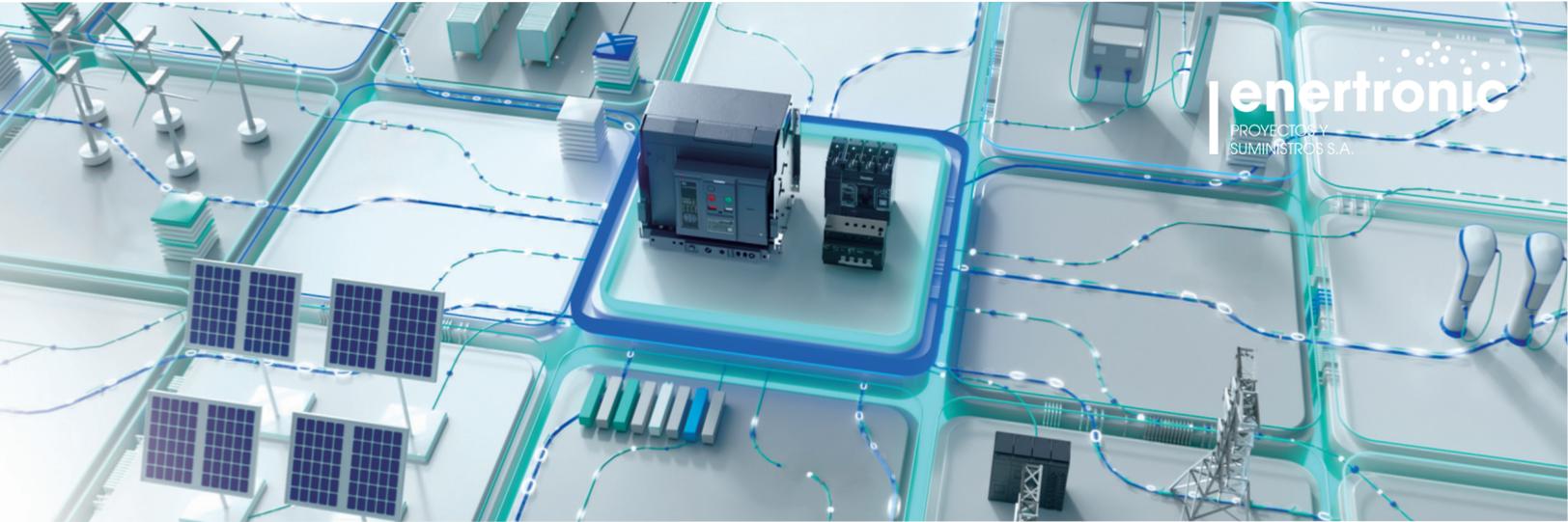




Solution Manual



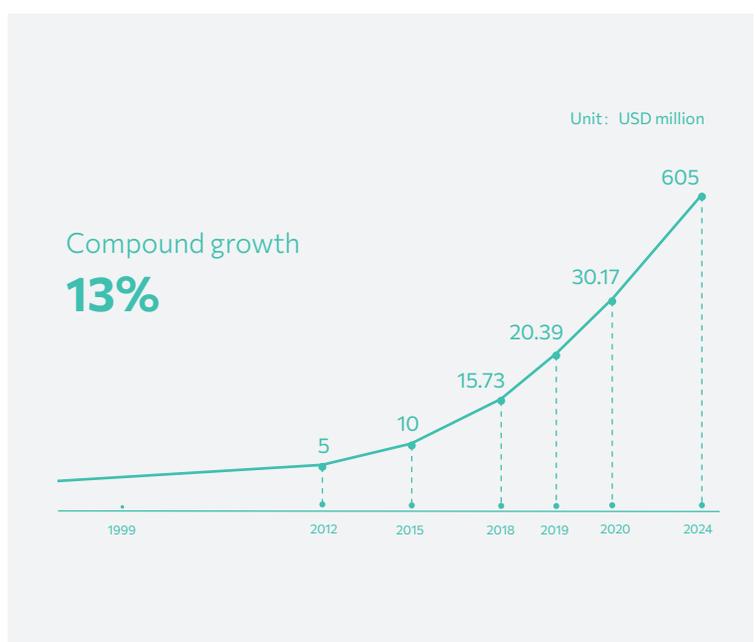
Company Profile

Founded in 1999, Lazzen is a leading technology company in the industry, dedicated to excellence in low-voltage electrical solutions and co-creating a smart, zero-carbon electrical ecosystem. Through advanced technologies in intelligent distribution, smart home, and new energy area, Lazzen provides innovative and leading solutions for clients in sectors such as new energy, industry, building, power, communication control etc.

Lazzen went public on the Shenzhen Stock Exchange in 2014 (stock code 002706.SZ.). Lazzen consistently invests over 6% annually in R&D, driving continuous innovation in products and solutions to help clients gain competitive advantages. The company has received numerous honors and qualifications, including National High-Tech Enterprise, National Enterprise Technology Center, National Science and Technology Progress Award, National Intellectual Property Advantage Enterprise, Accredited CNAS and US Testing Center, and National Green Factory.

Currently, Lazzen service network covers over 200 cities in China and more than 30 countries overseas, providing convenient and efficient services to clients worldwide. The brand slogan "LAZZEN powering the world" has earned widespread trust and praise from customers.

2024 Sales Revenue



- 26 Year**
Founded in 1999
- \$0.6B**
Sales by USD in 2024
- 6% R&D**
Investment ratio
- 25 Lab**
Over 450 test
- >40% share**
LV in new energy market
- >70% share**
LV in 4G&5G base station
- >200GW**
New Energy equipment
- >30 Country**
Business area

History

Focus on low-voltage industry for 26 years



1999Y
Founded in Shanghai



2005Y
Standardized factory



2014Y
IPO in Shenzhen



2015Y
Move Liangxin Shanghai Intelligent Park



2019Y
Issued 1U breaker to solve the power supply problem for 5G base station





2022Y
Logo switch to "LAZZEN" From "Nader", Sametime, Put Hangzhou Bay Super Factory into Operation

2024Y
The highest-level technology award in China "The National Science and Technology Progress Award"



Hangzhou Bay Super factory

Global Service Network

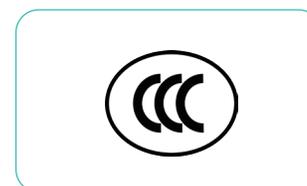


Certification

Test Center Qualification



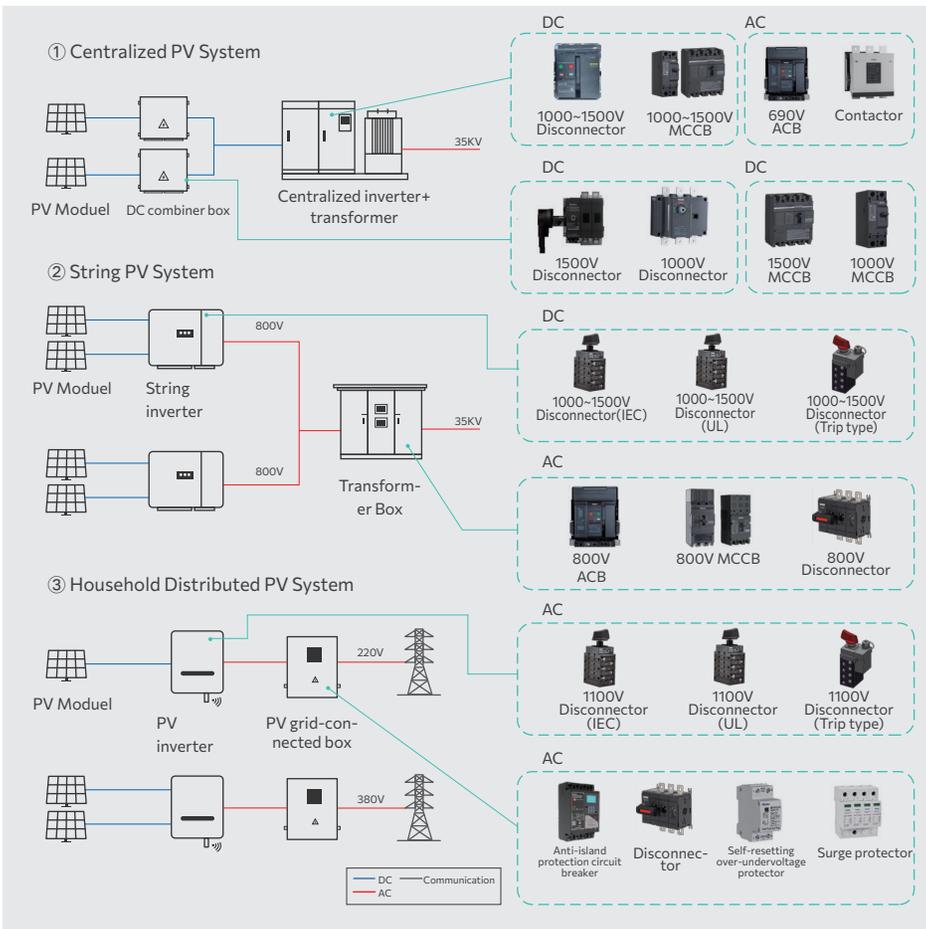
Products Certification



Solutions for PV System

PV Power Distribution System

By virtue of PV-specific product system covering all scenarios, LAZZEN can provide highly customized and cost-effective solutions for low-voltage power distribution system and has an efficient and considerate whole-process service system to actualize the intelligent operation and maintenance of the PV system and safeguard the efficient and stable operation of the PV system.



Core Products and Highlights



NDW2GZ 2P DC1500V Isolator
2500A Frame
30% size reduction
2P DC1500V
Icw 160kA/0.2s
DC-PV2, DC-22A



NDW3A-2500 UL AC ACB
Up to 2000A
Up to 750AC
Poles: 3P
UL1066



LNG63 DC1500V Isolator
63A Frame
DC1500V
4/6/8/10/12P
Remote trip
CE, TUV



NDG3VH DC1500V Isolator
315/630A Frame
2P DC1500V
Icw 20kA 0.15s
DC-PV2
CE, TUV, UL, AS



NDM3Z DC1500V MCCB
125-630A Frame
DC1500V
Icu 20KA
TUV, CE, UKCA



NDM3A-VH AC1000V MCCB
250/320/400/630A
AC800V, AC1000V
Icu 35kA-50kA

Industry Benchmarking Projects



**Abu Dhabi, UAE
Al Dhafra PV2 PV Project**

Project Scenario: SG250HX inverter, 3.25MW box transformer
Project Capacity: 1.6GW



**Jalisco, Mexico
Prodiel, S.L. PV Project**

Project Scenario: String PV inverter, 3.25MW box transformer, DC combiner box
Project Capacity: 270MW



**Tiangang Lake, Sihong, Jiangsu, China
National PV Application Leader Project**

Project Scenario: 90kW string inverter, 1.25MW centralized inverter, box transformer
Project Capacity: 500MW



**National 4,000m Ultra-High Altitude
Demonstration Project in Ganzi
Prefecture, China**

Project Scenario: 3.25MW box transformer
Project Capacity: 200MW

References

- Top 1**
Rank of national PV market segment
The sales volume ranked first in national PV market segment in 2024.
- \$230 million**
national PV market share
The sales volume of national PV market segment was 1600 million in 2024.
- 55%**
Market share in national PV market
The market share of low-voltage switchgear in national PV market segment was 55% in 2024.

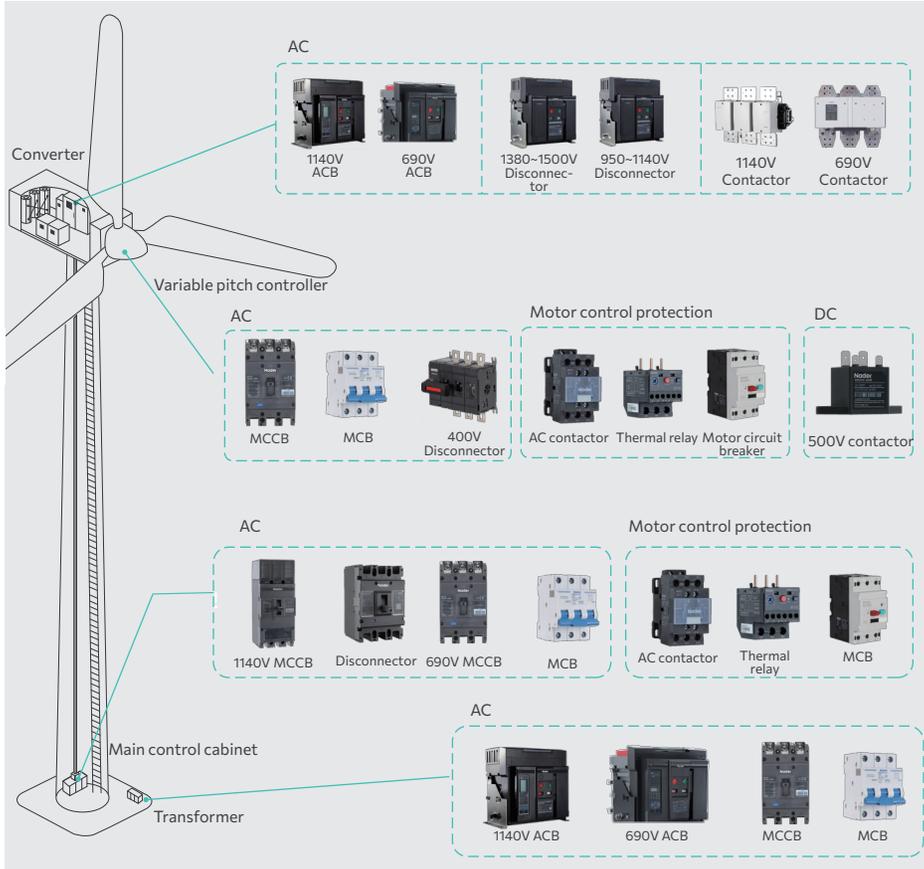
Main Customer List



Solutions for Wind Power System

Wind Power Distribution System

LAZZEN is committed to meeting the needs of industry users for the reliability, economical efficiency and sustainable development of low-voltage products, providing one-stop low-voltage electrical products and services for the new energy wind power industry.



Core Products and Highlights



NDW3HU/XU ACB
2500-6300A Frame
HU:AC1140V
XU:AC1500V
75kA @1140V (40HU)



NDW1A ACB for Substation
In:200-6300A
V:690VAC
Poles:3P/4P
Icu max 120kA



NDC1 HU AC1140 Contactor
Up to 2560A
Up to AC1140V



NDC5K vacuum AC2000V Contactor
Up to 3200A
Up to AC2000V
1M times E-endurance

Industry Benchmarking Projects



“
GOLDWIND 16MW Offshore Wind Turbine Generator with the World's Highest Unit Capacity

Project Scenario: Goldwind GWH252-16MW Sets
Unit Capacity: 16MW (8MW inverter × 2)



“
Reed Bridge 50MW Wind Power Project in Loja Province, Ecuador

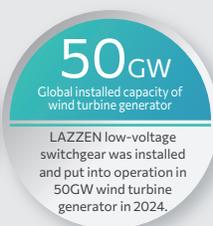
Project Scenario: Dongfang Electric
DEW-D4000-148 Sets
Project Capacity: 50MW



“
National Large-scale Grid-Parity Wind Power Demonstration Project in Ulanqab, China

Project Scenario: Shanghai Electric
W4500-155 Sets
Project Capacity: 500MW

References



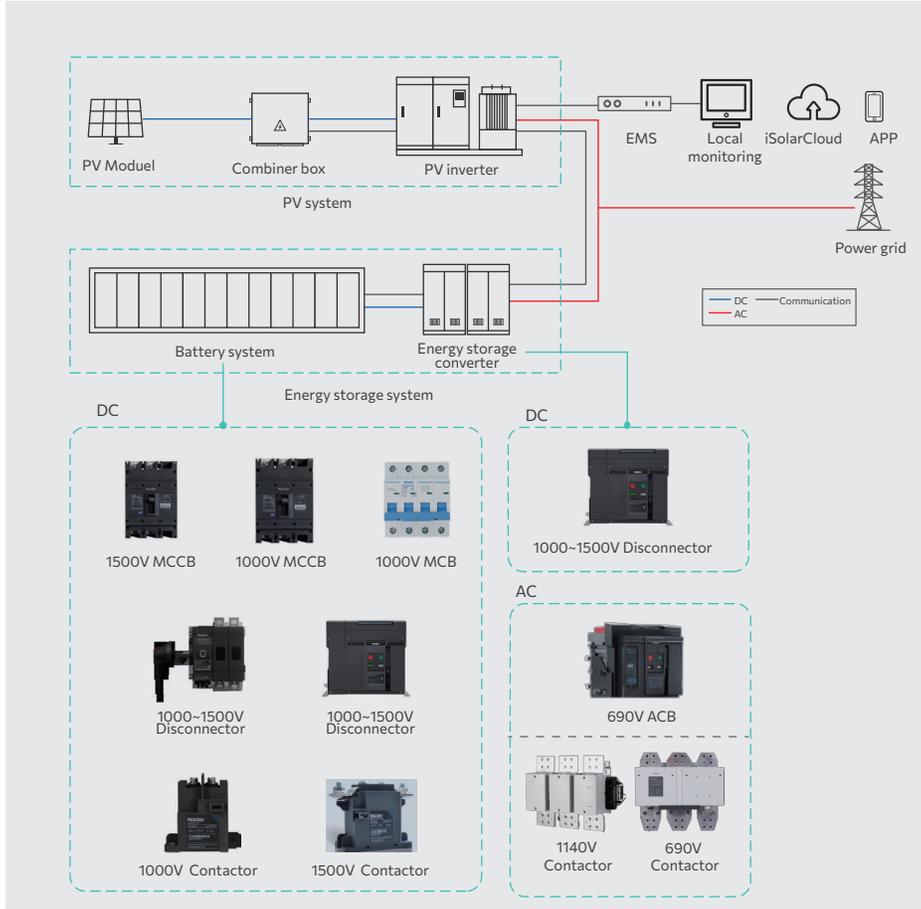
Main Customer List



Solutions for Energy Storage System

Energy Storage Power Distribution System

LAZZEN is committed to meeting the needs of industry users for the reliability, economical efficiency and sustainable development of low-voltage products, providing one-stop low-voltage electrical products and services for the new energy storage industry.



Core Products and Highlights

NDW2GZ DC1500V Isolator



- 2500A Frame
- 30% size reduction
- 2P DC1500V
- Icw 160kA/0.2s
- DC-PV2, DC-22A

NDG3A-Z DC1500V Isolator



- 1600/2500/3200A Frame
- 2P DC1500V
- DC-20A/B
- CE, TUV

NDG3VH DC1500V Isolator



- 2250/400/630A Frame
- 2P DC1500V
- Icw 20kA 0.15s
- DC-PV2
- CE, TUV, UL

NDB2NZ-80H DC MCB



- 80A Frame
- 4P DC1000V
- non-polarity
- CE, TUV, UL

NDZ3AT-H DC Contactor



- 250-600A Frame
- DC1500V
- non-polarity
- CE, TUV, UL

Industry Benchmarking Projects



“
70MW/130MWh Wind Power Storage Project in Texas, USA

Scope of Cooperation: Wind power storage station on power generation side
Application: high-voltage battery box, combiner box
Cooperative Customer: Narada Power Source



“
50MW/32.44MWh Power Grid Frequency-Modulated Energy Storage Project, Ireland

Scope of Cooperation: Frequency modulated power plant on grid side
Application: High-voltage battery box, combiner box
Cooperative Customer: Narada Power Source



“
7MW/23.5MWh PV-Diesel-BESS Microgrid Project, Shuanghu, Tibet

Scope of Cooperation: Power plants on power generation side
Application: PCS
Cooperative Customer: Sungrow Power Supply
Cooperative Customer and Performance Data

References

Top 1
Ranking in national energy storage market segment

The sales volume ranked first in national energy storage market segment in 2024.

70GWh+
National installed capacity of energy storage equipment

LAZZEN low-voltage switchgear was installed and put into operation in 70GWh energy storage equipment in 2024.

60%
Market share in China's energy storage market

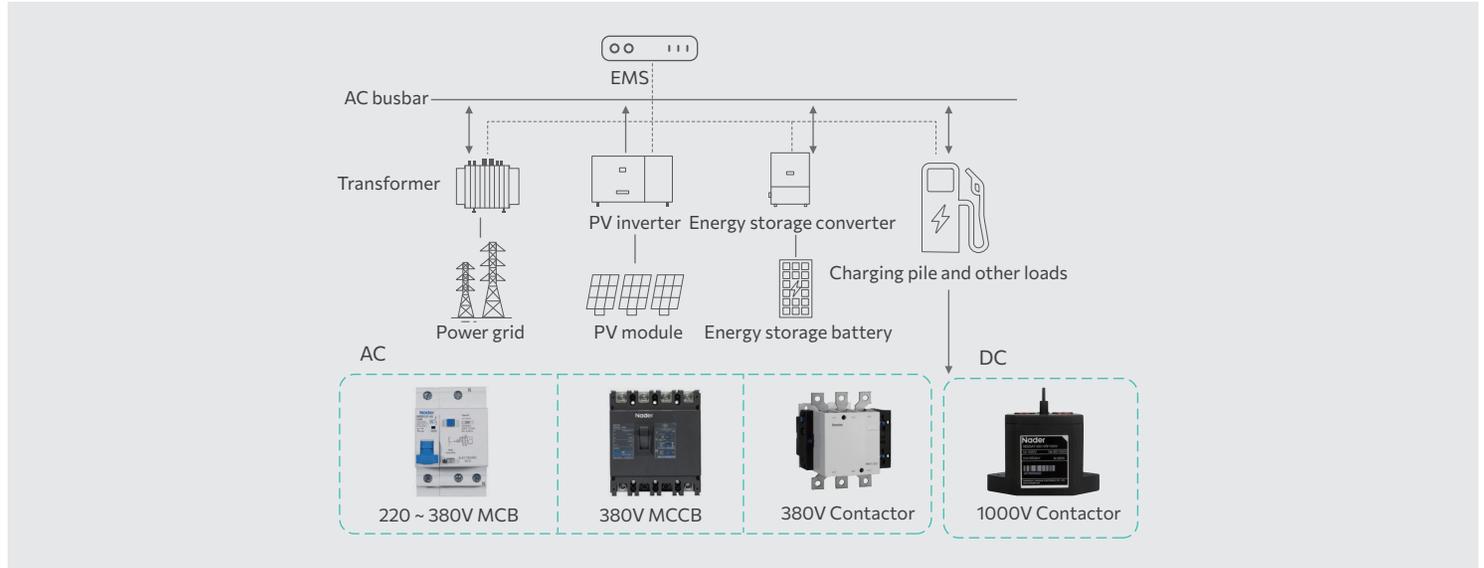
The market share of low-voltage switchgear in national energy storage market segment was 60% in 2024.

Main Customer List

Solutions for EV Charging

Power Distribution System for EV Charge Stations

LAZZEN is committed to meeting the needs of industry users for the reliability, economical efficiency and sustainable development of low-voltage products, providing one-stop low-voltage electrical products and services for the new energy charging pile industry.



Core Products and Highlights



New RCBO adding B type protection

- 1-63A
- 1P/1PN/2P/3P/4P
- Type A or Type B
- All Overload, Short circuit, Current Leakage and Isolation combined in one
- Easy to use without secondary design
- Meet the latest EV charging design standards



NDZ3W-50-300R

- In:50-300A
- DC 1000V



NDM2L Leakage Current breaker

- 16-630A
- Type:A or AC
- Bottom wiring (power input)



NDC2-R AC Contactor

- 80-750A
- 30% size reduction



NDZ2-R AC Contactor

- In:150-350A
- DC 1000V

Industry Benchmarking Projects



“
Charging Station in Geely Auto
Research Institute

Scope of Cooperation: Charging stations in parking lots
Application: AC pile, DC pile
Cooperative Customer: CSG



“
BYD Aerial
Charging Tower

Scope of Cooperation: Charging stations in parking lots
Application: AC pile
Cooperative Customer: BYD



“
Benz-StarCharge Charging Service
Stations in Beijing Daxing International
Airport

Scope of Cooperation: Charging stations in parking lots
Application: AC pile
Cooperative Customer: StarCharge

References



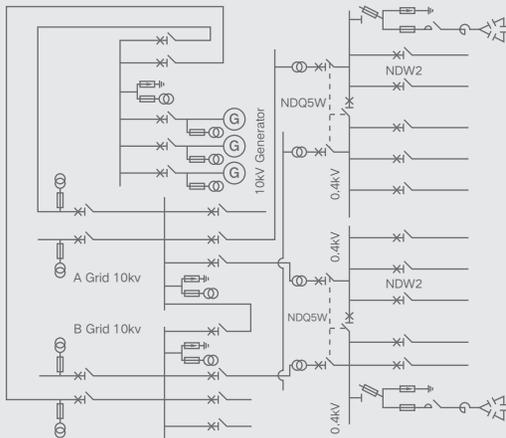
Main Customer List



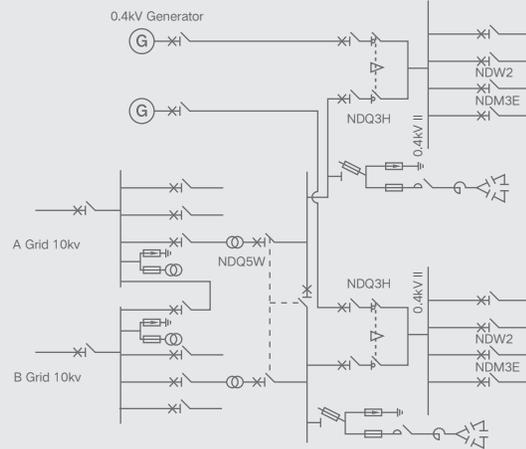
Solutions for the Telecom and Data Center

Power distribution system in data centre

The low-voltage power distribution system is also known as the lifeline for protecting the critical physical infrastructure of data centers. In the era of parallel cloud computing and edge computing, ensuring the safe and reliable operation of data centers while maintaining technical and economic efficiency is essential. A well-designed and implemented power distribution system plays a key role in this process.



Classical power distribution system ①



Classical power distribution system ②

Core Products and Highlights

NDG3 Series Isolator



- In:100-1250A
- AC/DC voltage
- 3P/4P
- Side operation to save 200% cabinet space (optional)

NDQ3H Automatic Transfer Switch



- In:63-5000A
- 2P/3P/4P
- AC-33A
- 100ms action
- Share N line

NDM3EU-225/400 UL MCCB



- In: 100-400A
- 3P
- Electronic trip
- UL489

NDQ5W Serie ATS



- 200-6300
- AC-33B
- 500ms action
- Two ACB with controller

Industry Benchmarking Projects



British operator
Network-wise Renovation
Project for Communication
Power Supply of BT



Huawei 4G Base Station
Project in North
America



Vertiv 4G Base Station
Transformation Project



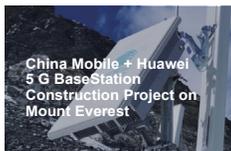
Vodafone, Turkey
4G communication
base station project



Samsung 5G Base
Station Project in Korea



China Mobile
Combined Switching
Power Supply Project



China Mobile + Huawei
5G Base Station
Construction Project on
Mount Everest



Laoshan IDC
Machine Room,
Qingdao, Shandong



Zhoupu IDC Cloud
Computing Center



China Mobile
(Hohhot) Data Center



China Telecom
Cloud Computing
Center, Liyang



China Mobile Data
Center, Xixian,
Shaanxi

References

70%
Application to global 5G
base stations

LAZZEN circuit breakers are
applied in 70% of 5G base
station telecom power
supply system worldwide.

Main Customer List



Solutions for others industry

Partnerships with leading clients in each sector

Since 1999, LAZZEN has been deeply involved in the industrial control industry, with a customer base exceeding 1,000. We focus on various industrial control segments, including Elevators, Air conditioning, Construction machinery, Rail, Photovoltaic equipment, Semiconductor equipment, Textile machinery, and secondary power systems, maintaining long-term strategic partnerships with leading clients in each sector.



Elevators



Air conditioning



Rail



Construction machinery



Marine



Robot



Port



Injection

Core Products and Highlights



NDM2L ELCB

- In:16-630A
- Poles:3P/4P
- Type:A or AC



NDC3 Contactor

- In: 09-95A
- Coil:85%~110%Us
- Reliable work @60°C
- AC/DC coil available(>40A)



NDBLE-32 RCBO

- In:6-32A
- Poles:1P+N (compact)
- Icn: 6kA
- Type: A,AC



NDB2LE-63X RCBO

- In:6-63A
- Poles:1P+N
- Icn: 6kA
- Type: A,AC



NDB1 MCB

- In:1-63A
- Poles:1P/1PN/2P/3P/3PN/4P
- Icn: 6kA
- Curve:B,C,D
- 40 C ~ +70 C



NDM3 MCCB

- In:10-1600A
- V:415V/690VAC
- Poles: 3P/4P
- Icu: C/L/M/H
- CCC、TUV、CE



NDC1 Contactor

- In:09-2560A
- AC-3,AC-4,AC-1
- Coil:85%~110%Us



NDR2 Motor Relay

- In:0.1-140A
- Together with NDC1

References

Main Customer List





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