options
- Models with optional add-on features such as :
 - Inbuilt by-pass system
 - Single phase prevention & phase reversal
 - Trip & alarm for abnormalities
 - Surge and spike suppression
 - High/low cut off, auto resumption



CURRENT & VOLTAGE TRANSFORMERS

The current and voltage transformers are used for stepping down the current and voltage from high to measurable values. The standard values of the secondary current are 1 Amps and 5 Amps. Similarly the standard secondary voltages are 110 Volt and $110/\sqrt{3}$ Volt. The current and voltage transformers are together known as instrument transformers and are critical to the measuring and protection system. The performance of energy meters & relays is based on the signals received from them. The instrument transformers are manufactured in compliance to IS/IEC standards.

Current Transformers - Technical Specification

System voltage (KV)	Highest System voltage (KV)	Primary Current (Amps)	Secondary Current (Amps)	High Voltage withstand (KV)	Impulse Level (KV)
11	12	10-1600	1 - 5	28	75
33	36	10-1600	1 - 5	70	170

Note: Various Indoor and Outdoor models have been tested for fault level up to 31.5 KA as per ISS

Note : Technical data given above is for information only the actual Product may differ as per customer's specification.

Voltage Transformers - Technical Specification

System voltage (KV)	No. of Phases	Burden (VA)	Accuracy Class	Insulation Level (KV)
11	1, 3	5 - 200	0.2/3P	12/28/75
33	1, 3	5 - 200	0.2/3P	36/70/170

Note : Technical data given above is for information only the actual Product may differ as per customer's specification.

OIL FILLED CT-PT UNITS

APPLICABLE STANDARD IS : 2705 / IEC 185, IS : 3156 / IEC 186



Please furnish the following information with enquiry :

Rated Power	No. of Steps
Rated Voltage	Type of Cooling
No. of Phase	Oil / Winding Temp.
Vector Group	Losses If Specified
Rated Frequency	Percentage Impedance
Outdoor/Indoor	Standard to which comply
Winding Material	Accessories Required
Voltage Variation	Protection Required
Off Load/On Load	Paint Standard Required



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