COOPER POWER SERIES

ASN series AC metal-enclosed switchgear and controlgear

# Safe, Green and Efficient

## MV/LV Assemblies

EATON
Powering Business Worldwide

COOPER






# Powering business worldwide

Eaton delivers the power inside hundreds of products that are answering the demands of today's fast changing world.

We help our customers worldwide manage the power they need for buildings, aircraft, trucks, cars, machinery and entire businesses. And we do it in a way that consumes fewer resources.

**Next generation transportation**

Eaton is driving the development of new technologies – from hybrid drivetrains and emission control systems to advanced engine components – that reduce fuel consumption and emissions in trucks and cars.

**Higher expectations**

We continue to expand our aerospace solutions and services to meet the needs of new aviation platforms, including the high-flying light jet and very light jet markets.

**Building on our strengths**

Our hydraulics business combines localised service and support with an innovative portfolio of fluid power solutions to answer the needs of global infrastructure projects, including locks, canals and dams.

**Powering Greener Buildings and Businesses**

Eaton's Electrical Group is a leading provider of power quality, distribution and control solutions that increase energy efficiency and improve power quality, safety and reliability. Our solutions offer a growing portfolio of "green" products and services, such as energy audits and real-time energy consumption monitoring. Eaton's Uninterruptible Power Supplies (UPS), variable-speed drives and lighting controls help conserve energy and increase efficiency.

**Cooper Industries Group & Cooper (Ningbo)**

The former Cooper Industries Group is a global cross-industry equipment manufacturer. With nearly 200 years of history and upwards of 30,000 employees worldwide, it owns 100-plus manufacturing bases in 23 countries. Cooper (Ningbo), a joint venture under Cooper Industries Group, is invested and established by Cooper China Investment Limited in 2007. It boasts several world-class production lines, covering nearly 30 kinds of products in 6 categories. The products are widely used in such sectors as data center, power grid, power generation, petrochemical, metallurgy, rail transportation, and infrastructure, and is a complete distribution solution and service provider.

**Eaton Electrical**

Eaton, as a leading global power management company, boasts a slew of industry-leading technologies and is dedicated to helping customers make more efficient and safer use of power, fluid power and mechanical power. It employs 97,000 employees worldwide, with its products exported to 175-plus countries and regions. As early as 1993, Eaton set up the first joint venture in the Chinese market. Then, it has realized rapid sustainable development via mergers and acquisitions, joint ventures and whollyowned enterprises. It has achieved a sales revenue of $1 billion in the Chinese market in 2010.

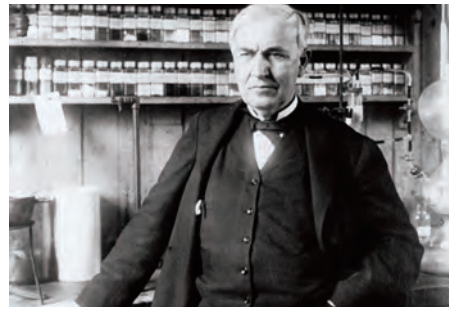
**Integration And Development**

In 2012, Eaton Electrical Group had fully acquired Cooper Industries Group. The two leaders in the electrical sector form to become a new global leader in power management. Cooper (Ningbo) is the strategic arm of Cooper Electric System for Asia Pacific region, global IEC product manufacturing base of Eaton, and UX36 and W-VACi manufacturer. We undertake the production of many advanced technologies and products in the electrical field. It boasts outstanding achievements in industry innovation in terms of manufacturing process and product design. Cooper (Ningbo), by virtue of its many advantages, joins hands with Eaton in bringing more focused, effective solutions for its customers, in a bid to create unmatched customer value.

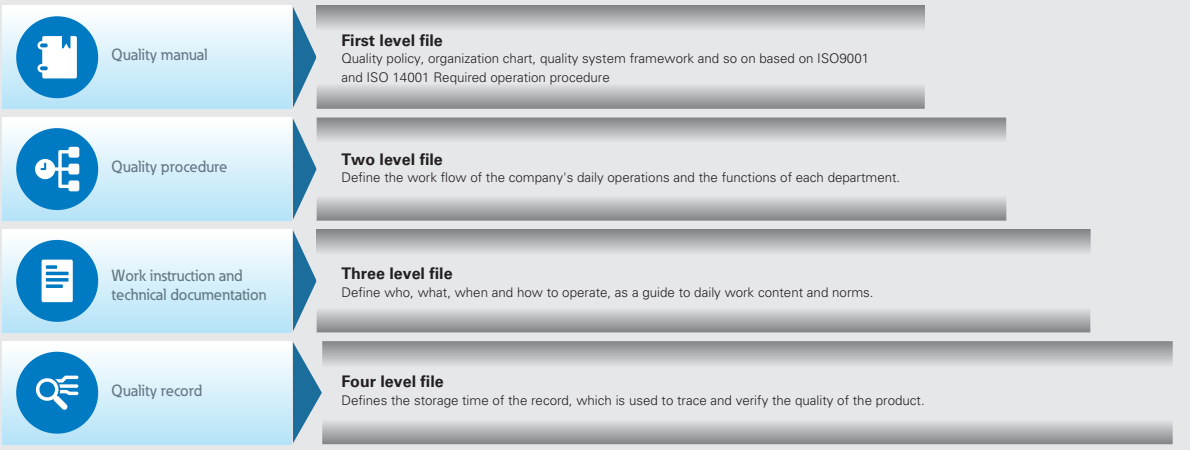
Cooper (Ningbo) is committed to providing customers with top-drawer products. Departing from traditional switchgear manufacturing model, it designs and installs the industry's most revolutionary intelligent production lines for switchgear. This innovation converts the former production mode into hightech intelligent management, marking a quantum leap for science and technology.

LSN and EPM series low-voltage switchgear assembly line uses power roller and transfer trolley for transport. The entire line adopts computers for centralized control, integrating assembly of electrical components, secondary wiring and the whole machine detection function. The standard process control safeguards product quality.


Cooper (Ningbo) pursues high quality and first-class, safest, most reliable products. It boats leading one-stop testing equipment in the industry, including conventional testing lab, electrical performance testing lab, mechanical performance testing lab, physical and chemical lab, precision measurement lab and X-Ray detection room and so on. Cooper (Ningbo) ensures to provide customers with the most efficient safe and reliable products.



In 2005, Edison R & D Center – the only R & D Center named after the great inventor Thomas Edison – was located in China, and in 2009 set up Edison (Ningbo) R & D sub-center at Cooper (Ningbo). In recent years, Cooper (Ningbo), relying on this R & D center, has formed industry-university-research cooperation with new characteristics in accordance with medium and long-term strategic planning, providing a strong impetus to the exceptional development of the company's innovative capability.




In accordance with the requirements of IS09001 quality system, we have established a complete file system covering IS09001- 2000 and ISO14001 files, which guarantees the consistency and stability of the management process. At the same time, each Cooper employee is required to undergo pre-job training, and standard operating instructions are provided at the production site, in order to ensure that production operations are conducted as per the standard process. Thus, it ensures that each product produced by Cooper (Ningbo) is safe and reliable.

**National and industry standards**

## Standards compliant

The design and manufacture of ASN3-12 switchgear meet the following standards:

- GB3906: AC metal-enclosed switchgear and controlgear for rated voltages of 3.6-40.5kV
- GB/T11022: Common specifications for high-voltage switchgear and controlgear standards
- GB1984: Alternating current high-voltage circuit-breakers
- DL/T404: Alternating-Current metal-enclosed switchgear and controlgear for rated voltages above 3.6kV and up to and including 40.5kV
- IEC60694: Common specifications for high-voltage switchgear and controlgear standards
- IEC62271-100: high-voltage switchgear and controlgear standards – Part 100: high-voltage AC circuit breakers
- IEC62271-200: Alternating-Current metal-enclosed switchgear and controlgear for rated voltages above 1kV and up to and including 52kV
- GB13540: Anti-seismic requirements of high-voltage switchgear and controlgear

## Type test

- Protection class inspection
- Measurement of loop resistance
- Temperature rise test
- Mechanical characteristic and mechanical operation test
- Mechanical life test
- Insulation test of operation mechanism and auxiliary loop
- Short-term power frequency withstand voltage test
- Lightning impact withstand voltage test
- Single-phase fault breaking capacity test
- Power and thermal stability test
- Vibration test

**Type test report**

## Conditions of use environment

| | |
|---|---|
| Ambient temperature ① | -15 °C to +40 °C |
| Average daily temperature | <35 °C |
| Altitude ② | <1000m |
| Relative humidity ③ | Average daily value <95% |
| | Average monthly value <90% |
| Water vapor pressure value | Average daily value <2.2kPa |
| | Average monthly value <1.8kPa |
| Anti-seismic capacity | seismic intensity does not exceed 8 degree |
| Location for installation | The surroundings are free from obvious pollution of dust, smoke, corrosive and or flammable gases, steam or salt mist |

① The rated current value of circuit breaker shall be lowered or fan is installed for compulsory heat dissipation if the ambient temperature exceeds +40°C;

② The external insulation strength of circuit breakers will reduce if the location for installation exceeds 1000m above sea level. Please consult the manufacturers for detailed requirements;

③ The switchgear is equipped with heater. If installed at a location with high humidity or large temperature fluctuations, the heater shall be turned on even under normal operation, in order to prevent condensation. The heat generated by the switchgear can be dissipated through additional ventilation facilities.

# ASN series AC metal-enclosed switchgear and controlgear

## Contents

# ASN series AC metal-enclosed switchgear and controlgear

**ASN1-40.5**

**ASN2-24**

**ASN3-12**

## Product description

**ASN series (ASN1-40.5, ASN2-24, ASN3-12) switchgear cabinet, as a new-generation medium-voltage AC metal-enclosed switchgear and controlgear developed by our company, is suited to three-phase AC 50/60Hz single bus and single bus segmented system. The products are mainly used for the acceptance and distribution of electrical energy, and for the circuit control, protection and monitoring in energy, industry, infrastructure, maritime and other fields.**

Full range of specifications of ASN series switchgear:

- ASN1 switchgear has rated voltage of 40.5kV, rated current of up to 3150A, and rated short-circuit breaking current of up to 40kA;
- ASN2 switchgear has rated voltage of 24kV, rated current of up to 4000A, rated short-circuit breaking current of up to 40kA;
- ASN3 switchgear has rated voltage of 12kV, rated current of up to 5000A, and rated short-circuit breaking current of up to 50kA.

Loss category of operation continuity of switchgear: LSC2B.

Partition level inside cabinet: PM level.

Meet the 1.1Ir temperature rise requirements.

Arcing class: IAC AFLR Class.

ASN series switchgear is equipped with high-performance VN series indoor medium-voltage vacuum circuit breakers or CEC/F contactor-fuse combination appliance.

The housing of ASN series switchgear adopts high-quality aluminum-zinc coated steel through NC machine tool processing and bending; the key parts adopt double-bending structure, with high mechanical strength and high corrosion resistance.

Of a modular design, ASN series switchgear mainly consists of the handcart chamber, cable chamber, bus chamber, and instrument chamber, and the housing protection class is IP4X.

For the ASN series switchgear, the main busbar uses rounded busbar, and the busbar end uses the fillet treatment; the electric field distribution is further optimized. Bus surface is covered with heat-shrinkable casing, so that switchgear has such features as compact structure, advanced technology, stable performance, safety and reliability.

ASN series switchgear has perfect and reliable mechanical interlocking device, and uses double error-prevention method with primarily mechanical interlock and supporting electrical interlock, thus effectively preventing accidental operation and safeguarding the equipment and personal safety.

ASN series switchgear allows the switching operation and handcart access only after its doors are closed, thus protecting the operator.

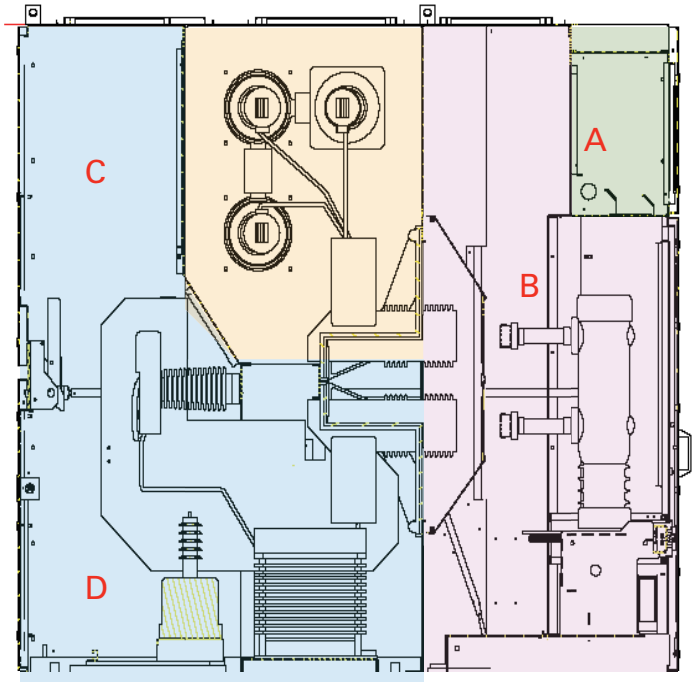
ASN series switchgear completes all the conventional test items as per China's national standards and international standards, and has passed the internal arc fault test, thus greatly improving the safety of switchgear.

# ASN series AC metal-enclosed switchgear and controlgear

## Structural features

### Modular design

ASN series switchgear adopts modular design. The cabinet is composed of such basic modules as instrument chamber (A), handcart chamber (B), bus chamber (C), cable chamber (D) as well as transformer, grounding switch and contact box. It allows flexible and convenient assembly and has high structural strength.



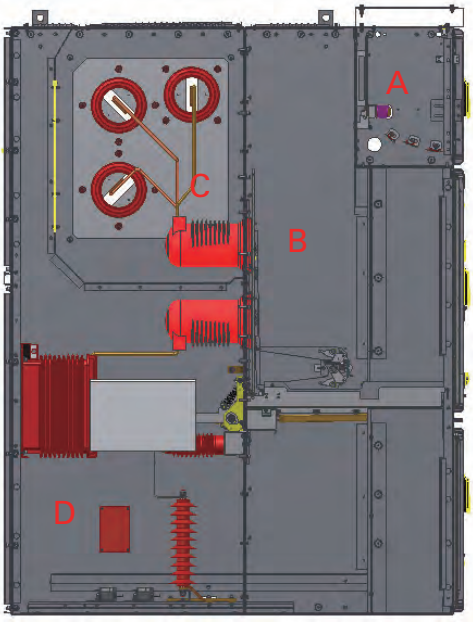

A: Instrument chamber

B: handcart chamber

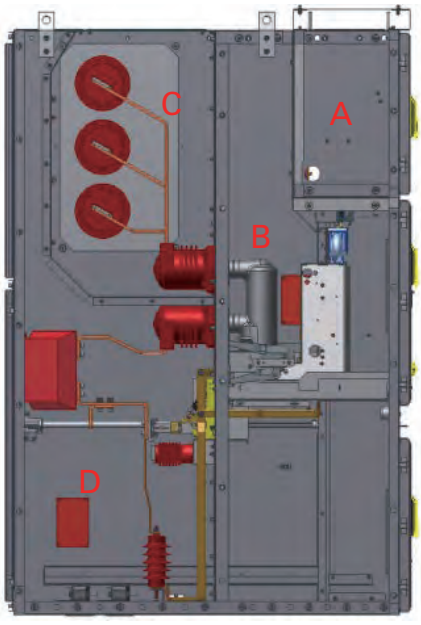
C: busbar chamber

D: Cable chamber

**ASN1-40.5**




**ASN2-24**




**ASN3-12**

# ASN series AC metal-enclosed switchgear and controlgear

## High-strength riveting process

Switchgear cabinet frame, made of aluminum riveted aluminum and zinc-coated steel plate, has high strength and high assembling efficiency, with a simple and beautiful appearance. The riveting has reasonable distribution of stress, thus reducing the possibility of structural damage and deformation.

The riveting process makes it possible to replace the middle switchgear on site. When it needs to replace the middle switchgear due to failure, field personnel can easily pull out the middle switchgear thanks to the riveting process.

## Unique metal shutter design

The static contact box for incoming and outgoing line of circuit breaker uses the fluidized metal shutter. Thus, the outer surface insulation capacity is greatly improved; also, when the breaker's handcart exits the work position, the metal shutter automatically closes and blocks the static contact box, thus meeting the requirements of IP2X protection class. Therefore, it ensures that operation and maintenance personnel will not accidentally touch the live static contact of switchgear, thereby ensuring personal safety.

When the circuit breaker is at the removed position, the shutter drive mechanism can be equipped with padlock to prevent accidents which may occur when non-professional switchgear operation and maintenance personnel forcibly open the shutter.

## Detachable instrument chamber

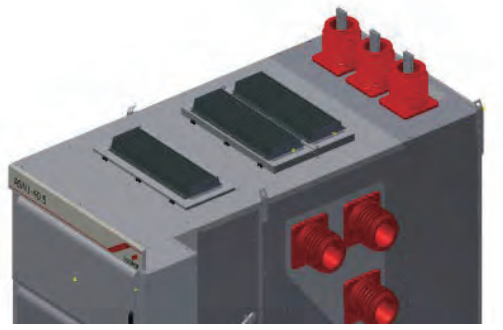
The instrument chamber is designed with a detachable module. The assembly and wiring of low-voltage components are completed on the assembly platform, and the devices are then installed on the cabinet to improve the appearance and safety of the low voltage wiring, and facilitate the maintenance and overhaul by operators.

## Design of convection ventilation

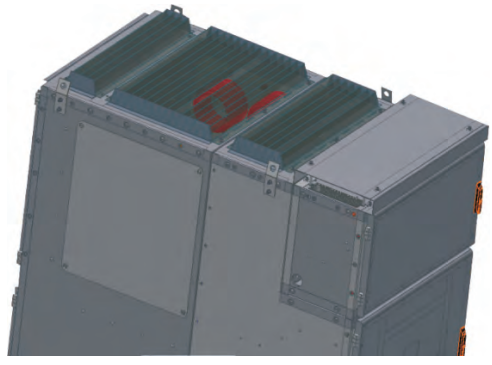
There is air duct at the bottom of circuit breaker chamber. When the circuit breaker has rising operating temperature, the hot air rises, and the cold air enters through the bottom to achieve natural ventilation, thus conducive to heat dissipation during the normal operation of circuit breaker.

## Safe pressure relief channel

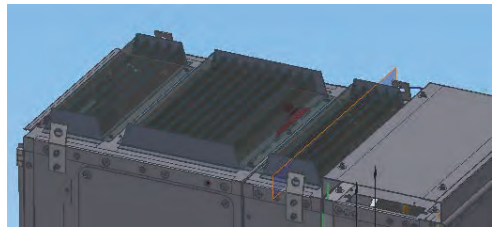
Automatic pressure relief device is equipped above the switchgear's circuit breaker chamber, bus chamber, and cable chamber. When there is arc inside the chamber due to a fault, the internal pressure of switchgear rises. Special sealing ring installed on the door will enclose the door, and the top pressure relief metal plate is automatically opened to release the pressure and high temperature, ensuring the safety of adjacent chambers and operation and maintenance personnel and meeting the requirements of IAC-class switchgear.



**ASN1-40.5**



**ASN2-24**



**ASN3-12**

# ASN series AC metal-enclosed switchgear and controlgear

## Flexible and reliable handcart propulsion mechanism

The circuit breaker chamber is equipped with handcart rails, and the handcart equipped with screw rod and nut propulsion mechanism makes it easier for operation inside the chamber, and also improves the reliability of the switchgear structure, thus avoiding the vibration of handcart inside the chamber due to external mechanical force.

## Spacious cable chamber

Spacious cable chamber makes it easier for construction and maintenance personnel to enter the switchgear cabinet for installation and maintenance.

Each phase is connected with at most six single-core cables or three 3-core cables.

Voltage transformers, current transformers, grounding switches, surge arresters, sensors and other components can be installed inside the cable chamber.

## Safe and reliable mechanical interlock

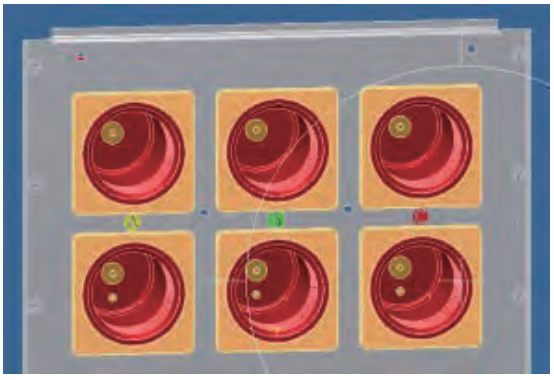
The switchgear put in place comprehensive measures to prevent misuse, and is equipped with reliable mechanical electrical locking device, thus fully meeting the following requirements: prevent mistaken opening and closing of circuit breaker; prevent pushing or pulling circuit breaker handcart with load; prevent the live grounding switch; prevent closing earthing switch with hot-line job; preventing pushing circuit breaker handcart when the earthing switch is off; prevent mistaken entry into the live chamber; thus, it can protect the safety of the operator and the device itself to the utmost extent.

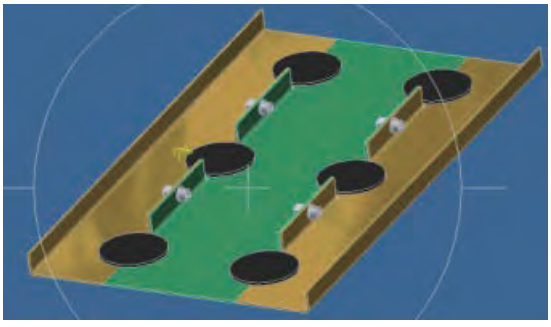
Circuit breakers have accurate positioning device at the working position and test position inside switchgear; mechanical locking ensures that it is allowed to close the circuit breaker only when the handcart of circuit breaker is at the exact working position or test position; meanwhile, only when the circuit breaker is at the opening status is it allowed to perform push-pull operation of the circuit breaker between the test position and the working position.

Circuit breaker has a mechanical lock between the receiving chamber and the secondary control plug, so as to prevent unplugging the second plug when circuit breaker handcart is at the working position, and avoid the continuous operation of switchgear without control and protection.

## Anti-vortex mounting plate

Wall bushing installation plate, mounting plate of contact box, and bottom plate of cable outlet hole are made of stainless steel plate to effectively prevent the generation of vortex.





## Some components are customized by professional manufacturers

Grounding switch, current/voltage transformer and other key components use the custom structure by specified suppliers, ensuring the product quality and delivery time, and also conducive to modular and standardized design. It has more convenient installation, more reliable switchgear quality, and shorter product lead time.

# ASN series AC metal-enclosed switchgear and controlgear

## Technical Parameters

**ASN1-40.5**

| Item | | Unit | Parameters |
|---|---|---|---|
| Switchgear type | | | ASN1-40.5 |
| Rated voltage | | kV | 33/36/40.5 |
| Rated frequency | | Hz | 50/60 |
| Rated insulation level | 1min power frequency withstand voltage (effective value) | kV | 95/118 |
| | Lightning impulse withstand voltage (peak) | kV | 185/215 |
| | Control circuit power frequency withstand voltage (1min) | V | 2000 |
| Rated current | | A | 1250, 1600, 2000, 2500, 3150 |
| Rated short-circuit breaking current | | kA | 25, 31.5, 40 |
| Rated short-circuit closing current | | kA | 63, 80, 100 |
| Rated short-time withstand current (4s) | | kA | 25, 31.5, 40 |
| Rated peak withstand current | | kA | 63, 80, 100 |
| Auxiliary control circuit rated voltage ① | | V | AC110/220, DC110/220 |
| Protection class | | | IP4X (or IP2X when the circuit breaker chamber door is opened or the compartment) |
| Arcing rating (IAC ALFR) | | kA/1s | 31.5/1 |

① Please consult the manufacturers for special voltage rating requirements.

# ASN series AC metal-enclosed switchgear and controlgear

## Technical Parameters

**ASN2-24**

| Item | | Unit | Parameters |
|---|---|---|---|
| Switchgear type | | | ASN2-24 |
| Rated voltage | | kV | 17.5/24 |
| Rated frequency | | Hz | 50/60 |
| Rated insulation level | 1min power frequency withstand voltage (effective value) | kV | 65/79 |
| | Lightning impulse withstand voltage (peak) | kV | 125/145 |
| | Control circuit power frequency withstand voltage (1min) | V | 2000 |
| Rated current | | A | 630, 1250, 1600, 2000, 2500, 3150, 4000 |
| Rated short-circuit breaking current | | kA | 25, 31.5, 40 |
| Rated short-circuit closing current | | kA | 63, 80, 100 |
| Rated short-time withstand current (4s) | | kA | 25, 31.5, 40 |
| Rated peak withstand current | | kA | 63, 80, 100 |
| Auxiliary control circuit rated voltage ① | | V | AC110/220, DC110/220 |
| Protection class | | | IP4X (or IP2X when the circuit breaker chamber door is opened or the compartment) |
| Arcing rating (IAC ALFR) | | kA/1s | 31.5/0.5 |

① Please consult the manufacturers for special voltage rating requirements.

# ASN series AC metal-enclosed switchgear and controlgear

## Technical Parameters

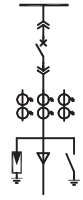
**ASN3-12**

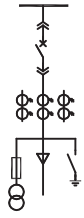
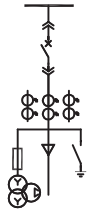
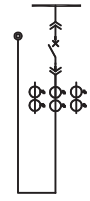
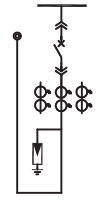
| Item | | Unit | Parameters |
|---|---|---|---|
| Switchgear type | | | ASN3-12 |
| Rated voltage | | kV | 3.6/7.2/12 |
| Rated frequency | | Hz | 50/60 |
| Rated insulation level | 1min power frequency withstand voltage (effective value) | kV | 42/48 |
| | Lightning impulse withstand voltage (peak) | kV | 75/85 |
| | Control circuit power frequency withstand voltage (1min) | V | 2000 |
| Rated current | | A | 630, 1250, 1600, 2000, 2500, 3150, 4000, 5000 |
| Rated short-circuit breaking current | | kA | 25, 31.5, 40, 50 |
| Rated short-circuit closing current | | kA | 63, 80, 125, 137 (150) |
| Rated short-time withstand current (4s) | | kA | 25, 31.5, 40, 50 |
| Rated peak withstand current | | kA | 63, 80, 125, 137 (150) |
| Auxiliary control circuit rated voltage ① | | V | AC110/220, DC110/220 |
| Protection class | | | IP4X (or IP2X when the circuit breaker chamber door is opened or the compartment) |
| Arcing rating (IAC ALFR) | | kA/1s | 50/1 |

① Please consult the manufacturers for special voltage rating requirements.

# ASN series AC metal-enclosed switchgear and controlgear

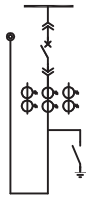
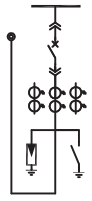
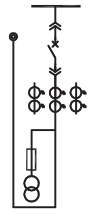
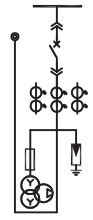
## Primary wiring scheme of ASN1-40.5 switchgear

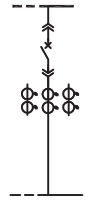
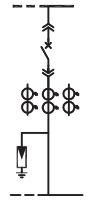
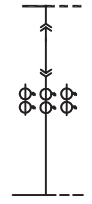
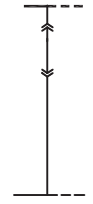
| **Scheme No.** | | **1** | **2** | **3** | **4** |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 3150 | 630 ~ 3150 | 630 ~ 3150 | 630 ~ 3150 |
| | Vacuum circuit breaker/isolation handcart | 1 | 1 | 1 | 1 |
| | Current transformer | 3 | 3 | 3 | 3 |
| | Voltage transformer | | | | |
| | High-voltage fuse | | | | |
| | Earthing switch | | | 1 | 1 |
| | Lightning arrester | | 3 | | 3 |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | Cable inlet and outlet line | Cable inlet and outlet line | Cable inlet and outlet line | Cable inlet and outlet line + PT |
| | Remarks | | | | |

| **Scheme No.** | | **5** | **6** | **7** | **8** |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 3150 | 630 ~ 3150 | 630 ~ 3150 | 630 ~ 3150 |
| | Vacuum circuit breaker/isolation handcart | 1 | 1 | 1 | 1 |
| | Current transformer | 3 | 3 | 3 | 3 |
| | Voltage transformer | 2 | 3 | | |
| | High-voltage fuse | 3 | 3 | | |
| | Earthing switch | 1 | 1 | | |
| | Lightning arrester | | | | 3 |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | Cable inlet and outlet line + PT | Cable inlet and outlet line + PT | Overhead inlet-outlet line | Overhead inlet-outlet line |
| | Remarks | | | | |

# ASN series AC metal-enclosed switchgear and controlgear

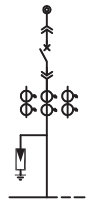
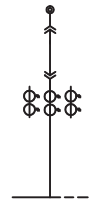
## Primary wiring scheme of ASN1-40.5 switchgear

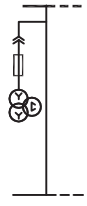
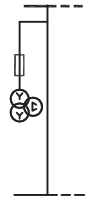
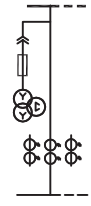
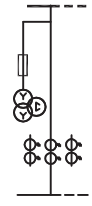
| **Scheme No.** | | **9** | **10** | **11** | **12** |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 3150 | 630 ~ 3150 | 630 ~ 3150 | 630 ~ 3150 |
| | Vacuum circuit breaker/isolation handcart | 1 | 1 | 1 | 1 |
| | Current transformer | 3 | 3 | 3 | 3 |
| | Voltage transformer | | | 2 | 3 |
| | High-voltage fuse | | | 3 | 3 |
| | Earthing switch | 1 | 1 | | |
| | Lightning arrester | | 3 | | 3 |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | Overhead inlet-outlet line | Overhead inlet-outlet line | Overhead inlet-outlet line+PT | Overhead inlet-outlet line+PT |
| | Remarks | | | | |

| **Scheme No.** | | **13** | **14** | **15** | **16** |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 3150 | 630 ~ 3150 | 630 ~ 3150 | 630 ~ 3150 |
| | Vacuum circuit breaker/isolation handcart | 1 | 1 | 1 | 1 |
| | Current transformer | 3 | 3 | 3 | |
| | Voltage transformer | | | | |
| | High-voltage fuse | | | | |
| | Earthing switch | | | | |
| | Lightning arrester | | 3 | | |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | Bus coupler circuit breaker | Bus coupler circuit breaker | Bus coupler isolation | Bus coupler isolation |
| | Remarks | | | | |

# ASN series AC metal-enclosed switchgear and controlgear

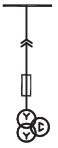
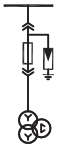
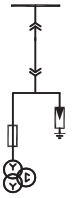
## Primary wiring scheme of ASN1-40.5 switchgear

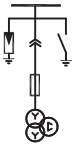
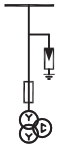
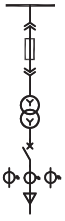
| **Scheme No.** | | **17** | **18** | **19** | **20** |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 3150 | 630 ~ 3150 | 630 ~ 3150 | 630 ~ 3150 |
| | Vacuum circuit breaker/isolation handcart | 1 | 1 | 1 | 1 |
| | Current transformer | 3 | 3 | 3 | |
| | Voltage transformer | | | | |
| | High-voltage fuse | | | | |
| | Earthing switch | | | | |
| | Lightning arrester | | 3 | | |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | Overhead inlet line + contact | Overhead inlet line + contact | Overhead inlet line + isolation | Overhead inlet line + isolation |
| | Remarks | | | | |

| **Scheme No.** | | **21** | **22** | **23** | **24** |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 3150 | 630 ~ 3150 | 630 ~ 3150 | 630 ~ 3150 |
| | Vacuum circuit breaker/isolation handcart | 1 | | 1 | |
| | Current transformer | | | 3 | 3 |
| | Voltage transformer | 3 | 3 | 3 | 3 |
| | High-voltage fuse | 3 | 3 | 3 | 3 |
| | Earthing switch | | | | |
| | Lightning arrester | | | | |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | Bus coupler + PT | Bus coupler + PT | Measurement | Measurement |
| | Remarks | | | | |

# ASN series AC metal-enclosed switchgear and controlgear

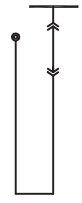
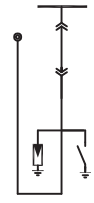
## Primary wiring scheme of ASN1-40.5 switchgear

| **Scheme No.** | | **25** | **26** | **27** | **28** |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 3150 | 630 ~ 3150 | 630 ~ 3150 | 630 ~ 3150 |
| | Vacuum circuit breaker/isolation handcart | 1 | 1 | 1 | 1 |
| | Current transformer | | | | |
| | Voltage transformer | 3 | 3 | 3 | 3 |
| | High-voltage fuse | 3 | 3 | 3 | 3 |
| | Earthing switch | | | | |
| | Lightning arrester | | 3 | 3 | 3 |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | PT | PT+lightning arrester | PT+lightning arrester | PT+lightning arrester |
| | Remarks | | | | |

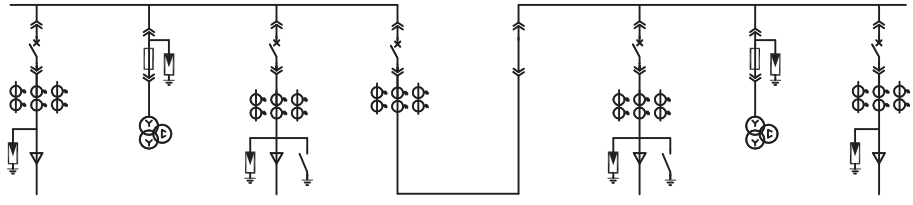
| **Scheme No.** | | **29** | **30** | **31** | **32** |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 3150 | 630 ~ 3150 | 630 ~ 3150 | 630 ~ 3150 |
| | Vacuum circuit breaker/isolation handcart | 1 | | 1 | 1 |
| | Current transformer | | | 3 | |
| | Voltage transformer | 3 | 3 | 1 | |
| | High-voltage fuse | 3 | 3 | 3 | 3 |
| | Earthing switch | 1 | | | |
| | Lightning arrester | 3 | 3 | | |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | PT + earthing | PT+lightning arrester | Electric transducer | Electric transducer |
| | Remarks | | | | |

# ASN series AC metal-enclosed switchgear and controlgear

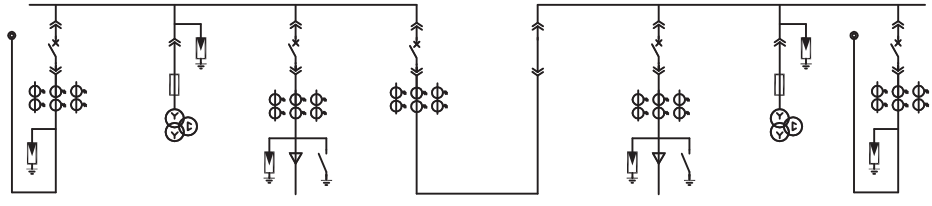
## Primary wiring scheme of ASN1-40.5 switchgear

| Scheme No. | | 33 | 34 | 35 | 36 |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 3150 | 630 ~ 3150 | 630 ~ 3150 | 630 ~ 3150 |
| | Vacuum circuit breaker/isolation handcart | 1 | 1 | 1 | 1 |
| | Current transformer | | | | |
| | Voltage transformer | | | | |
| | High-voltage fuse | | | | |
| | Earthing switch | | 1 | | 1 |
| | Lightning arrester | | 3 | | 3 |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | Isolation | Isolation | Isolation | Isolation |
| | Remarks | | | | |

### Typical primary scheme (1)



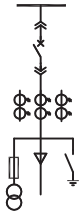
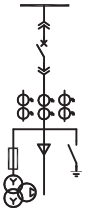
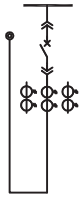
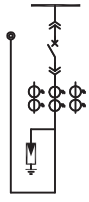
### Typical primary scheme (2)



# ASN series AC metal-enclosed switchgear and controlgear

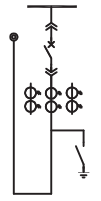
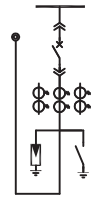
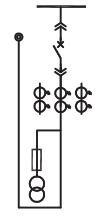
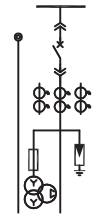
## Primary wiring scheme of ASN2-24 switchgear

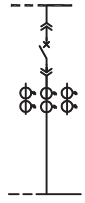
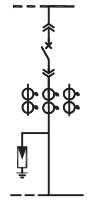
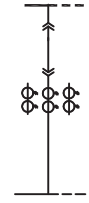
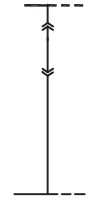
| **Scheme No.** | | **1** | **2** | **3** | **4** |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 4000 | 630 ~ 4000 | 630 ~ 4000 | 630 ~ 4000 |
| | Vacuum circuit breaker/isolation handcart | 1 | 1 | 1 | 1 |
| | Current transformer | 3 | 3 | 3 | 3 |
| | Voltage transformer | | | | |
| | High-voltage fuse | | | | |
| | Earthing switch | | | 1 | 1 |
| | Lightning arrester | | 3 | | 3 |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | Cable inlet and outlet line | Cable inlet and outlet line | Cable inlet and outlet line | Cable inlet and outlet line + PT |
| | Remarks | | | | |

| **Scheme No.** | | **5** | **6** | **7** | **8** |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 4000 | 630 ~ 4000 | 630 ~ 4000 | 630 ~ 4000 |
| | Vacuum circuit breaker/isolation handcart | 1 | 1 | 1 | 1 |
| | Current transformer | 3 | 3 | 3 | 3 |
| | Voltage transformer | 2 | 3 | | |
| | High-voltage fuse | 3 | 3 | | |
| | Earthing switch | 1 | 1 | | |
| | Lightning arrester | | | | 3 |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | Cable inlet and outlet line + PT | Cable inlet and outlet line + PT | Overhead inlet-outlet line | Overhead inlet-outlet line |
| | Remarks | | | | |

# ASN series AC metal-enclosed switchgear and controlgear

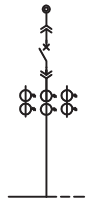
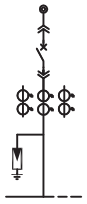
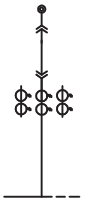
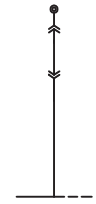
## Primary wiring scheme of ASN2-24 switchgear

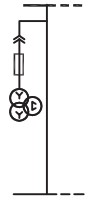
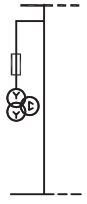
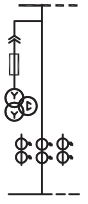
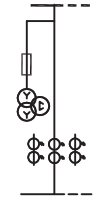
| **Scheme No.** | | **9** | **10** | **11** | **12** |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 4000 | 630 ~ 4000 | 630 ~ 4000 | 630 ~ 4000 |
| | Vacuum circuit breaker/isolation handcart | 1 | 1 | 1 | 1 |
| | Current transformer | 3 | 3 | 3 | 3 |
| | Voltage transformer | | | 2 | 3 |
| | High-voltage fuse | | | 3 | 3 |
| | Earthing switch | 1 | 1 | | |
| | Lightning arrester | | 3 | | 3 |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | Overhead inlet-outlet line | Overhead inlet-outlet line | Overhead inlet-outlet line +PT | Overhead inlet-outlet line +PT |
| | Remarks | | | | |

| **Scheme No.** | | **13** | **14** | **15** | **16** |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 4000 | 630 ~ 4000 | 630 ~ 4000 | 630 ~ 4000 |
| | Vacuum circuit breaker/isolation handcart | 1 | 1 | 1 | 1 |
| | Current transformer | 3 | 3 | 3 | |
| | Voltage transformer | | | | |
| | High-voltage fuse | | | | |
| | Earthing switch | | | | |
| | Lightning arrester | | 3 | | |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | Bus coupler circuit breaker | Bus coupler circuit breaker | Bus coupler isolation | Bus coupler isolation |
| | Remarks | | | | |

# ASN series AC metal-enclosed switchgear and controlgear

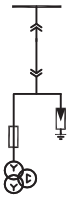
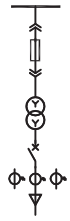
## Primary wiring scheme of ASN2-24 switchgear

| **Scheme No.** | | **17** | **18** | **19** | **20** |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 4000 | 630 ~ 4000 | 630 ~ 4000 | 630 ~ 4000 |
| | Vacuum circuit breaker/isolation handcart | 1 | 1 | 1 | 1 |
| | Current transformer | 3 | 3 | 3 | |
| | Voltage transformer | | | | |
| | High-voltage fuse | | | | |
| | Earthing switch | | | | |
| | Lightning arrester | | 3 | | |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | Overhead inlet line + contact | Overhead inlet line + contact | Overhead inlet line + isolation | Overhead inlet line + isolation |
| | Remarks | | | | |

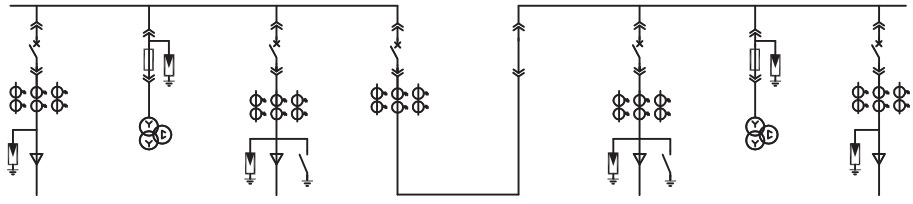
| **Scheme No.** | | **21** | **22** | **23** | **24** |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 4000 | 630 ~ 4000 | 630 ~ 4000 | 630 ~ 4000 |
| | Vacuum circuit breaker/isolation handcart | 1 | | 1 | |
| | Current transformer | | | 3 | 3 |
| | Voltage transformer | 3 | 3 | 3 | 3 |
| | High-voltage fuse | 3 | 3 | 3 | 3 |
| | Earthing switch | | | | |
| | Lightning arrester | | | | |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | Bus coupler + PT | Bus coupler + PT | Measurement | Measurement |
| | Remarks | | | | |

# ASN series AC metal-enclosed switchgear and controlgear

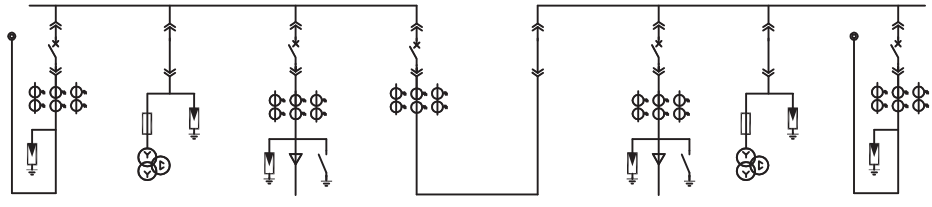
## Primary wiring scheme of ASN2-24 switchgear

| Scheme No. | | 25 | 26 | 27 | 28 |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 4000 | 630 ~ 4000 | 630 ~ 4000 | 630 ~ 4000 |
| | Vacuum circuit breaker/isolation handcart | 1 | 1 | 1 | 1 |
| | Current transformer | | | 3 | |
| | Voltage transformer | 3 | 3 | 1 | |
| | High-voltage fuse | 3 | 3 | 3 | 3 |
| | Earthing switch | | | | |
| | Lightning arrester | 3 | 3 | | |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | PT + lightning arrester | PT + lightning arrester | Electric transducer | Electric transducer |
| | Remarks | | | | |

### Typical primary scheme (1)



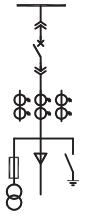
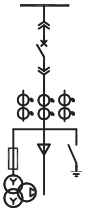
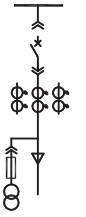
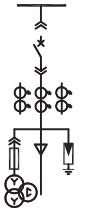
### Typical primary scheme (2)



# ASN series AC metal-enclosed switchgear and controlgear

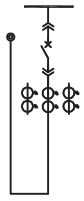
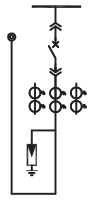
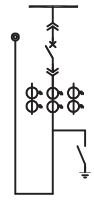
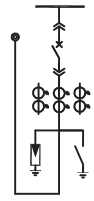
## Primary wiring scheme of ASN3-12 switchgear

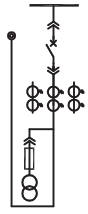
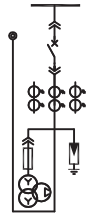
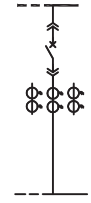
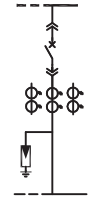
| **Scheme No.** | | **1** | **2** | **3** | **4** |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 5000 | 630 ~ 5000 | 630 ~ 5000 | 630 ~ 5000 |
| | Vacuum circuit breaker/isolation handcart | 1 | 1 | 1 | 1 |
| | Current transformer | 3 | 3 | 3 | 3 |
| | Voltage transformer | | | | |
| | High-voltage fuse | | | | |
| | Earthing switch | | | 1 | 1 |
| | Lightning arrester | | 3 | | 3 |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | Cable inlet and outlet line | Cable inlet and outlet line | Cable inlet and outlet line | Cable inlet and outlet line + PT |
| | Remarks | | | | |

| **Scheme No.** | | **5** | **6** | **7** | **8** |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 5000 | 630 ~ 5000 | 630 ~ 5000 | 630 ~ 5000 |
| | Vacuum circuit breaker/isolation handcart | 1 | 1 | 1 | 1 |
| | Current transformer | 3 | 3 | 3 | 3 |
| | Voltage transformer | 2 | 3 | 2 | 3 |
| | High-voltage fuse | 3 | 3 | 3 | 3 |
| | Earthing switch | 1 | 1 | | |
| | Lightning arrester | | | | 3 |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | Cable inlet and outlet line + PT | Cable inlet and outlet line + PT | Cable inlet-outlet line +PT | Cable inlet-outlet line +PT |
| | Remarks | | | | |

# ASN series AC metal-enclosed switchgear and controlgear

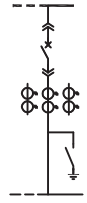
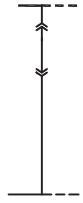
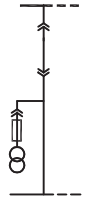
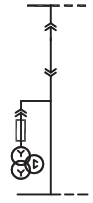
## Primary wiring scheme of ASN3-12 switchgear

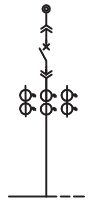
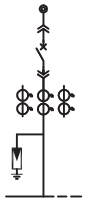
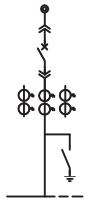
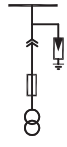
| **Scheme No.** | | **9** | **10** | **11** | **12** |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 5000 | 630 ~ 5000 | 630 ~ 5000 | 630 ~ 5000 |
| | Vacuum circuit breaker/isolation handcart | 1 | 1 | 1 | 1 |
| | Current transformer | 3 | 3 | 3 | 3 |
| | Voltage transformer | | | | |
| | High-voltage fuse | | | | |
| | Earthing switch | | | 1 | 1 |
| | Lightning arrester | | 3 | | 3 |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | Overhead inlet-outlet line | Overhead inlet-outlet line | Overhead inlet-outlet line | Overhead inlet-outlet line |
| | Remarks | | | | |

| **Scheme No.** | | **13** | **14** | **15** | **16** |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 5000 | 630 ~ 5000 | 630 ~ 5000 | 630 ~ 5000 |
| | Vacuum circuit breaker/isolation handcart | 1 | 1 | 1 | 1 |
| | Current transformer | 3 | 3 | 3 | 3 |
| | Voltage transformer | 2 | 3 | | |
| | High-voltage fuse | 3 | 3 | | |
| | Earthing switch | | | | |
| | Lightning arrester | | 3 | | 3 |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | Overhead inlet-outlet line+PT | Overhead inlet-outlet line+PT | Bus coupler circuit breaker | Bus coupler circuit breaker |
| | Remarks | | | | |

# ASN series AC metal-enclosed switchgear and controlgear

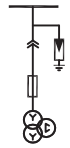
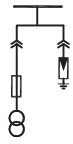
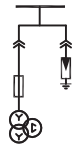
## Primary wiring scheme of ASN3-12 switchgear

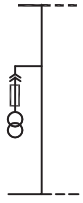
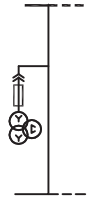
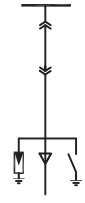
| **Scheme No.** | | **17** | **18** | **19** | **20** |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 5000 | 630 ~ 5000 | 630 ~ 5000 | 630 ~ 5000 |
| | Vacuum circuit breaker/isolation handcart | | 1 | 1 | 1 |
| | Current transformer | 3 | | | |
| | Voltage transformer | | | 2 | 3 |
| | High-voltage fuse | | | 3 | 3 |
| | Earthing switch | 1 | | | |
| | Lightning arrester | | | | |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | Bus coupler circuit breaker | Bus coupler isolation | Bus coupler isolation + PT | Bus coupler isolation + PT |
| | Remarks | | | | |

| **Scheme No.** | | **21** | **22** | **23** | **24** |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 5000 | 630 ~ 5000 | 630 ~ 5000 | 630 ~ 5000 |
| | Vacuum circuit breaker/isolation handcart | 1 | 1 | 1 | |
| | Current transformer | 3 | 3 | 3 | |
| | Voltage transformer | | | | 2 |
| | High-voltage fuse | | | | 3 |
| | Earthing switch | | | 1 | |
| | Lightning arrester | | 3 | | 3 |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | Overhead inlet line + contact | Overhead inlet line + contact | Overhead inlet line + contact | PT |
| | Remarks | | | | |

# ASN series AC metal-enclosed switchgear and controlgear

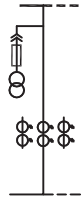
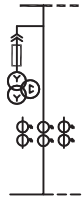
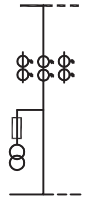
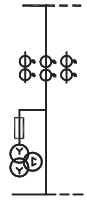
## Primary wiring scheme of ASN3-12 switchgear

| **Scheme No.** | | **25** | **26** | **27** | **28** |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 5000 | 630 ~ 5000 | 630 ~ 5000 | 630 ~ 5000 |
| | Vacuum circuit breaker/isolation handcart | | | | |
| | Current transformer | | | | |
| | Voltage transformer | 3 | 2 | 3 | |
| | High-voltage fuse | 3 | 3 | 3 | |
| | Earthing switch | | | | |
| | Lightning arrester | 3 | 3 | 3 | |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | PT | PT+lightning arrester | PT+lightning arrester | Bus coupler |
| | Remarks | | | | |

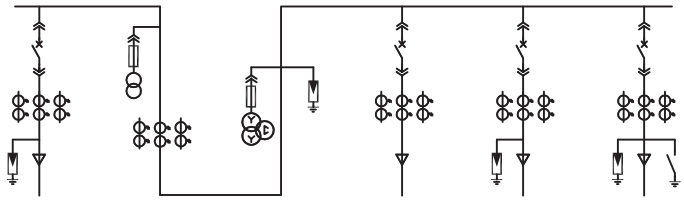
| **Scheme No.** | | **29** | **30** | **31** | **32** |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 5000 | 630 ~ 5000 | 630 ~ 5000 | 630 ~ 5000 |
| | Vacuum circuit breaker/isolation handcart | 1 | 1 | 1 | 1 |
| | Current transformer | | | | |
| | Voltage transformer | 2 | 3 | | |
| | High-voltage fuse | 3 | 3 | | |
| | Earthing switch | | | | 1 |
| | Lightning arrester | | | | 3 |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | Bus coupler+PT | Bus coupler+PT | Isolation | Isolation |
| | Remarks | | | | |

# ASN series AC metal-enclosed switchgear and controlgear

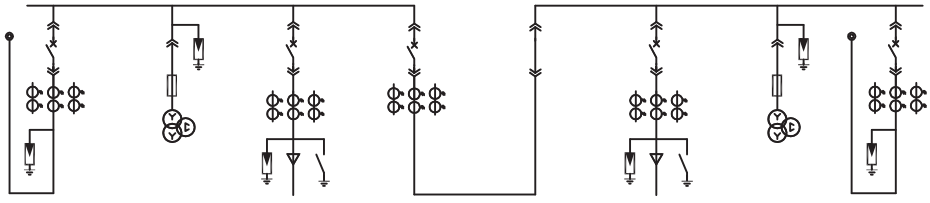
## Primary wiring scheme of ASN3-12 switchgear

| Scheme No. | | 33 | 34 | 35 | 36 |
|---|---|---|---|---|---|
| Drawing of primary wiring scheme | |  |  |  |  |
| Primary element | Rated current of main busbar (A) | 630 ~ 5000 | 630 ~ 5000 | 630 ~ 5000 | 630 ~ 5000 |
| | Vacuum circuit breaker/isolation handcart | | | | |
| | Current transformer | 3 | 3 | 3 | 3 |
| | Voltage transformer | 2 | 3 | 2 | 3 |
| | High-voltage fuse | 3 | 3 | 3 | 3 |
| | Earthing switch | | | | |
| | Lightning arrester | | | | |
| | Live display device | As required by user | As required by user | As required by user | As required by user |
| | Purpose | Measurement + contact | Measurement + contact | Measurement + contact | Measurement + contact |
| | Remarks | | | | |

### Typical primary scheme (1)

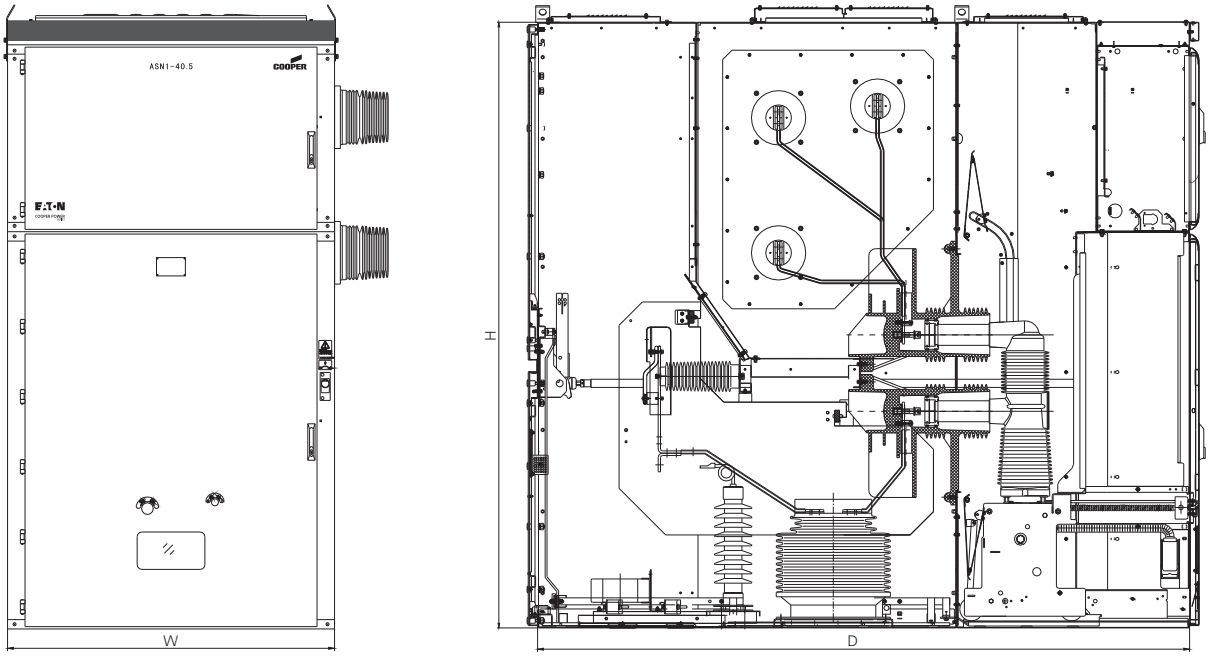


### Typical primary scheme (2)



# ASN series AC metal-enclosed switchgear and controlgear

## External dimensions and mounting base drawing

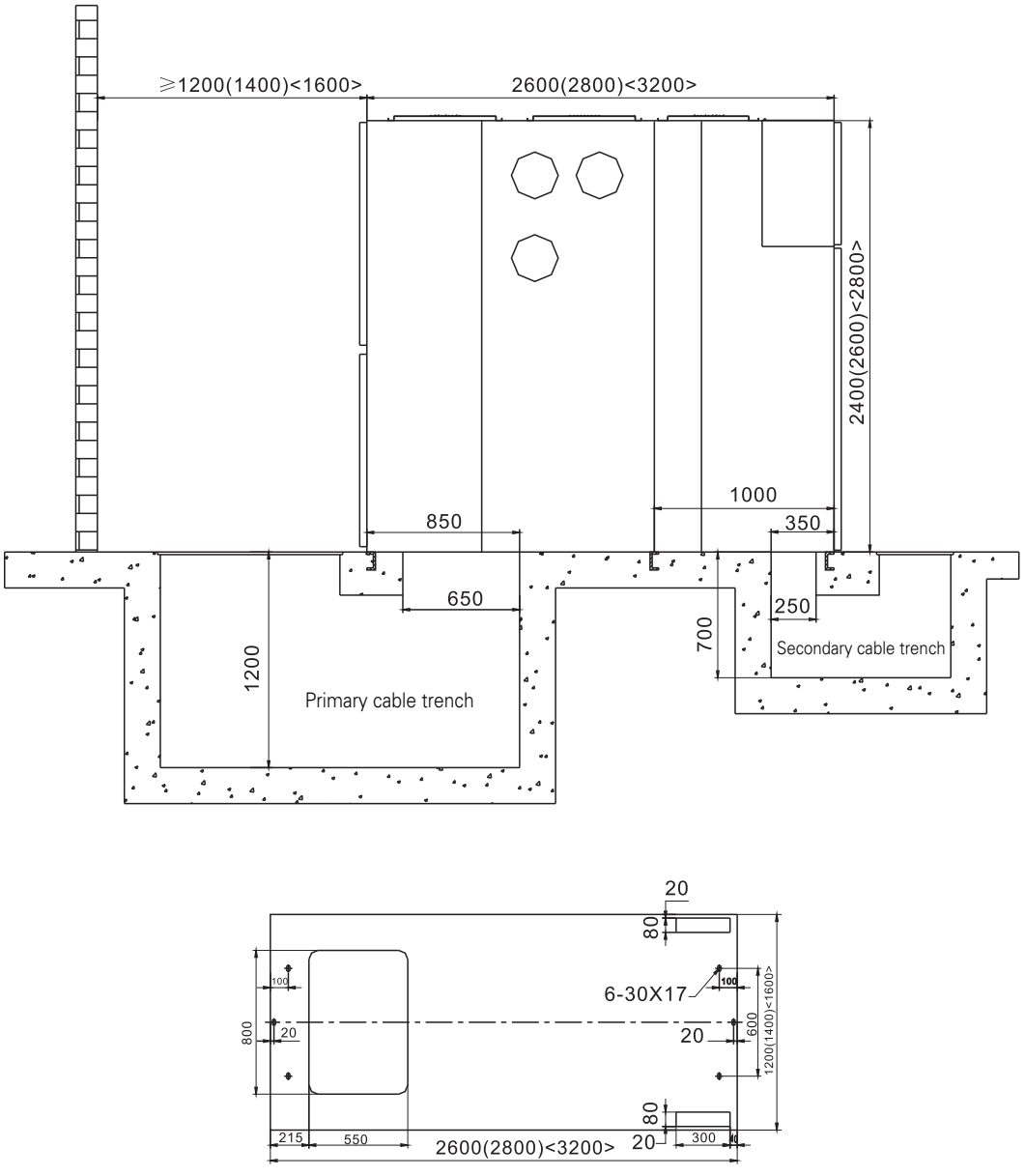



**Drawing of ASN1 switchgear dimensions and structure**

| Item | Unit | Parameters | |
|---|---|---|---|
| Height (H) | mm | 2400 | 2600 |
| Width (W) | mm | 1200 | 1400 |
| Depth (D) | mm | 2600 | 2800 |
| Weight | kg | 850~1850 | 850~1850 |

# ASN series AC metal-enclosed switchgear and controlgear

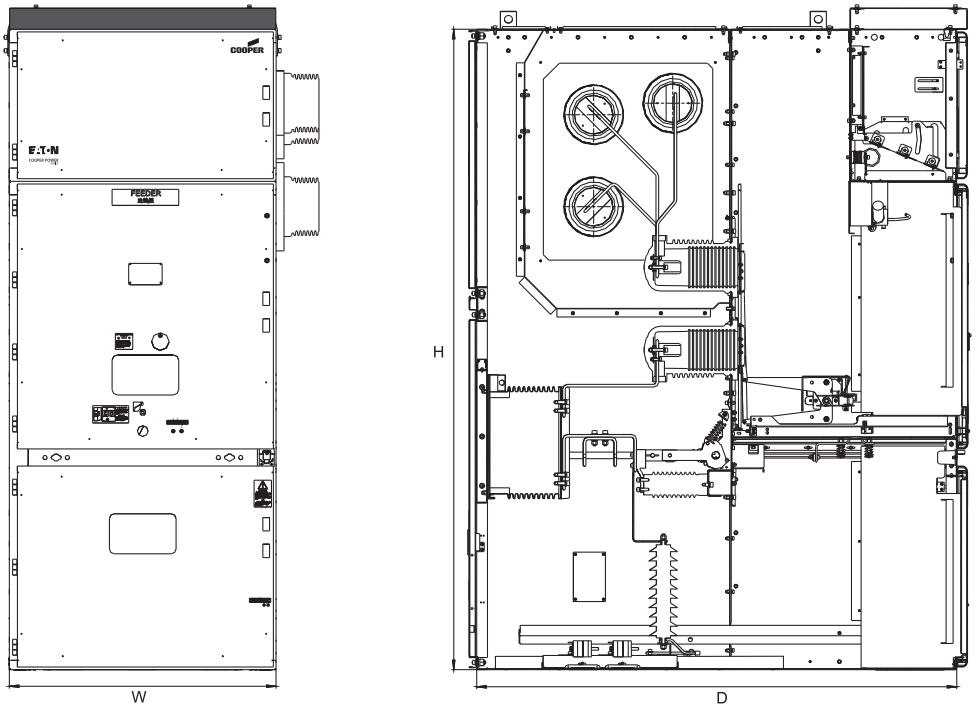
## External dimensions and mounting base drawing




**Drawing of installation foundation and sizes of holes of bottom plate for ASN1 switchgear**

# ASN series AC metal-enclosed switchgear and controlgear

## External dimensions and mounting base drawing



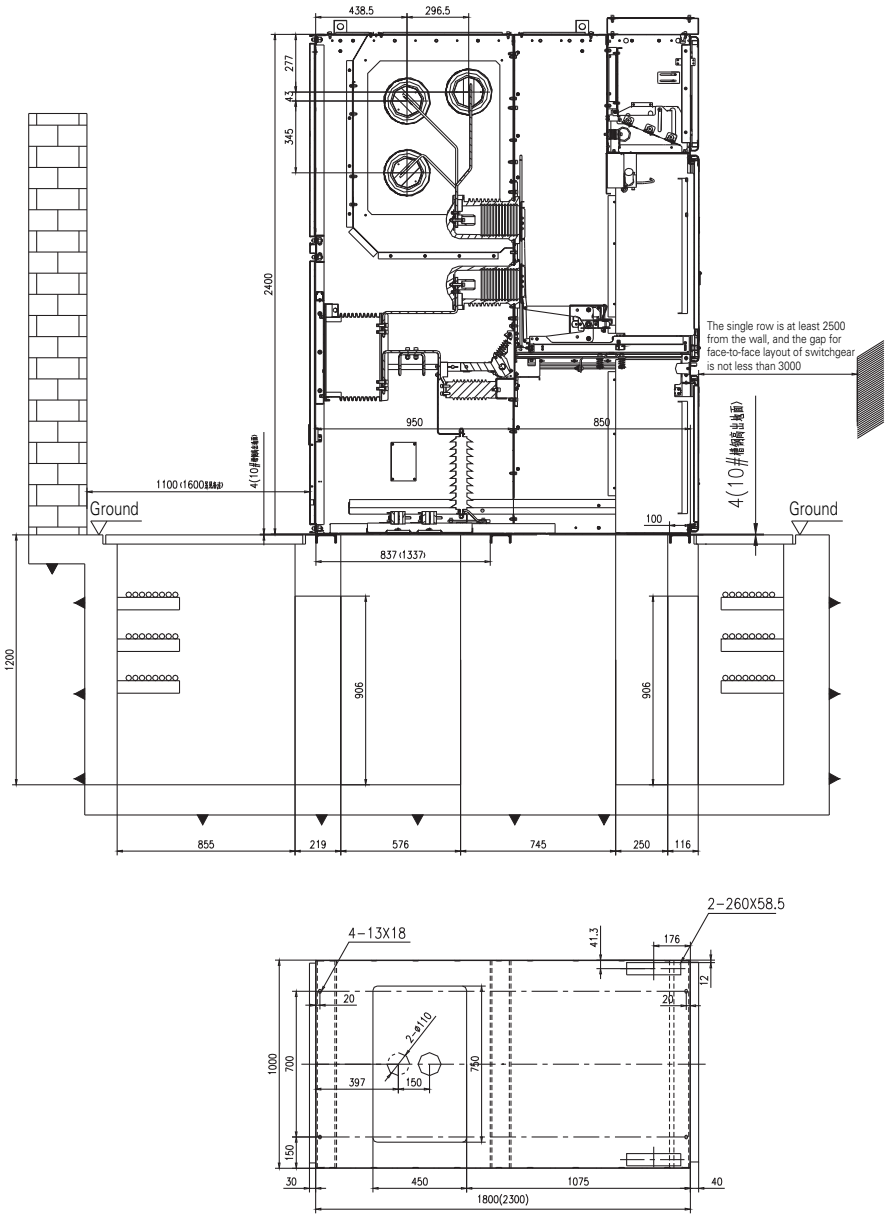

**Drawing of ASN2 switchgear dimensions and structure**

| Item | | Unit | Parameters |
|---|---|---|---|
| Height (H) | | mm | 2400 |
| Width (W) | Rated current of branch bus is 1250A and below | mm | 800 (1000 optional) |
| | Rated current of Branch bus is 1600A and above | mm | 1000 |
| Depth (D) ① | | mm | 1800 |
| Weight | | kg | 840~1440 |

① Depth of overhead inlet and outlet cabinet is 2300mm.

# ASN series AC metal-enclosed switchgear and controlgear

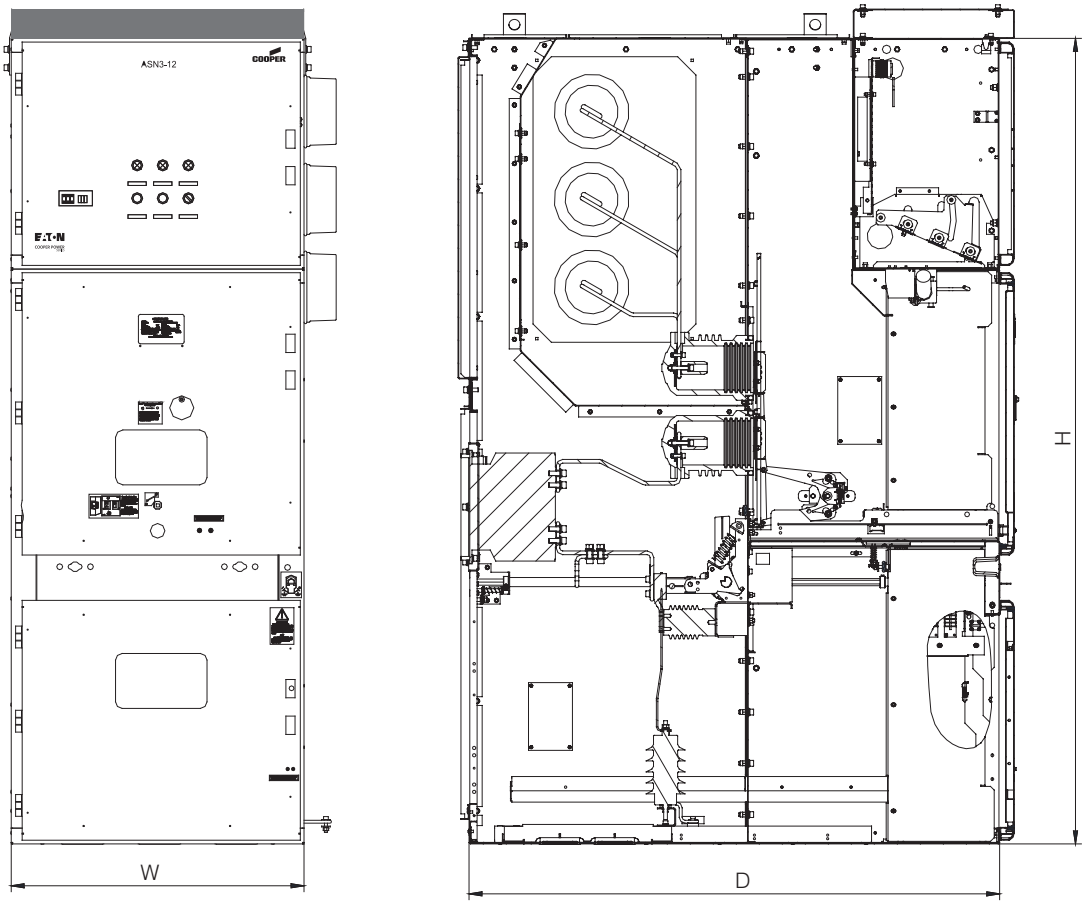
## External dimensions and mounting base drawing




**Drawing of installation foundation and sizes of holes of bottom plate for ASN2 switchgear**
(remarks: these sizes can vary according to other schemes)

# ASN series AC metal-enclosed switchgear and controlgear

## External dimensions and mounting base drawing



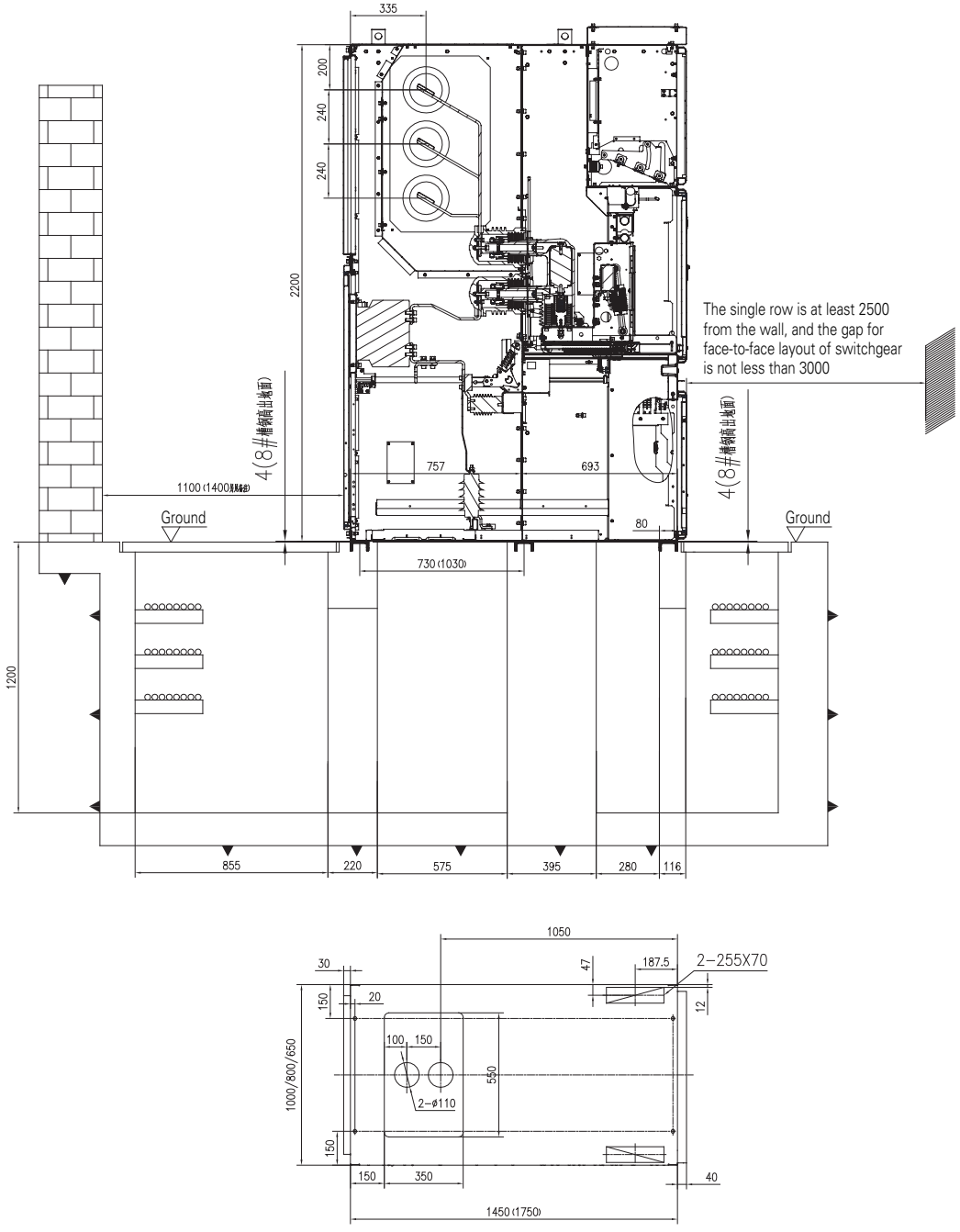

**Drawing of ASN3 switchgear dimensions and structure**

| Item | | Unit | Parameters |
|---|---|---|---|
| Height (H) | | mm | 2200 |
| Width (W) | Rated current of branch bus is 1250A and below and the thermal stability current is 31.5kA and below | mm | 800 (550, 650 optional) |
| | Rated current of branch bus is 1250A and below and the thermal stability current is 40kA and 50kA | mm | 800 |
| | Rated current of branch bus is 1600A or 2000A | mm | 1000 (800 optional) |
| | Rated current of branch busbar is 2500A and above | mm | 1000 |
| Depth (D) ① | | mm | 1450 |
| Weight | | kg | 700~1200 |

① Depth of overhead inlet and outlet cabinet is 1750mm.

# ASN series AC metal-enclosed switchgear and controlgear

## External dimensions and mounting base drawing




**Drawing of installation foundation and sizes of holes of bottom plate for ASN3 switchgear**

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