

COMPACT SUBSTATIONS (CSS) — PACKAGE HV · TRANSFORMER · LV

Compact substation spectrum & selection guide

Factory-integrated compact substations housing HV switchgear / RMU, oil-filled or dry-type transformer and LV distribution in one enclosed footprint. Built for metro, campus and industrial parks — faster civil works, reduced site cabling risk and SCADA / PFC-ready interfaces.

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1. Package ratings

Compact CSS
Up to 500 kVA

Small campus and commercial packages — HV RMU + DT + LV board in a compact outdoor / indoor shell.

Medium CSS
500 kVA – 1,250 kVA

Industrial and township packages — oil or dry transformer options, metering and PFC-ready LV arrangements.

Large CSS
1,250 kVA – 2,500 kVA+

Metro, parks and heavy campus duty — dual feeder / RMU options, SCADA interfaces and project LV distribution.

2. Technical specifications by tier

Parameter	Compact (≤500 kVA)	Medium (500–1,250 kVA)	Large (1,250–2,500 kVA+)
Primary / secondary	HV as specified · LV 433 V typical	HV / LV per project	HV dual / ring · LV multi-board
Cooling	Transformer ONAN / AN as fitted	ONAN / ONAF or AN / ANAF	As per transformer type & rating
Efficiency	IS 1180 / dry-type practice inside package	Low-loss DT or CRT as specified	Project capitalisation · package losses
Impedance	Transformer %Uk per study	Project %Uk	Custom %Uk · feeder studies
Core	CRGO (amorphous optional) / CRT CRGO	CRGO / cast-resin CRGO	High-grade CRGO as specified
Windings	Cu / Al · oil or cast resin	Cu / Al per transformer type	Project winding material
Tap changing	OCTC typical	OCTC / OLTC options	OLTC / AVR where specified
Applications	Small campus · Commercial	Township · Light industry	Metro · Parks · Heavy campus
Standards	IS / IEC package practice	IS / IEC · site safety arrangements	IS / IEC · SCADA / RMU interfaces

3. Why choose a compact substation?

Single footprint package
HV switchgear, transformer and LV distribution ship as one engineered enclosure — less civil work, fewer site interfaces and faster energisation than stick-built substations.

Oil-filled or dry-type inside
Choose oil-immersed DT or cast-resin / VPI dry-type to match fire codes, indoor / outdoor siting and insurance rules without redesigning the package shell.

SCADA & RMU ready
Ring-main units, metering, PFC and SCADA / remote I/O interfaces are planned into the package so utility and campus control rooms stay connected from day one.

Safer, cleaner handover
Factory assembly and routine tests reduce site cabling risk and commissioning surprises — ideal for metro, malls, IT parks and industrial campuses.

4. Applications

Metro & transit

Enclosed packages for stations and depots — compact footprint, controlled access and utility-grade HV / LV arrangements.

Campuses & malls

Commercial and institutional loads with oil or dry transformer options and tidy outdoor / indoor CSS shells.

Industrial parks

Multi-tenant parks needing fast handover — RMU / dual feeder options and LV boards sized to the plot load.

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