

UP TO 20 MVA

Solar & Inverter Duty Transformers

Inverter duty transformers for solar and wind generation up to 20 MVA — dual-secondary step-up units with electrostatic shielding, de-rated core flux and windings designed for the harmonic spectrum an inverter actually produces.

RANGE

Up to 20 MVA

SECONDARIES

Dual, shielded

STANDARD

IEC 60076 · IEEE C57.159



Tanks awaiting core-and-coil assembly

A solar transformer is not a distribution transformer with a different label.

An inverter feeds the transformer a non-sinusoidal current with significant harmonic content, and it does so on a duty cycle that is de-energised for roughly half the year. Both facts change the design.

Harmonic currents drive eddy-current heating in the windings that a standard design does not allow for, so conductors are transposed and the core flux density is de-rated to leave headroom. The overnight de-energised period means no-load loss dominates lifetime energy cost far more than it does on a distribution feeder — which is why the low-no-load-loss design is worth paying for here and not always elsewhere.

Dual secondary

Two LV windings, each typically rated at half the total, decoupled by design.

Harmonic rated

Designed against the inverter's harmonic spectrum, not a sine wave.

Shielded

Copper electrostatic shield between HV and each LV winding.

SOLAR

Utility-scale PV

Inverter step-up duty at ground-mounted solar plants.

SOLAR

Rooftop and C&I

Smaller step-up units for commercial and industrial rooftop systems.

WIND

Wind generation

Step-up duty at wind farms.

HYBRID

Storage and hybrid

Plants combining generation with battery storage.

Fields marked "On enquiry" are issued against a specific enquiry. Full specification, reference tables and fittings: aggarwalglobal.com/products/solar-transformers.html

GENERAL

Rated power	Up to 20 MVA
HV voltage	11 kV or 33 kV
LV voltage	315 / 380 / 415 / 480 / 600 / 690 / 800 V — the inverter output, not 433 V
Winding arrangement	Two, three or more secondaries; dual secondary is the norm
Duty	Step-up, outdoor, solar or wind generation
Frequency	50 Hz standard; 60 Hz for export
Cooling	ONAN or ONAF; KNAN with ester fluid to order
Applicable standards	IS 2026, IS 1180, IEC 60076, IEEE C57.110, IEEE C57.159

ELECTRICAL

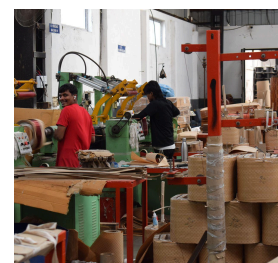
Vector group	YNd11d11 or Dyn11yn11 for dual secondary; Dyn11, YNd11, Dyn5, Yzn11 to order
Impedance HV-LV	Typically 7% to each LV winding
Impedance LV1-LV2	Typically 11% or above — this is what decouples the two inverters
Harmonic design basis	Designed for the inverter harmonic spectrum, minimum 5% THD, with 3rd and 5th harmonic suppression
Harmonic derating	Per IEEE C57.110 — supply the inverter's harmonic spectrum with your enquiry
Electrostatic shield	Copper shield between HV and each LV winding, each brought out to its own 1.1 kV terminal
Core flux density	De-rated for harmonic headroom
Tapping	Off-circuit $\pm 5\%$ or $\pm 10\%$ in 2.5% steps; on-load to order

STANDARDS

IS 1180 (Part 1):2014	Outdoor oil-immersed distribution transformers up to 2500 kVA, 33 kV — including the energy-efficiency levels
IS 2026 (Parts 1–5)	Power transformers — general, temperature rise, insulation levels, terminal markings, short-circuit withstand
IEC 60076 series	International power transformer standard — the export equivalent
IS 3024	Cold-rolled grain-oriented (CRGO) electrical steel sheet and strip
IS 335:2018	Insulating mineral oil for transformers and switchgear
IS 3639:1966	Fittings and accessories for power transformers
IS 2099 / IS 7421	HV and LV porcelain bushings
IS 3637	Gas-and-oil-operated (Buchholz) relays

ROUTINE TESTS ON EVERY UNIT

- Winding resistance at each tap — IS 2026 (Part 1) cl. 16.2
- Voltage ratio, polarity, phase sequence and vector group — cl. 16.3
- Short-circuit impedance and load loss at 50% and 100% — cl. 16.4
- No-load loss and no-load current at 90%, 100% and 112.5% voltage — cl. 16.5
- Insulation resistance — cl. 16.6
- Separate-source voltage withstand — IS 2026 (Part 3) cl. 10



ENQUIRIES

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