

# Smart MNS

低压抽出式开关柜

LV Withdrawable  
Switchgear



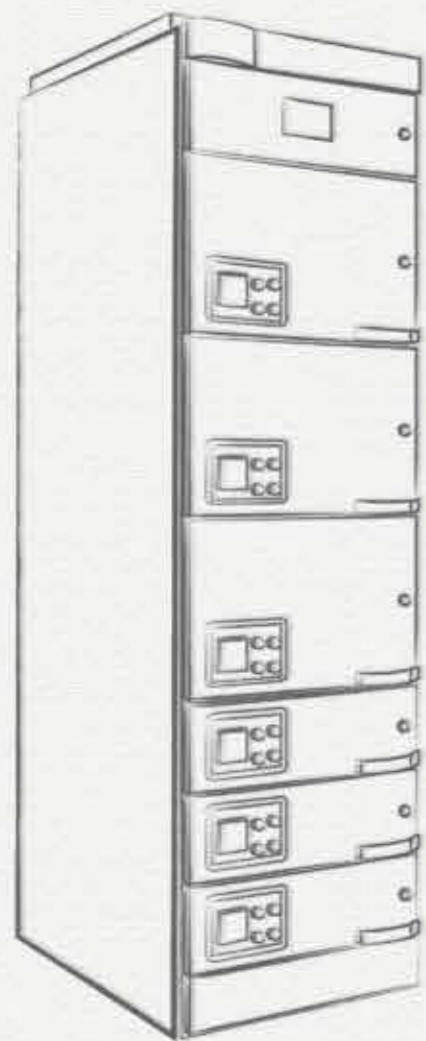
**MECON**  
明及电气



**尊重自己 请勿仿冒!**  
**Counterfeiting Not Allowed!**

一味模仿和抄袭，只能将国内开关行业陷入同质化的低水平竞争，只能使“中国制造”彻底丧失创新的动力和能力。

中国开关制造行业未来能到达的高度，并不会受制于我们今天所在的位置，而一定取决于我们前行的姿态。自律才会自重，自尊方能自强！明及电气愿与致力于中国创造的竞争伙伴企业一道共同前进！



**明及与祖国一起成长**  
*Mecan grow together with the motherland*

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# 技术无止境，我们正在继续努力！

与我们已经生产的十多万台断路器产品相比，  
更让我们自豪的是这十五年来一点一滴的不断创新……



VCM  
2008



动密封技术：创新的动密封结构设计保障用于充气柜断路器可靠运行。



VBM  
SmartEx  
2010



VBM PRO  
2010



Smart在线监测技术：创新的在线监测技术，实现断路器智能化。



VBM PRO 12  
2012



VBM PRO 19  
2015



Smart Unit  
2016



VBM 16  
2007



VBM 15  
2007



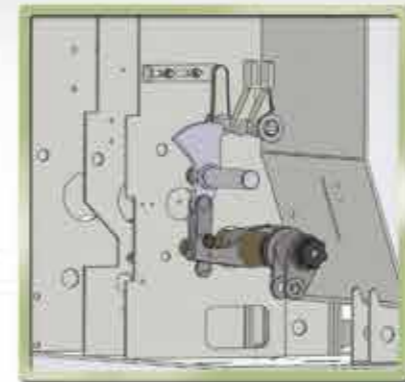
全封闭脱扣电磁铁：创新的结构形式，保证电磁铁线圈不受潮。



VBM 10  
2007



K6  
2007



创新的合闸保持单元：合闸保持动作原理可靠，从根本上杜绝了合闸动作故障。



VBM 9  
2005



VBM 8  
2004

VS1：明及核心团队研发的第一款真空断路器产品，全国数百家制造商累计生产逾百万台。



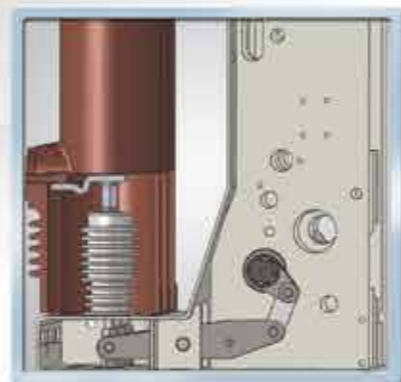
VS1  
1995



VBI  
1998



VBM 4  
2001



超程可调：创新的主导电回路与操动机构连接方式，方便超程调整和维护，便于提高三相合分闸的同期性。



VBM 5  
2002



VBM 7  
2003



主回路侧装布置：断路器ABC三相采用前中后的布置形式，断路器整机宽度尺寸大幅缩小。



DM6  
2004

# Overview

## 产品概述



### 概述

Smart MNS低压抽出式开关柜，适用于交流50~60Hz、额定工作电压至690V的配电系统；用于发电、输电、配电、电能转化和电能消耗设备的控制。

本开关柜符合IEC60439-1、VDE0660第500部分、GB7251.1-2005《低压成套开关设备和控制设备》国家标准、并通过3C强制性产品认证。

### 使用条件

- 环境温度：上限+40℃，下限-5℃，24h内平均温度不高于+35℃。
- 海拔高度：不超过2000m。
- 相对湿度：空气清洁，相对湿度在最高温度为+40℃时不超过50%；在较低温度时允许有较高的相对湿度，例如+20℃时为90%，但应考虑到由于温度变化，有可能偶然产生凝露。
- 运输储存：-25℃至+55℃之间，在短时间内（不超过24h）可达+70℃，在这些极限温度下装置不应遭到任何不可恢复的损伤，而且在正常的条件下应能正常的工作。

注：超出上述条件，请与本公司协商。

### Summary

Smart MNS low voltage withdrawable switchgear is applied for power control and transmission system of AC 50~60Hz, rated working voltage up to 690V. It possesses the functions of control of the equipment of power generating, transmission, distribution, transforming and consumption. This type of switchgear meets with the requirements of IEC60439-1, part 500 of VDE0660 and state standard of GB7251.1-1997. The product has passed the "3C" compulsory certification.

### Technical Features

- Ambient Temperature: Max: +45℃, Min: -5℃, +35℃ average over 24 hours.
- Altitude: ≤2000m.
- Relative Humidity: Not exceed 50% in clear air with the max. temperature of +40℃; Higher relative humidity is permitted in lower temperature. For example, the relative humidity is 90% for the temperature of +20℃. But the variety of temperature should be taken into consideration because it's possible to condensate.
- Transportation and Storage: The temperature is between -25℃ to +55℃. In short time (not exceed 24h) the temperature can be +70℃. In the limited temperature, the equipment should not suffer nonrecoverable damage and in the normal condition, the equipment should work normally.

Not: If the condition exceeds the above, please consult with our company.

### 产品特点

- 结构紧凑，以较小的空间容纳较多的功能单元。
- 柜体能背靠背排列。
- 全部选用标准模块，方便工程设计人员设计。
- 柜体可按照工作和环境不同要求设计出相应的防护等级。
- 在一个柜体中可自由组合不同型式，如固定式和抽屉式。
- 具有防电弧设计。
- 设备更新改进方便。
- 柜体最大程度地做到免维修。
- 有电缆侧出线或后出线两种方案。
- 独特机械锁定机构，操作灵活方便，无需特殊复杂工具。
- 设备运行连续性和可靠性高。
- 大量采用高强度阻燃型工程塑料组件，操作人员人身安全有保障。

### Characteristic

- The structure is compact which can hold more functional units with smaller space.
- The cubicles can be arranged rear to rear.
- Standardized modulars are used which is convenient for designing.
- The cubicle can be of different protection degrees according of different working and environmental requirements.
- In one cubicle, it can be composed to different types, such as fixed and withdrawable types.
- It is designed for arc-protection.
- The switchgear is convenient for renewal and improvement.
- The cubicle is almost maintenance-free.
- It has side outgoing and rear outgoing schemes.
- It has unique mechanical locking mechanism, which is convenient for operation without special tools.
- The equipment is of high running continuousness and reliability.
- A lot of high intensity fire-resistant plastic assemblies are used, which can ensure the safety of operators.



# Technical Data

## 技术参数



项目 Item	参数 Parameters data	
额定工作频率 (Hz) Rated working frequency	50、60	
额定工作电压 (V) Rated working voltage	400、690	
额定绝缘电压 (V) Rated insulation voltage	690	
额定冲击耐受电压 (kV) Rated impulse withstand voltage	8	
过电压等级 Over-voltage degree	III	
污染等级 Pollution degree	3	
最大工作电流 (A) Max. working current	水平母线 Horizontal busbar	4000
	垂直母线 Vertical busbar	1000
额定短时耐受电流有效值(1s) / 峰值 (kA) Rated short-time withstand current rms (1s) / Peak	水平母线 Horizontal busbar	55-100 / 105-250
	垂直母线 Vertical busbar	60 / 130-150
外壳防护等级 Protection Degree	IP30、IP40、IP54	
外形尺寸 (高 × 宽 × 深) Outline dimensions (H *W *D)	2200 × 600 (800, 1000) × 600 (800, 1000)	

注: 1. 垂直母线电流最大到2000A;  
2. 订购IP54防护等级时应与本公司协商

Not: 1. The current of vertical busbar is extremely up to 2000A.  
2. If ordering the products with the Protection Degree of IP54, you should consult with our company.

### 绿色 环保 Green



Smart MNS 所使用材料全部为可回收无污染环保材料。  
All materials of Smart MNS are recyclable and pollution-free environment-friendly materials.

### 简洁 紧凑 Simple and Compact



同类开关柜产品中体积最小的产品之一，因此在新建变电站和改造项目中能带来突出的经济效益。  
It is one of the products with the smallest volume among similar types of products. Therefore, it can bring outstanding economic benefit for newly built substations and transformation projects.

### 安全 可靠 Safe and Reliable



全封闭金属外壳，相对地和相间采用可回收塑料和硅橡胶实现全绝缘，防护等级IP67；方便查看隔离断口，确保运行人员操作安全；无压力元件，无需泄漏检测等运行安保措施。  
Recyclable plastic and silicon rubber are used for fully-enclosed metal case and phase to ground and phase to phase to achieve full insulation, with the level of protection of IP67; facilitate checking isolating fracture, and ensure operating safety of operating personnel; no pressure element, without the need of operating security measures such as leakage detection.

### 智能 Intelligent



具备配网各种自动化运行保护装置、以及确保设备安全运行的在线监测装置，确保Smart Unit 可以在全自动化电力网络中安全运行。  
It has distribution network, various types of automated operation protection devices and online monitoring devices ensuring safe operation of equipment, to ensure that Smart Unit can operate safely in fully automated power network.

### 特殊 应用 Special Applications



可以安全运行于高海拔、盐雾潮湿、低温寒冷、安全防爆或者高环保要求的各种特殊使用场所。  
Safe operation in high altitude, salt spray wet, low temperature cold, safety explosion-proof or advanced high environmental requirements of various special place.

# Introduction Structure

## 开关柜结构

### 柜体结构

Smart MNS柜基本框架为C型型材组合装配结构。C型型材是以E=25mm为模数安装孔的钢板弯制而成。按一次回路方案变化需要，加上必要的门、封板、安装支架以及母线、功能单元等零部件，组装成一台完整的开关柜。柜体基本尺寸见表2所示。

MCC柜根据需要可组装成单面操作柜和双面操作柜，每一柜体又可分隔成三个小室：主母线室、电器室和电缆室，具体见图1所示。

#### Structure of Cubicle

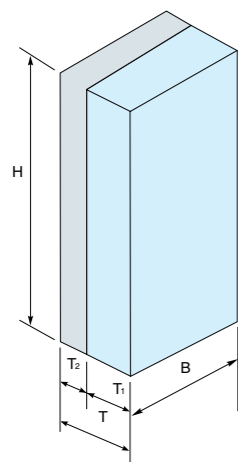
The main frame of Smart MNS cubicle is assembly structure by C-shaped steel. C-shaped steel is bended by steel plate with the mounting holes of the modules of E=25mm. According to the need of variety of Primary Schemes, when it is equipped with necessary door, enclosed plate, installation support and the components of busbar, functional units, it can be assembled a complete switchgear. The main dimension see Table 2. MCC cubicle can be assembled to be separation cubicles at single face and double faces. Each cubicle can be divided into three small compartments: main busbar compartment, electric compartment and cable compartment. Detailed, see Picture 1.

表2 Table 2

高 H	宽 W			深 D		
H	B	B1	B2	T	T1	T2
2200	600			1000	400	600
2200	800	600	200	1000	400	600
2200	1000	600	400	600	400	200
2200	1000	600	400	800	400	400
2200	1000	600	400	1000	400	600
2200	1000	600	400	1000	400	200

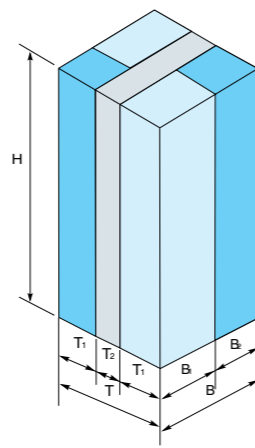
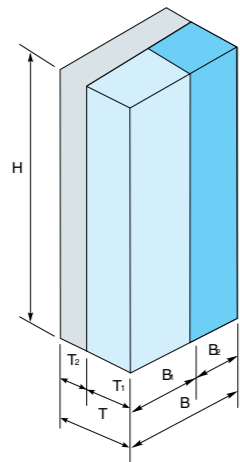
#### 单面操作柜

Operational Cubicles at Single Face



#### 双面操作柜

Operational Cubicles at Double Faces



母线区 Busbars

电缆区 Cable

电器区 Electric District

图1 Picture 1

### 安全保护系统

主母线室与电器室之间有一块阻燃型的高密度聚氨酯塑料功能板，其作用为有效防止开关元件因故障引起的燃弧与母线之间的短路造成事故。

上下抽屉之间都有带通风孔的镀锌金属板相隔离，较小的8E/4、8E/2抽屉其四周均为阻燃型工程塑料件，故相邻回路之间有较强的绝缘隔离作用。

柜内采用了多种工程塑料组件以支撑带电部位，这些组件是不含卤素的，并且有CTI300等级以上的防漏电性能。

#### Protection System

There is a fire-resistant high intensity plastic plate between main busbar compartment and electric compartment to prevent arc caused by fault and shortcircuit between busbar.

The upper and lower drawers are separated by galvanized metal plate with ventilation holes. The smaller 8E/4 and 8E/2 drawers are isolated by fire-resistant plastic components. So the adjacent return circuits are of good insulation and isolation. In the cubicle many kinds of engineering plastic components are used to support parts. These components don't contain halogen and they are of the function of leakage protection above the degree of CTI300.



阻燃型塑料功能板中的垂直母线  
Vertical busbar in fire-resistant functional plate

### 柜内部小室分隔

PC柜内分隔成四个隔室：

水平主母线室、功能单元室、电缆隔室、控制回路隔室。

抽出式电动机控制中心和小电流的动力配套中心(MCC)分隔成三个小室：

水平主母线隔室、功能单元隔室、电缆隔室。

#### Partition of Compartment

The PC cubicle is divided into four compartments: horizontal main busbar compartment, functional units compartment, cable compartment and circuit control compartment.

Withdrawable motor control center and small current power distribution center (MCC) are divided into three compartments: horizontal main busbar compartment, functional units compartment and cable compartment.

### 主母线

开关柜可配置两组主母线，安装在开关柜的后部母线室，两组母线可分别安装在柜后上部或下部。根据进线需要，上下两组母线可分别采用不同或相同截面的材料。两者既可单独供电，也可并联供电，还可用作后备电源。

#### Main Busbar

The switchgear can be equipped with two groups of main busbar to be mounted on the rear of busbar compartment. The two groups of busbar can be mounted on the upper and down parts of the rear of cubicle respectively. The upper and down groups of busbar can be of same or different cross section area according to the need of incoming. The two groups can supply power alone, also can supply paralleling, and can be used for stand by power.



8E、16E、24E装置小室  
Chamber for 8E 16E 24E

# Introduction Structure

## 开关柜结构



Smart MNS抽出式开关柜（侧出线）

Smart MNS withdrawable switchgear (side outgoing)



8E/4、8E/2装置小室，电缆和控制线连接（侧出线）

Chamber for 8E/4 8E/2 connection of cable and control wire

## 配电母线

配电母线（垂直母线）组装在阻燃型塑料功能板中，既可防止电弧引起的放电，又能防止人体接触，通过特殊连接件与主母线连接。垂直母线（直角L型段50×30×5mm）同主母线一起，不加隔板就能达到IP20抗冲击的防护等级。

### Power Distribution Busbar

Distribution busbar (vertical busbar) is assembled in the fire-resistant functional plates, which can prevent the discharging caused by arc, but also can prevent human from touching. They are connected to the main busbar through special connector. Vertical busbar (right angle L type 50\*30\*5mm) and main busbar can reach the anti-impulse protection degree of IP20 without the partition plate.

## 保护线 and 中性线及连接排

Smart MNS系统可布置4线或5线制的母线系统。保护/中性线排水平安装在装置、电缆小室的下方，并用绝缘子作固定。排的长度按运输单元划分。

保护/中性线连接排垂直安装在电缆小室内，用绝缘子固定。

PE、N和PEN排及连接排上均开有模数孔，用于电缆的连接。

### Protection Wire, Neutral Wire and Connection Bar

Smart MNS system can be laid 4 wires or 5 wires of busbar system. Protection/neutral wires are laid horizontally under the device and cable compartment, fixed by insulators. Protection/neutral wires connection bar are mounted in the cable compartment vertically and fixed by insulators. On the bar of PE, N and PEN, there are module holes for connection of cable.

## 辅助电路电缆槽

在功能单元隔室的顶部装有辅助回路电缆槽，槽内可安放柜间连接线和公用电源线。

### Cable Channel for Auxiliary Circuit

On the top of functional compartment, cable channel for auxiliary circuit is mounted for lying of connection wires between cubicles and shared power line.

# Side Outgoing Scheme (Standard)

## 侧出线方案 (标准方案)

## 柜体结构

抽出式开关柜可分为单元小室、母线小室、电缆小室，其尺寸（宽×深×高）1000×600/800/1000×2200mm。

抽出式组件由组件本身和组件安装小室两部分组成，动力单元和控制单元的组件为抽出式安装，标准规格为8E/4、8E/2、8E、16E、24E。4个8E/4或2个8E/2组件可以水平安装在600mm宽的装置小室内，组件高度为8E（200mm）。8E、16E、24E单个组件就需要600mm宽的装置小室，组件的高度就是组件规格所指的尺寸。

功能单元隔室总高度为72E。

抽出式组件作抽出操作时，开关柜的主电源不必切断，在相邻组件不断电的情况下做组件插入/抽出，不会发生触电的危险。

### Frame

Withdrawable switchgear can be divided into unit compartment, busbar compartment and cable compartment. The dimensions are 1000(W)\*600/800/1000(D)\*2200mm(H). Withdrawable assemblies are composed of itself and its compartments. The power unit and control unit are mounted withdrawably and the standard specifications are 8E/4, 8E/2, 8E, 16E and 24E. Four assemblies of 8E/4 or two of 8E/2 can be mounted horizontally in the device compartment with the width of 600mm. Single assembly of 8E, 16E and 24E need a compartment with the width of 600mm. The height of assembly is just the corresponding dimension of its specification. The total height of functional compartment is 72E. When operating withdrawable unit, the main power of switchgear needn't to be cut off. In case the adjacent assemblies are not cut off, when the assembly plug-in or withdrawn, electrical shock will not happen.

## 电缆和控制线连接

在抽屉单元的一侧，电缆小室中装有接线装置和端子，用于连接出线电缆、控制线和抽屉之间的接线。

进出线电缆和控制线接线装置布置在电缆小室的右侧的导轨上。主回路端子位于后部，控制线端子位于前方45°方向。

控制线端子的接线可用螺丝或插入式线鼻子连接。

抽屉的转接件上主回路端子小于63A的，配有PE端子。

### Connection of Cable and Control Line

In one side of the drawer unit, there are connection device and terminals in cable compartment used for connection between outgoing cable, control cable and drawers. The connection device of incoming and outgoing cable and control cable is arranged on the right rail of cable compartment. The terminal of main circuit is on the rear part, and that of control cable is on the front with the direction of 45°. Screw or plug-in terminal can be used for wiring of control cable connection. For the changer of drawer, when the current of terminal of main circuit is less than 63A, it is equipped with PE terminal.

# Side Outgoing Scheme (Standard)

## 侧出线方案 (标准方案)



8E/4抽出式组件  
8E/4 withdrawable assemblies



8E/2抽出式组件  
8E/4 withdrawable assemblies

### 标准抽屉方案

- 配电用隔离开关或塑壳断路器
- 马达起动开关带塑壳断路器

抽屉规格有：8E/4、8E/2、8E、16E和24E

#### Connection of Cable and Control Line

- Power distributing isolation switch or MCCB
  - Motor starter with MCCB
- Unit of drawer: 8E/4, 8E/2, 8E, 16E and 24E.

### 8E/4和8E/2抽屉

8E/4和8E/2抽屉结构包括有仪表板，绝缘材料制成的侧板，带电缆接线端子的后盖和16芯控制线端子，安装导轨1根或2根，按不同要求可配2个16芯的端子。8E/4至32A，8E/2至63A。

仪表板上设有敲落孔，用于安装计量、操作、显示器件。主开关（一般为马达开关带断路器）的操作由装在仪表板上的手柄来实现。该手柄具有电气及机械联锁功能。电气联锁采用一个2开2闭的微动开关。

#### 8E/4 and 8E/2 Drawers

The structure of 8E/4 and 8E/2 drawers include instrument board, side board made by insulating material, rear cover with cable terminal, terminals of 16 core wires of control cable, one or two mounting rails. According to different requirements, it can be mounted 2 terminals with 16 core wires. The current of 8E/4 is up to 32A, and 8E/2 to 63A.

On the instrument board, knock-off holes are laid used for mounting the instruments of measuring, operating and displaying. The operating of main switch (generally it' motor with CB) is through the handle on the instrument board. The handle is of functions of electrical and mechanical interlock. One microswitch with 2 NC and 2 NO contactors is used for electrical interlock.

### 8E、16E和24E抽屉

8E至24E抽屉结构包括有一个仪表板和绝缘材料制成的后盖、前盖板、金属侧板及走线槽。二次回路控制电缆连接用16芯或32芯的端子。

抽屉有两种规格：抽屉不抽出就具有试验位置或抽屉抽出后具有试验位置。

铰链式抽屉门为更换元件提供方便（如：熔断器调换），不必抽出抽屉就可实现。

“抽屉不抽出就具有试验位置”的抽屉单元在工作位置或试验位置必须用工具才能打开前门。抽屉在隔离位置时用手即可打开前门。

“抽屉抽出后具有试验位置”抽屉单元，在试验和隔离位置上用手即可打开前门。

前门上的开孔用于仪表板的布置。仪表板的位置在前门开启、关闭时留在原位不动。仪表板设有敲落孔用于安装计量操作和指示器件，操作手柄具有电气（2开2闭微动开关）和机械联锁功能。

主开关操作单独设有手柄。并与抽屉的位置操作手柄具有机械联锁。

在工作位置上开关手柄可被锁住。试验和隔离位置也可用最多3把挂锁锁住。



8E抽出式组件  
8E withdrawable assemblies



16E抽出式组件  
16E withdrawable assemblies

#### 8E、16E and 24E Drawers

The structures of 8E to 24E drawers include an instrument board, rear board and front covers made by insulating materials, metal side plate and wire channel. Terminals with 16 or 32 core wires are used for connecting of control cable.

There are two types of drawers: one is of "Test Position" without withdrawing, and another is of "Test Position" after withdrawing. Hinge door is convenient for replacing assemblies (for example, fuse) because it can be replaced without withdrawing.

When such drawer unit as being of "Test Position" without withdrawing is on working position or test position, the front door can be opened only with the help of special tool. When the drawer is in "Isolating Position", the front door can be opened by hand directly.

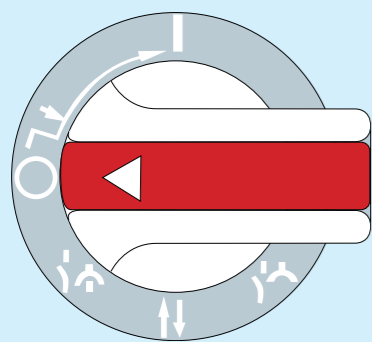
When the drawer unit being of "Test Position" after withdrawing is in "Test" or "Isolating" position, the front door can be opened by hand directly.

The holes on the front door are used for mounting of instrument board. The position of instrument board will not change when the front door is opened or closed. On the instrument board, knock-off holes are arranged for measuring and displaying instruments. The operating handle is of functions of electrical (Microswitch with 2 NO and 2 NC) and mechanical interlock.

There is special handle for operating the main switch and it is interlocked with the operating handle of drawer. In working position, the handle can be locked. In "Test" or "Isolating" position, it can be equipped with 3 padlocks for safety.

### 8E/4、8E/2抽屉开关手柄位置说明

Different Positions of the Operation Handle for 8E/4、8E/2 Drawer



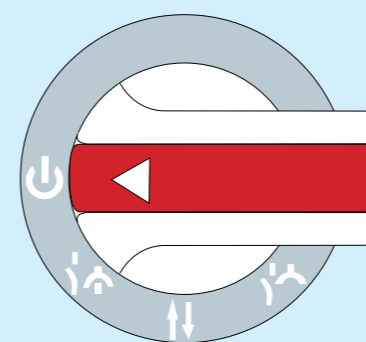
开关手柄  
Handle of switch

- I 工作位置 - 主开关合闸、控制回路接通，组件锁定。
  - O 分闸位置 - 主开关分闸、控制回路断开、组件锁定。
  - ⚡ 试验位置 - 主回路断开，控制回路接通，组件锁定。
  - ⇄ 抽出位置 - 主回路和控制回路均断开。
  - 🔒 隔离位置 - 抽出30mm距离，主回路及控制回路均断开，完成隔离。
- 操作手柄向里按动以后，方能从 O 位置转向 I 位置，操作手柄上可给主开关分闸、试验、隔离三位置加挂锁，作为安全保护，最多可加3把锁。

- I Working position-main switch ON, control circuit is connected, drawer is locked.
  - O OFF position-main switch OFF, control circuit is connected, drawer is locked.
  - ⚡ Test position-main circuit is disconnected, control circuit is connected, drawer is locked.
  - ⇄ Withdrawing position. Main circuit and control circuit are disconnected.
  - 🔒 Isolating position-drawer is pulled out by 30mm and locked in the position, main circuit and control circuits are disconnected.
- Only when the operating handle is pressed in, can it be changed from O position I position. In the position of "Main Switch OFF", "Test" and "Isolating", it can be equipped with 3 padlocks for safety.

### 8E、16E、24E抽屉开关手柄位置说明

Different Positions of the Operation Handle for 8E、16E、24E Drawer



抽屉的位置操作手柄  
The operating handle of drawer

- 🔒 工作位置 - 抽屉锁住。主开关（隔离开关或塑壳开关）可操作（通过单独手柄）。主开关分闸后，手柄方能转向试验位置。
  - ⚡ 试验位置 - 主开关分闸。控制回路接通，抽屉锁住。
  - ⇄ 抽出位置 - 主回路及二次回路均断开。
  - 🔒 隔离位置 - 抽屉抽出30mm。主回路及二次回路均断开。组件机械联锁锁住。
- 🔒 Working Position-drawer is locked. Main switch (isolating switch or MCCB) can be operated through special handle. Only when the main switch OFF, the handle can be operated to test position.
  - ⚡ Test Position-main switch OFF. Control circuit is connected and drawer is locked.
  - ⇄ Withdrawing Position-main circuit and control circuits are disconnected.
  - 🔒 Isolating Position-drawer is pulled out 30mm. Main and control circuits are disconnected. Assemblies are mechanically interlocked.



# Rear Outgoing Schemes

## 后出线方案

### 柜架结构

抽出式柜后出线方案是专为减少开关柜排列宽度而设计的。主母线垂直安装在柜子的顶部，柜的后半部为电缆室，进出线电缆均从柜后电缆室连接，柜子的正面为装置小室，安装开关设备的功能单元。即将开关柜右侧面的电缆室移至柜后部。

馈电柜柜宽600mm（尽量为800mm，200mm的空间用来接二次电缆）、深1000mm，顶部为独立的主母线室。正面装置有效安装高度为72E（E=25mm），经多功能板与后部电缆室隔离，充分利用了开关柜的安装空间，结构紧凑，单元配置灵活。背面电缆室带门，安装及维修方便。

### Frame

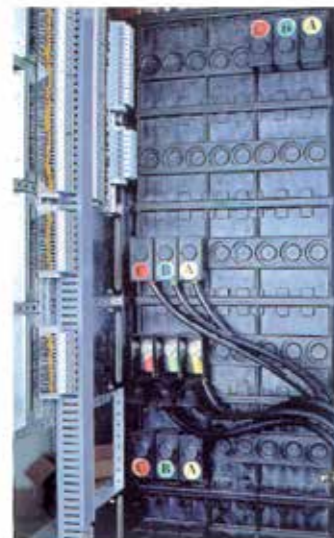
The rear-outgoing scheme is designed specially for reducing the arranging width of switchgear. Main busbar is mounted vertically on the top of cubicle. The half of the rear part of the cubicle is cable compartment for connecting of cable incoming and outgoing. The front of the cubicle is device compartment to mount the functional units. That is to say, the compartment on the right side is moved to the rear of cubicle.

The dimensions of feeding cubicle are W600 (800mm is better because the other 200mm can be used to connecting secondary cable), D1000mm. The top is arranged for independent main busbar compartment. On the front-face, the effectual main busbar compartment. On the front-face, the effectual mounting height is 72E(E=25mm). After separating by multifunctional plate, the mounting space is saving enough to make the structure compact, and units equipping flexibly. On the rear the cable compartment is with door convenient for mounting and maintenance.



Smart MNS抽出式开关柜（后出线）

Smart MNS withdrawable switchgear (rear outgoing)



电缆和控制线连接（后出线）

Connecting of cable and control line (rear outgoing)

# Main Components

## 主要元器件

### ASW 系列万能式空气断路器

ASW Series ACB

型号 Type	ASW-2000	ASW-3200	ASW-4000
额定电流 (A) Rated current	2000	3200	4000
额定工作电压 (V) Rated operation voltage	400 690	400 690	400 690
极数 Poles	3 4	3 4	3
CT值 In(A)订购时确定 CT Value	630 800 1000 1250 1600 2000	2000 2500 3200	4000
额定极限短路分断能力 (Ics)kA, 400V Rated max. short-circuit breaking capacity	80	65/80	80
额定运行短路分断能力 (Icm)kA, 400V Rated short-circuit connecting capacity (peak)	50	220	220
额定短时耐受电流 (Icw)kA, 400V Rated short-time withstand current	50	65	65

### AH、AL、AE 系列塑料外壳式断路器

AH、AL、AE Series MCCB

壳架电流 (A) Rated current	脱扣器额定电流 (A) Rated current of release	极限分断能力 (kA) Breaking capacity
100	16 20 25 32 40 50 63 80 100	36 50 70
250	100 125 160 180 200 225	36 50 70
400	200 250 315 350 400	50 70 85
630	250 315 350 400 500 630	50 70 85
800	630 700 800	50 70 85

### BH-0.66 系列电流互感器

BH-0.66 Series Current Transformer

型号 Type	一次侧额定电流 (A) Primary Side Rated Current	二次侧额定电流 (A) Secondary Side Rated Current
BH-M8	5~100	5
BH-40	150~1500	
BH-60	150~2000	
BH-80	300~2500	
BH-100	400~4000	
BH-120	1000~5000	

# Primary Scheme

## 一次方案

方案编号 Item	01	02	03	04
一次方案 Main schematic diagram				
柜宽 <sup>(1)</sup> Width	40E	32E	32E	40E
柜宽 <sup>(1)</sup> Width	40E	32E	32E	40E
设备室高 Equipment height	72E	72E	72E	72E
最大工作电流 (A) Max. operation current	1500 × 2	3150	3150	3150
主要设备 Main equipment	ASW-630 ~ 1600(3P) BH-0.66	ASW-630 ~ 3200 BH-0.66	ASW-630 ~ 3200 BH-0.66	ASW-630 ~ 3200 BH-0.66
用途 Use	电缆进出线 cable input or output	电缆进出线 cable input or output	柜顶进出线 input or output on cubicle top	母联 busbar coupling

方案编号 Item	13	
一次方案 Main schematic diagram		
柜宽 <sup>(1)</sup> Width	24E	32E
柜宽 <sup>(1)</sup> Width	24E 32E	
设备室高 Equipment height	72E	72E
最大工作电流 (A) Max. operation current	2500	3150
主要设备 Main equipment	BH-0.66或用户自备自装 or equipped by users	BH-0.66或用户自备自装 or equipped by users
用途 Use	计量 measuring	

方案编号 Item	05	06	07	08	09	10	11	12
一次方案 Main schematic diagram								
柜宽 <sup>(1)</sup> Width	40E	40E			40E			
柜宽 <sup>(1)</sup> Width	24E 32E	24E 32E			24E 32E			
设备室高 Equipment height	8E/4	8E/2	8E	16E	24E	8E	16E	24E
最大工作电流 (A) Max. operation current	30	50	175	300	480	175	300	480
主要设备 Main equipment	AH/AL/AE系列塑壳断路器 BH-0.66							
用途 Use	馈线 feeder			母线 busbar coupling				

方案编号 Item	14	15	16	17	18	19	20	21	22	
一次方案 Main schematic diagram										
柜宽 <sup>(1)</sup> Width	32E	40E	40E			40E				
柜宽 <sup>(1)</sup> Width	24E 32E	24E 32E	24E 32E			24E 32E				
设备室高 Equipment height	72E	8E/4	8E/2	8E/4	8E/2	8E	16E	24E	8E/2	
最大控制功率 (kW 380V) Max. control power	4000A	7.5	15	5	15	50	75	160	15	
主要设备 Main equipment	BH-0.66或用户 自备自装 or equipped by users	AH/AL/AE系列塑壳断路器 BH-0.66								
用途 Use	计量 measuring	不可逆 not converse			可逆 converse					

注：柜宽（1）适用电缆侧出线方案。柜宽（2）适用电缆后出线方案（建议优先采用侧出线方案）  
Not: Width (1) is fit for Side-outgoing scheme, width(2) is fit for back-outgoing scheme.

注：柜宽（1）适用电缆侧出线方案。柜宽（2）适用电缆后出线方案（建议优先采用侧出线方案）  
Note: Width (1) is fit for Side-outgoing scheme, width(2) is fit for back-outgoing scheme.

# Primary Scheme

## 一次方案接线图

方案编号 Item	23	24	25	26	27	28	29	30	31
一次方案 Main schematic diagram									
柜宽 <sup>(1)</sup> Width	40E				40E		40E		
柜宽 <sup>(1)</sup> Width	24E 32E				24E 32E		24E 32E		
设备室高 Equipment height	8E/2	8E	16E	24E	8E/2	8E/2	8E	16E	24E
最大控制功率 ( kW 380V ) Max. control power	15	30	65	100	7.5	7.5	15	65	100
主要设备 Main equipment	AH/AL/AE系列塑壳断路器 BH-0.66								
用途 Use	可逆 converse				Y/Δ				

方案编号 Item	32	33	34	35	36	37	38	39
一次方案 Main schematic diagram								
柜宽 <sup>(1)</sup> Width	40E				40E			
柜宽 <sup>(1)</sup> Width	24E 32E				24E 32E			
设备室高 Equipment height	8E/2	8E	16E	24E	8E/2	8E	16E	24E
最大工作电流 ( A ) Max. operation current	15	65	100	165	15	65	100	160
主要设备 Main equipment	AH/AL/AE系列塑壳断路器 BH-0.66							
用途 Use	不可逆 not converse				可逆 converse			

注：柜宽（1）适用电缆侧出线方案。柜宽（2）适用电缆后出线方案（建议优先采用侧出线方案）

Note: Width (1) is fit for Side-outgoing scheme, width(2) is fit for back-outgoing scheme.

方案编号 Item	40	41	42	43	44	45
一次方案 Main schematic diagram						
柜宽 <sup>(1)</sup> Width	40E				24E	24E
柜宽 <sup>(1)</sup> Width	24E 32E					
设备室高 Equipment height	8E/2	8E/2	16E/2	32E/2	72E	72E
最大控制功率 ( kW 380V ) Max. control power	7.5	15	65	100	最大补偿容量 ( 120KVAR ) max. compensation capacity	
主要设备 Main equipment	AH/AL/AE系列塑壳断路器 BH-0.66				QSA-400 RT14 B BKMJ RVC	QSA-400 RT14 B BKMJ
用途 Use	Y/Δ				自动控制正屏 main screen	自动控制辅屏 auto control aux screen

方案编号 Item	46	47	48	49
一次方案 Main schematic diagram				
柜宽 Width	32E	32E	40E	40E
设备室高 Equipment height	72E	72E	72E	72E
最大控制功率 ( kW 380V ) Max. control power	120-180kVAR		200-300kVAR	
主要设备 Main equipment	QSA-400 RT14 B BKMJ RVC	QSA-400 RT14 B BKMJ	QSA-630 RT14 B BKMJ RVC	QSA-400 RT14 B BKMJ
用途 Use	自动控制正屏 main screen	自动控制辅屏 auto control aux screen	自动控制正屏 main screen	自动控制辅屏 auto control aux screen

注：柜宽（1）适用电缆侧出线方案。柜宽（2）适用电缆后出线方案（建议优先采用侧出线方案）

Note: Width (1) is fit for Side-outgoing scheme, width(2) is fit for back-outgoing scheme.

开关柜在全部装配齐全并经检验合格后，方可装箱运输。装箱分单台、二台、三台和四台4种运输方式，运输单元最多为3000mm，应尽可能避免单独装箱，以减少主母线之间的连接点。

当产品运抵目的地后，首先应检查装箱是否完整。若开关柜不是立即使用，应存放在干燥、清洁处。

开关柜应按照柜架尺寸图安装，基础槽钢由用户自备。如需电缆出线，还必须开安装电缆沟。安装时应根据图纸做主母线连接，对母线表面做好清洁处理，然后用螺栓紧固，并进行电缆或架空布线工作。开关柜并联安装时，应在并联孔部位用螺栓紧固。

开关柜在配电室内必须竖直安装。若靠墙安装时，为满足散热要求，应保证：与墙壁距离最小为80mm，与天花板的最小距离为500mm。

柜体单列时，柜前走廊以2500mm为宜，双列布置时，柜前操作走廊以2500mm以上为宜。双面维护形式柜后需有1200mm通道。

Only when the switchgear is equipped completely and inspected qualified, it can be packaged and transported. The Packaging can be classified single, two panels, three panels and four panels. The max. package unit is 3000mm. Single package should try to be avoided to reduce the connection between main busbars. After it's arrival to destination, firstly we should check whether the package is completed. If it is not used at moment, it should be stored in dry and clean places.

The switchgear should be installed according to the Dimension Drawing of Frame and Use should supply the channel steel for basement. If cable outgoing is needed, cable channel should be mounted. The connection of main busbar should be according to the drawings and the surface of busbar should be cleaned and then fixed by bolts. When the switchgear is parallel connected, bolts should strengthen them on the parallel connection holes.

The switchgear should be installed upright. When it is mounted against the wall, the least distance to the wall should be 80mm and the least distance to the ceiling should be 500mm to ensure the requirement of radiation. When the cubicle is arranged in single row, 2500mm of passage in front of the cubicle is better; when the cubicle is arranged in double rows, more than 2500mm of passage is better. For double-faces maintenance cubicles, the passage at the back of cubicle should be 1200mm least.

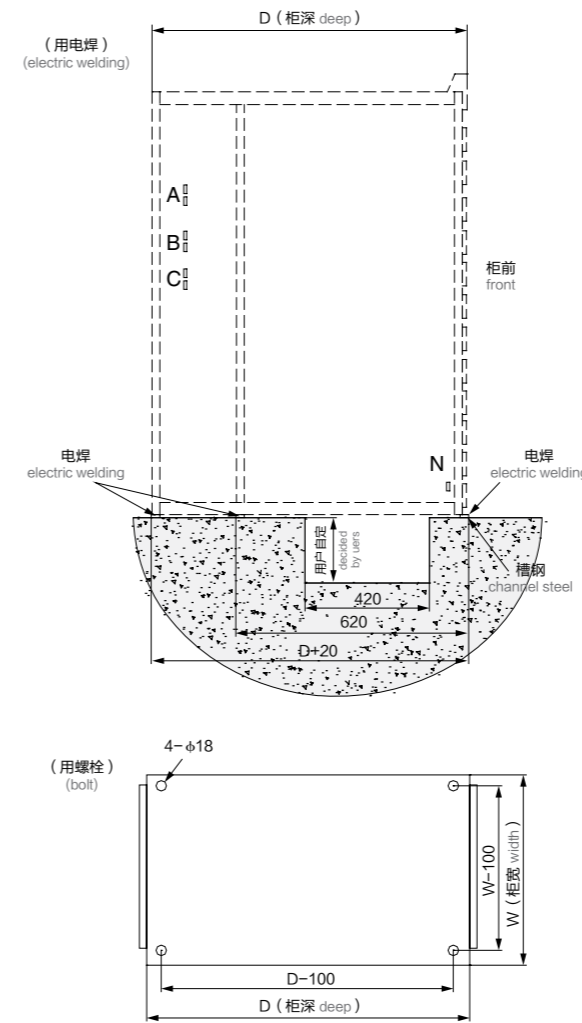


图14 Smart MNS配电柜右侧出线基础安装示意图

Diagram 14 Smart MNS electricity-distributing board's mounting scheme (right-side outgoing)

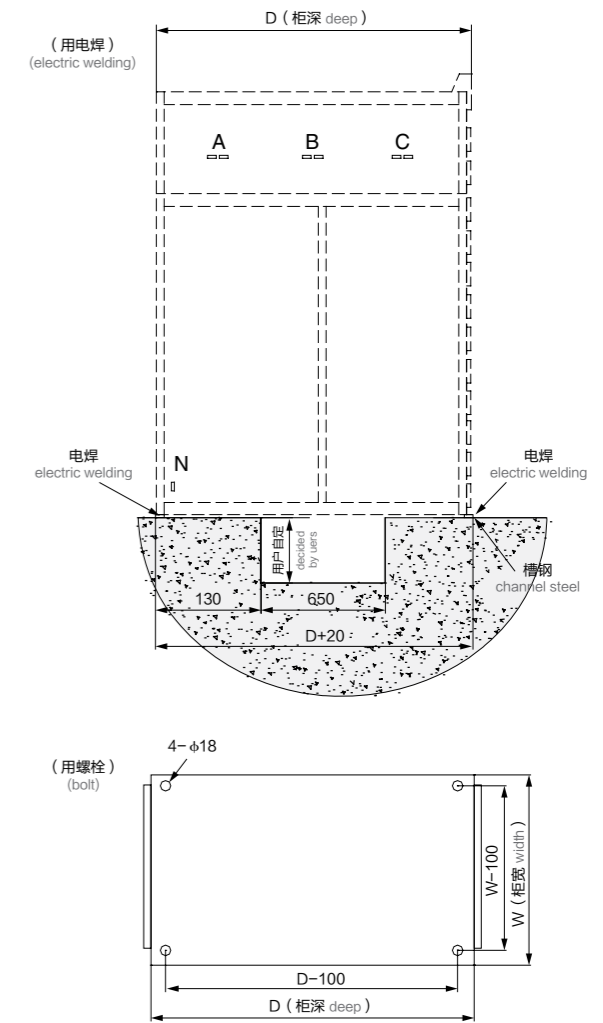


图15 Smart MNS配电柜后出线基础安装示意图

(注：三相母线也可立放)

Diagram 15 Smart MNS electricity-distributing board's mounting scheme (right-side outgoing)

## Ordering information

### 订货须知

订货时用户应提供下列资料：

1. 回路方案及单线系统图
2. 二次控制原理图（或按本公司标准控制原理图）
3. 配电柜内电器元件明细表（包括型号、规格、数量）
4. 配电柜排列图
5. 配电柜进出线方式

Following information should be provided by the customers when ordering:

1. Single-line diagrams.
2. Control and measuring circuit diagrams (or provided as standards by our company).
3. The list of components in each board (including type, specification and quantity).
4. The arrangement plan for distribution boards.
5. The way of cables entry.

样本中相关技术数据本公司保留修改权利，更改后恕不另行通知。

# MECAN

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明及主页

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