



NEW POWER SYSTEM SOLUTIONS

CSG SMART ELECTRICAL TECHNOLOGY CO.,LTD.

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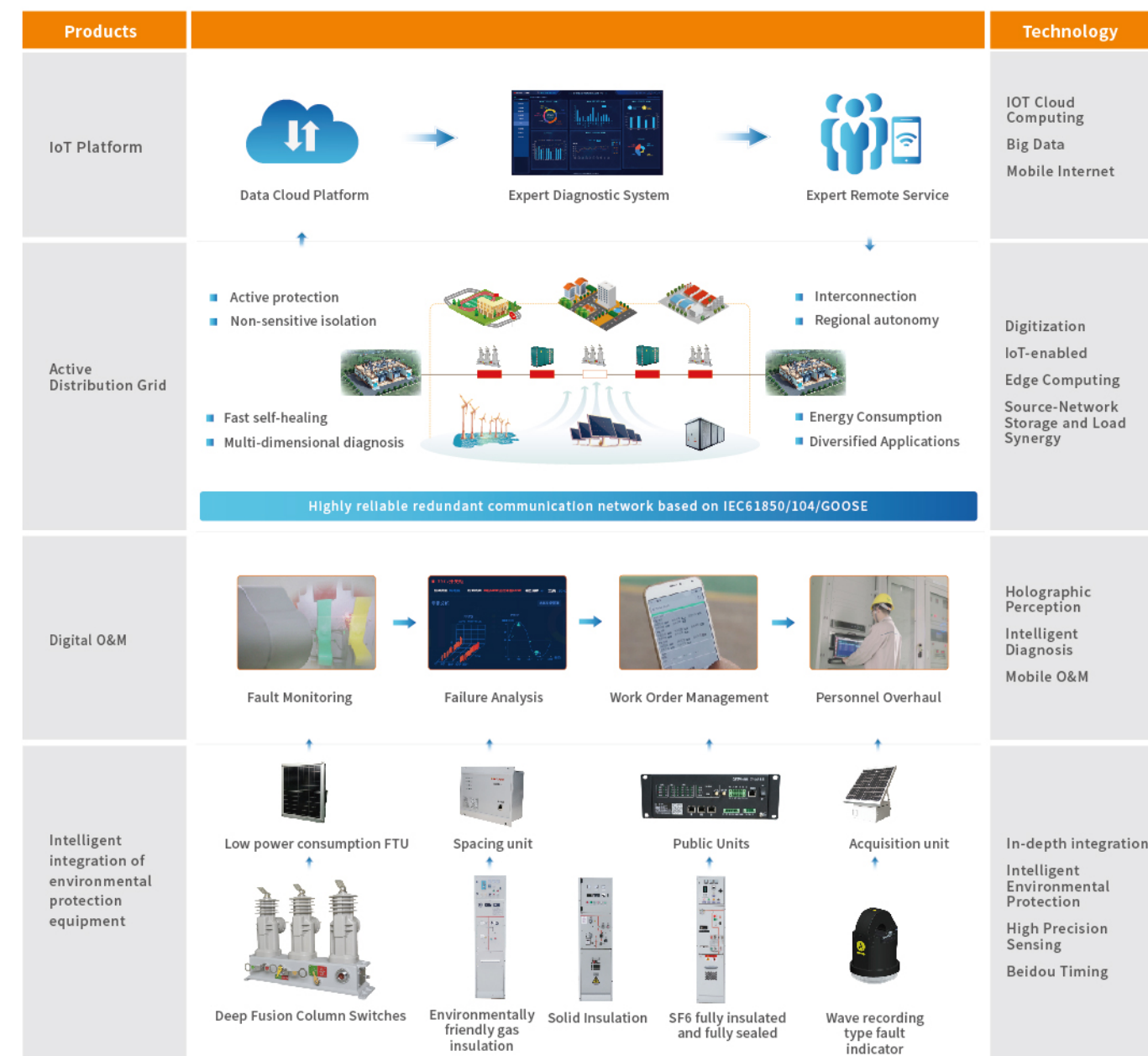
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Smarter Technology Smarter Future

Medium Voltage Smart Distribution Network Solution

The solution for high power supply reliability in medium voltage distribution networks fully integrates modern information technologies such as cloud computing, big data, IoT, and mobile Internet. Based on multidimensional analysis, fast self-healing, interconnection, and regional autonomy advanced distribution network protection and control strategies, it actively enhances the perception and self-decision-making capabilities of the distribution network to improve its operational status. Additionally, it ensures worry-free connection between distributed energy sources and the main electric grid, facilitates the collaborative interaction of "generation-grid-load-storage," and improves the level of renewable energy consumption, resulting in an efficient, reliable, flexible, convenient, low-carbon, and eco-friendly green distribution network.

System topology:



HXGN-12 SF6 Fully-Insulated and Fully-Sealed ring network cabinet



Economic features:

Name	Parameter
Insulation mode	SF6 gas insulation
Dimensions	420*750*1950
Rated voltage	12 kV
Rated current	630 A
Rated frequency	50 Hz
Rated short time current (4s)	20/25 kA
Rated peak withstand current	50/63 kA
Rated short-circuit breaking current	20/25 kA
Ground switch short-time withstand current	20/25\4s kA
Rated power frequency (1min withstand voltage)	48kV (break) 、42kV (phase-phase, ground)
Rated lightning impulse withstand voltage (1.2\50μs)	85/110kV (break) 、75/95kV (phase-phase, ground)
Protection level	IP4X (cabinet shell) 、IP67 (Air cabinet)
Mechanical stability	≥10000 times
Annual leakage rate of gas (This parameter does not apply to solid cabinets.)	≤0.05%/year
Arc extinction mode	vacuum arc extinguish

Safety features:

- High-voltage components are sealed in a reliably grounded chamber with an IP67 protection rating.
- Unaffected by environmental conditions on-site and can withstand short-term flooding.
- The insulation medium is stable, and the dielectric strength is high.

Environmental features:

- The use of 304 stainless steel gas box provides strong anti-corrosion and anti-rust properties.
- The mechanism is made of galvanized nickel alloy, and the salt spray test exceeds 300h.
- The vacuum arc-extinguishing chamber has a strong breaking capacity, and the electrical life reaches 30 times.

Economic features:

- Small in size, saving space, especially suitable for limited on-site space.
- Maintenance-free. The shared gas box solution makes on-site installation work easier.
- The product has a wide range of applications and a high degree of standardization and modularity.

HBXGN-12 Environmentally -friendly gas insulated ring main unit



Economic features:

	Parameter
Insulation mode	Environmentally friendly gas insulation(dry ai)
Dimensions	420*850*1950
Rated voltage	12 kV
Rated current	630 A
Rated frequency	50 Hz
Rated short time current (4s)	20/25 kA
Rated peak withstand current	50/63 kA
Rated short-circuit breaking current	20/25 kA
Ground switch short-time withstand current	20/25\4s kA
Rated power frequency (1min withstand voltage)	48kV (break) 、 42kV (phase-phase, ground)
Rated lightning impulse withstand voltage (1.2\50μs)	85/110kV (break) 、 75/95kV (phase-phase, ground)
Protection level	IP4X (cabinet shell) 、 IP67 (gas box)
Mechanical stability	≥10000 times
Annual leakage rate of gas (This parameter does not apply to solid cabinets)	≤0.05%/year
Arc extinction mode	Vacuum arc-extinguishing

Safety features:

- High-voltage components are sealed in a reliably grounded gas chamber with a protection level of up to IP67.
- The product can withstand short-term flooding and is not affected by the on-site environment.
- Mature and reliable production processes ensure stable product quality.
- The insulation medium status is detectable and recoverable.

Environmental features:

- Dry air is used as the insulation medium, avoiding the use of greenhouse gases.
- The product reduces its impact on the environment throughout its lifecycle.

Economic features:

- No need to install SF6 monitoring and forced ventilation equipment on-site.
- No need to recover insulation gas after the end of its lifecycle.
- The product saves space and is especially suitable for limited on-site space.
- Maintenance-free. The shared gas box solution makes on-site installation work easier.

GTXGN-12 Solid—Insulated Ring Main Units



Economic features:

Name	Parameter
Insulation mode	Solid insulation (epoxy resin)
Dimensions	420*900*1700
Rated voltage	12 kV
Rated current	630 A
Rated frequency	50 Hz
Rated short time current (4s)	20/25 kA
Rated peak withstand current	50/63 kA
Rated short-circuit breaking current	20/25 kA
Ground switch short-time withstand current	20/25\4s kA
Rated power frequency (1min withstand voltage)	48kV (break) 、42kV (phase-phase, ground)
Rated lightning impulse withstand voltage (1.2\50μs)	85/110kV (break) 、75/95kV (phase-phase, ground)
Protection level	IP4X (cabinet shell) 、IP67 (gas box)
Mechanical stability	≥10000 times
Annual leakage rate of gas (This parameter does not apply to solid cabinets.)	≤0.05%/ year
Arc extinction mode	Vacuum arc-extinguishing

Safety features:

- High-voltage components are sealed in a reliably grounded gas chamber with a protection level of up to IP67.
- The product can withstand short-term flooding and is not affected by the on-site environment.
- Mature and reliable production processes ensure stable product quality.
- The APG casting process is mature, with no risk of gas box deformation.

Environmental features:

- Solid insulation material is used as the insulation medium, avoiding the use of greenhouse gases.
- The product reduces its impact on the environment throughout its lifecycle.
- Solid insulation with no risk of gas leakage.

Economic features:

- No need to install SF6 monitoring and forced ventilation equipment on-site.
- The product saves space and is especially suitable for limited on-site space.
- Maintenance-free. The shared gas box solution makes on-site installation work easier.

Data Terminal unit (DTU)



Basic functions:

- Automatic distribution automation with basic functions of telemetry, telecommunication, and remote control

Line protection function:

- Fault detection and data acquisition functions
- Flexible configuration of protection tripping
- Backup self-investment function

Fault recording:

- Supports high-speed recording of ground and short-circuit fault waveforms
- Supports uploading to the distribution main station in Comtrade file format

Remote control function:

- Solid insulation material is used as the insulation medium, avoiding the use of greenhouse gases.
- The product reduces its impact on the environment throughout its lifecycle.
- Solid insulation with no risk of gas leakage.

Data statistics:

- Line load measurement and line loss analysis
- Collecting comprehensive protection equipment data within the collection station
- Line harmonic calculation and analysis
- Load point and extreme value statistics

Economic features:

Name		Parameter
Power System	Input Power	AC220V50HZ dual power supply input, voltage tolerance -20%~+20%, frequency tolerance $\pm 5\%$, long-term stable output >80W, instantaneous output >500W, duration >15s
	Communication Power Output	Rated DC24V, steady-state load capacity $\geq 24V/15W$, instantaneous output $\geq 24V/20W$, duration $\geq 50ms$
	Operation Power Output	Rated DC48V, instantaneous output $\geq 48V/8A$, duration $\geq 15s$
	Backup Power	Rated voltage DC48V, single-cell battery not less than 7Ah, service life ≥ 3 years
AC Analog	Number of AC Analog	A single terminal supports 64 analog inputs
	Rated Voltage	AC100V/AC220V, 50Hz
	Rated Current	1A/5A, 50Hz
	Voltage Sampling Accuracy	0.5 level
	Current Sampling Accuracy	0.5 level
	Active and Reactive Power Sampling Accuracy	1 level
	Loop Power Consumption	Voltage power consumption per circuit $\leq 0.5VA$ current power consumption per circuit $\leq 0.75VA$
DC Analog	AC Overload	1.2In or 1.2Un, continuous operation; 20In, allowed for 1s
	Number of DC Analog	Support for up to 3 channels of DC quantity inputs
	Nominal Voltage	0~60V
	Voltage Sampling Accuracy	0.5 level
Telemetry Telecontrol	Number of Telemetry	Maximum support for 116 hard binary inputs
	Telegraph Power Supply	Adaptive to DC24V/DC48V
	Resolution	$\leq 2ms$
	Debounce Time	0~60000ms
	Number of Telecontrol Channels	Supports up to 20 remote control channels, with 2 remote control quantities (close/open control) configured per channel
	Communication	Ethernet and RS232/RS485 interfaces

GTXGN-12 Solid – Insulated Ring Main Units



Product Features:

- A pillar-type structure
- Vacuum arc-extinguishing
- Spring/Permanent magnetic operating mechanism
- Lightweight
- Capable of closing, carrying, and opening circuits under normal current conditions
- Capable of carrying and interrupting circuits under abnormal current conditions within a specified time limit

Economic features:

Name		Parameter
Structural form		Pillar-mounted
Arc-extinguishing method		Vacuum arc-extinguishing technology
Insulating medium		Air-insulated
Rated voltage		12kV
Rated current		630A
Rated cable-charging breaking current		10A
Rated line-charging breaking current		1A
Rated power frequency withstand voltage for 1 minute	Phase-to-ground/phase-to-phase	42kV
	breaker clearance	48kV
Rated lightning impulse withstand voltage (peak value of 1.2/50μs)	Phase-to-ground/phase-to-phase	75kV
	breaker clearance	85kV
Rated peak withstand current		20/4 kA/s
Rated short-circuit breaking current		50kA
Rated short-circuit closing current		20kA
Mechanical stability		50kA
Rated short-circuit breaking operation frequency		≥10000 times
SF6 gas annual leakage rate		≥8 times
Different time intervals between opening and closing operations		≤0.1%
Operating mechanism type or model		≤2ms
Operating mode		Spring-operated
Motor voltage		electrically operated with manual control function DC24V
Rated current ratio		DC24V
Current accuracy level		Phase current: 600A/5A or 600A/1A
		Zero-sequence current: 20A/1A
Temperature range		Phase current: protection level of 5P10, measurement level of 0.5
		Zero-sequence current: when the input current on the primary side is from 1A to the rated current, the relative error is ≤3%, and when the primary current input is 100A, the protection relative error is ≤10%
Zero-sequence voltage transformation ratio		-40°C~70°C
Accuracy level		(10kV/√3)/(6.5V/3)
Partial discharge		3P Level
Insulation resistance after being combined with the switch (relative to ground)		≤20pC (1.2Um/√3)
Rated voltage ratio		>1000 MΩ
Accuracy level		10kV/0.22kV
Temperature range		3 Level
Rated peak withstand current		-40°C~70°C

ZW20 nonsegregated Outdoor breaker boxes



Product Features:

- Nonsegregated Box Structure
- SF6 Insulation, Vacuum Arc-extinguishing
- Spring/Permanent Magnet Operating Mechanism
- Good Insulation Performance, Maintenance-free
- Capable of Closing, Carrying, and Breaking Current in Normal Line Conditions
- Capable of Carrying and Breaking Current within a specified time under abnormal line conditions.

Economic features:

Name		Parameter
Structure form		nonsegregated Box
Arc extinguishing method		Vacuum Arc-extinguishing
Insulation medium		SF6
Rated voltage		12kV
Rated cable charging breaking current		630A
Rated cable charging breaking current		10A
Rated line charging breaking current		1A
Rated power frequency withstand voltage for 1 minute	Rated power frequency withstand	42kV
	voltage for 1 minute	48kV
Rated lightning impulse withstand voltage (peak value) (1.2/50μs)	Rated lightning impulse withstand	75kV
	voltage (peak value) (1.2/50μs)	85kV
Rated short-time withstand current and duration		20/4 kA/s
Rated peak withstand current		50kA
Rated short-circuit breaking current		20kA
Rated short-circuit making current		50kA
Mechanical stability		≥10000 times
Rated short-circuit breaking current breaking times		≥8 times
Annual leakage rate of SF6 gas		≤0.1%
Clearance distance		≥35mm
Opening and closing time difference		≤2ms
Operating mechanism type or model		Spring-operated
Operation mode		Electric-operated, with manual operation function
Motor voltage		DC24V
Rated current ratio		Phase current: protection class 5P10, measurement class 0.5
Current accuracy level		Phase current: 5P10 protection, 0.5 measurement. Zero-sequence current: ≤3% relative tolerance for primary side input current from 1A to rated current, and ≤10% protection relative tolerance for primary current input of 100A
Temperature range		-40°C~70°C
Zero-sequence voltage transformation ratio		$(10kV/\sqrt{3})/(6.5V/3)$
Accuracy level		3P level
Partial discharge		≤20pC (1.2Um/√3)
Insulation resistance after combination with the switch (switch to ground)		>1000 MΩ
Rated voltage ratio		10kV/0.22kV
Accuracy level		3 level
Temperature range		-40°C~70°C



ZW20 nonsegregated Outdoor breaker boxes

Box-type FTU

Hood-type FTU

Product Features:

- Equipped with basic functions of distribution automation, including "Three Remote" (remote signaling, remote measurement, and remote control)

Line Protection Function:

- Fault detection and protection tripping.
- Rapid fault isolation on-site
- Supports both on-site FA (Fault Analyzer) function and centralized FA function

Remote Control Function:

- Remote modification of protection setting values
- Remote equipment upgrade

Fault Wave Recording:

- Supports high-speed recording of ground fault and short-circuit fault waveforms
- Supports uploading to the distribution main station in Comtrade file format

Data Statistics:

- Line load metering and line loss analysis
- Line harmonic calculation and analysis
- Load benchmarking and extreme value statistical analysis

Technical parameters:

Name		Parameter
Power Supply System	Input Power	AC220V50HZ dual power input, voltage tolerance of -20% ~ +20%、frequency tolerance of ±5%. long-term stable output ≥80W, instantaneous output ≥500W, duration≥15s
	Communication Power Output	Rated DC24V, load capacity ≥16A, duration ≥100ms
	Operation Power Output	DC24V rated, instantaneous output ≥24V/8A, duration ≥15s
AC Analog	Backup Power	Maintenance-free valve-regulated lead-acid battery or super capacitor
	Quantity of AC Analog	Each terminal supports 8 analog inputs.
	Rated Voltage	AC100V/AC220V, 50Hz
	Rated Current	1A/5A, 50Hz
	Voltage Sampling Accuracy	0.5 level
	Current Sampling Accuracy	0.5 level (≤1.2In) ; 5P10 (≤10In)
	Accuracy of Active and Reactive Power Sampling	1 level
	Circuit Power Consumption	Voltage power consumption per circuit ≤0.5VA current power consumption per circuit ≤0.75VA
DC Analog	AC Overload	1.2In o r1.2Un, continuous operation; 20In allowed for 1s
	Quantity of DC Analog	Collect 8 DC quantities
	Number of Tele-Signals	Support up to 7 hard binary inputs
	Tele-Signal Power Supply	DC24V
	Resolution	≤2ms
	Debouncing Time	0~60000ms
	Remote Control Channels	Support a maximum of 1 remote control, with 2 remote control quantities (open/close control output) configured for each circuit
	Communication	Ethernet port, RS232/RS485 interface

ZW20 nonsegregated Outdoor breaker boxes



Product Features:

- 12.8kHz High Frequency Sampling
- 3A Low Load Start
- 80 Minutes of Long Waveform Storage
- ≤50μA Low Power Consumption
- 20μs Three-Phase Synchronization Error
- ±0.5A(0~100A) 0.5%(100~600A)

Technical parameters:

Name		Parameter
Acquisition unit	Working Environment Temperature	-40 °C~+75 °C
	Working Relative Humidity	10%~100%
	Salt Spray Concentration	5%
	Maximum Absolute Humidity	35g/ m3
	Rated Frequency	50Hz
	Applicable Voltage Level	6~35kV
	Applicable Load Current	0-630A
	Applicable Wire Cross-Sectional Area	35~300 mm2
	Short Circuit Action Error	≤ 5%
	Waveform Transient Peak Value Error	≤ 10%
	Three-Phase Time Synchronization Error	≤30μs
	Load Current Monitoring Accuracy	≤ 0.5%(100A~600A)、±0.5A(Under 100A)
	Misoperation Prevention	Equipped with anti-misoperation function
	Minimum Recognition Time for Reclosing	0.2s
	Short Circuit Alarm Adaptivity	Equipped with load-adaptive short-circuit fault function
	Shortest Duration of Short Circuit Fault Alarm Current	20ms~40ms
	Alarm Method	Flash, wireless RF transmission, fault waveform recording
	Alarm Flashing Time/Cycle	Flash duration not less than 50ms, interval time 3s
	Reset Method	Timing, power-on, reset by nature
	Automatic Reset Time Error	≤ 12min(24h)
Aggregation unit	Power Consumption for Waveform Recording Performance	3A
	Static Current	≤80μA
	Battery Capacity and Voltage	≥8.5AH、 3.6V
	Mean Time between Failures (MTBF)	>70000h
	Applicable Voltage Level	6~35kV
	Applicable Load Current	0-630A
	Measurement Capacity	More than 3 sets of collecting units (3 in each set)
	Clock Accuracy	Tolerance within 24 hours <2s
	Fault Alarm Upload Time	<60s
	Backup Power	Rated voltage: 12V Battery life: >15 days Backup battery life: >5 years
	Mean Time between Failures (MTBF)	≥70000h
	Recorded Waveform Data	More than 64 fault waveform files.
	Fixed-Point Data	30 days, >96 data pts/day.
	Communication Standard	2G/3G/4G
	Serial Interface	2 channels of RS-232 serial communication.
	Interface Transmission Rate	19200bit/s
	Basic Function	Data monitoring, automatic reconnection upon communication interruption
	Communication Connection with Indicating Unit	Wireless RF
	Frequency of Communication with Master Station	1 time every 15 minutes (time is adjustable)