

CHNT

Empower the World



PREFABRICATED SUBSTATION

A Dedicated Solution for Onshore Wind Farms

CHINT Smart Electrical



Our Solutions Include

 Crystalline Silicon Manufacturing	 New Energy	 Power Systems & Energy Storage
 Wires & Cables	 Power T&D	 Integrated Power Distribution
 Low-voltage Electrical	 Meters	 Building Electrical

Founded in 1984, CHINT Group Co., Ltd. (CHINT) is a global leading smart energy solutions provider. With more than 40 years of industry expertise, CHINT has remained committed to industrial innovation and brand excellence. Our company drives progress through five strategic pillars: industrialization, technological advancement, global expansion, digital transformation, and platform development.

CHINT operates across three core sectors—Green Energy, Intelligent Electrical Solutions, and Smart Low-Carbon Solutions — supported by two key platforms: CHINT Global and Sci-Tech Innovation Incubation. Its extensive business network spans more than 140 countries and regions, powered by a global workforce of over 50,000 employees.

In 2024, CHINT achieved USD 25 billion in revenue and has maintained its position among the Top 500 Chinese Enterprises for over 20 consecutive years. Notably, CHINT Electrics became China's first publicly listed company specializing in low-voltage electrical appliances, reinforcing its industry leadership.

 USD 25 Billion Annual Revenue, CHINT Group	 USD 27.7 Billion Total Assets, CHINT Group	 15% YoY Revenue Annual Growth, CHINT Group
 140+ Business Coverage in Countries and Regions	 3%-12% Annual R&D Investment Obtained from the Percentage of Sales	 10,000+ Accumulated Authorized Patents
 40+ Global Subsidiaries	 50,000 Global Employees	 68% Localization Rate of CHINT Global Employees

GLOBAL R&D LOCALIZATION

Making smart electricity and clean energy a reality from the future

20+



Global Research Institutes

650+



Industry and International Standards Formulation

10,000+



Accumulated Authorized Patents

3%-12%



Annual R&D Investment Obtained from the Percentage of Sales

CHINT Intelligent Electrical Laboratory Center



Asia Pacific Innovation Lab, Singapore



NOARK Global R&D Center



GLOBAL Logistics LOCALIZATION

Penetrate locally, escalate globally

80%+



Increase of On-time Delivery Rate

50%+



Increase of Global Project Coverage

<60

Days



Shorten the Average Delivery Cycle

20+

Global Logistics Centers

North America

USA, Mexico, Canada

Asia Pacific

India, Vietnam, Indonesia, Malaysia, Shanghai, Wenzhou

Latin America

Brazil, Ecuador

West Asia and Africa

Egypt, Kenya, Dubai, Nigeria

Europe

Spain, Italy, Czech Republic, Turkey, Kazakhstan, Romania, Netherlands

Dubai Global Logistics Center



Brazil Global Logistics Center



CHINT Global Intelligent Fulfillment Center (Wenzhou)

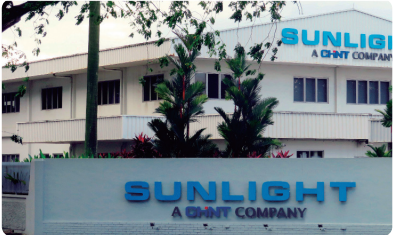


GLOBAL FOOTPRINT

- Business Covering  **140+** Countries and Regions
-  **40+** Global Subsidiaries
-  **30+** Global Manufacturing Bases
-  **2,300+** Global Distributors
-  **68%** Localization Rate of Global Employees



Sunlight **Singapore & Malaysia**



Main Products: Low-voltage Switchgears

Sunlight **Vietnam**



Main Products: MSB, MCC, SDB, DB, CU, Fire Pump Panel, Weatherproof Panel, String Combine Box, Solar Switchboard

SchneiTec CHINT **Cambodia**



Main Products: MV Equipment including 22kV Distribution Transformer, Switchgear, Smart RMU, Capacitor Bank

Metering Factory **Uganda**



Main Products: Meters

Solar Factory **Thailand**



Main Products: PV Module, PV Cell

Meter Factory **Mexico**

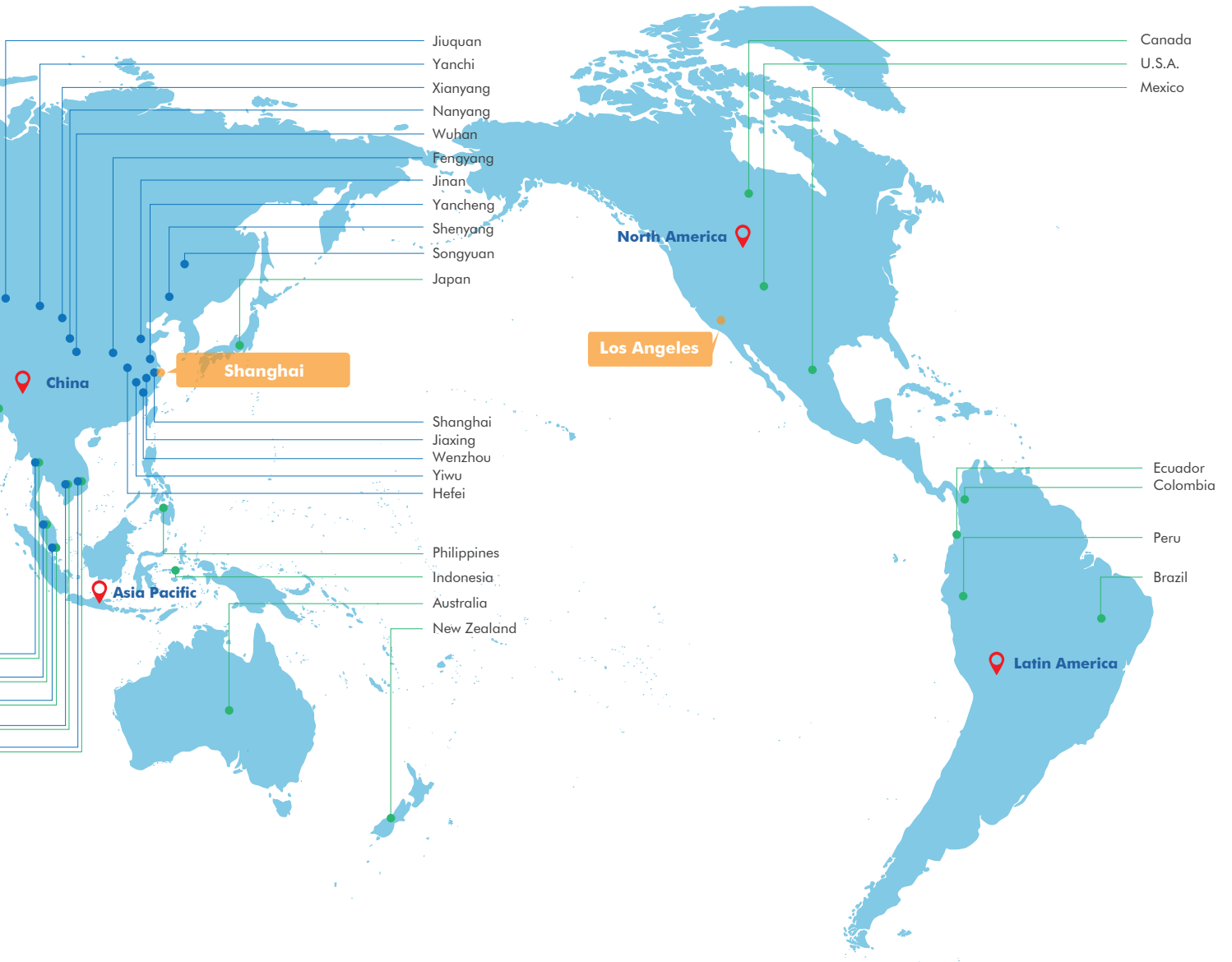


Main Products: Smart Meters

Meter Factory **Kenya**



Main Products: Smart Meters



CHINT – EGEMAC

Egypt



Main Products: Full Series of Low-voltage Switchgears

CHINT ATC

Saudi Arabia



Main Products: RMU and Intelligent Power T&D Products of 33kV and below

CHINT-AJLAN & Bros

Saudi Arabia



Main Products: Low-voltage Components

Wenzhou Low-voltage Intelligent Factory

China



Main Products: Low-voltage Components

Power T&D Shanghai Factory

China



Main Products: Power Transformer, GIS, MV and LV Switchgear, HGIS, HV Circuit Breaker, Disconnecter

Power T&D Jiaxing Factory

China



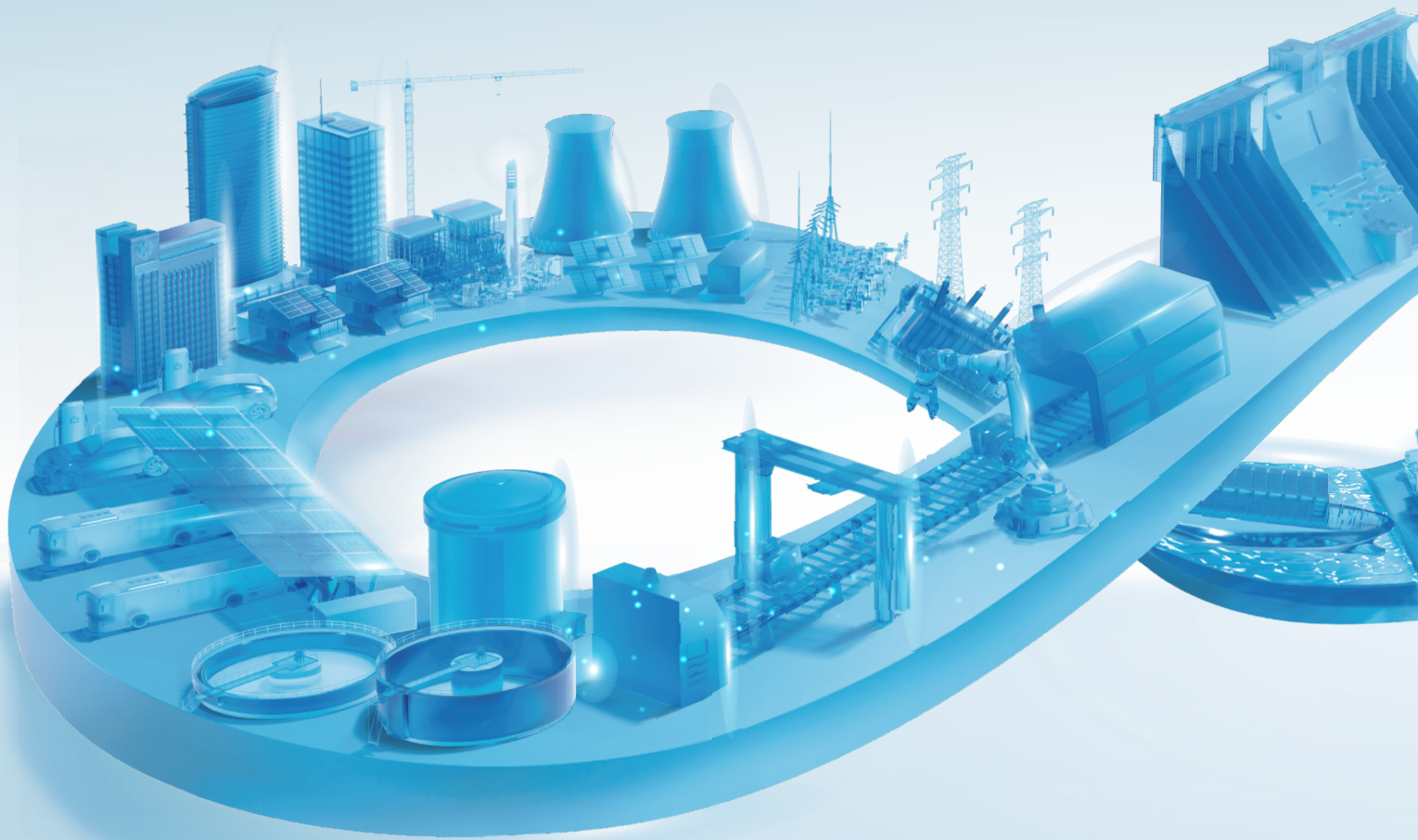
Main Products: MV and LV Switchgear, C-GIS, MV Circuit Breaker, Prefabricated Substation

Haining Solar Intelligent Factory

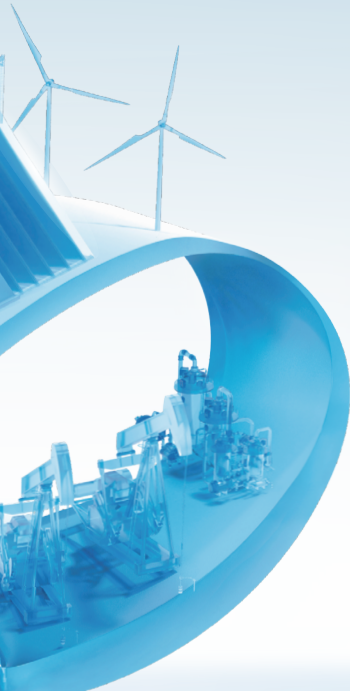
China



Main Products: PV Module, PV Cell



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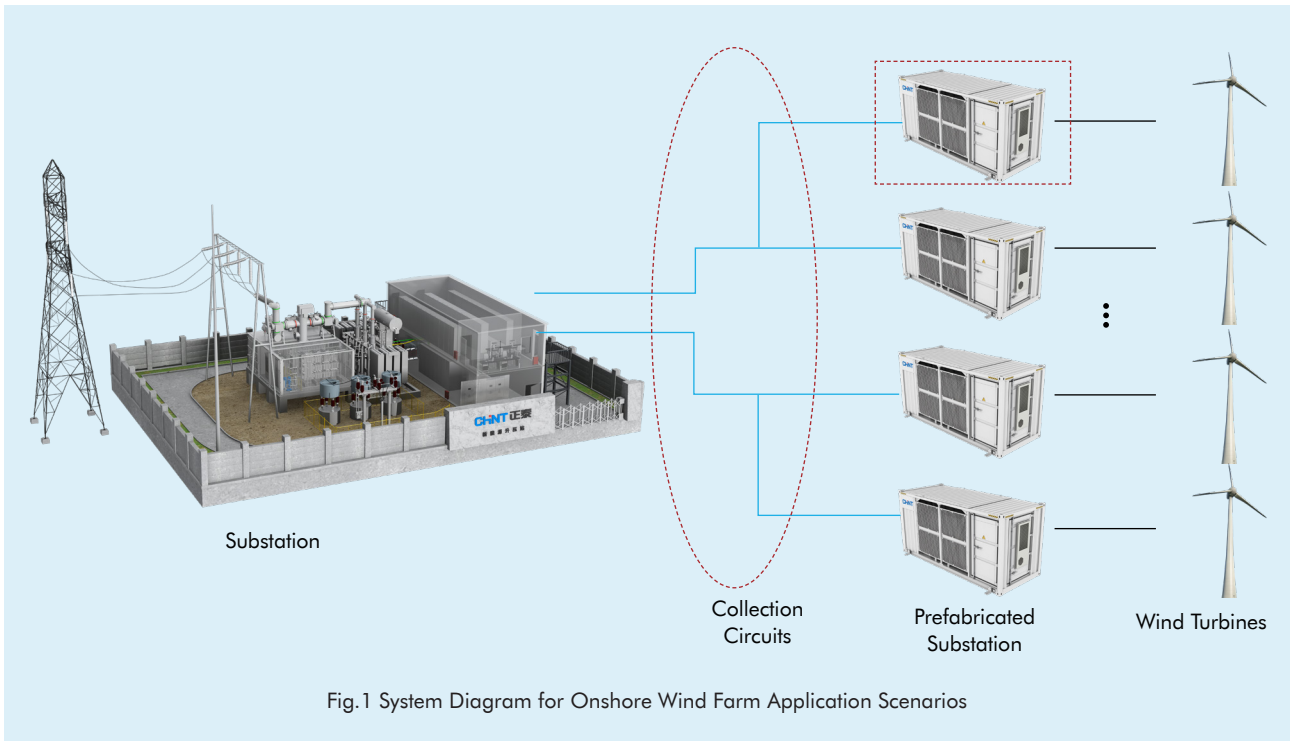
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1.0

PRODUCT INTRODUCTION

The prefabricated substation provides a compact, integrated solution for onshore wind farms by stepping up the low-voltage AC output from wind turbines to medium voltage for collection and transmission to the main grid. The entire system, integrated into a single steel shell, includes MV switchgear, transformers, LV panels, and auxiliary power, streamlining power conversion and distribution.

Building on a robust smart manufacturing base and extensive industry knowledge, CHINT Group focuses on addressing the dynamic challenges of its customers. We offer a full suite of services—from initial design and integration to commissioning and life-cycle maintenance—delivering a convenient, economical, and dependable solution.



1.0

PRODUCT INTRODUCTION

1.1 Performance Features



Flexible 40.5kV Capability

Supports voltages up to 40.5kV with options for dry-type or oil-immersed transformers. The MV/LV side design is customizable to project requirements.



Seamless EMS Integration

Features a unified communication interface for full SCADA compatibility, enabling rapid setup and commissioning.



Comprehensive Monitoring & Control

Enables real-time status monitoring of MV switchgear, transformers, and LV panels. Provides high-precision online measurement of electrical parameters (current and voltage).



Modular Design

Utilizes extensive factory prefabrication and a modular approach to minimize on-site work while optimizing transport and installation efficiency.

1.2 Reliability



All-Range Safety Protection

Engineered with a full suite of protective functions such as overcurrent, short-circuit, and earth fault protection to safeguard the entire prefabricated substation.



Robust Enclosure Protection

Built with an IP54-rated shell designed to be dustproof and waterproof, offering complete external defense for the internal components.



Advanced Corrosion Defense

Features a high-quality, even three-layer paint finish that delivers exceptional corrosion resistance, guaranteeing reliable performance in diverse environments.

1.3 Rapid Deployment



Pre-Integrated Equipment

Internal components are pre-installed and integrated at the factory, enabling rapid on-site installation and commissioning.



Standard Container Design

Constructed using standard 20-foot or 40-foot container dimensions, which facilitates easy transportation and installation.



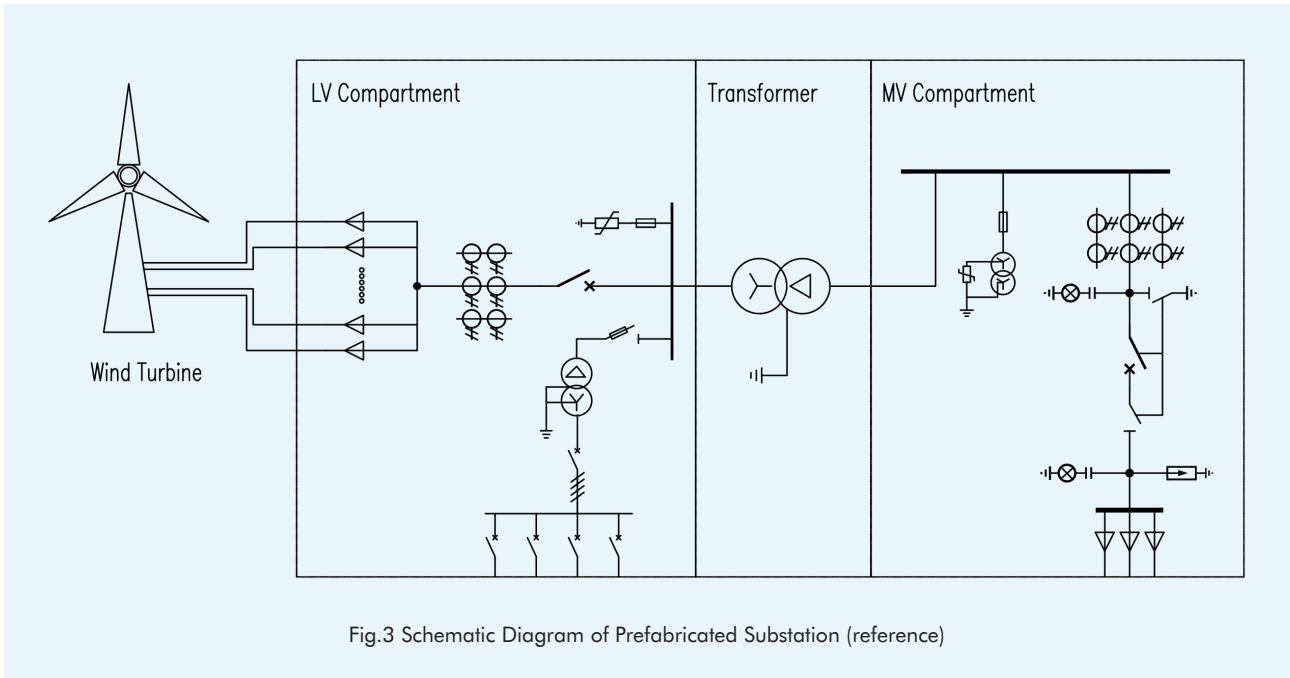
Simplified Site Work

On-site work is minimized and limited to the connection of incoming, outgoing, and communication cables.

1.0

PRODUCT INTRODUCTION

1.4 System Topology



2.0

PRODUCT STRUCTURE

2.1 Integrated Three-bay Design

The unit integrates three fully functional compartments:

- MV Compartment: Supports ring-main, radial, and dual power supply schemes. medium-voltage metering is available as an option.
- Transformer Compartment: Accommodates low-loss oil-immersed or dry-type transformers. It is equipped with an automatic forced air-cooling system and maintenance lighting.
- LV Compartment: Features a flexible panel or cabinet design, capable of supporting standard functions (power distribution, lighting, metering) or a self-powered system.

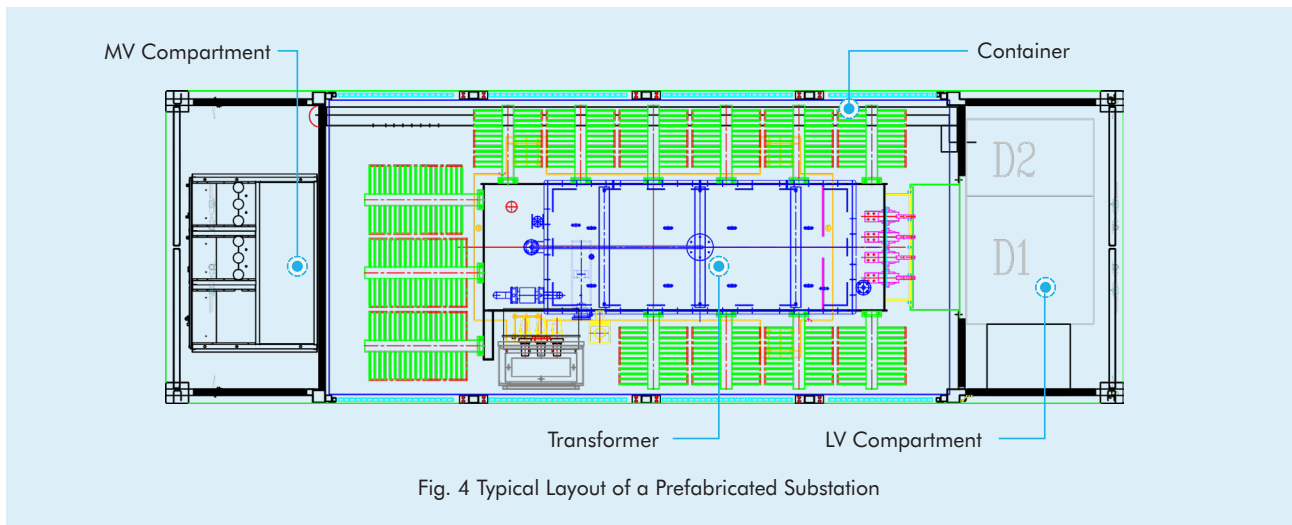


Fig. 4 Typical Layout of a Prefabricated Substation

2.2 Operator-oriented Layout

- Compact and ergonomic design for easy operation and maintenance.
- Medium-voltage circuit breakers feature an interlocking mechanism for fault prevention.
- The transformer is mounted on rails for easy access and service.
- All compartments are equipped with labyrinth ventilation and automatic lighting.
- A double-layer insulated roof structure minimizes solar heat absorption, while ventilated eaves promote convective airflow and heat dissipation.
- A robust steel base frame ensures structural strength and rigidity.

2.3 High-Efficient Cooling System

- Optimal thermal performance is achieved by utilizing either natural convection or forced air cooling, tailored to the specific climatic conditions of the project location.
- An automatic temperature controller in the transformer compartment ensures full-rated capacity operation by managing transformer temperature.

2.4 Layout Forms

Internal layout schematic of prefabricated transformer (MV-MV Compartment, T-Transformer Compartment, L-LV Compartment)



Fig. 5



Fig. 6

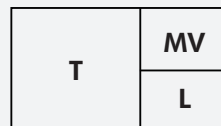


Fig. 7

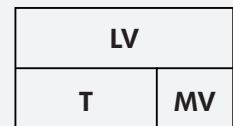


Fig. 8

3.0

WORKING CONDITION

3.1 Ambient Operating Conditions

NO.	Items	Value
1	Temperature	-40°C ~ 55°C
2	Humidity (daily average value)	≤ 95%
3	Humidity (monthly average value)	≤ 90%
4	Altitude	> 1000 m (derating)
5	Corrosion grade (ISO 12944-1)	Max. C5-H
6	Outdoor Wind Speed	≤ 35 m/s
7	Environment free from conductive dust, and hazardous substances that are corrosive to metals or insulation, or flammable/explosive.	

*CHINT can offer customized solutions for unique environmental requirements

3.2 Superior Environmental Durability

- Suitable for extreme ambient temperatures from -40°C to +55°C
- Withstands 1440 hours of salt spray test
- Withstands 144 hours of damp heat test
- Rated for Class A fire resistance
- Rated for seismic Level L8 resistance
- Equipped with a dehumidifier for high-humidity environments
- Features dust-filter screens for sandy, dusty, or sandstorm-prone environments



4.0

TECHNICAL PARAMETERS

4.1 Typical Specifications

Prefabricated Substation			
Rated Power	12500 kVA@30°C	8200 kVA@30°C	6600 kVA@30°C
Rated Voltage	1.14/(24~40.5) kV	1.14/(12~40.5) kV	1.14/(12~24) kV
Communication	RS485/ Ethernet/Optical Fiber	RS485/Ethernet/Optical Fiber	RS485/Ethernet/Optical Fiber
Frequency	50/60 Hz	50/60 Hz	50/60 Hz
Ingress Protection	IP54	IP54	IP54
Anti-corrosion	Max. C5-H	Max. C5-H	Max. C5-H
Service Life	≥ 25 years	≥ 25 years	≥ 25 years
Size (L*W*H)	TBD	6058*2438*2896 mm	6058*2438*2896 mm
Transformer			
Type	Oil (Mineral oil or natural ester)	Oil (Mineral oil or natural ester)	Oil (Mineral oil or natural ester)
Vector Group	D/yn11	D/yn11	D/yn11
LV/MV Voltage	1.14/(24~40.5) kV	1.14/(12~40.5) kV	1.14/(12~24) kV
Tapping on HV	±2*2.5%	±2*2.5%	±2*2.5%
Winding Material	Cu/Cu or AL/AL	Cu/Cu or AL/AL	Cu/Cu or AL/AL
Cooling Type	ONAN or KNAN	ONAN or KNAN	ONAN or KNAN
Insulation Class	Class A	Class A	Class A
PEI	EU Tier 2	EU Tier 2	EU Tier 2
MV Compartment			
Insulation Type	SF6 / SF6 Free	SF6 / SF6 Free	SF6 / SF6 Free
Rated Voltage	24~40.5 kV	12~40.5 kV	12~24 kV
Rated Current	1250A	630 A	630 A
Rated Short-time Withstand Current	31.5 kA/2 s	25 kA/4 s	21 kA/3 s
Protection Relay	50/51/50N/51N	50/51/50N/51N	50/51/50N/51N
LV Compartment			
Rated Current of ACB	7200 A/3P	5000 A/3P	4000 A/3P
Rated Voltage	1.14kV	1.14kV	1.14kV
Rated Short-time Withstand Current	65 kA/1 s	65 kA/1 s	65 kA/1 s
Notes: The parameters are for reference only; the actual capacity of the wind turbine shall prevail.			

5.0

TYPICAL CONNECTION SCHEME

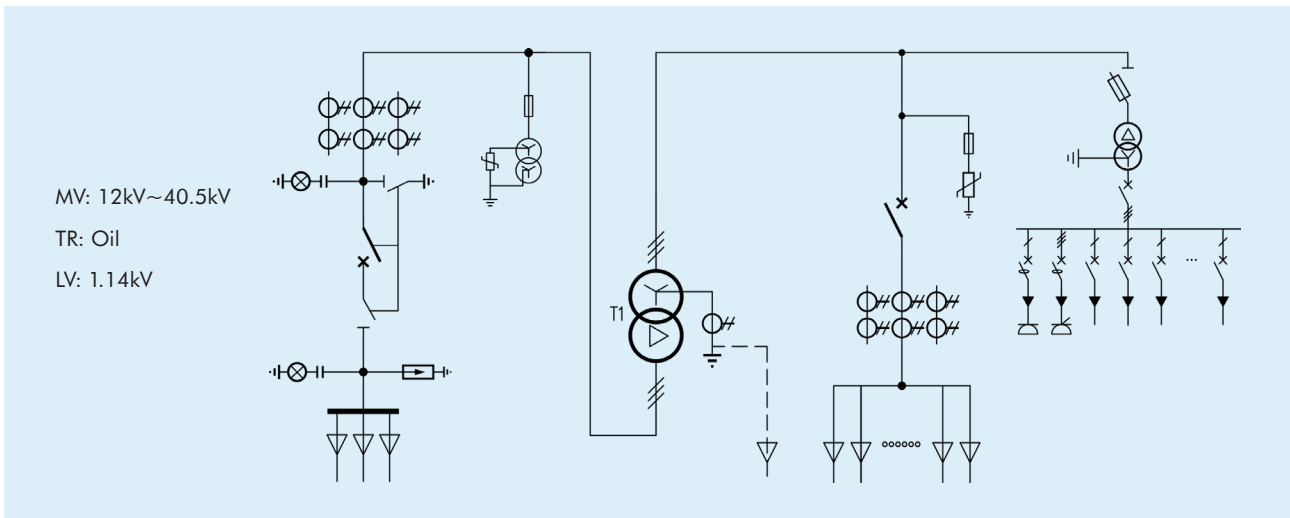
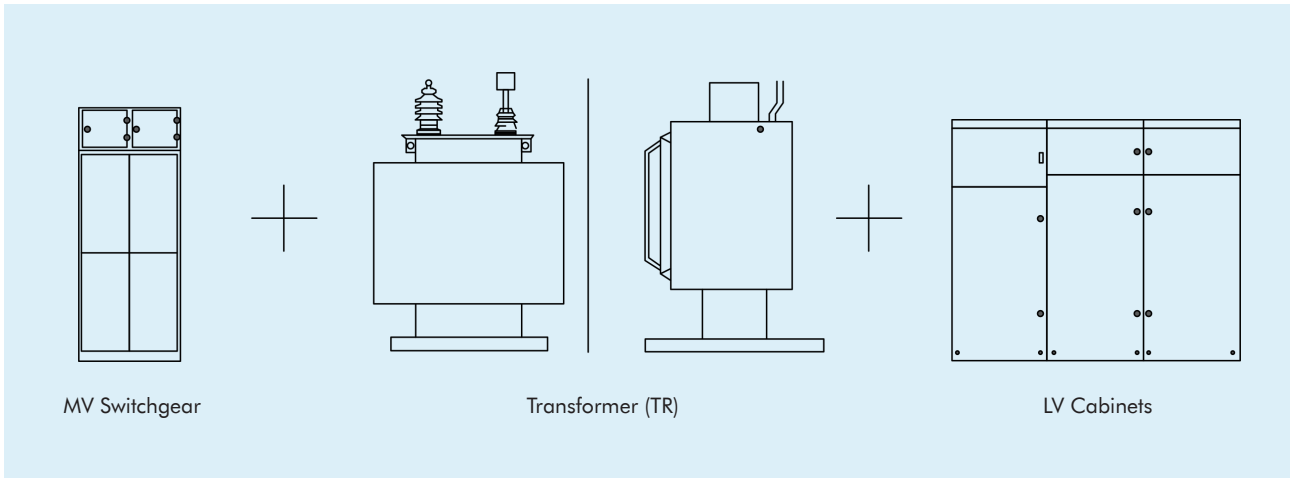


Fig. 9 Reference Imagery: On-shore Wind Farm Substation Applications

Asia Pacific

China | Global HQ

ZHEJIANG CHINT ELECTRICS CO., LTD.

Add: A3 Building, No. 3655 Sixian Road, Songjiang Shanghai 201614.
Tel: +86 21 5677 7777
Fax: +86 21 5677 7777
E-mail: global-sales@chintglobal.com
Web: www.chintglobal.com

Vietnam

CHINT Vietnam Holding Co., Ltd

Add: Level 3 The CREST Office, No 15 Tran Bach Dang, An Khanh ward, Ho Chi Minh City, Vietnam.
Tel: +84 0283 8270 015
E-mail: marketing.vn@chintglobal.com
Web: www.chintglobal.vn

Sunlight Electrical (VN) Co., Ltd

Add: 20 Doc Lap Ave, VSIP, Thuan An City, Binh Duong Province, Vietnam.
Tel: +84 0274 3743 505
E-mail: sales.sev@sunlightgroup-vn.com.vn
Web: www.sunlightvietnam.com.vn

Australia

CHINT AUSTRALIA PTY LTD

Add: 3/20 Cliff Street, Milsons Point, NSW 2061
Tel: +61 1800 270 870
Email: info.australia@CHINT.com

India

CHINT India Energy Solution Private Limited

Add: Discovery Tower, Plot No. A-17, Ground Floor Industrial Area Sector 62 Noida, India 201309.
Tel: +91 1202 9750 57
E-mail: marketing@chint.co.in
Web: www.chint.co.in

Malaysia

Alpha Automation (Selangor) Sdn. Bhd.

Add: No. 11, Temasya 18, Jalan Pelukis U1/46B, Seksyen U1, 40150 Shah Alam, Selangor.
Tel: +603-5569 7787
Fax: +603-5569 9295
Email: chintmalaysia@alphasel.com
Web: www.alphasel.com

Europe

Italy

CHINT ITALIA INVESTMENT SRL

Add: Via Bruno Maderna 7 30174 Venezia
Tel: +39 041.446614
Fax: +39 041.5845900
E-mail: info@chint.it

Czech Republic

NOARK Electric Europe s.r.o.

Add: Sezemická 2757/2, 193 00 Prague 9
Tel: +420 226 203 120
E-mail: europe@noark-electric.com

Romania

NOARK ELECTRIC ROMANIA

Add: Tudor Vladimirescu nr. 45 et. 5 cod postal 050881 Sector 5 , Bucuresti
Tel: +40 371 444 920
E-mail: InfoRO@noark-electric.com

Poland

NOARK ELECTRIC POLAND

Add: Św. Michała 62 61-005 Poznań
Tel: +48 785 765 825
E-mail: monika.malczewska@noark-electric.com

France

CHINT ELECTRICS FRANCE

Add: Tour Trinity, 1b place de la Défense, 92400 Courbevoie, France

Singapore | Asia Pacific HQ

CHINT GLOBAL INTERNATIONAL PTE LTD

Add: 8 Kallang Avenue, #04-06/09 Aperia Office Tower 1, Singapore 339509.
Tel: +65 6329 3110
Fax: +65 6329 3159
E-mail: sales.apac@chint.com
Website: www.ChintGlobal.com

SUNLIGHT ELECTRICAL PTE LTD

Add: 1 Third Chin Bee Road, Singapore 618679.
Tel: +65 6741 9055
Fax: +65 6265 4586
E-mail: sales@sunlightgroup.com
Web: www.sunlightgroup.com

Cambodia

CHINT (Cambodia) Power Equipment Co., Ltd

Add: No.15, St. 542, Sangkat Boeung Kok 1, Khan Toul Kork, Phnom Penh, Cambodia.
Tel: +855 23 231 077
E-mail: lbin3@chintglobal.com
Web: www.chintglobal.com

SchneiTec CHINT Co., Ltd

Add: Ansor Kdam Village, Sna Ansa Commune, Krakor District, Pursat Province, Cambodia
Tel: +855 09 5353 268
E-mail: liubin@schneitec-chint.com.kh / info@schneitec-chint.com.kh
Web: www.schneitec-chint.com.kh

Indonesia

PT. CHINT Indonesia

Add: Kompleks Prima Center I, Blok C9-10, Jl. Pesing Poglar Jl. Pool PPD No. 11, RT.9/RW.2, Cengkareng, Jakarta Barat.
Tel: +62 21 5436 3000
E-mail: sales@chint-indonesia.com
Web: www.chint-Indonesia.com

Philippines

CHINT ELECTRIC CO., LTD

Add: Unit 201, Taipan Place, F. Ortigas Jr. Road, Ortigas Center, Pasig City, Metro Manila, Philippines.
Tel: +63 (2) 83653068
E-mail: liq07@chintglobal.com / chintph@chintglobal.com
Web: www.chintglobal.com

Netherlands

CHINT ELECTRICS NETHERLANDS B.V

Add: Kabelweg 57, 1014 BA Amsterdam
Tel: +31 85 210 08 06
E-mail: salesnl@chintglobal.com

Kazakhstan

LLP CHINT KZ

Add: Almaty, Dostyk Avenue 210A, Business Centre "Koktem Grand, 5th Floor, Office 51
Tel: +7 727 325 9990
E-mail: chint-kz@chintglobal.com

Turkey

CHINT Turca Elektrik Sanayi ve Ticaret Anonim Sirketi

Add: Fatih Sultan Mehmet Mahallesi, Poligon Caddesi, Buyaka 2 Sitesi, Kule-1, Kat:17, Ümraniye/Istanbul
Tel: +90 216 621 00 55
E-mail: info@chint.com.tr

Spain

CHINT ELECTRICS S.L.

Add: Calle José Echegaray, Num 8.Parque Empresarial Las RozasEdificio 3, Planta Baja, Oficina 7-8.C.P: 28232 Las Rozas (Madrid)
Tel: +34 91 645 03 53
E-mail: info@chint.eu

UK

CHINT GLOBAL (UK) LIMITED

Add: 4TH FLOOR 1-3 PEMBERTON ROW, LONDON, UNITED KINGDOM EC4A 3GB

West Asia & Africa

Egypt

CHINT Electrics (Egypt) Co., Ltd

Add: Building (B123-C11) Smart Village, Abu Rawash, Giza - Egypt
Tel: (+20) 235 373 725/(+20) 235 373 735
P.O BOX : 00202
E-mail: chinteg@chintglobal.com

CHINT EGEMAC for Electrical Products co. Ltd

Add: Area No.4B inside area No.6 Developers Industrial Zone, Eloula industrial compound, 6th of October, Giza, Egypt.
E-mail: ahmed.bayoumi@chint-egemac.com
Tel: (+2) 01064108151/01202348586
Fax: (+2)38642389
Web: www.CHINT-EGEMAC.com

Saudi Arabia

CHINT AJLAN AND BROTHERS ELECTRICAL CO., LTD

Add: East Ring Rd Ext, New Industry Area, Riyadh 14338 KSA
E-mail: chint-ajlanbros@chint.com
Web: www.chint-ajlanbros.com

CHINT ARABIAN ELECTRICAL INDUSTRIAL CO., LTD.

Building NO 7183, 3RD Industrial City, Damman Kingdom of Saudi Arabian
Tel: 966557951923
E-mail: Belal.Abdel@chintglobal.com
Web: www.chint-atc.com

U.A.E

CHINT MIDDLE EAST AND AFRICA DMCC

Add: Unit No. 2101, Jumeirah Business Center 1, Jumeirah Lakes Towers, Dubai, UAE
Tel: +97145571532
P.O BOX: 337555
E-mail: global-sales@chintglobal.com
Web: https://chintglobal.com

Uganda

CHINT METERS&ELECTRICAL UGANDA CO. LTD

Add: PLOT 378, TIRINYI ROAD, TANGSHAN MBALE INDUSTRIAL PARK, MBALE, UGANDA
Tel: +256 741242096
E-mail: chintuganda@chint.com

Nigeria

CHINT POWER&ENERGY SERVICES LIMITED

Add: 3rd Floor, Churchgate Tower 2, PC 31 Churchgate Street, Victoria Island, Lagos Nigeria
Tel: +234 8108637866
E-mail: nigeria@chintglobal.com

Kenya

ZHENGTAI ELECTRICS(KENYA) CO., LIMITED

Add: OFFICE 1A, 8TH FLOOR, KISM TOWERS, LR No. 209/945/1- NGONG ROAD - NAIROBI, KENYA
Tel: +254 713 871 243
E-mail: chintkenya@chintglobal.com

Latin America

Brazil

CHINT ELÉTRICOS AMÉRICA DO SUL LTDA.

Add: Av. Paulista, 1765 - Edifício Scarpa - Conjunto 22, Bela Vista - CEP 01311-200 - São Paulo - SP
Tel: +55 (11) 3266-7786
E-mail: chintbr@chint.com

Peru

CHINT LATAM (PERU) S.A.C.

Add: Av. Camino Real No.348, Torre El Pilar, Oficina 603, San Isidro, Lima 27, Peru
Tel: +51 1 763 4917
E-mail: chintlatamperu@chint.com

Ecuador

CHINT ELECTRICS (HONG KONG) LIMITED (ECUADOR BRANCH)

Add: Calle: REP.DEL SALVADOR Número: 10-84 Intersección: AV NACIONES UNIDAS Edificio: CENTRO COMERCIAL MANSION BLANCA
E-mail: lufz@chintglobal.com

Colombia

CHINT Colombia

Add: Cll 110 #9-25 | Oficina 516 | Torre Empresarial Pacific | Bogotá - Colombia
Tel: +57 (601) 712-5419
Email: infoco@chintglobal.com

North America

United States

NOARK Electric (USA) Inc

Add: 2188 Pomona Blvd., Pomona, CA 91768
Tel: 626-330-7007
Fax: 626-330-8035
E-mail: nasales@noark-electric.com

Mexico

CHINT SOLAR MEXICO S DE RL DE CV

Add: Blvd. Miguel de Cervantes 301, Torre Norte, Piso 15, C.P 11520, Colonia Granada, Alcaldía Miguel Hidalgo, CDMX
C.P. 11520 CDMX, México
Tel: +52 1-55-8881-6127
E-mail: info@chint-mexico.com

CHINT GLOBAL PTE. LTD.

Building A3, 3655 SiXian Road, Songjiang District, Shanghai, China

Tel: +86-21-5677 7777 **Web:** www.chintglobal.com

E-mail: global-sales@chintglobal.com

