

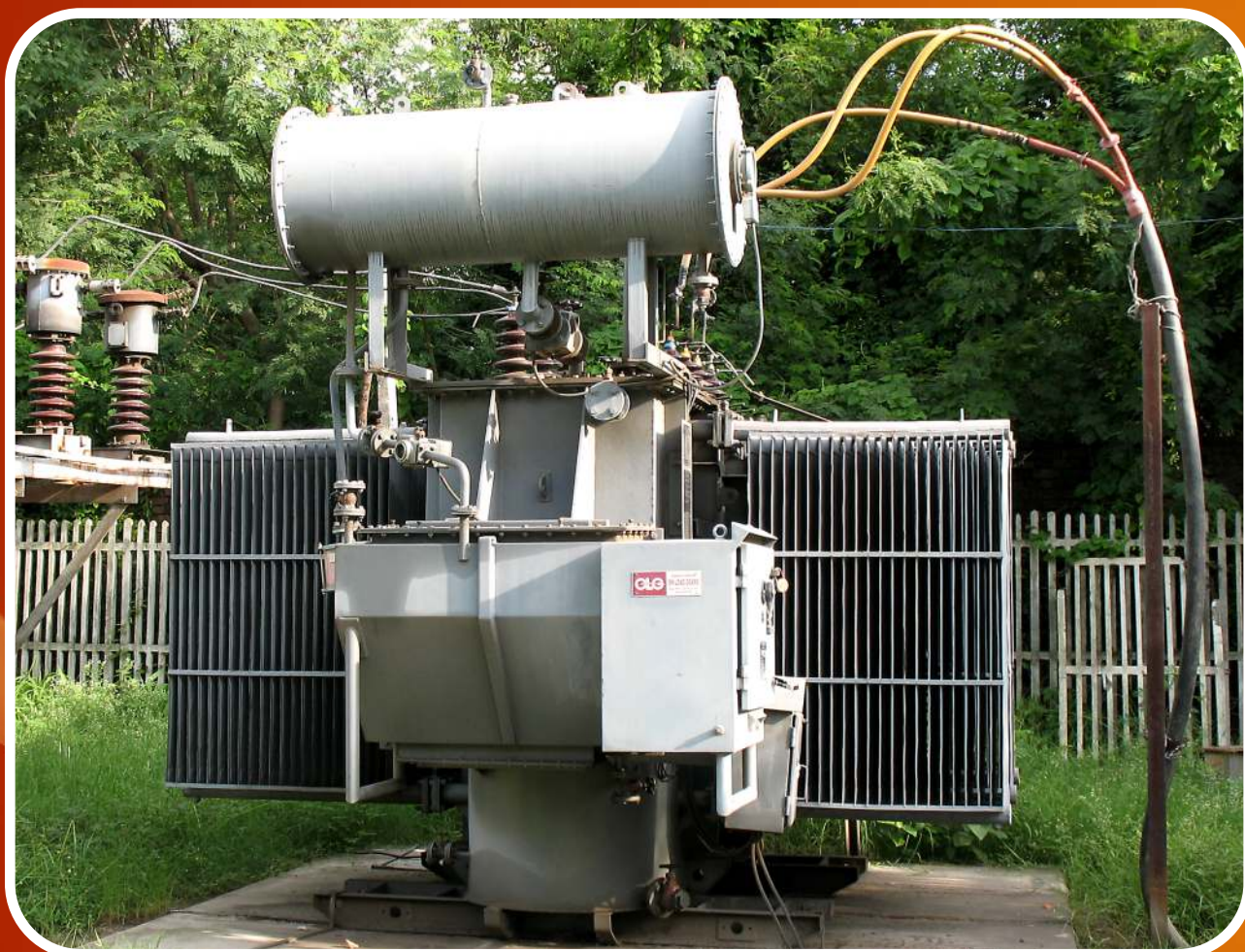
Energising India since 1969...



**TECHNICAL
ASSOCIATES
LIMITED**

An ISO 9001 : 2008 Company

Distribution & Small Power Transformers



WE TRANSFORM THE NATION'S POWER

INTRODUCTION



3 ϕ Distribution Transformers
(100 KVA, 11 KV)

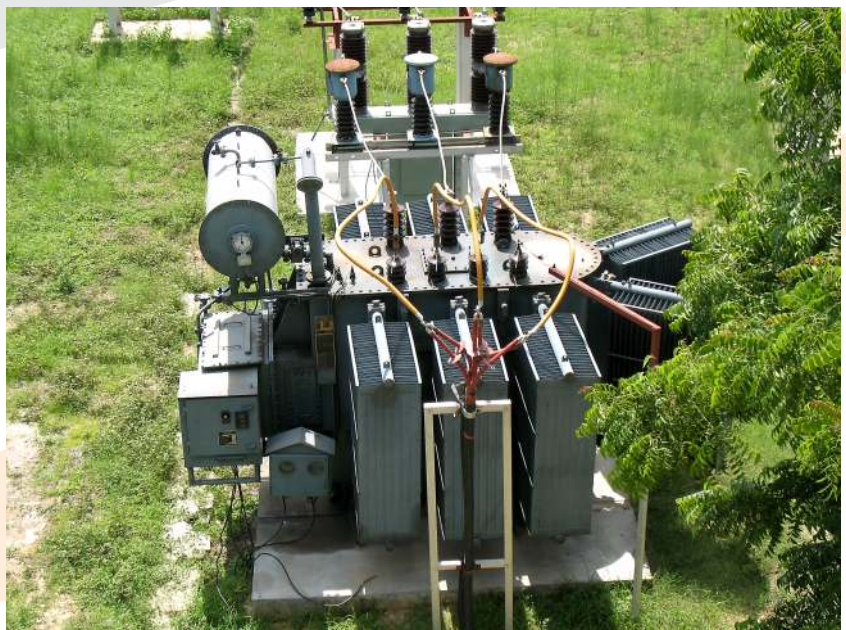


3 ϕ Distribution Transformers (11 KV)



Impulse Testing Facility

- Technical Associates Ltd. (TAL) is one of oldest and preferred manufacturers of Distribution Transformers (DTs) in India: Manufacturing DTs for more than 42 years.
- One of the **Top Ten manufacturers** of DTs.
- Manufacturing Capacity: 4,000 MVA p.a., or almost 6000 DTs per month.
- Range:
 - Stacked Core & Wound Core 1 ϕ Oil Filled DTs in 11, 22 & 33 KV Class from 5 KVA upwards.
 - 3, 4 & 5 Star Rated DTs in conformance with BEE's Energy Labeling programme.
 - 3 ϕ Oil Filled DTs in 11, 22 & 33 KV Class up to 6.3 MVA.
 - Special purpose transformers for industries/commercial requirements.
- More than 5,00,000 DTs already delivered & successfully commissioned for various customers in India.
- All delivered transformers successfully type tested from accredited 3rd party test houses (as per IEC 60076 and IS 2026).
- In-house design team of highly experienced engineers uses CAD techniques for development and continuous improvement of reliable, cost-effective transformers in conformance with IS, IEC or ANSI standards.
- Sophisticated and calibrated testing equipments for in-house Routine and Type Tests.
- Strict Quality control for incoming stock, process monitoring and finished products using SQC techniques.
- Installation & commissioning of Power and Distribution Transformers by trained and experienced engineers backed by timely supply of spares.



3 ϕ Distribution Transformer (33 KV)

PRODUCT RANGE



1 ϕ Wound Core Distribution Transformer (11 KV)



1 ϕ Stacked Core Distribution Transformer (11 KV)



5 MVA, 33/11 KV Small Power Transformer



Distribution Transformer Assembly Line

Single Phase Wound Core Transformer: Voltage class 6 KV, 11KV

- n TAL manufactures single phase wound core transformers from 5 KVA to 100 KVA up to 11 KV voltage class.
- n Circular cores are formed from prime grade CRGO steel for ensuring low loss. Annealing of the formed cores under inert atmosphere ensures stress relieving thereby retaining the original characteristic of electrical steel.
- n Progressively wound LV and HV windings bring reliability in terms of short circuit withstand ability of the Transformer whereas proper drying and choice of right grade of insulation ensure the capacity to withstand the specified impulse level.

Three Phase stacked Core Distribution & Small Power Transformers: Voltage class – 6 KV, 11KV, 22 KV, 33 KV

- n TAL manufactures three phase stacked core distribution transformers starting from 10 KVA up to 1000 KVA in 6 KV or 11 KV voltage class
- n Small Power Transformers that are typically used in the distribution system are also manufactured up to 6.3 MVA in 11 or 33 KV voltage class
- n Conventional stacked core Transformers are made from Prime grade CRGO steel and using electrolytic grade copper or Aluminium as per customers' requirement.
- n TAL uses step-lap or mitered joint laminations with low burr, made from prime CRGO sheets, to reduce no-load loss and noise level. HV and LV coils are prepared in dust free environments and are subjected to regular in process check.
- n Designing of HV coils is focused on ensuring effective uniform distribution of voltage to take care of impulse and transients while



Transformers ready for Dispatch



3.15 MVA, 33/11 KV Transformer



10 MVA, 33/11 KV Transformer

compression of coils for proper geometrical shape to take care of axial forces during short circuit condition.

- n The Core-Coil Assembly (also known as the active part) is processed under controlled conditions in air drying and vacuum ovens to ensure removal of moisture while preventing insulation damage on account of excessive heating. This increases the service life of these transformers to a great effect.
- n Excellent infrastructure, including facilities available for backward integration like in-house Core slitting, conductor manufacturing, Tank fabrication ensure quality control at every step. Input stocks as well as finished Transformers are subjected to quality checks as per organization's quality policy.

Customisation Options:

Customers also have the option of being able to customize their Distribution Transformers with multiple options as given below:

1. Mounting arrangements: (a) Wheels, (b) Side/Bottom mounted.
2. Tank types: (a) Conventional (Bolted), (b) Sealed, (c) Corrugated.
3. Radiators: (a) Conventional, (b) Flange bolted/ Welded.
4. Surface Treatment options: (a) Painted with finishes for different atmospheric conditions, (b) Powder Coated, (c) Galvanized.
5. Connections: (a) Bushings, (b) Cable Boxes.
6. On Load/ Off Circuit Tap Changers.
7. Anti Theft features for preventing theft of Transformer Oil.

MANUFACTURING PROCESS AND INFRASTRUCTURE



Material handling capacity up to 300 MT

- In-house facilities for Core slitting, cutting & annealing, Conductor manufacturing & paper covering, Tank fabrication, Oil storage and filtration, Insulation processing using latest machineries for QC and JIT approach.
- Sophisticated manufacturing, process & handling equipments such as Vapour Phase Drying Plants, Winding Machines with Variable Frequency Drives, etc. ensure product reliability.
- Excellent material handling facilities such as EOT Cranes up to 300 MT, Air Castors and innovative plant layouts for easy and fast movement of components.



Core Building for Distribution Transformers



Paper Wrapping on Conductor



Finished Coils

TESTING



Computerized Test Bench

- Fully computerized automatic testing facilities for all routine tests as per IS, IEC, ANSI.
- Impulse testing facilities from Haefely (Switzerland) (1600 KVp, 160 KJ & 99 KVp, 45 KJ) installed upgradeable for testing of 400 KV transformers.
- In-house Temperature rise test facilities.
- PD measurement facility.
- DGA for Oil analysis.
- Short-circuit test at Independent accredited Laboratories as per customers' requirement.

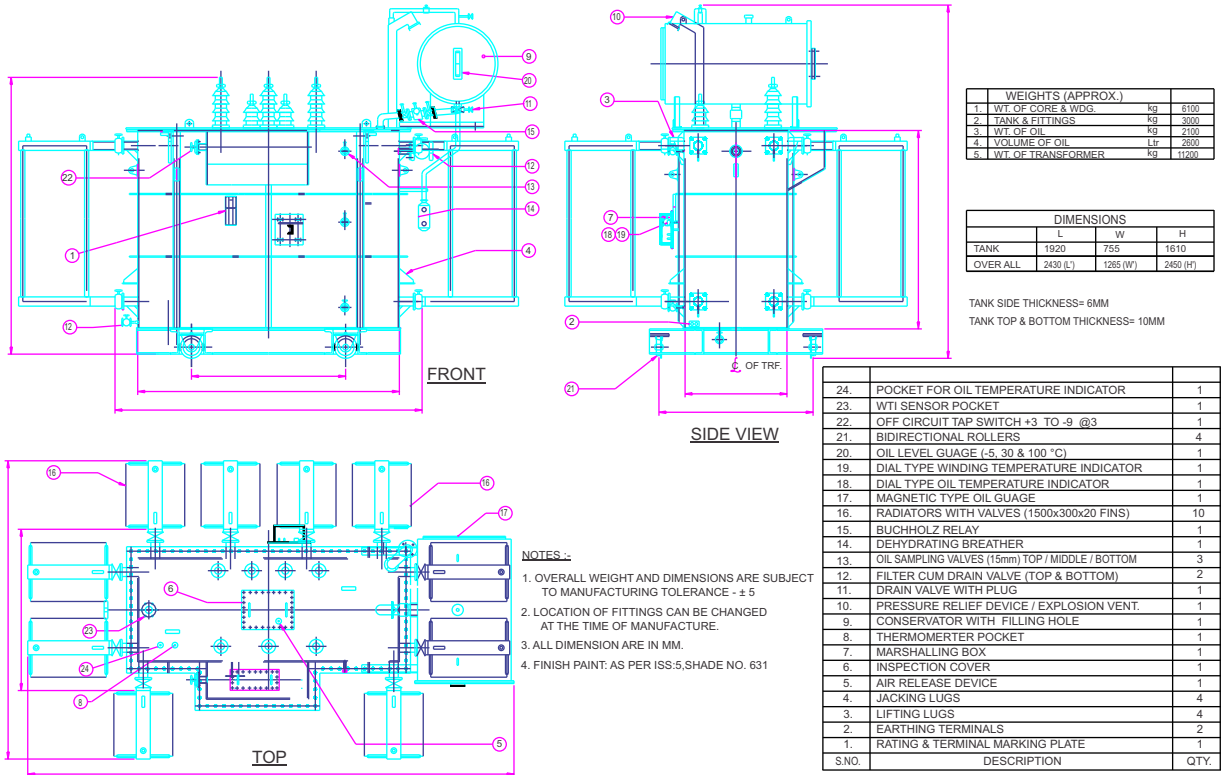
TYPICAL PARAMETERS OF DISTRIBUTION TRANSFORMERS

Single Phase Distribution Transformers								
Sl. No.	Rating	Voltage Class	% Z	No Load Loss (Watt)	Load Loss (Watt)	Dimension (mm)		
						Length	Breadth	Height
1	5 KVA	11/√3/240 KV	2.75%	22.5	120	515	350	880
2	10 KVA	11/0.250 KV	4.00%	50	210	785	665	655
3	16 KVA	11/0.250 KV	4.00%	75	250	850	770	695
Three Phase 11 KV Distribution Transformers								
Sl. No.	Rating	Voltage Class	% Z	No Load Loss (Watt)	Load Loss (Watt)	Dimension (mm)		
						Length	Breadth	Height
1	10 KVA	11/0.433 KV	4.00%	50	210	785	665	655
2	16 KVA	11/0.433 KV	4.50%	80	475	900	980	881
3	25 KVA	11/0.433 KV	4.50%	85	685	880	660	1310
4	40 KVA	11/0.433 KV	4.50%	140	950	950	900	1180
5	63 KVA	11/0.433 KV	4.50%	155	1235	1005	830	1485
6	100 KVA	11/0.433 KV	4.50%	260	1760	1050	1010	1425
7	200 KVA	11/0.433 KV	4.50%	400	3135	1350	1250	1700
8	315 KVA	11/0.433 KV	5.00%	800	4600	1260	1150	1700
9	500 KVA	11/0.433 KV	4.50%	850	6140	1800	1725	1780
10	630 KVA	11/0.433 KV	4.75%	1000	7000	1300	1850	2100
11	750 KVA	11/0.433 KV	5.00%	1500	9000	1875	1375	1950
12	1000 KVA	11/0.433 KV	5.00%	1200	8000	1700	1540	2257
Three Phase 33 KV Small Power Transformers								
Sl. No.	Rating	Voltage Class	% Z	No Load Loss (KW)	Load Loss (KW)	Dimension (mm)		
						Length	Breadth	Height
1	3.15 MVA	33/11 KV	6.25%	3.0	16	2450	5000	5000
2	5 MVA	33/11 KV	7.15%	5.0	31	3000	2300	3000
3	6.3 MVA	33/11 KV	7.15%	7.5	43	3000	3400	3250

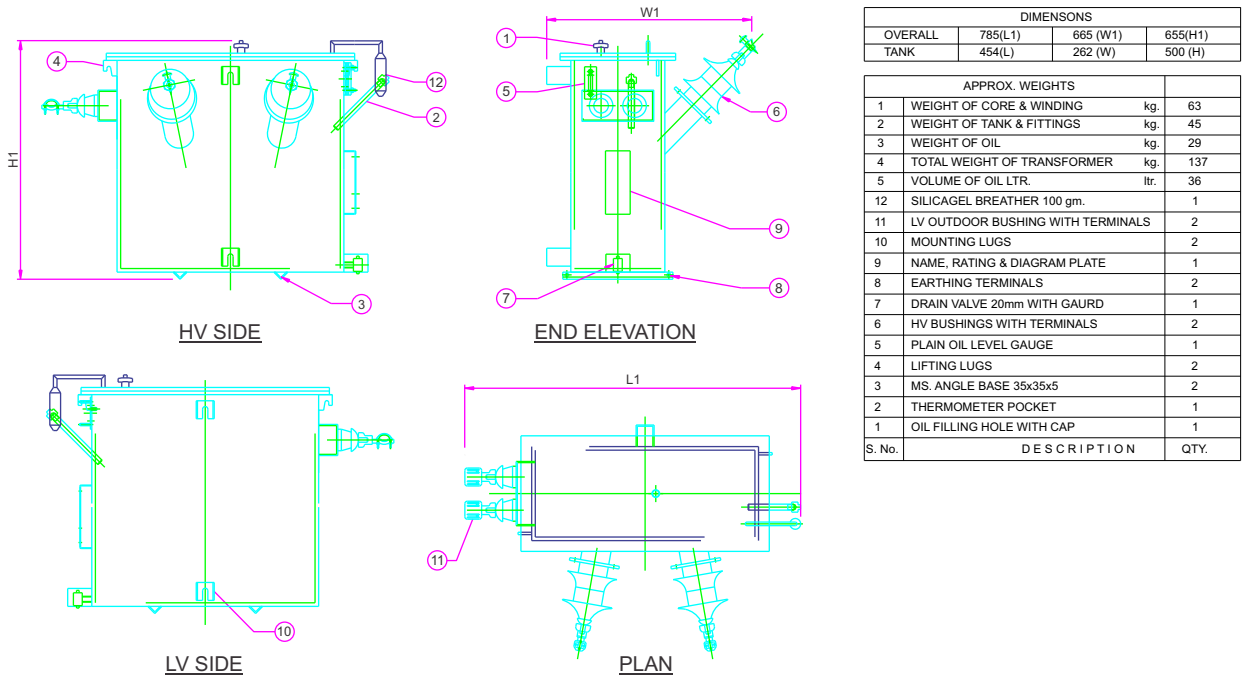
Note : The above figures are indicative only.
Customised transformers in Intermediate sizes can be built as per specification with ON LOAD / OFF LOAD tap changers.



Typical OGA of 33/11 kV, 3 ϕ , 5 MVA, Small Power Transformer



Typical OGA of 11 kV, 1 ϕ , 10 KVA, Distribution Transformer



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