*Our goal is the sea of stars!*

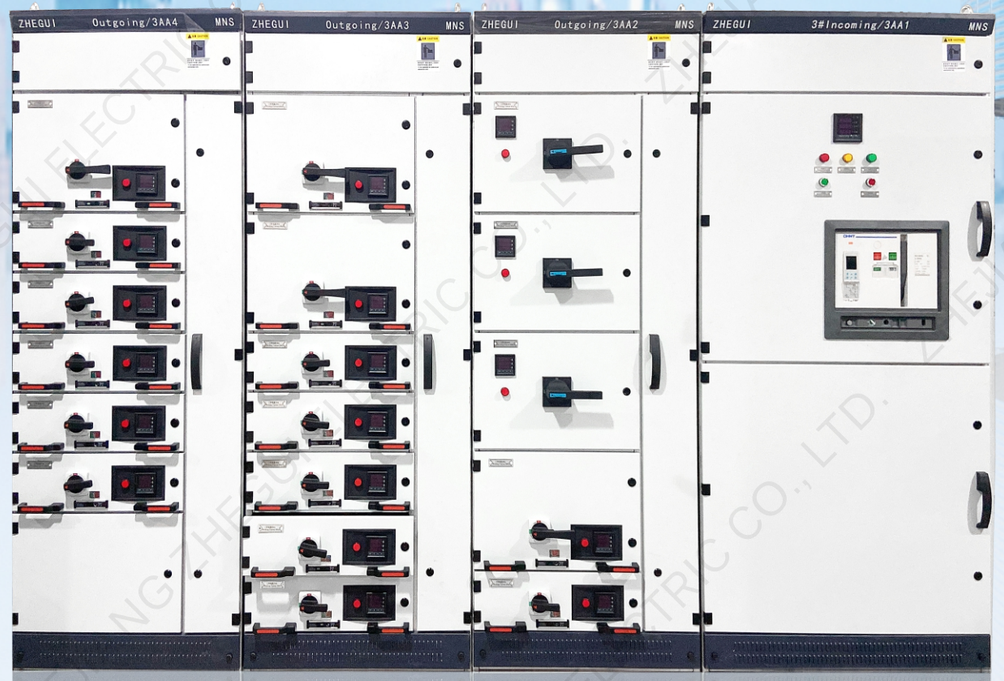

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Giantele®

# MNS

## Low-voltage withdrawable switchgear




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# MNS

## Low-voltage withdrawable switchgear

### Product introduction

This series of low-voltage drawout switchgear is suitable for power conversion, distribution and control of power in power plants, substations, petrochemical industry, metallurgical steel rolling, transportation energy, light power textile and other factories and mining enterprises, residential areas, high-rise buildings and other places, as AC 50-60Hz, rated working voltage AC 660V and below the current system.9 "Low-voltage switchgear and control equipment" GB7251 "Low-voltage switchgear" and other standards.



## Environmental condition

- The ambient air temperature is not higher than +40 ° C, not lower than -5 ° C, and the average temperature within 24 hours is not higher than +35 ° C;
- Atmospheric conditions: The air is clean, the relative humidity is not more than 50% at the maximum temperature of +40 ° C, and a higher relative humidity is allowed at a lower temperature, such as 90% at +20 ° C, but the temperature change should be taken into account, and condensation may occur occasionally; The altitude does not exceed 2000m;
- The device is suitable for transport and storage processes at the following temperatures; Within the range of -25 ° C to +55 ° C, +70 ° C can be reached in a short period of time (not more than 24h), and the device shall not suffer any irreparable damage at these limit temperatures, and shall be able to work normally under normal conditions; If the above conditions of use cannot be met, it shall be resolved by negotiation between the user and the manufacturer.
- When the device is used on offshore oil drilling platforms and nuclear power plants, a separate technical agreement shall be signed.

## Basic technical parameters

### Electrical performance

| | | |
|---|---|---|
| Rated insulation voltage | | AC690V |
| Rated operating voltage | | AC400V |
| Rated current of main bus | | ≤6300A |
| Rated withstand current of main bus (1s) | | 50kA,80kA |
| Rated peak withstand current of main bus | | 105kA,176kA |
| Maximum operating current of the distribution bus (vertical bus) | | 1000A |
| Distribution busbar | | |
| | Normal form | 105kA(Max.)/0.1s |
| | Enhanced | 176kA(Max.)/0.1s |

## Class of protection

- In line with IEC529, DIN40050 standards.
- IP30 for solid protection greater than Φ2.5MM.
- IP40 for solid protection with diameter greater than Φ1.0MM.
- The IP54 protects against dust and splashes in any direction.
- (IP54 protection should be ordered in consultation with the manufacturer)

## Cabinet structure

- The basic structure of the switchgear cabinet is composed of C profile assembly. Section C is made of steel plate with E=25mm module mounting hole. All cabinets and inner partitions are galvanized and purified.
- Around the door panels, the side panels are made of high voltage electrostatic spray.

## Switch cabinet type

- Power distribution center cabinet (PC): Emax, MT, 3WN, AH, ME series circuit breakers can be used.
- Motor control center cabinet (MCC): assembled by large and small drawers, the main switch of each circuit adopts high break plastic-case circuit breaker or rotary load switch with fuse.
- Automatic power factor compensation cabinet (with manual, automatic and remote power factor compensation devices)

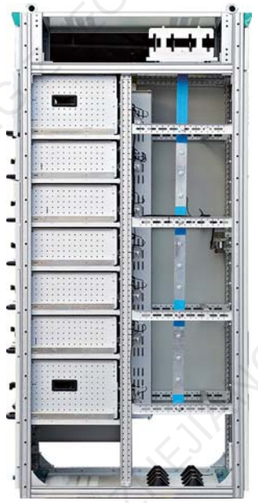
## A Power Distribution center (PC) cabinet

| H | W | D | | | Remark |
|---|---|---|---|---|---|
| H | B | T | T1 | T2 | |
| 2200 | 400 | 1000 | 800 | 200 | Main bus switch |
| 2200 | 400 | 1000 | 800 | 200 | F1s-1250-2000 ME630-1605 |
| 2200 | 600 | 1000 | 800 | 200 | F2s-2500 |
| 2200 | 800 | 1000 | 800 | 200 | F3s-3200 ME2000-3200 |
| 2200 | 1000 | 1000 | 800 | 200 | F4s-4000 Me3205 |
| 2200 | 1200 | 1000 | 800 | 200 | ME4005 |

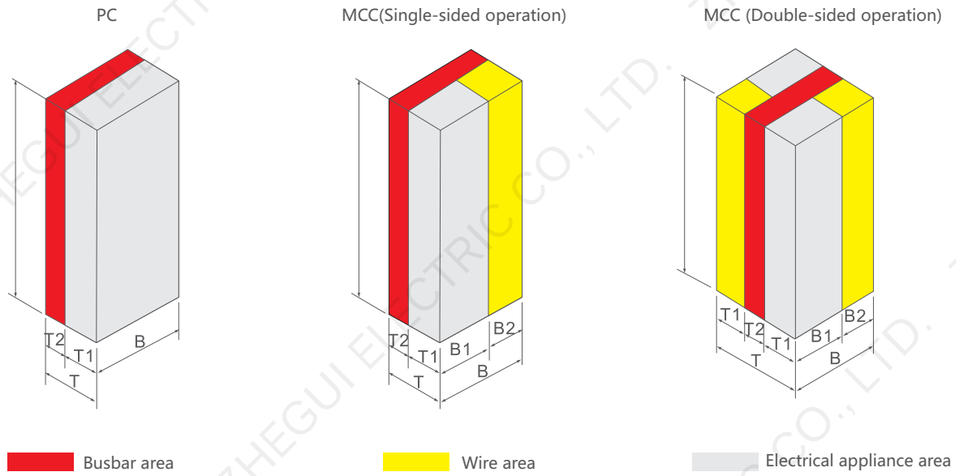
## B Motor Control Center (MCC) cabinet

| H | W | | | D | | | Remark |
|---|---|---|---|---|---|---|---|
| H | B | B1 | B2 | T | T1 | T2 | |
| 2200 | 1000 | 600 | 400 | 600 | 400 | 200 | One side operation |
| 2200 | 1000 | 600 | 400 | 1000 | 400 | 200 | Double single-sided operation |

## ○ Cabinet frame structure composed of C-shaped profiles (Figure 1)



## ○ Cabinet diagram (Figure 2)




## ○ Power Distribution Center (PC)

- The PC cabinet is divided into three compartments;
  Horizontal bus compartment: at the rear of the cabinet;
  Functional unit compartment: on the upper or left side of the front of the cabinet;
- Partition measures: the horizontal bus compartment and the functional unit compartment are separated by steel plates;
  The control loop compartment and the functional unit compartment are separated by a flame retardant polyphenyl ether plastic cover.
- The frame circuit breaker installed in the cabinet can be manually operated outside the cabinet under the closed state. Observe the opening and closing state of the circuit breaker and determine whether the circuit breaker is in the test position or in the working position according to the position relationship between the operating mechanism and the door.
- A component separation structure is designed between the main circuit and the auxiliary circuit. The auxiliary electrical unit composed of instruments, signal lights and buttons is installed on the plastic board, and the cover made of flame-retardant polyurethane foam plastic is separated from the main circuit after the board.

## ○ Draw-out motor control Center and low-current Power Distribution Center (MCC)

- The pull-out MCC cabinet is divided into three compartments, namely, the horizontal bus compartment behind the cabinet, the functional unit compartment on the left side of the front of the cabinet, and the cable compartment on the right side of the front of the cabinet. A functional board made of flame-retardant foam plastic is used to separate the horizontal bus compartment from the functional unit compartment, and a steel plate is used to separate the cable compartment from the horizontal bus compartment and the functional unit compartment.
- The drawers of MCC(Motor Control Center) are divided into the following 5 types:
  8E/4: Height 200 x width 150 x depth 400mm
  8E/2: Height 200 x width 300 x depth 400mm
  8E: Height 200 x width 600 x depth 400mm
  16E: Height 400 x width 600 x depth 400mm
  24E: height 600 x width 600 x depth 400mm.

## ○ Rear outlet switchgear structure

- The rear outlet cable designed to reduce the arrangement width of the switch cabinet, the main bus cable of the switch cabinet is horizontally installed on the top of the switch cabinet, the rear half of the cabinet is a cable room, and the incoming and outgoing cables are connected in the cable room at the back of the cabinet. The front side of the switchgear cabinet is the device chamber, where the functional unit of the switchgear is installed. In this system design, the cable room on the side of the switch cabinet is moved to the rear close cabinet, which greatly reduces the arrangement width of the switch cabinet, so as to further meet the requirements of the space layout of the substation.
- The width of the feed cabinet is 600mm and the depth is 1000/1200mm. At the top is an independent main busbar chamber isolated from the device chamber. The effective installation height of the front device chamber is 72E(E-25mm), which is isolated from the rear cable room by a multi-functional board, making full use of the installation space of the switch cabinet. Compact structure, flexible unit configuration. Back cable room with door, easy to install and maintain.
- The width of the inlet cabinet is determined by the frame current of the inlet unit. The recommended width is 400/600/800/1000mm and the cabinet depth is 1000mm.

## Bus system

- The switchgear can be configured with two sets of main bus cables, which are installed in the rear busbar room of the switchgear. Two groups of bus bars can be installed respectively in the upper and lower parts of the rear cabinet. According to the needs of the incoming line, the upper and lower two groups of busbars can be used respectively with different or the same section of materials. Both can be supplied separately, in parallel, or can be used as a backup power supply.
- Distribution bus (vertical bus) can choose "L "type copper bar, can also choose rectangular copper bar; When the vertical copper bar is "L" type copper bar, the supporting insulating part is the function board, which has good safety performance, small size and maximum current of 1000A; When rectangular copper bars are selected for vertical copper bars, the corresponding insulating part is the bus clamp, which has good safety performance, large volume and maximum current up to 2000A. All the structural parts of the cabinet are connected with self-tapping screws, which has high grounding reliability.
- The neutral bus and the neutral protection bus are installed parallel to the lower part of the functional unit compartment and vertically in the cable room. If the N wire and PE wire are separated by an insulator, the N wire and PE wire are used separately. If the conductor is shorted between the two, the PE/N wire is formed.

## Protective grounding system

- The protection circuit of the device consists of a PE wire (or PE/N wire) which is individually decorated and runs through the entire queue length and a conductive structural part.
- The metal structural parts in the device, in addition to the exterior door and sealing plate, the rest are galvanized, and the connection of the structure is carefully designed to enable it to pass a certain short circuit current.

## Auxiliary current and cable troughs

- The top of the compartment of the functional unit is provided with an auxiliary circuit cable slot, in which the connecting cable between cabinets and the public power cable can be pressed. plate, the rest are galvanized, and the connection of the structure is carefully designed to enable it to pass a certain short circuit current.

## Cable and control wire connection

- On one side of the pull-out assembly, the cable compartment is equipped with wiring devices and terminals for connecting the outgoing cable and the wiring between the control line and the assembly. The inlet and outlet cables and control wire wiring devices are arranged on the track on the right side of the cable compartment.
- The main loop terminal is located at the rear, and the control line terminal is located 45° in front. The wiring of the control wire terminal can be connected by screw or insert wire nose or by copper wire connection, and the main loop terminal less than 65A on the adapter of the draw-out component is equipped with PE terminal.



## Safety protection system

- There is no one or a group of flame-retardant plastic function boards in each cabinet, which is installed between the main bus room and the electrical room. Its function is to effectively prevent the accident caused by the fly-arc and short circuit between the bus bar caused by the fault of the switching element, and strict isolation measures are taken.
- The upper and lower drawers are separated by galvanized metal bottom plates with ventilation holes, and the smaller 8E/4, 8E/2 drawers are surrounded by flame-retardant engineering plastic parts, so there is a strong insulation between the adjacent circuits. A variety of plastic components are used in the cabinet to support the live parts, and these components are halogen-free. And has CT1300 grade above anti-leakage performance.

## Drawer type

- There are five standard sizes, all based on an 8E(200mm) height:
  8E/4: Four drawer units are assembled in an 8E height space.
  8E/2: Assemble 2 drawer units in 8E height space.
  8E: Assemble 1 drawer unit in 8E height space.
  16E: Assemble 1 drawer unit in a 16E(400mm) height space.
  24E: Assemble 1 drawer unit in 24E(600mm) height space.
- The five drawer units are available as a single assembly in a cabinet or as a hybrid assembly.
  The maximum number of drawer units that can be accommodated in a cabinet for a single assembly is shown in Table 3.

| Drawer type | 8E/4 | 8E/2 | 8E | 16E | 24E |
|---|---|---|---|---|---|
| Maximum number of units to accommodate | 36 | 18 | 9 | 4 | 3 |