



INDUCTION ELECTRIC



INDUCTION ELECTRIC

*An ISO 9001-2015 Certified
NSIC / SSI Registered Unit*

OUR CAPABILITIES

We make Transformers fulfilling the following special features:

- ▲ Total loss upto 1% of the rated capacity to increase the efficiency.
- ▲ Dry Type Transformer with special IP protection as per customer's requirements.
- ▲ Special core design to reduce noise level and overall weight of the Transformer.
- ▲ Transformer with multiple primary winding and single secondary winding to sustain the varied supply conditions.
- ▲ In house test facility to carry out the tests as per relevant IS.

OUR MISSION

Our thinking is driven by commitment to make best of the transformers to satisfy our customers with respect to proven design, quality input material & finally through Inspection.

OUR SUCCEES SOME DRY TYPE & OIL COOLED

Different Rating of Dry & Oil cooled transformers have been successfully passed the Short Circuit Test at CPRI, ERDA. We Have Succesfully Tested Short Circuit & Impulse of 3 STAR DISTRIBUTION TRANSFORMER. INDUCTION ELECTRIC was established in 2009 with an aim to provide AC Power solution tailored for the need of Industrial customers with excellent team work and constant R&D activities, we have graduated in many fields. We have diversified our operation into manufacturing of various Transformers to give a total power solution to our esteemed clientele. We are an ISO 9001 certified company with an integrated manufacturing and testing facility at Kolkata.

OUR EFFORTS

To achieve customers delight, we ensure teh following :

- ▲ Regular investment in R & D.
- ▲ Our products to undergo rigorous tests to determine the performance and compliance to various manufacturings standards.
- ▲ To deploy qualified technical personnel in order to ensure quickest sales & service support.

WHY INDUCTION

- ▲ Robust design features make all the differance.
- ▲ A lifetime trouble free operation fetback.
- ▲ Prompt & short delivery effcient service network to ensure pre sales service.
- ▲ An ISO certified organization.

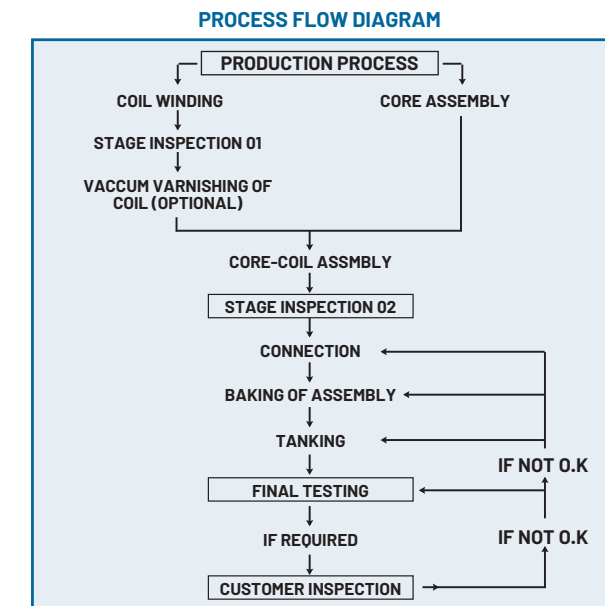
OUR TRANSFORMERS RANGE

- ▲ Power Transformers for substation up to 10 MVA, 33KV.
- ▲ Distribution Transformers (Oil cooled / Dry type). 3 Star Rated
- ▲ Flame Proof Dry Type Transformers up TO 2500 KVA.
- ▲ Furnace Transformers up to 7.5 MVA.
- ▲ Convrter Transformers.
- ▲ Earthing Transformer.
- ▲ Automatic Voltage Regulator.



OUR QUALITY SYSTEMS

The quality of our transformer is assured by well defined Quality Policy and procedures in conformance to the ISO-9001:2015 standard. Quality Assurance Plan is guided by the urge to provide uncompromising quality to our valued customers to ensure lasting satisfaction. Each transformer undergoes a prescribed range of the tests as per IS: 1180 & IS: 11171. In addition, supplementary tests are carried out as part of an internal sampling procedure to ensure continuous quality monitoring.



HIGH VOLTAGE DRY TYPE POWER TRANSFORMERS

Dry type power transformers require minimum maintenance to provide many years of reliable trouble-free service. Unlike liquidfilled transformers which are cooled with oil or a fire-resistant liquid dielectric, dry type units utilize only environmentally safe, CSA and UL recognized high temperature insulation systems. Every dry type design provides a safe and reliable power source which does not require fire-proof vaults, catch-basins, or the venting of toxic gases. These important safety factors allow the installation of dry type transformers inside buildings close to the load, which improves overall system regulation and reduces costly secondary lines losses.

INDUCTION dry type power transformers are primarily designed for stepping down high voltages from transmission and distribution systems to utilization voltages and commercial, industrial, institutional, or utility applications. They are ideally suited for both indoor and outdoor applications.

INDUCTION ELECTRIC provides quality dry type power transformers up to 2.5MVA at 11 KV and 75 kV BIL. A sampling of their applications are:

- Power distribution
- Indoor or outdoor primary and secondary substations
- Grounding transformers
- Mining, pump, and paper application transformers
- Corrosion-resistant transformers for marine distribution and power
- Low electromagnetic field emission transformers for hospital and institutional use
- Traction power rectifier transformers for transit systems
- Motor starting and drive applications
- High harmonic and intermittent load applications
- Many other applications

INDUCTION ELECTRIC has the engineering capability to design, manufacture, and test all standard and specialty dry type transformers, related magnetic products, and power transformers rated up to 2.5MVA and 75kV BIL.

INDUCTION ELECTRIC engineering and design team consists of highly competent and qualified individuals with many years of transformer design experience.





OUR RANGE OF DRY TYPE UNIT

Drive Isolation Transformers: specifically designed to meet the requirements of AC and DC variable speed drives or rectifier units. Available in 6-pulse, 12-pulse, and 18-pulse..

Electrostatically Shielded Transformers: Protect systems from high-frequency transients that occur due to switching and loading on distribution lines. Energy Efficient Transformers (e-Rated TM):

Low Sound Level Transformers: Designed to emit lower than normal audible hum.Special Frequency Designs: To operate at frequencies other than 60Hz.

VPI and Epoxy Dipped Windings: All Pioneer Electric transformers windings are vacuum pressure impregnated and polyester resin. For applications with harsh operating conditions or where airborne contaminants are present an epoxy resin coating can be added to the polyester impregnated coils.

- Provisions for future fans or fan packages completely installed with or without control power.
- Bus coordination with primary and secondary switchgear
- Digital thermometers to monitor winding temperatures.
- Neutral grounding resistors and monitors
- Strip heaters to avoid condensation when the transformer is not energized
- Ground fault relays
- Anti-vibration mountings to reduce transformer hum...
- Lighting arrestors: distribution, intermediate, or station class.
- Provisions for rolling, skidding, and lifting.
- Provisions for bus duct entry
- Key interlock systems
- Fully insulated bus



AUTOMATIC VOLTAGE REGULATING UNIT

This comprises basically the following major components

- Rolling contact type voltage Regulator
- Buck / Boost Transformer
- Automatic controlgear comprising Driver motor and Electronic voltage sensing relay.

OPERATION

The variable input is boosted up or bucked down to the required level through the series winding of the buck / boost transformer. The primary of the buck / boost transformer is fed from the voltage regulator so that exact magnitude can be injected into the line either in phase or in antiphase as the case may be. This injected voltage is steplessly variable through the rolling contacts of the voltage regulator.

The Electronic voltage sensing relay is connected across neutral and one phase on the output side. The relay is preset and remains inoperative at the preset voltage. it sends a signal to the drive motor so as to run it either in the clockwise or anticlockwise direction depending on the deviation of the voltage from the pre-set value. The drive motor is coupled to the rolling contact mechanism by chain & sprockets and its clockwise / anticlockwise rotation means movemets of the rolling contacts up or down the bared face of the regulator coil. This movemnt continues and ceases only when the output voltage comes to the pre-set value making the relay in operative.



APPLICATIONS

Applications of the Automatic voltage regulator are legion. To name a few are distribution system voltage control, providing stable voltage to pump motors thereby maintaining proper output and increasing efficiency, providing stable voltage to cold storages, providing stable voltage to tea processing machinery, computers, audio video transmission systems, Defence equipments Electronic Components processing etc.

ADVANTAGES :

- | | |
|---|--|
| 01. Saving in Energy | 02. Constant voltage output with Accuracy 1% |
| 03. Lesser failure of Electrical Equipment | 04. Improvement in Power Factor and reduction in MDI |
| 05. Less Production Loss & Better Efficiency in Plant | 06. Better utilisation of Existing Transformers and Cables |
| 07. Depreciation claim 100% as per I.T. Act | 08. 6-12 months payback period |

ENERGY SAVING MEANS SAVING OF POWER TARIFF

Throughput Capacity	Lowest 1KVA, singlephase to Highest 5000KVA, 33KV three-phase.
Voltage	110 volts, singles-phase to 33KV, three-phase
Torque of Mechanical Drive	10 kgcm to 40 kgcm at output shaft.
Accuracy of Control	Normal + 1% , Special + 1/2%.
Speedof Control	Normally less than 1% of line voltage per second on Automatic Control. Special upto 3% of line voltage per second.
Waveform Distortion	Negligible at full load.
Power factor Deterioration	Normally less than 2% at full load

The Range is being constantly extended

TESTING

Every power transformer supplied by INDUCTION Electric receives the following standard production tests :

- Resistance Measurement: Measures the DC resistance of the windings to ensure integrity. • Ratio Test: Determines that the ratio of the turns in the primary winding to the turns in the secondary windings is correct.
- Polarity and Phase Relation Test: Compares the instantaneous direction of the current and voltage in the primary relative to the secondary to determine the angular displacement and phase sequence. Determining the polarity is particularly important when paralleling or banking two or more transformers.
- No-Load Loss and Excitation Current Test: Measures the losses in a transformer operating at rated voltage and frequency under no load conditions. These losses include core loss, dielectric losses, and 12R losses from no-load current flow in the primary winding.
- Load Loss Test: Measures losses in the windings resulting from full load current flow and stray losses due to magnetic leakage to the core clamps and other structural members.
- Impedance Test: Measures the voltage required to circulate rated current through the windings.
- Applied Potential Test: Determines the dielectric strength of the insulation between windings and between the windings and ground.
- Induced Potential Test: Checks the dielectric strength and integrity of the turn to turn and layer to layer insulation.
- Temperature Rise Test(OPTIONAL): The transformers are tested under loading conditions that give losses as as possible to the nameplate rating to ensure its ability to operate within its designed temperature limit.



Physical Dimensions: Pressed Steel Radiator

Weight (kg)	100	150	200	250	315	400	500	630	750	800	1000	1250	1500	2000	3000	5000	10000
Weight (kg)	600	760	1000	1150	1369	1400	1795	2540	2800	2875	3000	3900	4800	5650	9400	13500	28500
Height (mm)	1350	1450	1600	1550	1600	1600	1650	1750	1990	1990	2050	2150	2250	2500	2650	-	-
Width (mm)	900	1050	1000	1000	1230	1230	1530	1630	1600	1650	1850	1950	2050	2200	2450	-	-
Length (mm)	1200	1230	1320	1420	1330	1330	1570	1670	1650	1650	1870	1970	2070	2220	2540	-	-

5 MVA AND 10/14 MVA TRANSFORMERS SAMPLE SPECIFICATIONS

Rated Power	5 MVA	10/14 MVA
Duty	Continuous	Continuous
Type	3	3
Rated frequency	50HZ	50Hz
Rated voltage HV/LV	33/11 kV	33/11kV
Type of Cooling	ONAN	ONAN/ONAF
Vector group & numerical index	Dyn-11	Dyn-11
Losses (No-load/full-load) (Approx.)	5.4/30 KW	7.2/69 KW
Tap Changing	Off-Load and On-Load	
Impedance voltage (principal) tap. 75 C (HVILV)	8% (Max)	12.5% (Max)
System highest voltage H.V. winding	36kV	36kV
L.V. Winding	12kV	12kV
Basic insulation level:		
HV/LV	200/95 kV	200/95 KV
Power frequency test for HV/LV,	70/28 kV	70/28 kV

OUR PRODUCTS

Electrical Transformer Oil Cooled and Dry Type

HT and LT Automatic Voltage Regulating Unit

Electrical Distribution Panel

Automatic PowerFactor Improvement Unit

DC Filter Choke

Motor Starting Auto Transformer

Resin Cast Transformer Upto 11KV

CERTIFICATES

ISO 9001:2015

CPRI and ERDA certificates

NSIC | SSI

APPROVAL

SAIL BOKARO | SAIL DSP | MECON

NALCO | CPRI | BCCL | WCL | HCL

PAYBACK ANALYSIS FOR 5000 KVA & 200 KVA TRANSFORMER

SL.	ANALYSIS	5000KVA	200KVA
1	Losses are considered for full load application (Utilization factor)	1	1
2	Electricity charges considered per KWH (Cost of Tk./unit)	6.05	6.05
3	Rating considered	5000KVA	200KVA
4	No. of hours in a year 24X365	8760	8760
A	24 X 7 POWERtrac Energy Efficient Transformer		
	No Load Loss 3.6KW + F. Load Loss 19KW	3.6+19 (KW)	-
	No Load Loss 0.36KW + F. Load Loss 2.82KW	-	0.360+2.82 (KW)
	Total Load Loss (KW)	22.6	3.18
A1	Electricity Bill per year due to losses (Tk.)		
	(utilization X price per unit X Total No of hrs X Loss) (1 X 6.05X 8760 X 22.6)/	Tk. 11,97,755.00	-
	(utilization X price per unit X Total No of hrs X Loss) (1 X 6.05X 8760 X 3.18)	-	Tk.1,68,534.00
B	Commercial Design Transformer (Ordinary Transformer)		
	No Load Loss + Load Loss	4.8+31 (KW)	0.56+5.4 (KW)
	Total Load Losses (KW)	35.8 (KW)	5.96 (KW)
B1	Electricity Bill per year due to losses (Tk.)		
	(utilization X price per unit X Total No of hrs X Loss) (1 X 6.05 X 8760 X 35.8)/	19,97,328.00	-
	(utilization X price per unit X Total No of hrs X Loss) (1 X 6.05 X 8760 X 5.96)	-	3,15,868.00
X	Yearly Saving due to Energy Efficient Transformer (B1-A1) (Tk.)	7,99,573.00	1,47,334.00
P1	Approx. Price of POWERtrac 5MVA or 200 KVA Transformer	63,00,000.00	4,00,000.00
P2	Price of commercial Design Transformer (Ordinary Transformer)	45,00,000.00	3,00,000.00
P1-P2	Price Difference for Energy Efficient Design (Tk.)	18,00,000.00	100,000.00
PB	Payback period in years (price difference/Savings per year) (PI-P2)IX	2.25 Year	1.47 Year
	Payback period (months) (PBX12)	27 Month	17 Month

INDUCTION ELECTRIC TRANSFORMER'S ELECTRICAL SPECIFICATIONS

TYPE P-1

11/0.415 KV, 3 PHASE, 50 HZ

Rated Power	(KVA)	50	100	150	200	250	315	400	500	630	750	800	1000	1250	1600	2000	2500	3000
Model No.	I for PNN	I 50IU	I 100IU	I 150IU	I 200IU	I 250IU	I 315IU	I 400IU	I 500IU	I 630IU	I 750IU	I 800IU	I 1000IU	I 1250IU	I 1600IU	I 2000IU	I 2500IU	I 3000IU
NO Load loss	(W)	153	234	330	360	450	540	630	720	900	945	990	1170	1350	1620	1845	2250	2890
Load loss at 75°C	(W)	810	1350	1800	2520	2610	2970	3330	4230	5400	6300	6500	8100	9450	11700	13500	17100	24300
Imped.vol at 15°C	1%	4	4	4	4	4	4.5	4.5	4.5	6	6	6	6	6	6	6	6	6
Regulation at p.f=1	(%)	1.75	1.41	1.3	1.10	1.08	1.04	0.987	0.941	0.987	0.9	1.03	1.00	0.98	0.95	0.93	0.90	0.83
Regulation at p.f=0.8	(%)	3.54	3.36	3.29	3.17	3.16	3.41	3.37	3.34	4.2364	4.27	4.33	4.31	4.30	4.28	4.26	4.24	4.23
Efficiency at p.f=1	At load 100%	(%)	98.00	98.42	98.6	98.79	98.81	98.89	98.95	99.00	99.05	99.04	99.03	99.06	99.09	99.12	99.15	99.19
	At load 75%	(%)	98.31	98.68	98.82	98.98	99.00	99.06	99.12	99.16	99.20	99.21	99.20	99.23	99.25	99.28	99.31	99.34
	At load 50%	(%)	98.52	98.85	98.98	99.11	99.13	99.29	99.23	99.27	99.31	99.34	99.33	99.35	99.38	99.40	99.43	99.46
	At load 25%	(%)	98.30	98.71	98.83	98.98	99.02	99.08	99.13	99.17	99.22	99.31	99.29	99.32	99.36	99.39	99.42	99.46
Efficiency at p.f=0.8	At load 100%	(%)	97.50	98.03	98.26	98.48	98.51	98.61	96.68	98.75	99.81	98.8	98.78	98.83	98.86	98.90	98.94	98.99
	At load 75%	(%)	97.89	98.34	98.53	98.72	98.75	98.83	98.98	99.95	99.00	99.01	99.00	99.03	99.07	99.10	99.13	99.17
	At load 50%	(%)	98.15	98.56	98.72	98.88	98.91	98.98	99.04	98.09	99.13	99.18	99.16	98.19	99.23	99.25	99.29	99.32
	At load 25%	(%)	97.88	98.38	98.55	98.73	98.77	98.85	98.91	98.97	99.02	99.14	99.12	99.15	99.21	99.24	99.28	99.32

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