

Metal-Clad Withdrawable Type Switchgear

KYN61-40.5 · 40.5 kV · up to 3150 A / 40 kA

Internal-Arc Resistant Design · AG3 Seismic · 3500 m Altitude Option

IEC 62271-200 · GB/T 3906



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KYN61-40.5 is a metal-clad withdrawable switchgear designed for three-phase AC 40.5 kV power systems, suitable for power receiving, distribution, control, protection and monitoring in single-busbar and bus-section configurations. The switchgear incorporates a fully compartmentalised metal-clad structure, closed-door operation and comprehensive mechanical interlocking. Configurations are available for demanding utility, industrial and infrastructure applications.



Fig. KYN61-40.5 switchgear — front view

Standards and Specifications

Chinese national standards	GB/T 3906-2020 · GB/T 1984 · GB/T 1985 · DL/T 593
IEC standards	IEC 62271-200 · IEC 62271-100 · IEC 62271-102 · IEC 62271-1

Service Conditions

Ambient temperature	-15 °C to +40 °C
Relative humidity — daily / monthly average	≤95% / ≤90%
Altitude	1000 m (3500 m with composite insulation)
Maximum seismic intensity	8 degrees (AG3)
Air clearance in cabinet	≥300 mm

The switchgear shall be installed where there is no fire or explosion hazard, no serious pollution, no chemically corrosive gas and no severe vibration. For conditions beyond the above, please consult us when ordering.

Protection & Finish

Enclosure / internal protection	IP4X / IP2X
Impact protection	IK10
Door panel colour	RAL 7035 standard · RAL 7032 or other optional

Special Precautions

In areas with high humidity and large temperature fluctuation, put the anti-condensation heater into operation immediately after commissioning and keep it running in both standby and service (it may be left off while a high-current cabinet is running).

Main Features

- Metal-clad, fully compartmentalised construction minimises fault propagation and separates low-voltage control circuits from primary high-voltage compartments
- Internal-arc resistant design engineered to IAC AFLR criteria (31.5 kA / 1 s)
- Minimum 300 mm air clearance without additional insulation barriers
- High-altitude configurations available for installations up to 3500 m (composite insulation)
- Closed-door operation with comprehensive mechanical interlocking; front and rear access

Smart & Digital Options

Motor-operated circuit breaker and earthing switch · wireless temperature monitoring · one-key sequential control · incoming / outgoing line temperature measurement.

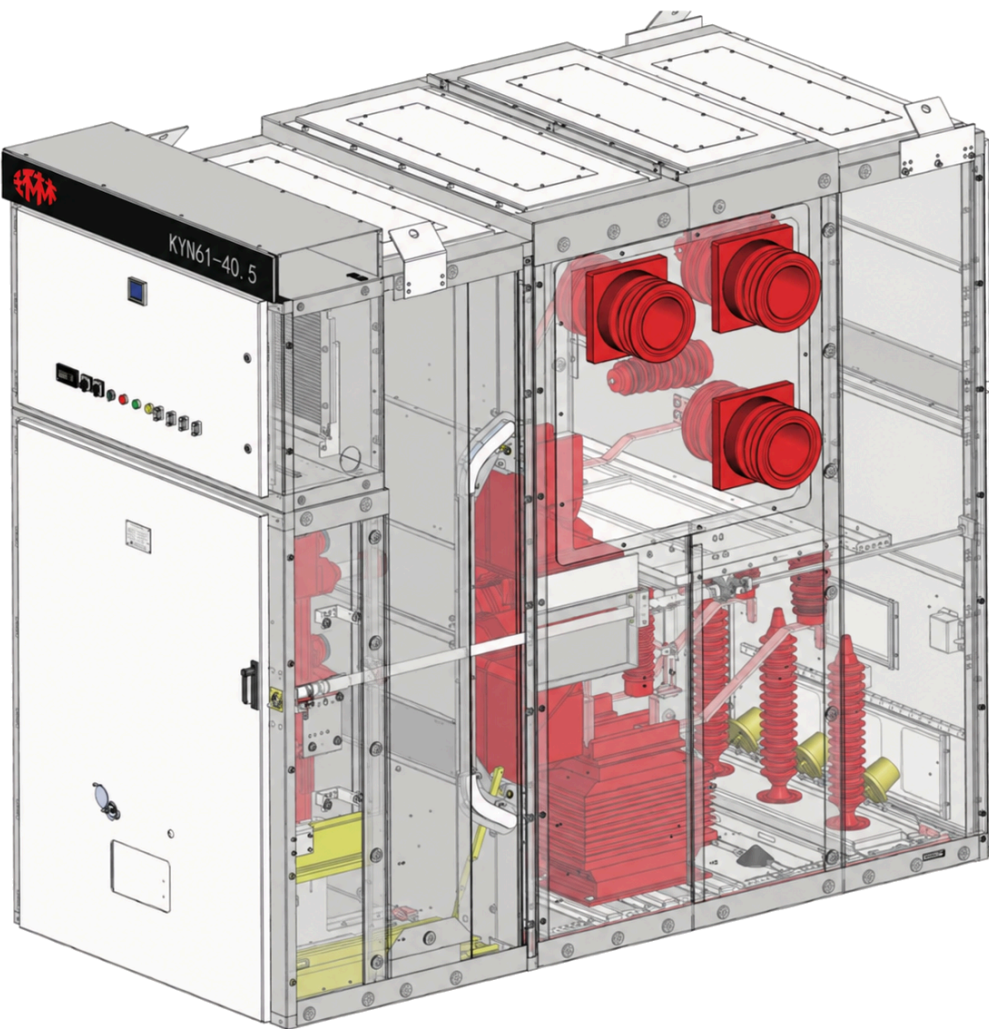


Fig. Internal structure — transparent view

KYN61-40.5 at a Glance

Rated voltage	40.5 kV
Maximum rated current	3150 A
Short-time withstand current	40 kA · 4 s
Internal-arc design rating	31.5 kA · 1 s
Partial discharge — design target	≤50 pC
High-altitude option	3500 m

Applications



UTILITY GRIDS



INDUSTRY



SOLAR & WIND



BUILDINGS

KYN61-40.5 Switchgear — Main Parameters

Parameter	Unit	40.5 kV
Rated voltage / insulation voltage	kV	40.5
Rated power-frequency withstand voltage	kV / 1 min	95
Rated lightning impulse withstand voltage	kV	185
Rated frequency	Hz	50
Rated short-time withstand current (4 s)	kA	25 / 31.5 / 40 **
Rated peak withstand current	kA	63 / 80 / 100 **
Rated current (main / branch busbar)	A	1250 / 1600 / 2000 / 2500 / 3150 *
Internal fault arc withstand current (1 s)	kA	≤31.5
Internal-arc design classification (IAC criteria)		AFLR
Protection / impact level		IP4X (door open: IP2X between compartments) · IK10
Outline dimensions W × D × H ***	mm	1400 (1680) × 2750 / 2800 / 3050 / 3200 × 2600
Weight	kg	1000 - 2000

* Forced air cooling is necessary when the switchgear current is 2500 A and above.

** Thermal and dynamic stability of the current transformers relate to the transformation ratio — confirm when ordering.

*** Dimensions of the front and rear doors are not included.

Testing & Quality

KYN61-40.5 is designed and manufactured to the requirements of GB/T 3906-2020 and IEC 62271-200. Our factory operates a complete in-house testing facility, and **every switchgear panel undergoes the full routine test programme before delivery.**

Design verification criteria

The design addresses the full GB/T 3906 type-test programme: insulation, temperature rise, partial discharge, mechanical operation, short-time withstand, short-circuit breaking, earthing closing, EMC, condensation, high / low temperature and internal fault arc.

Routine tests — performed on every panel

Insulation, mechanical operation, main-circuit resistance measurement, auxiliary electrical device test, wiring correctness check, and partial discharge test for grid projects or projects with PD requirements.

Design for Safety

- Internal-arc resistant structure engineered to IAC AFLR criteria (31.5 kA / 1 s): pressure-relief channels, fully riveted frame, solid door panels, explosion-proof covers and observation windows, protected operation holes
- Partial-discharge control — rounded busbars, no sharp edges, rational conductor layout; design target ≤50 pC for the complete assembly
- Temperature-rise control — anti-eddy-current measures and forced air cooling in the handcart, busbar and cable compartments, complying with GB/T 11022 limits
- Optional arc protection — compartment sensors detect an internal arc and initiate selective breaker tripping, minimising damage and outage scope

Basic Structure

KYN61-40.5 features a metal-clad, compartmentalised construction comprising four independently segregated functional compartments: busbar (A), circuit breaker (B), cable (C) and low-voltage (D). The withdrawable handcart carries a vacuum or SF6 circuit breaker, or is configured as an isolation or PT handcart; an optional live-display device indicates the state of the primary circuit.

Enclosure & Pressure Relief

- 2.0 mm Al-Zn coated steel sheets, precision formed and assembled by bolting and riveting — uniform dimensions and high mechanical strength
- Door panels baked after electrostatic spraying — impact and corrosion resistant
- Pressure relief devices above the breaker, busbar and cable compartments open automatically under internal fault pressure, venting gas safely upwards

Sectional View

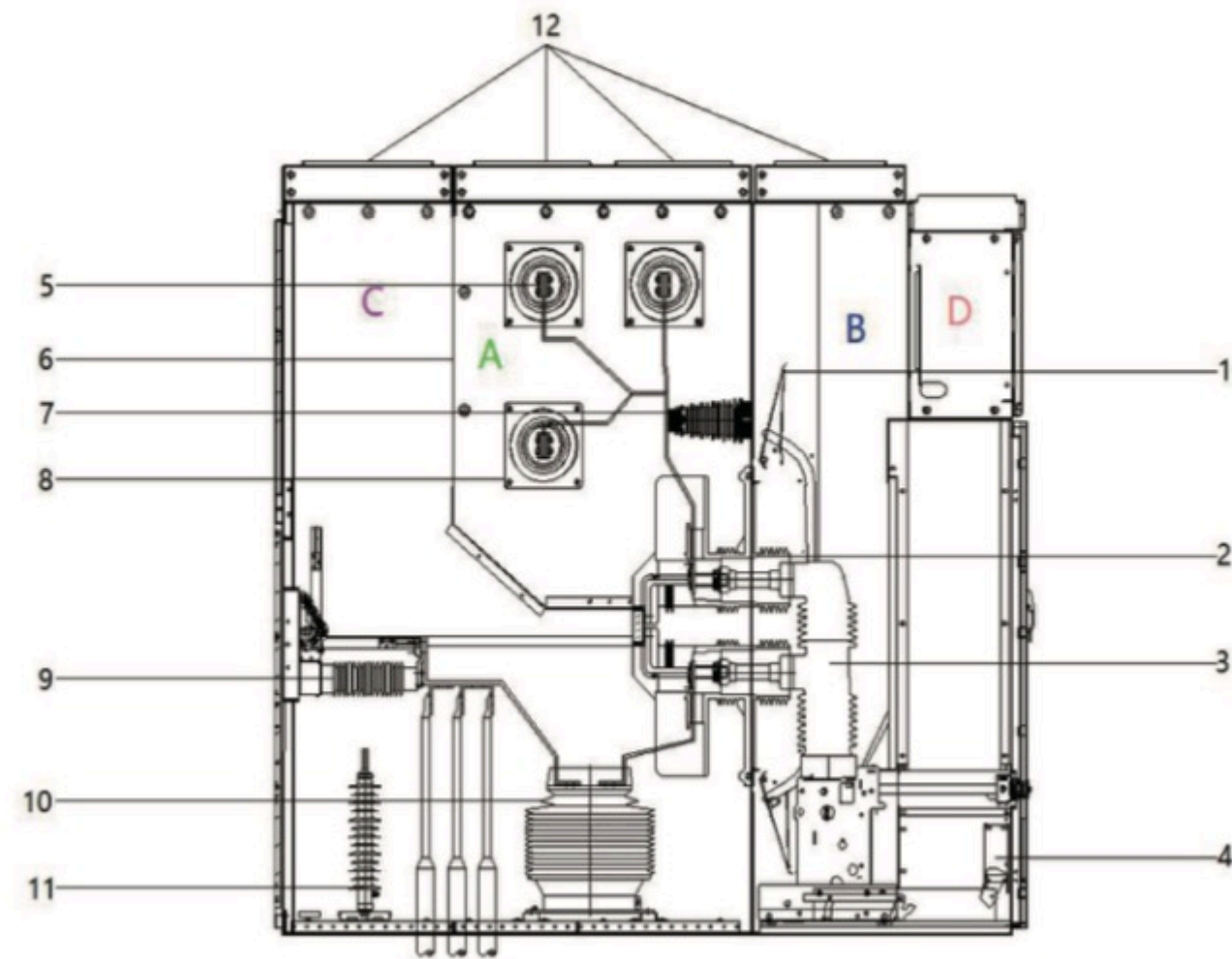


Fig. KYN61-40.5 sectional view — compartments A-D, components 1-12

- | | | | |
|----|------------------------|----|------------------------------|
| A | Busbar compartment | B | Circuit breaker compartment |
| C | Cable compartment | D | Low-voltage compartment |
| 1 | Shutter | 2 | Static contact box (bushing) |
| 3 | Vacuum circuit breaker | 4 | Control wiring plug |
| 5 | Main busbar | 6 | Partition |
| 7 | Support insulator | 8 | Wall bushing |
| 9 | Earthing switch | 10 | Current transformer |
| 11 | Surge arrester | 12 | Pressure-relief plate |

Four Independent Compartments

Compartment Functions

Circuit Breaker Compartment

- Guide rails ensure balanced, reliable handcart movement between working and test / isolation positions; the handcart is operated with the door closed and its status is visible through the window
- The metal shutter opens and closes automatically with handcart movement, so operators cannot touch live parts
- Secondary control circuits connect through a plug-and-socket connector — engageable only in the test / disconnected position and mechanically locked in the service position

Busbar Compartment

- One or two rectangular R-angle copper bars per phase according to rated current; main busbar runs through adjacent cabinets in sections
- Main and branch busbars sheathed with heat-shrink sleeves; adjacent cabinets isolated by bushings and metal partitions, preventing fault transfer

Cable Compartment

- Accommodates CT, PT, earthing switch with short-circuit making capability (manual or motor-operated), surge arrester; generous space for several parallel cables per phase
- Cable sealing ends mounted above 700 mm; the earthing switch is mechanically interlocked with the rear door

Low-Voltage Compartment

- Accepts various secondary equipment; control busbar on top separated by a metal partition, convenient for site installation
- Metal-shielded secondary cable trunking with generous access space; control cables enter through the left-side trunking

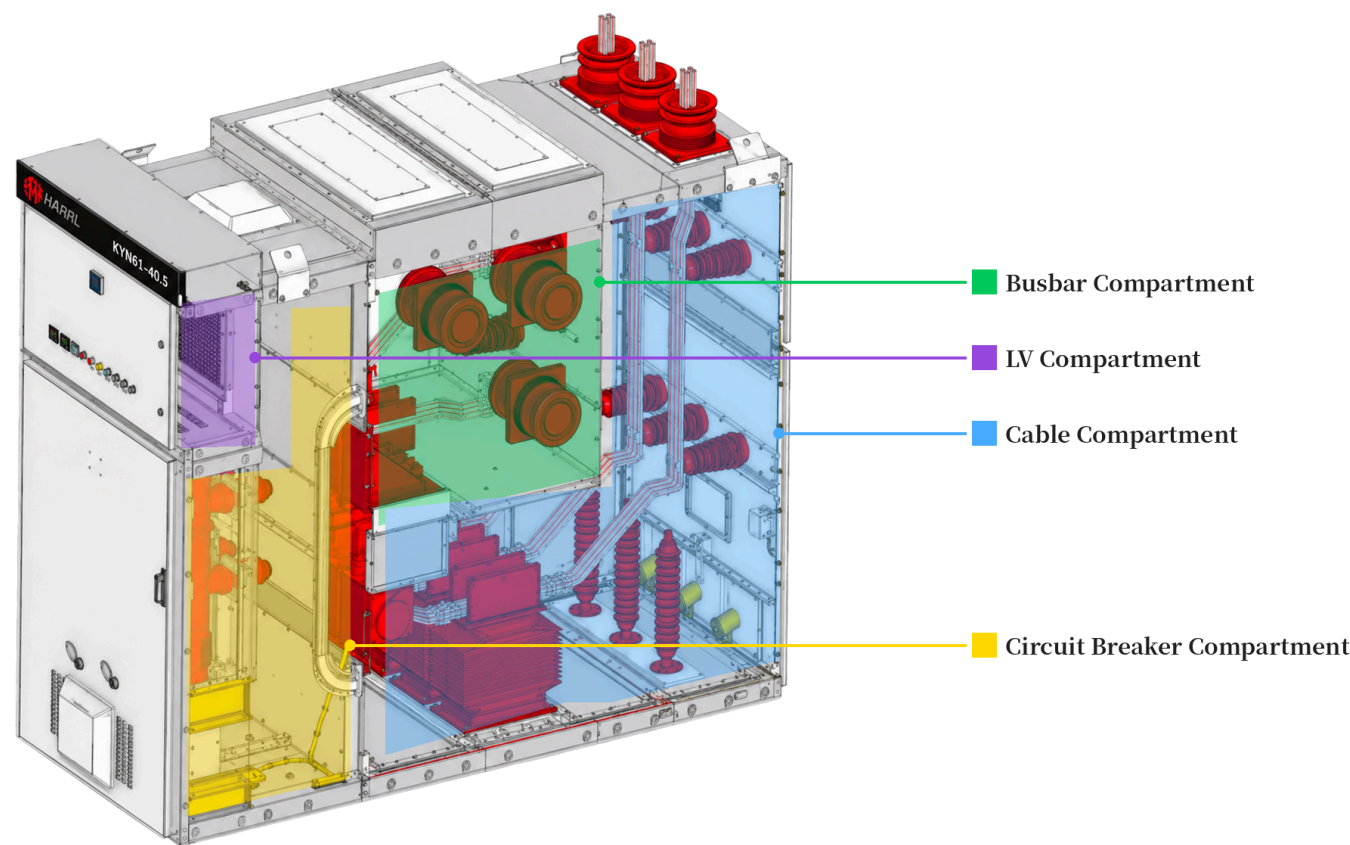


Fig. KYN61-40.5 compartment arrangement — cutaway view

Interlocking Against Mis-operation

- The handcart moves from test / isolation to working position only when both the circuit breaker and the earthing switch are open — and vice versa (mechanical)
- The breaker can close only when the handcart has fully reached the test or working position (mechanical)
- If control power is lost in test or working position, the breaker cannot close and can only be opened manually (electrical)
- The earthing switch can close only with the handcart in test / isolation or removed position; when closed, the handcart cannot move to working position (mechanical)
- In working position the breaker control plug is locked and cannot be unplugged

Padlock & Electromagnetic Lock (optional)

Compartment doors and operation holes can be padlocked (hook 4 – 8 mm), blocking handcart movement and earthing-switch operation; locking electromagnets can secure the main switch and cable compartment doors automatically.

Auxiliary Devices

Shutter locking device — with the handcart withdrawn the shutter cannot be opened by hand. Emergency tripping device — the breaker can be tripped mechanically with a dedicated tool while closed.

Vacuum Circuit Breaker

Solid-embedded withdrawable type, 40.5 kV

- Arc-extinguishing chamber on top, operating mechanism below — convenient for commissioning; large-creepage insulation design
- Complete mechanical and electrical interlocking with high reliability and long service life

Item	Unit	Data
Rated voltage	kV	40.5
Rated current	A	1250 - 3150 *
Rated short-circuit breaking current	kA	25 / 31.5 / 40
Rated short-circuit making current (peak)	kA	63 / 80 / 100
Thermal / dynamic stability current	kA	25-40 (4 s) / 63-100
Rated SC breaking operations (E2)	ops	30
Power-frequency withstand voltage	kV / 1 min	95
Lightning impulse withstand (peak)	kV	185
Rated operating sequence		0-0.3s-C0-180s-C0 (≤31.5 kA) 0-180s-C0-180s-C0 (40 kA)

* 2500 A and above requires forced air cooling. High-vacuum ceramic interrupters, imported or domestic; an SF6 circuit breaker is available as an alternative.

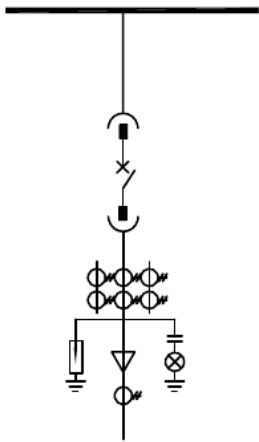
Typical Scheme Units

Scheme numbers 001 – 030 (positions 015, 025, 029 and 030 reserved); other primary schemes produced to your single-line diagram

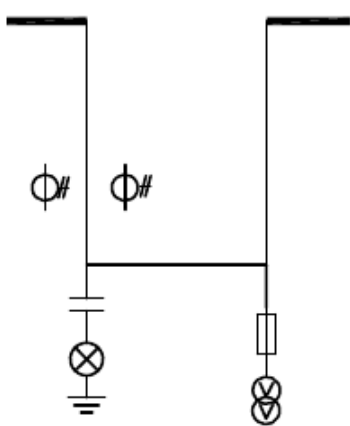
Scheme No.	Function	Current A	Main components
001-010	Incoming / outgoing feeder	1250 - 3150	VCB + CT; earthing switch, arrester, PT + HV fuse per scheme
011-014	Bus coupler	1250 - 3150	VCB + CT; arrester per scheme
016-019	Isolation	1250 - 3150	Isolation handcart
020	Bus riser	1250 - 3150	Voltage indicator per user needs
021-024	Voltage transformer panel	–	PT + HV fuse; CT, earthing switch, arrester per scheme
026-027	Metering panel	–	2 CT + 2 PT; arrester per scheme
028	Station service transformer panel	–	CT + 3 PT + earthing switch

1. Schemes 001-005 bottom cable in / bottom out; 006-007 surface in / surface out; 008-010 busbar overhead.
2. Voltage indicators are supplied according to user needs. Full scheme sheets with component lists are available on request.

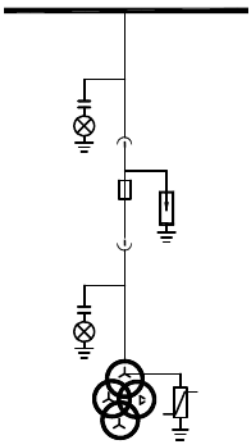
Fig. 1— Typical Scheme Units, Single-Line Diagrams



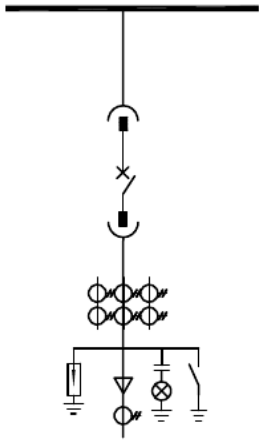
Incoming feeder unit



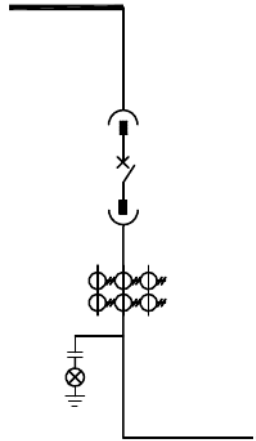
Metering unit (fixed)



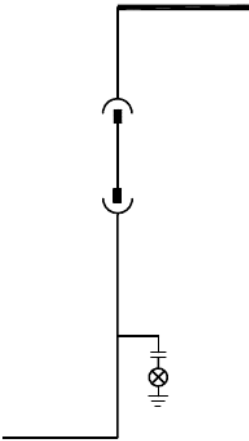
Voltage transformer unit



Outgoing feeder unit



Bus-section unit



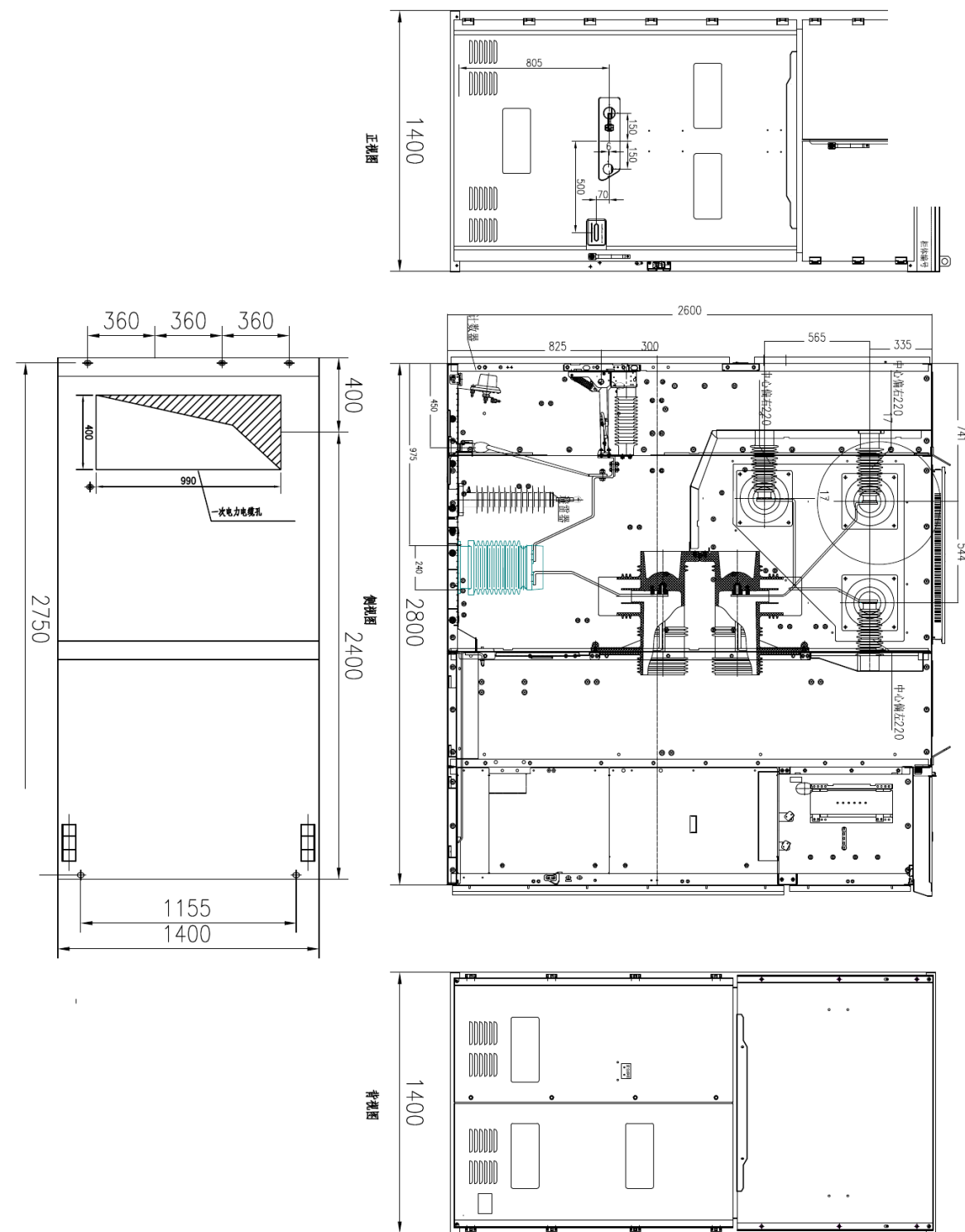
Isolation unit

* Main busbar 35 kV TMY-3 (80×10). Full single-line sheets with component schedules for schemes 001-030 are available on request.

Main components

40.5 kV solid-embedded vacuum circuit breaker, current transformer, voltage transformer, HV fuse, earthing switch, surge arrester, live-display device.

Fig. 2 — Outline and Installation Dimensions (W 1400 × D 2800 × H 2600)



* Primary cable hole 990 × 400 mm; base fixing 1155 / 1400 mm, top suspension holes 3 × 360 mm. Certified layout and foundation drawings are issued for approval after order.

Layout and Foundation

- Leave maintenance channels between the rear cover / cabinet sides and the wall; for double-row face-to-face arrangement keep ≥ 3000 mm between rows
- Use pre-embedded channel steel as the foundation frame and secure it by secondary grouting; anchor plates every 1 – 1.5 m along the frame
- Levelness and straightness error ≤ 1 mm/m and ≤ 2 mm total; install in a dry, clean, ventilated room after foundation inspection and acceptance

Ordering Instruction

- Single-line diagram, main busbar model and specification, rated voltage, current and short-circuit breaking current
- Distribution room layout and switchgear arrangement drawings; incoming / outgoing cable specification
- Control, measurement, protection and locking / automatic device requirements; model and quantity of main components
- Busbar bridge span, height and current-carrying capacity where required
- Regional or special operating requirements, and non-standard accessories and spare parts, stated in detail when ordering

Documents & accessories with every delivery

Certificate of Conformity · factory inspection report · instruction manual · primary and secondary wiring diagrams · general arrangement drawing · packing list. Standard accessories: handcart crank, energy-storage handle, earthing-switch operating handle and door keys.

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Product specifications and designs are subject to change without prior notice due to continuous product development and technical improvements. Actual products may vary from those shown in this brochure.



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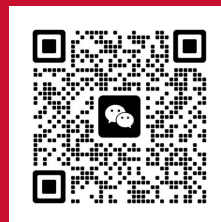
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