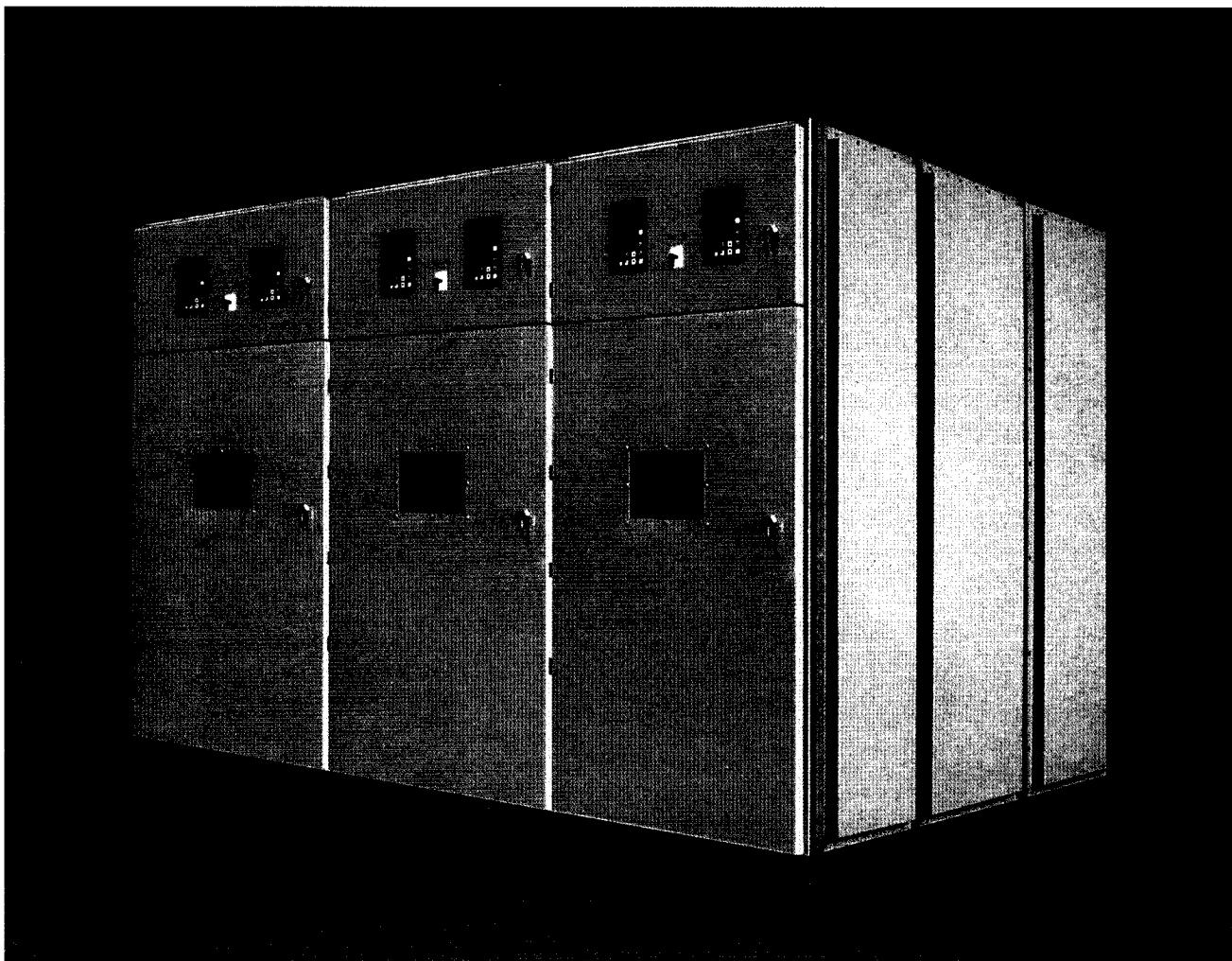


镇江伊顿电器有限公司
Zhenjiang Eaton Electrical Systems Co.,Ltd.

**40.5kV Unitole UR7 型
金属铠装移开式开关设备
Unitole Type UR7 Metal-clad With-
drawable Switchgear**



TAKING CARE OF YOUR POWER

EATON

■ 产品技术一体化采用美国伊顿(原西屋电气)先进技术并按中国电网标准制造。

Use integrated advance technology of American EATON (Westing-House Electric) and manufactured in compliance with Chinese Electrical System Standard.

■ 安全可靠 Safety and Reliability

- 金属铠装全封闭结构
- 真空灭弧室采用大爬电距离，专门满足中国DL标准
- 采取均衡电场的措施，局部放电低，无闪络故障
- 主导体采用热缩材料绝缘，具有较高的绝缘性能
- 低压室及各高压隔室之间各自独立隔开
- 快速合闸接地开关用于接地并具有关合短路电流的能力
- 具有可靠的五防闭锁装置，能有效地防止误操作
- 透过门板的前后观察窗，可方便地察看断路器分合闸状态及手车位置，机构储能状态，接地开关分合位置以及电缆头的连接情况
- 在意大利CESI高能试验中心通过内部电弧故障试验
- 产品符合IEC60298、GB3906、DL404等标准和中国电力系统的要求
- Full enclosed Metal-clad structure.
- Long creep age of vacuum interrupter in compliance with Chinese DL standard.
- Use equalizing electric field, low partial discharge, no flashover fault.
- Main conductor insulated by hot-shrink sleeve. Have high isolation capability.
- The low-voltage compartment and all high-voltage compartment are totally enclosed separately.
- Quickly closed earthing switch can earth and have the capability of making short circuit current.
- Have reliable "five prevention" interlock device, and prevent from maloperation effectively.
- Can inspect the opening or closing status of VCB and position of truck, charging status of mechanism. Opening or closing status of earthing switch and connecting status of cable.
- Pass internal arc fault test in Italian CESI High power test center.
- In compliance with IEC60298 GB3906 DL404 standard and the requirement of Chinese electrical system.

■ 操作维护便利 Convenient operation and maintenance

- 壳体防护等级IP4X，可防止污秽物及小动物进入
- 真空断路器手车为免维修型，与其配套的操动机构仅需少量维护
- 采用特殊设计的接地开关操作机构，操作时轻巧、快速、省力
- 手车室活门开启机构简单、可靠
- 手车互换性好，更换断路器非常方便
- 二次线敷设于尺寸宽裕的线槽内，美观并便于查线
- 装设标准型的互感器
- 可适应电缆和母排进出或电缆及母排混合式进出
- The protection degree of the enclosure is IP4X, can prevent the pollution and beastie from entering.
- VCB is free-maintenance. and its mechanism only need little maintenance.
- Special design of mechanism of earthing switch make it operated quickly and deftly.
- The shutters is simple and reliable.
- The truck are exchangeable. VCB can be changed easily.
- Installed standard transformer.

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1.1 概述

镇江伊顿电器有限公司生产的UR7铠装式金属封闭开关设备（简称UR7开关柜）系由美国伊顿集团联合设计开发的先进中压开关设备。适用于三相交流50Hz额定电压40.5kV的单母线及母线分段的电力系统，用于接受和分配电能并对电路实行控制、保护及监测。

UR7开关柜具有各种防止误操作的措施，包括防止带负荷移动手车，防止带电合接地开关和防止接地开关在断路器关合位置闭合等功能。

UR7开关柜配置性能优良的移开式405W-VACW真空断路器，开关柜配置先进可靠的微机综合继保和监测装置。UR7铠装式金属封闭开关设备是技术先进、性能稳定、结构合理、使用方便、安全可靠的配电设备。

Summary

Type UR7 metal-clad withdrawable switchgear (hereafter called UR7 switchgear) is designed unitedly by American Eaton Co. It can use in 3-phase AC 50Hz 40.5kV single busbar and its sectionalizer electrical system, for electricity distribution, circuit control, protection monitor and measuring.

UR7 switchgear have enough anti-mishandling measure including: prevent from moving truck with load, prevent from closing earthing switch with electricity and prevent form closing earthing switch when VCB is closed.

UR7 switchgear equip high-capability withdrawable VCB typed 405W-VACW and equip advanced micro-process integrated protection relay and monitor device. UR7 is a equipment that having advanced technology, steady capability, logical structure, convenient use, safety and reliability.

1.2 采用的标准及规范

UR7开关柜依据下列标准进行设计与制造

国际电工委员会标准:

IEC 60298 (1990) 额定电压1kV以上52kV及以下交流金属封闭开关设备和控制设备

IEC 60694 (1980) 高压开关设备标准的共用条款

IEC 6056 (1987) 高压交流断路器

美国ANSI标准:

C37.04, C37.09, C37.20.2

中国国家标准:

GB3906-1991 3-35kV 交流金属封闭开关设备

GB/T11022-1999 高压开关设备和控制设备标准的共用技术要求

GB1984-1989 交流高压断路器

DL/T404-1997 户内交流高压开关柜订货技术条件

Standards

UR7 Switchgear is designed and manufactured in compliance with the following standards.

AC metal-enclosed switchgear and controlgear for rated voltages above 1kV and up to 52kV.

Common specifications for high-voltage switchgear and controlgear standards.

High-voltage alternating-current circuit-breakers

ANSI standard including: ANSI C37.04, C37.09, C37.20.2

GB standards:

3~35kV AC metal-enclosed switchgear and controlgear.

Common technical requirements for HV switchgear and controlgear.

AC high voltage circuit breakers.

Order information for indoor HV switchgear.

1.3 使用条件

1.3.1 正常使用条件

环境温度:

最高环境温度: +40℃

最低环境温度: -15℃

环境湿度:

日平均相对湿度95%以下

月平均相对湿度90%以下

开关柜安装场所的最高海拔高度为1000m。

地震烈度不超过8度

开关柜应安装在无火灾、无爆炸危险、无严重污秽、无化学腐蚀气体及剧烈振动的场所。

Service condition

Normal ambient condition

Environmental temperature

Max. temperture: +40℃

Min. temperture: -15℃

Environmental humidity:

Daily average relative humidity: Below 95%

Monthly average relative humidity: Below 90%

Earthquake intensity not more than 8 degree.

Suitable site conditions: Without risk of fire, explosion, heavy contamination, chemical corrosion and violent shock.

1.3.2 特殊使用条件

根据IEC694以及GB3906标准的规定，本公司和用户可就超出正常运行条件的特殊运行条件进行协商并达成协议。客户必须针对每一个特殊运行条件事先与本公司协商。例如：当开关柜安装的海拔高度超过1000m时；设备安装在海上采油井架平台。

为防止凝露现象，开关柜设有板式加热器。当开关柜处于备用状态时，即应投入使用。即使在正常运行中，也应注意投用。

Special service conditions

According to IEC60694 and GB3906, agreement on special operation requirement exceeding normal operation requirement can be reached between our company and clients, and clients must negotiate with our company on every special operation requirement before hand. For example: The height above sea level of site is more than 1000m, installed on maritime oil derrick.

To prevent dew, switchgear install lathy heater. It should be used when switchgear is in spare status. even switchgear is work, It also must pay attention to.

2 技术参数

Technical Data

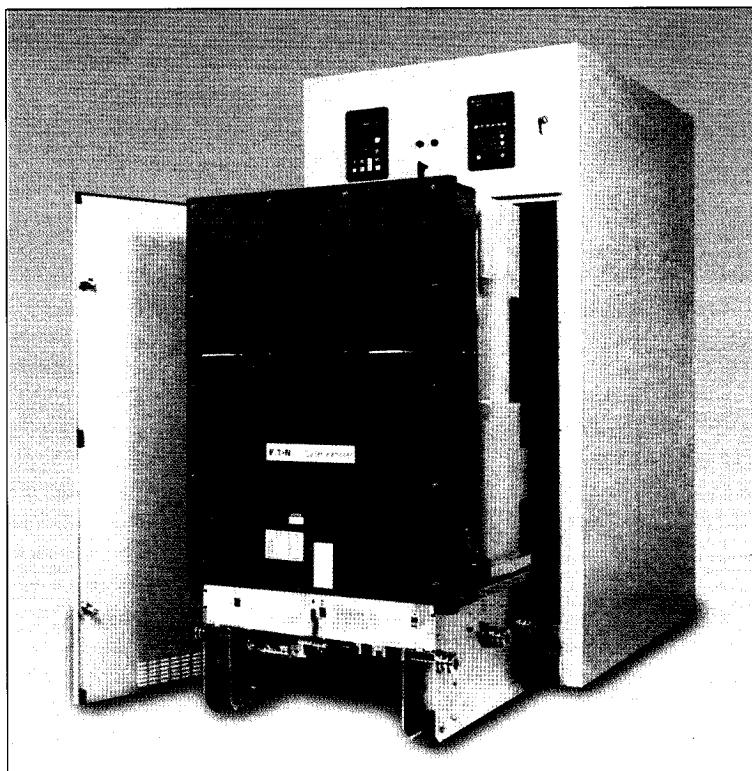
2.1 UR7开关柜主要技术参数 Main Technial data

表 1
Table 1

| 项目 Item | 单位 Unit | 主要技术参数 Main technical data |
|--|------------|---|
| 额定电压 Rated Voltage | kV | 40.5 |
| 额定频率 Rated frequency | Hz | 50 60 |
| 额定电流 Rated current | A | 630 1250 1600 2000 2500 3150* |
| 额定短路开断电流 Rated short breaking Current | KA | 16 20 25 31.5 |
| 额定关合电流(峰值) Rated closing & Latching Current(peak) | KA | 40 50 63 80 |
| 3s额定热稳定电流 3s rated short time current KA rms | KA | 16 20 25 31.5 |
| 额定动稳定电流(峰值) Rated short circuit making current (peak) | KA | 40 50 63 80 |
| 1min额定工频耐受电压 1min rated power frequency withstand voltage | kV | 95 |
| 额定雷电冲击耐受电压(峰值) BIL (peak) | kV | 185 |
| 隔离断口间1min额定工频耐受电压 1min rated power frequency withstand voltage between disconnecting contacts | kV | 118 |
| 隔离断口间额定雷电冲击耐受电压(峰值) BIL peak (between disconnecting contacts) | kV | 215 |
| 外壳防护等级 Enclosure protection degree | | IP4X |
| 操动机构及操作电源 Operation mechanism and Voltage | | 电动机弹簧储能式 Motor spring charged AC: 110V 220V DC: 48V 110V 220V |

* 3150A为强迫风冷

Up to 3150A with forced air-cooling



3.1 概述

UR7开关柜由固定柜体和移开部件(手车)两大部分组成，根据柜内电气设备功能分成母线室(A)、功能单元室(B)、电缆室(C)和仪表室(D)等四个功能单元，如图3.1所示。

开关柜的可移开部件配置真空断路器手车、电压互感器手车、隔离手车等。

开关柜的外壳防护等级可达IP4X，手车室门打开时防护等级为IP2X。

开关柜内可装设检测一次回路带电的带电显示装置(由客户选择)。

UR7开关柜结构设计可防止开关柜内部故障电弧的影响，能有效地保证操作人员和设备的安全。

Summary

UR7 switchgear is made up of two parts, fixed cubicle and removable cradle, and as to different electrical functions, it may have four functional units, bus compartment, functional units, cable compartment and instrument compartment, see drawing 3.1.

Removable part may be equipped with VCB truck, PT truck , disconnecting truck.

Protection degree of switchgear enclosure can be IP4x,when door is open, protection degree can be IP2X.

Live indication device(client option) to check primary circuit can be supplied in cubicle.

The design of UR7 structure can prevent from influence of internal arc fault. To ensure the safety of operator and equipment.

开关柜的外形尺寸和重量

Outline dimension and weight of cubicle are as following:

| | | |
|-------------|----|--------------|
| 高度 (Height) | mm | 2600 |
| 宽度 (Width) | mm | 1200 (1600*) |
| 深度 (Depth) | mm | 2750 |
| 重量 (Weight) | kg | 850~1850 |

* 站用变压器柜宽为1600mm。

The width of transformer panel in substation is 1600mm

3.2 柜体设计

开关柜采用国际流行的拼装组合式结构，开关柜的外壳和隔板是采用敷铝锌板经CNC机床加工和折弯之后组装栓铆而成。因此，装配好的开关柜能保证尺寸上的统一性及很高的机械强度。

开关柜的门板面漆采用静电喷涂后焙烤，表面抗冲击，耐腐蚀，外形美观。

开关柜的顶部，在断路器室、母线室和电缆室的上方均设有压力释放装置，当发生内部故障电弧时，伴随电弧的出现，开关柜内部气压升高，顶部装设的压力释放金属板将被自动打开，释放压力和排泄气体，装设在门上的特殊密封圈把柜前面封闭起来，以确保操作人员和开关柜安全。

Frame Design

Switchgear have world-popular combined bolted structure. Between enclosure and functional units there are Al-Zn-coated plate and bolted together after processed and bent by digital control sheet metal processing system(CNC) imported. so it can ensure the uniform of size and high mechanical strength.

The door and covers are baked after epoxy powder coated. The surface is anti-strike , high degree of corrosion resistance and good look.

Functional unit compartment, bus compartment and cable compartment have individual over-pressure relief vents. And have pressure relief device at top of individual cell, when there is internal fault current ,it may efficiently release gas inside cubicle and assure personnel and cubicle safety.

3.3 断路器手车室

断路器手车室见图3.2

在断路器手车室内装有手车的推进机构，推进机构包括丝杆推进机构，手车定位机构，主回路活门机构和二次插头机构。

丝杆推进机构：当手车从柜外进入柜体，通过丝杆推进机构使手车从试验位置进入工作位置，推进机构具有一系列的联锁功能。

手机定位机构：当手车进入试验位置，手车与柜体通过手车定位轮与定位机构进行定位、导向，确保手车与柜体正确的连接。

主回路活门机构：当手车从试验位置进入到工作位置，活门自动打开，反之活门自动关闭，保证操作人员不会触及带电体。

二次插头机构：当手车从断开位置到工作位置，二次插件通过手车上的导向装置自动插接，反之二次插件自动分离。

手车处于“工作”位置时，由于机械联锁作用，二次插头被锁定，不能被解下。断路器手车在二次插头未接通之前仅能进行手动分闸，但由于断路器手车的合闸闭锁电磁铁未通，无法手动合闸。

VCB Compartment

VCB truck compartment see drawing 3.2

In VCB Truck compartment there is levering mechanism for cradle which includes screw levering mechanism, cradle positioning mechanism ,shutter mechanism for primary circuit and secondary connecting mechanism.

Screw levering mechanism: it may help cradle to move from test position to service position, levering mechanism features a series of inter-locking functions,

Cradle position mechanism: when cradle at test position, cradle positioning wheel and mechanism may assure correct connection between cradle and cubicle by positioning and guiding.(Have nothing to do with bottom wheel of cradle)

Main circuit shutter mechanism: when cradle moves from test position to service position, shutter automatically open, and on the contrary automatically close to assure operator never touch live part.

Secondary connection mechanism: when cradle moves from disconnect position to service position, secondary plug-in connector automatically cut in, otherwise, it may automatically disconnect.

When cradle is in service position, the secondary plug is locked and can not be released because of mechanical interlock. When the secondary plug is not connected, VCB truck only can be opened manually .

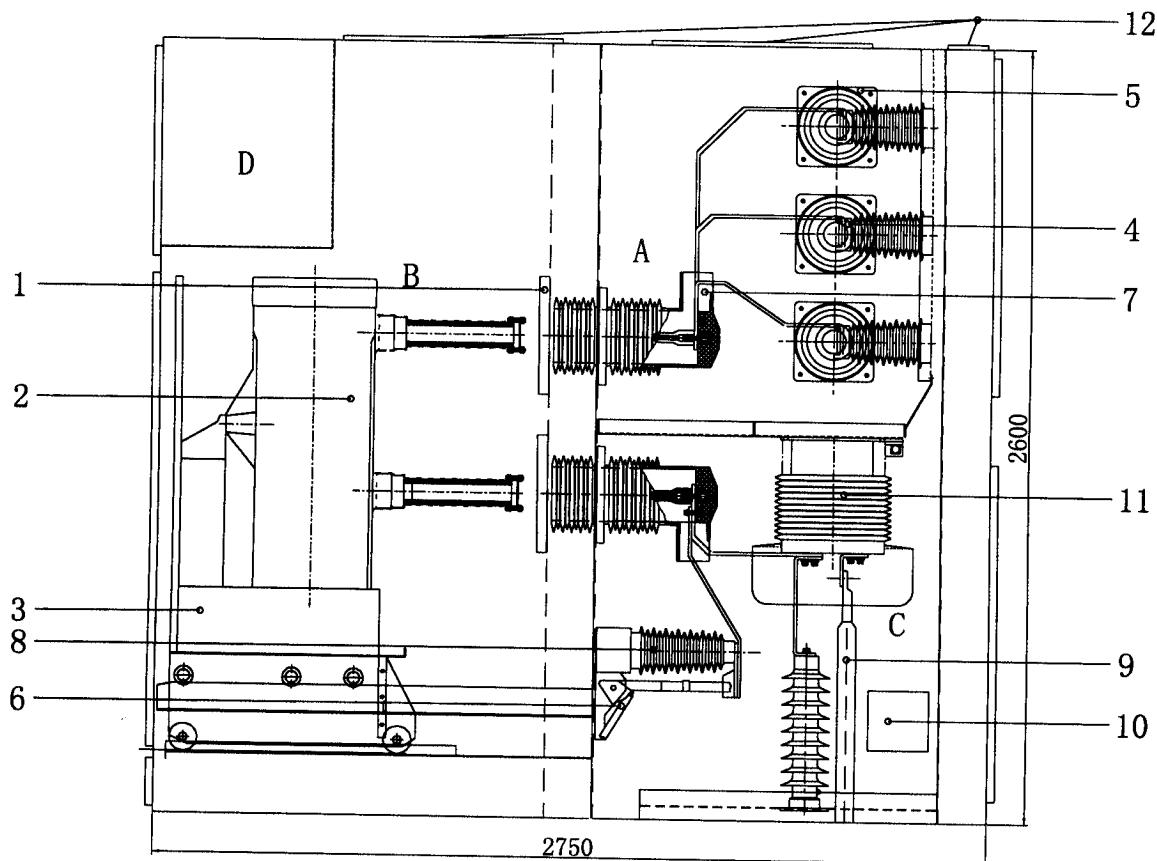
It can not be closed manually because of closing interlock electromagnetic coil is not work.

3 开关柜结构

Structure

图3.1 UR7型金属铠装移开式开关柜剖面图

Fig.3.1 Side view of UR7



A — 母线室
Busbar compartment
B — 断路器室
VCB compartment
C — 电缆室
Cable compartment
D — 低压室
L.V. compartment

1 — 活门
Shutter
2 — 断路器
VCB
3 — 二次插头
Secondary plug
4 — 主母线
Main busbar
5 — 母线套管
Busbar bush
6 — 接地开关
Earthing switch
7 — 静触头盒
Stationary bushing insulation

8 — 支持绝缘子 (可选配带电显示装置)
Insulator (Can select voltage indicator)
9 — 电力电缆
Cable
10 — 板式加热器
Heater
11 — 电流互感器
Current transformer
12 — 泄压装置
Pressure relief device

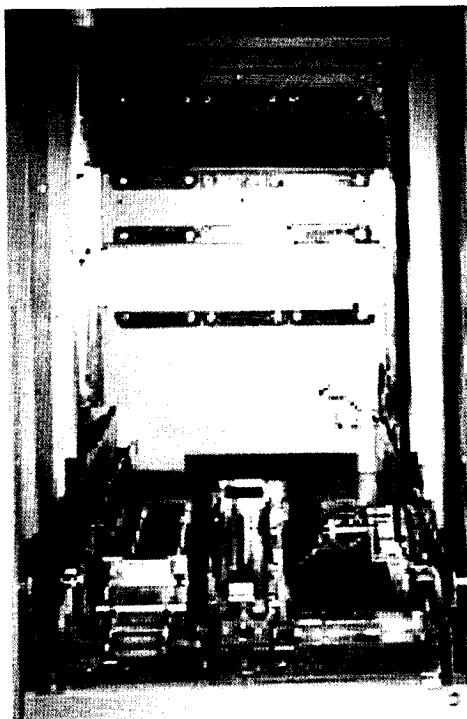


图3.2 断路器手车室

Fig.3.2 VCB truck compartment

手车的面板上设有手动合、分闸按钮，合、分闸机械指示牌，合、分闸计数器，储能指示牌，能方便、正确的观察手车运行状态。

Handcart

The frame of truck is made of cold rolled steel and weld together after processed and bent by digital control sheet metal processing system.. according to different functions, cradles can be CB cradle, Pt cradle and etc, which have uniform height and depth. Cradles with same rating may be interchangeable.

VCB cradle can be in "service" position or "test/disconnect" position in switchgear. There are orientating interlock device in every position to ensure cradle only do relevant operation in special position.

Interlock function must be complied when moving cradle. Ensure that VCB is open before cradle moved.

VCB cradle is in "test/disconnect" position first when entering the cell. and is moved to "service" position by handle.

VCB cradle equips vacuum interrupter and relevant operation mechanism. there are 3 individual poles in VCB cradle see drawing 3.3. The upper and lower contact arms equipped tulip type contact system are installed in the VCB's poles. The secondary wire of operation mechanism is educed by a tailor-made secondary plug.

The position of VCB can be indicated by the VCB position indicator on low-voltage door and saw through the view-window . there are manual closing/open push button, closing/open mechanical indicating plate , closing/open counter, charging indicating plate on the front plate of cradle. It can observe the running status of VCB easily and correctly.

3.4 手车

手车框架由冷轧钢板经折弯焊接制成。根据用途，手车可分为断路器手车、电压互感器手车等。各类手车的高度都统一，相同规格的手车能互换。

断路器手车在柜内有“工作”位置和“试验/隔离”位置，每一位置均设有定位闭锁装置，保证手车处于特定位置时才允许进行相应操作。

移动手车必须满足联锁条件，保证手车移动之前断路器必须分闸。

断路器手车进入开关柜内时，首先处于“试验/隔离”位置，然后由摇动手把将手车推入“工作”位置。

断路器手车装有灭弧室及相应的操动机构。如图3.3手车上的断路器有三相独立的极柱。由装有花瓣式触指系统的上下触臂安装在断路器的极柱上。操动机构的二次线由特制的二次接插件引出。

手车在柜内的位置既能从低压室面板上的位置指示器指示，也能从门上的观察窗看到。

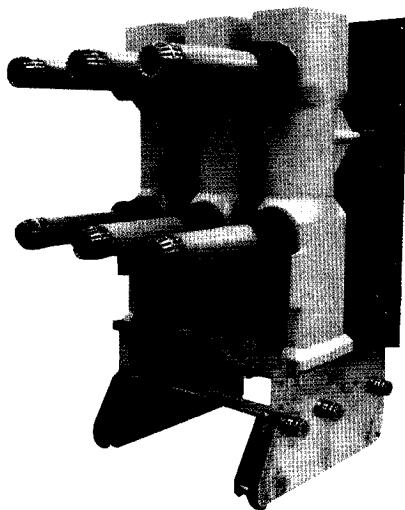


图3.3 405W-VACW 断路器手车
Fig.3.3 VCB truck

3.6 母线室

主母线采用矩形铜排，材料均采用进口电解铜，主母线和分支母线套有热缩套管，从而形成可靠的复合绝缘。主母线分段贯穿于相邻的柜之间，大爬距绝缘子固定支撑并通过套管及隔板达到柜与柜之间互相隔离的目的。

简便的接地联锁机构，有效地防止了误操作。

母排出厂前已预先钻孔，四边加工成R5mm圆角。母排结合部分均镀银，母排固定采用高强度钢制螺栓。

Busbar

The main busbar system is constructed of rectangular high-quality electrolytic copper imported. Main busbar and branch covers heat-shrink sleeve. It can make reliable complex insulation. Main busbar is stationary supported by long creep isolator divided across the adjacent switchgear. Switchgear is insulated each other by sleeve and isolating plate.

Handy earthing interlock mechanism avoid mishandling effectively.

The busbars have round edges(R5mm). Holes in the busbar are punched before leaving the factory. The joints are silver-plated. The bolts of the busbar are made of high tensile strength stainless steel.



图3.4 电缆室
Fig.3.4 Cable compartment

3.5 触指系统

UR7开关柜一次回路中的静触头和手车上的动触头之间的导电装置采用花瓣式触指系统，如图3.3。触指系统结构设计合理，加工制造简单，安装维修方便，具有接触电阻小，承受热稳定电流及动稳定电流大等优良的电气性能。当手车摇入或摇出时，触指系统接触或分离自如，手车操作非常方便。

Contact finger system

The conducting device of UR7 use tulip type contact finger system between stationary contact in main circuit and moving contact in cradle. See drawing 3.3 logical structure design, easy manufacture, convenient installation and maintenance of contact finger system can ensure good electrical capability like low contact resistor ,withstanding high thermal current and Dynamic stable current. Contact finger system connect or disconnect easily when cradle draws in or out. The operation of cradle is easily.

3.7 电缆室 Cable compartment

电缆室可安装电流互感器、接地开关，并可连接多根平行的电缆。电流互感器吊装在电缆室上方，使电缆室空间增大，电缆联接高度大于800mm，非常便于电缆安装。见图3.4

接地开关为手动操作机构，由于采用独特的蜗杆式操动原理，操作非常省力。

CT and earthing switch can be mounted in the cable compartment, cable connection can be made using more parallel cables. The space of cable compartment is larger than before since the CT now is suspended in the cubicle. The height of connect is more than 800mm. It is very convenient to install the cable.

Earthing switch use manual operation mechanism. worm type operation mechanism is the most effortless to run the earthing switch.

3.8 低压室

低压小室及其门板可以根据不同要求安装各种二次设备。在开关柜内留有金属屏蔽的二次控制电缆导线槽且具有充裕进出的空间。进出开关柜的控制电缆通过预留于左边的导线槽进入低压小室，室内配有用于柜间连接的二次小母线。

Low-voltage

It can install any kinds of secondary component in the low voltage department and panel according to different requirement. It installs secondary controlling cable slot screened by metal in the switchgear which have enough space for cable in or out. The controlling cable slot cross switchgear posit left.

3.9 防止误操作的联锁机构

UR7开关柜根据国内外对开关柜的防误要求，设计具有一系列闭锁装置，从根本上防止可能出现严重后果的误操作，确保操作人员及开关设备的安全。

具体的主要闭锁功能如下：

- 当断路器和接地开关处于分闸位置时，手车才能从试验/隔离位置移到工作位置，反之也一样（机械闭锁）。
- 当断路器手车完全处于试验或工作位置时，断路器才能合闸（机械闭锁）。
- 只有当断路器手车处于试验/隔离位置时，接地开关才能合闸（机械闭锁）。
- 当断路器合闸时，断路器手车不能从试验/隔离位置移到工作位置（机械闭锁）。
- 当手车处于工作位置时，控制回路二次插件被锁定不能脱开（机械闭锁）。
- 当断路器手车在试验或运行位置失去控制电源时，断路器不能合闸，仅能用手动分闸（电气联锁）。
- 接地开关与电缆室门装设机械联锁，可防止误入带电间隔。
- 隔离手车与断路器手车之间增加电气联锁，可防止带负荷推拉手车。
- 低压室微机保护装置或操作开关可选择加锁的方式，防止误分、合断路器。

UR7 is designed with a series of anti-mishandling blocking devices to comply with at home and abroad requirement for switchgear, and avoid potential risk to assure personal and switchgear safety. Main blocking functions are as following:

When circuit breaker and earthing switch are at open position, cradle can move from test/disconnect position to service position, if otherwise , no mechanical blocking is possible.

- Only when CB cradle at test or service position can CB close.
- Only when CB cradle at test or disconnect position can earthing switch close.
- When CB closes. CB cradle can not move from test/disconnect position to service position.
- When cradle at service position, secondary plug-in device of control circuit can not disconnect.
- When cradle lost control power in test/service position. CB can not close but manual open.
- There is mechanical interlock between earthing switch and door of cable cell to avoid entering cable cell mistakenly.
- There is electrical interlock between disconnecting cradle and CB cradle to avoid drawing cradle when electrified.
- The protection relay or switch can be locked to avoid operating CB mistakenly.
- To guarantee the consistency of UR7 performance, The main circuit component used in UR7 is designed and manufactured by Cutler-Hammer Co. or product supplied by local famous supplier and confirmed by us. So, it ensure that UR7 is a advanced technology, steady performance and safe and reliable electricity distribution equipment.

UR7开关柜中所选用的一次回路主要电器元件均是由美国伊顿公司（原西屋电气）研制，或采用合资公司确认的中国当地知名厂商提供的产品。以保证UR7开关柜性能指标的一致性，相互匹配，从而保证了UR7开关柜成为技术先进、性能稳定和安全可靠的配电设备。

To guarantee the consistency of UR7 performance, The main circuit component used in UR7 is designed and manufactured by Eaton Co (West-House Electric). or product supplied by local famous supplier and confirmed by us. So, it ensure that UR7 is a advanced technology, steady performance and safe and reliable electricity distribution equipment.

4.1 断路器

405W-VACW真空断路器是UR7开关柜一次回路中最重要的电器元件（见图4.1）。它是由美国伊顿公司为满足IEC、GB、DL标准专门设计制造的第四代断路器。集中体现了伊顿公司数十年配电系统方面丰富的设计和制造经验。

405W-VACW真空断路器可在工作电流范围内频繁操作及多次开断短路电流。它适合于重合闸操作，并有极高的操作可靠性。

405W-VACW真空断路器手车运动导轨与特制的手车支座上的金属滑轮相接触，距开关柜底板200mm，因此开关柜基础槽钢的安装与敷设精确度对手车运动的影响可以忽略。

正常工作条件下，断路器在允许技术参数范围内使用，可保证安全、可靠地运行。使用过程中仅需少量的清扫、润滑等维护工作。

405W-VACW真空断路器技术参数见表2。

操动机构的基本配置模式可满足多数用户的要求，它具有完善、可靠的电气和机械辅助元件，其内部接线详见图4.2。图中所示的可选项是为特殊使用条件配备的，由用户订货时选定。弹簧操动机构的主要电气参数见表3。

405W-VACW vacuum CB is the most important component in primary circuit of UR7 switchgear, it meets with IEC, GB, DL standard. It is the newest integration of rich designing and manufacturing experiences in electricity distribution field for tens of years.

It can operate continually in rated current and can break many times in short circuit current. It meet the requirement of reclosing operation and the operation is reliable.

Moving orbit of 405W-VACW vacuum CB cradle connect with metallic pulley of cradle. Its height is 200mm, the influence of installation of slot steel and its installation precision on cradle moving can be ignored.

VCB can run safely and reliably in normal service condition and allowable technical parameter scope. It only need little maintenance in use.

Basic configuration module meets requirement of most requirement. It installs perfect and reliable electrical and mechanical auxiliary component. Inter-wiring see drawing 4.2. the option indicated in drawing is for special application. It is selected by user with order. Main electrical parameter of spring operation mechanism see list 3.

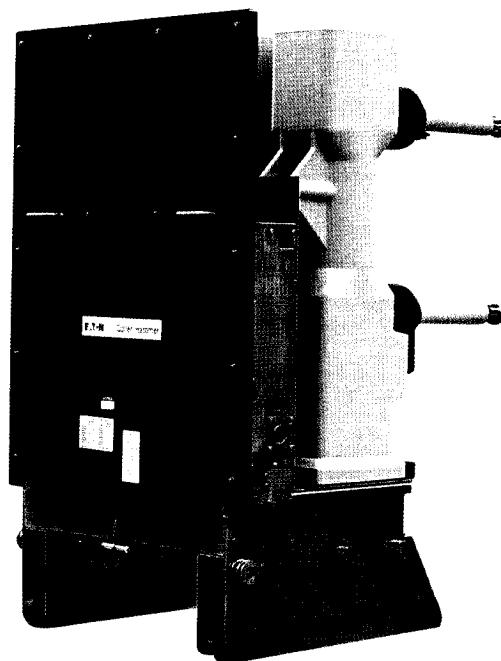


图4.1 405W-VACW真空断路器
Fig.4.1 VCB

4 一次回路主要电器元件

Main electrical components of Primary circuit

405W-VACW真空断路器的主要技术参数

Main technical data of 405W-VACW vacuum circuit breaker

表 2
Table 2

| 项目 item | 单位 Unit | 主要技术数据 Main technical data |
|--|------------|-------------------------------|
| 额定电压 Rated voltage | kV | 40.5 |
| 额定电流 Rated current | A | 630 1250 1600 2000 2500 |
| 额定短路开断电流 Rated short circuit breaking current (rms) | kA | 16 20 25 31.5 |
| 额定短路关合电流 Rated short circuit making current (peak) | kA | 40 50 63 80 |
| 1min工频耐压 1min power-frequency withstand voltage | kV | 95 |
| 雷电冲击耐压(峰值) Lightning impulse withstand voltage (peak) | kV | 185 |
| 操作电压 Operating voltage | V | DC 48 110 220 AC 110 220 |
| 操作顺序 Operating sequence | | O-0.3s-CO-3min(15s)-CO |
| 合闸时间 Closing time | ms | ≤ 75 |
| 分闸时间 Opening time | ms | ≤ 45 |
| 燃弧时间 Arcing time | ms | ≤ 15 |
| 开断时间 Breaking time | ms | 50~60 |
| 机械寿命 Mechanical life | 次 | 10000 |
| 额定短路电流开断次数 Rated short circuit current breaking times | 次 | 50 |

储能电机

Charging motor

表 3
Table 3

| 额定电压 Rated voltage | 工作电流(A) Service current | 最大电流(A) Max. current | 储能时间(s) Charging time |
|-----------------------|----------------------------|-------------------------|--------------------------|
| 110V DC/AC | 3 | 12 | < 15 |
| 220V DC/AC | 3 | 12 | < 15 |

合闸线圈、分闸线圈直流电阻(±5%欧姆)

DC resistance of closing coil, opening coil

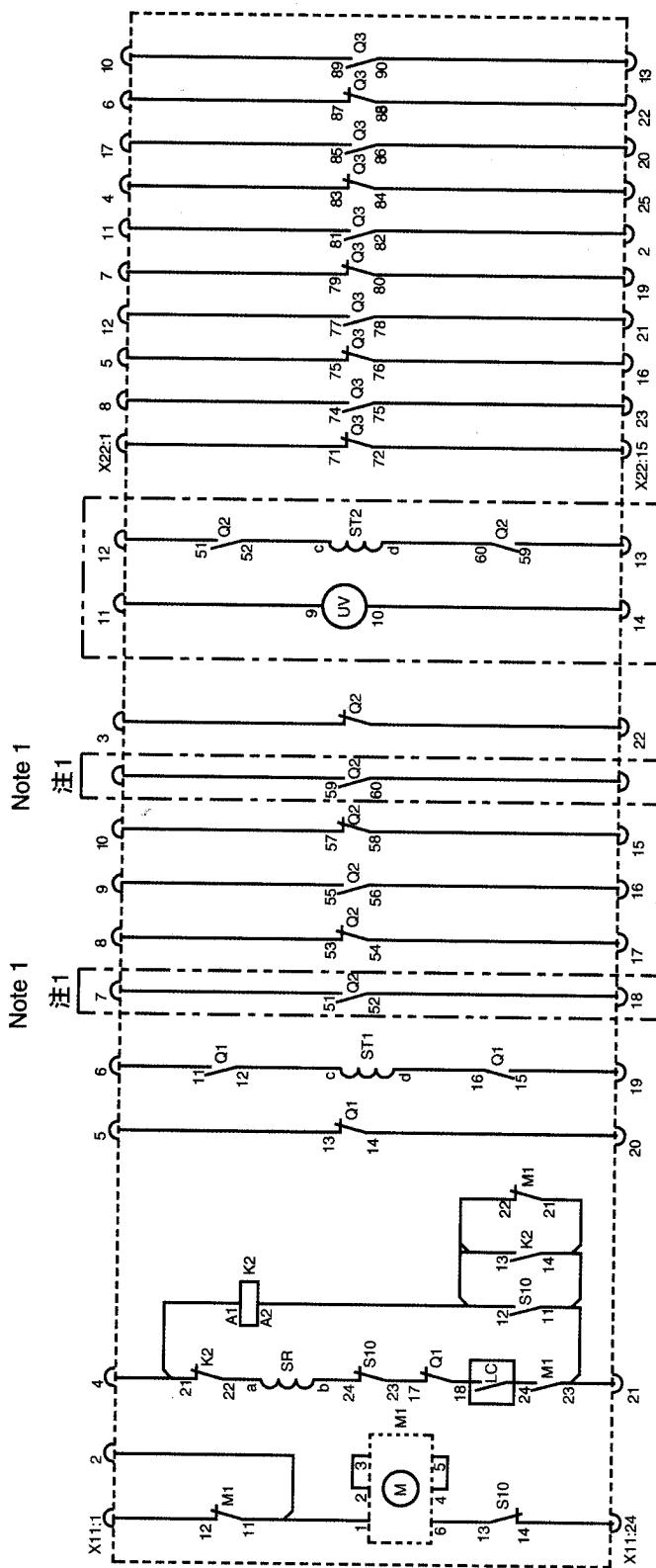
表 4
Table 4

| 额定电压 Rated voltage | 48V DC | 110V DC | 220V DC |
|-----------------------|--------|---------|---------|
| 合闸线圈 Closing coil | 2.9 | 18 | 71 |
| 分闸线圈 Opening coil | 2.9 | 18 | 71 |

4 一次回路主要电器元件

Main electrical components of Primary circuit

图4.2 手车式405W-VACW真空断路器电气控制接线图
Electrical wiring scheme of 405W-VACW VCB



M1 储能机构辅助开关
Charging mechanism auxiliary contact
S10 储能机构辅助开关
Charging mechanism auxiliary contact
SR 合闸线圈
Closing coil
ST1 分闸线圈
Tripping coil
Q1 辅助开关
Auxiliary contact
Q2 辅助开关
Auxiliary contact
Q3 辅助开关 (可选)
Auxiliary contact (option)

M1 辅助开关
Auxiliary contact
K2 防跳继电器
Anti-Pumping relay
M 储能电机
Charging motor
UV 欠压脱扣器 (可选)
Under voltage tripper (option)
ST2 分励脱扣线圈 (可选)
Shunt tripper coil (option)
X11、X22 二次插头
Secondary plug

注1：选择ST2脱扣线圈时，无此端子。

Note1: There is no this terminal if choosing ST2 tripping coil.

4 一次回路主要电器元件

Main electrical components of Primary circuit

4.2 互感器

UR7开关柜选用的电流互感器和电压互感器是采用本公司认可的产品，保证与开关柜的技术性能统一，可满足不同用户的需要见表5、表6。

The CTs and PTs equipped in UR7 are confirmed by us. Its capability is consistent with UR7. see list 5, list 6.

电流互感器技术参数

Technical data of current transformer.

表 5
Table 5

| 项目 Item | 单位 Unit | 技术参数 Technical data |
|--|------------|--|
| 额定电压 Rated voltage | kV | 40.5 |
| 工频耐压 Power frequency withstand voltage | kV | 95 |
| 雷电冲击耐压(峰值) Lightning impulse withstand voltage (peak) | kV | 185 |
| 额定一次电流 Rated primary current | A | 20-3150 |
| 额定二次电流 Rated secondary current | A | 1, 5 |
| 精度级别 Accuracy class | | 0.2, 0.5, 1.0, 3.0, 5P10, 5P20, 10P10, 10P20 |
| 额定容量 Rated capacity | kA | 10-30 |
| 热稳定电流(4秒) 4s thermal current | kA | 25, 31.5 * |
| 动稳定电流 Dynamic current | kA | 63, 80 * |

* 电流互感器动热稳定电流与变比有关，在订货时具体确认。

Thermal & Dynamic current of the CT is related to ratio which can be affirmed when ordered.

电压互感器技术参数

Technical data of voltage transformer

表 6
Table 6

| 项目 Item | 单位 Unit | 技术参数 Technical data |
|--|------------|------------------------|
| 额定电压 Rated voltage | kV | $35/\sqrt{3}$, 35 |
| 工频耐压 Power frequency withstand voltage | kV | 95 |
| 雷电冲击耐压(峰值) Lightning impulse withstand voltage (peak) | kV | 185 |
| 额定二次电压 Rated secondary voltage | V | $100/\sqrt{3}$, 100/3 |
| 精度级别 Accuracy class | | 0.2, 0.5, 1.0, 3.0 |
| 额定容量 Rated capacity | VA | 20-100 |

4.3 接地开关

UR7开关柜选用的JN15快速接地开关是经本公司认可的产品。配备本公司独特设计的手动蜗杆操动机构，只需传统机构三十分之一力即可驱动接地开关。接地开关具有短路关合能力。

接地开关带有分合闸位置指示器。操动机构主要采取手动操作。操动机构连杆上安装机械联锁机构，与断路器手车进行联锁。另外还可以加装闭锁电磁铁，实现电气联锁。

接地开关带有辅助接点，提供接地开关分合闸状态的信号。

Earthing switch

UR7 uses Earthing switch typed JN15 confirmed by us. It equips worm type operation mechanism. Only needs 1/30 effort of traditional mechanism to run the earthing switch. It have short circuit making capability.

There is open/closing position indicator for earthing switch. It use manual operation mechanism. It installs mechanical interlock mechanism on pole of operation mechanism for interlocking VCB cradle. It also installs interlocking electromagnet for electrical interlock.

There are auxiliary contact in earthing switch to provide the signal of open/closing status.

接地开关技术参数

Technical data of earthing switch

表 7
Table 7

| 项目 Item | 单位 Unit | 技术参数 Technical data |
|--|------------|------------------------|
| 额定电压 Rated voltage | kV | 35 |
| 热稳定电流(4秒) 4s thermal current | kA | 31.5 |
| 动稳定电流 Dynamic current | kA | 80 |
| 关合速度 Making speed9m/s) | m/s | > 6 |
| 主回路接触电阻 Resistance of main circuit (UΩ) | μΩ | < 120 |

4.4 避雷器

UR7开关柜采用进口或中外合资企业生产的技术先进、性能可靠的无间隙氧化锌避雷器。

Surge arrester

UR7 equips advance-technology and reliable-performance gapless ZnO surge arrester imported or manufactured by joint venture company.

避雷器技术参数

Technical data of Surge arrester

表 8
Table 8

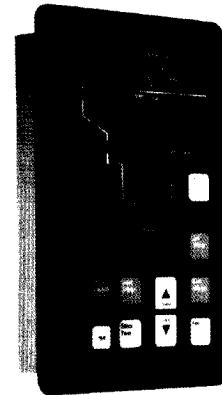
| 项目 Item | 单位 Unit | 技术参数 Technical data |
|--|------------|------------------------|
| 系统额定电压 System rated voltage | kV | 40.5 |
| MOA额定电压 Rated voltage of arrester | kV | 42/51 |
| MOA持续运行电压 Continuous voltage of MOA | kV | 23.4/40.8 |
| 最大陡波残压 MAX. Steep wave residual voltage | < kV | 154 |
| 最大雷电残压 MAX. Lightning residual voltage | < kV | 134 |
| 最大操作残压 MAX. Operating residual voltage | < kV | 114 |
| 2ms方波容量 2ms square wave impulse withstand current | A | 400 |
| 最小直流1mA参考电压 Reference voltage and 1mA DC | > kV | 73 |

5.1 微机综合保护继电器

本公司生产的UR7开关柜保护继电器是配置美国伊顿公司先进的Digitrip系列微机保护继电器，并可采用美国伊顿公司的IMPACC监控系统，将数据及信息传输到计算机上进行监控管理，使配电系统具有智能化，为用户节约大量人力物力。也可根据用户的要求配置指定的其它型式保护继电器。如用南京INT公司的PA100、PA200、PA300等系列微机综合保护装置。

Micro-processing integrated protection relay

UR7 equips advance Digitrip series micro-processing integrated protection relay and relevant IMPACC SCADA system manufactured by American Eaton Co.. Also it can select other protection relay according to the requirement of customer like PA100/PA200/PA300 series of NANJING INT Co.

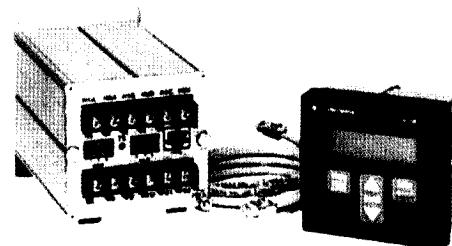


5.2 测量仪表

本公司主要采用美国伊顿公司的IQ系列微机监测装置，也可以根据用户的要求配备用户指定的国产仪表。

Measuring instrument

We advise customer to use IQ series micro-processing monitor device of American Eaton Co.. Also it can select other monitor device according to the requirement of customer.



5.3 控制开关

主要配备奥地利蓝墨尔(BLUE LINE)公司的系列产品，具有可靠的质量保证。

Controlling selector

UR7 equips series device of reliable quality manufactured by BLUE LINE (Austria).

5.4 位置指示器

UR7开关柜的断路器手车，断路器及接地开关的位置指示都采用与模拟母线配合的位置指示器。位置指示器采用LED发光二极管。它具有功耗小、寿命长、指示明确等优点。它同时可用来监视操作电源完好及监视手车是否到位。

The position indicator of VCB cradle, VCB, earthing switch work in with simulant line. Indicator is LED type. It have advantage of low power consumption, long life, clear indication. It can monitor operation power and cradle.

5.5 带电显示装置

UR7开关柜内可装设检测一次回路运行情况的带电显示装置(由用户选择)。该装置由高压传感器和显示器两部分组成。传感器安装在馈线侧，显示器安装在开关柜的低压室面板上。

Voltage indication

UR7 can install voltage indication(selected by customer) monitoring the running status of main circuit. It is made up of high voltage sensors and indication. Sensors are installed at cable side. Indication is installed on the front plate of low-voltage compartment.

5.6 其它二次元件

UR7开关柜的操作电源的保护采用世界驰名公司的微型空气开关(MCB)，原则上不采用低压熔断器，减少易损件备品。

二次端子排一律采用德国凤凰公司或德国WAGO公司的产品。

Other secondary component

UR7 use MCB manufactured by world famous company to protect the operation power instead of using low-voltage fuse. It can reduce spare parts

Secondary terminal use PHOENIX Germany or WAGO Germany.

6 主结线方案

Main wiring scheme

主结线方案中各功能进行分类代号 Function code of main wiring scheme

I-进线柜 F-馈线柜 D-隔离柜 B-母线分段柜 R-母线提升柜 M-专用计量柜 P-电压测量柜 S-避雷器柜
I-Incoming panel F-Feeder panel D - Disconnecting panel R-Busriser M - Measuring panel P - PT panel S - Surge arrester panel

| 方案编号 Scheme No. | 01 | 02 | 03 | 04 | 05 |
|---|----------------------------------|---------------------------------|----------------------------------|--------------------------------------|---------------------------|
| 主 结 线 方 案 Main Wiring scheme | | | | | |
| 主母线额定电流 (A) Main busbar rated current | 630~3150 | 630~3150 | 630~3150 | 630~3150 | 630~3150 |
| 主要设备 Main equipment | 真空断路器 VCB/405W-VACW 1 3 | 电流互感器 CT/LZZB12-36 1 3 | 电压互感器 PT/JDZX11-35R 1 2 | 高压熔断器 H.V.fuse/XRNP1-35 1 3 | 接地开关 ES/JN15 1 1 |
| 用途 Application | I.F | I.F | I.F | I.F | I.F |
| 备注 Remarks | | | | | |

| 方案编号 Scheme No. | 06 | 07 | 08 | 09 | 10 |
|---|----------------------------------|---------------------------------|----------------------------------|--------------------------------------|---------------------------|
| 主 结 线 方 案 Main Wiring scheme | | | | | |
| 主母线额定电流 (A) Main busbar rated current | 630~3150 | 630~3150 | 630~3150 | 630~3150 | 630~3150 |
| 主要设备 Main equipment | 真空断路器 VCB/405W-VACW 1 3 | 电流互感器 CT/LZZB12-36 1 3 | 电压互感器 PT/JDZX11-35R 1 3 | 高压熔断器 H.V.fuse/XRNP1-35 1 3 | 接地开关 ES/JN15 1 1 |
| 用途 Application | I.F | I.F | I.F | I.F | I.F |
| 备注 Remarks | | | | | |

6 主结线方案

Main wiring scheme

主结线方案中各功能进行分类代号 Function code of main wiring scheme

I-进线柜 F-馈线柜 D-隔离柜 B-母线分段柜 R-母线提升柜 M-专用计量柜 P-电压测量柜 S-避雷器柜
I-Incoming panel F-Feeder panel D - Disconnecting panel R-Busriser M - Measuring panel P - PT panel S - Surge arrester panel

| 方 案 编 号 Scheme No. | 11 | 12 | 13 | 14 | 15 |
|---|--|----------|----------|----------|----------|
| 主 结 线 方 案 Main Wiring scheme | | | | | |
| 主母线额定电流 (A) Main busbar rated current | 630~3150 | 630~3150 | 630~3150 | 630~3150 | 630~3150 |
| 主要设备 Main equipment | 1 VCB/405W-VACW 3 CT/LZZB12-36 1 PT/JDZX11-35R 1 H.V.fuse/XRNP1-35 1 ES/JN15 1 Surge arrester 1 Voltage indicator | | | | |
| 用 途 Application | I.F | | D | D | D |
| 备 注 Remarks | | | | | |

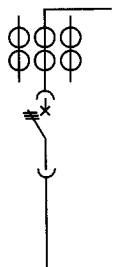
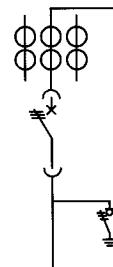
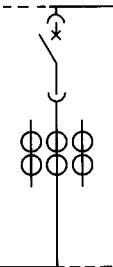
| 方 案 编 号 Scheme No. | 16 | 17 | 18 | 19 | 20 |
|---|--|----------|----------|----------|----------|
| 主 结 线 方 案 Main Wiring scheme | | | | | |
| 主母线额定电流 (A) Main busbar rated current | 630~3150 | 630~3150 | 630~3150 | 630~3150 | 630~3150 |
| 主要设备 Main equipment | 1 VCB/405W-VACW 1 CT/LZZB12-36 1 PT/JDZX11-35R 1 H.V.fuse/XRNP1-35 1 ES/JN15 1 Surge arrester 1 Voltage indicator | | | | |
| 用 途 Application | I.D | I.D | I.D | I.D | I.D |
| 备 注 Remarks | | | | | |

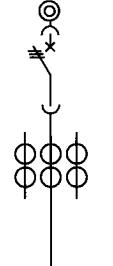
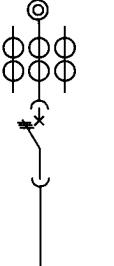
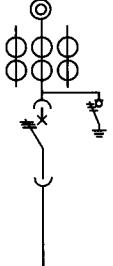
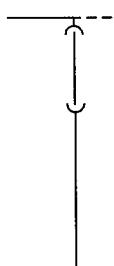
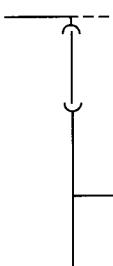
6 主结线方案

Main wiring scheme

主结线方案中各功能进行分类代号 Function code of main wiring scheme

I-进线柜 F-馈线柜 D-隔离柜 B-母线分段柜 R-母线提升柜 M-专用计量柜 P-电压测量柜 S-避雷器柜
I-Incoming panel F-Feeder panel D - Disconnecting panel R-Busriser M - Measuring panel P - PT panel S - Surge arrester panel

| 方 案 编 号 Scheme No. | 21 | 22 | 23 | 24 | 25 |
|---|-----------------------------|----|--|---|---|
| 主 结 线 方 案 Main Wiring scheme | | |  |  |  |
| 主母线额定电流 (A) Main busbar rated current | | | 630~3150 | 630~3150 | 630~3150 |
| 主要设备 Main equipment | 真空断路器 VCB/405W-VACW | | 1 | 1 | 1 |
| | 电流互感器 CT/LZZB12-36 | | 3 | 3 | 3 |
| | 电压互感器 PT/JDZX11-35R | | | | |
| | 高压熔断器 H.V.fuse/XRNP1-35 | | | | |
| | 接地开关 ES/JN15 | | | 1 | |
| | 避雷器 Surge arrester | | | | |
| | 带电显示装置 Voltage indicator | | | | |
| 用 途 Application | | | B | B | B |
| 备 注 Remarks | | | 主母线只可向右联络 Main busbar only couple right side | 主母线只可向右联络 Main busbar only couple right side | |

| 方 案 编 号 Scheme No. | 26 | 27 | 28 | 29 | 30 |
|---|---|---|--|---|---|
| 主 结 线 方 案 Main Wiring scheme |  |  |  |  |  |
| 主母线额定电流 (A) Main busbar rated current | 630~3150 | 630~3150 | 630~3150 | 630~3150 | 630~3150 |
| 主要设备 Main equipment | 真空断路器 VCB/405W-VACW | 1 | 1 | 1 | |
| | 电流互感器 CT/LZZB12-36 | 3 | 3 | 3 | |
| | 电压互感器 PT/JDZX11-35R | | | | |
| | 高压熔断器 H.V.fuse/XRNP1-35 | | | | |
| | 接地开关 ES/JN15 | | 1 | | 1 |
| | 避雷器 Surge arrester | | | | |
| | 带电显示装置 Voltage indicator | | | | |
| 用 途 Application | I.F | I.F | I.F | R | R |
| 备 注 Remarks | | | | | |

6 主结线方案

Main wiring scheme

主结线方案中各功能进行分类代号 Function code of main wiring scheme

I-进线柜 F-馈线柜 D-隔离柜 B-母线分段柜 R-母线提升柜 M-专用计量柜 P-电压测量柜 S-避雷器柜
I-Incoming panel F-Feeder panel D - Disconnecting panel R-Busriser M - Measuring panel P - PT panel S - Surge arrester panel

| 方案编号 Scheme No. | 31 | 32 | 33 | 34 | 35 |
|---|--|----------|---|---|----------|
| 主 结 线 方 案 Main Wiring scheme | | | | | |
| 主要设备 Main equipment | 主母线额定电流 (A) Main busbar rated current | 630~3150 | 630~3150 | 630~3150 | 630~3150 |
| | 真空断路器 VCB/405W-VACW | | | | |
| | 电流互感器 CT/LZZB12-36 | | | | |
| | 电压互感器 PT/JDZX11-35R | 3 | 3 | 3 | 3 |
| | 高压熔断器 H.V.fuse/XRNP1-35 | 3 | 3 | 3 | 3 |
| | 接地开关 ES/JN15 | | 1 | | 1 |
| | 避雷器 Surge arrester | | | | |
| | 带电显示装置 Voltage indicator | | | | |
| 用途 Application | | P | P | P | P |
| 备注 Remarks | | | 主母线只可向右联络 Main busbar only couple right side | 主母线只可向右联络 Main busbar only couple right side | |

| 方案编号 Scheme No. | 36 | 37 | 38 | 39 | 40 |
|---|--|----------|----------|--|--|
| 主 结 线 方 案 Main Wiring scheme | | | | | |
| 主要设备 Main equipment | 主母线额定电流 (A) Main busbar rated current | 630~3150 | 630~3150 | 630~3150 | 630~3150 |
| | 真空断路器 VCB/405W-VACW | | | | |
| | 电流互感器 CT/LZZB12-36 | | 3 | | 2 |
| | 电压互感器 PT/JDZX11-35R | | | 2 | 2 |
| | 高压熔断器 H.V.fuse/XRNP1-35 | | | 2 | 2 |
| | 接地开关 ES/JN15 | | | | |
| | 避雷器 Surge arrester | | | | |
| | 带电显示装置 Voltage indicator | | | | |
| 用途 Application | | I | I | P | P |
| 备注 Remarks | | | | 主母线可左右联络 Main busbar can couple left and right side | 主母线可左右联络 Main busbar can couple left and right side |

6 主结线方案

Main wiring scheme

主结线方案中各功能进行分类代号 Function code of main wiring scheme

I-进线柜 F-馈线柜 D-隔离柜 B-母线分段柜 R-母线提升柜 M-专用计量柜 P-电压测量柜 S-避雷器柜

I-Incoming panel F-Feeder panel D-Disconnecting panel R-Busriser M-Measuring panel P-PT panel S-Surge arrester panel

| 方案编号 Scheme No. | 41 | 42 | 43 | 44 | 45 |
|---|--|----------|----------|----------|----------|
| 主 结 线 方 案 Main Wiring scheme | | | | | |
| 主要设备 Main equipment | 主母线额定电流 (A) Main busbar rated current | 630~3150 | 630~3150 | 630~3150 | 630~3150 |
| | 真空断路器 VCB/405W-VACW | | | | |
| | 电流互感器 CT/LZZB12-36 | 3 | | | |
| | 电压互感器 PT/JDZX11-35R | 2 | 1 | 2 | 2 |
| | 高压熔断器 H.V.fuse/XRNP1-35 | 2 | 3 | 3 | 3 |
| | 接地开关 ES/JN15 | | | | |
| | 避雷器 Surge arrester | | | | |
| | 带电显示装置 Voltage indicator | | | | |
| 用途 Application | | P | P | P | P |
| 备注 Remarks | | | | | |

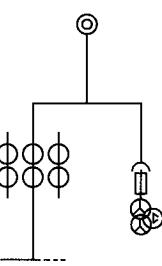
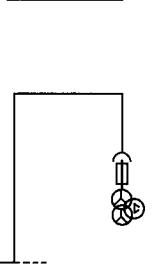
| 方案编号 Scheme No. | 46 | 47 | 48 | 49 | 50 |
|---|--|----|----------|----------|----------|
| 主 结 线 方 案 Main Wiring scheme | | | | | |
| 主要设备 Main equipment | 主母线额定电流 (A) Main busbar rated current | | 630~3150 | 630~3150 | 630~3150 |
| | 真空断路器 VCB/405W-VACW | | | | |
| | 电流互感器 CT/LZZB12-36 | | | 3 | |
| | 电压互感器 PT/JDZX11-35R | | 2 | 3 | 3 |
| | 高压熔断器 H.V.fuse/XRNP1-35 | | 3 | 3 | 3 |
| | 接地开关 ES/JN15 | | | | |
| | 避雷器 Surge arrester | | | | |
| | 带电显示装置 Voltage indicator | | | | |
| 用途 Application | | | P | M | P |
| 备注 Remarks | | | | | |

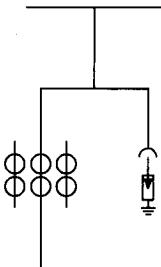
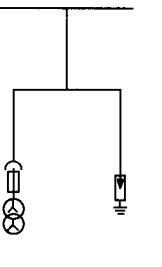
6 主结线方案

Main wiring scheme

主结线方案中各功能进行分类代号 Function code of main wiring scheme

I-进线柜 F-馈线柜 D-隔离柜 B-母线分段柜 R-母线提升柜 M-专用计量柜 P-电压测量柜 S-避雷器柜
I-Incoming panel F-Feeder panel D - Disconnecting panel R-Busriser M - Measuring panel P - PT panel S - Surge arrester panel

| 方 案 编 号 Scheme No. | 51 | 52 | 53 | 54 | 55 |
|---|-----------------------------|----|--|----------|---|
| 主 结 线 方 案 Main Wiring scheme | | |  | |  |
| 主母线额定电流 (A) Main busbar rated current | | | 630~3150 | 630~3150 | 630~3150 |
| 主要设备 Main equipment | 真空断路器 VCB/405W-VACW | | | | |
| | 电流互感器 CT/LZZB12-36 | | 3 | | |
| | 电压互感器 PT/JDZX11-35R | | 3 | 3 | |
| | 高压熔断器 H.V.fuse/XRNP1-35 | | 3 | 3 | |
| | 接地开关 ES/JN15 | | | | |
| | 避雷器 Surge arrester | | | | 3 |
| | 带电显示装置 Voltage indicator | | | | |
| 用途 Application | | | M | P | S |
| 备注 Remarks | | | | | |

| 方 案 编 号 Scheme No. | 56 | 57 | 58 | 59 | 60 |
|---|---|---|----|----|----|
| 主 结 线 方 案 Main Wiring scheme |  |  | | | |
| 主母线额定电流 (A) Main busbar rated current | 630~3150 | 630~3150 | | | |
| 主要设备 Main equipment | 真空断路器 VCB/405W-VACW | | | | |
| | 电流互感器 CT/LZZB12-36 | 3 | | | |
| | 电压互感器 PT/JDZX11-35R | | 3 | | |
| | 高压熔断器 H.V.fuse/XRNP1-35 | | 3 | | |
| | 接地开关 ES/JN15 | | | | |
| | 避雷器 Surge arrester | 3 | 3 | | |
| | 带电显示装置 Voltage indicator | | | | |
| 用途 Application | S | P | | | |
| 备注 Remarks | | | | | |

6 主结线方案

Main wiring scheme

主结线方案中各功能进行分类代号 Function code of main wiring scheme

I-进线柜 F-馈线柜 D-隔离柜 B-母线分段柜 R-母线提升柜 M-专用计量柜 P-电压测量柜 S-避雷器柜
I-Incoming panel F-Feeder panel D - Disconnecting panel R-Busriser M - Measuring panel P - PT panel S - Surge arrester panel

| 方 案 编 号 Scheme No. | 61 | 62 | 63 | 64 | 65 |
|--|----------|----------|----------|----|----|
| 主 结 线 方 案 | | | | | |
| Main Wiring scheme | | | | | |
| 主母线额定电流 (A) Main busbar rated current | 630~3150 | 630~3150 | 630~3150 | | |
| 主要设备 Main equipment | | | | | |
| 真空断路器 VCB/405W-VACW | | | | | |
| 电流互感器 CT/LZZB12-36 | | | | | |
| 电压互感器 PT/JDZX11-35R | 3 | 3 | | | |
| 高压熔断器 H.V.fuse/XRNP1-35 | 3 | 3 | | | |
| 接地开关 ES/JN15 | | 1 | | | |
| 避雷器 Surge arrester | 3 | | | | |
| 带电显示装置 Voltage indicator | | | | | |
| 用途 Application | P | P | S | | |
| 备注 Remarks | | | | | |

| 方 案 编 号 Scheme No. | 66 | 67 | 68 | 69 | 70 |
|--|----|----|----|----|----|
| 主 结 线 方 案 | | | | | |
| Main Wiring scheme | | | | | |
| 主母线额定电流 (A) Main busbar rated current | | | | | |
| 主要设备 Main equipment | | | | | |
| 真空断路器 VCB/405W-VACW | | | | | |
| 电流互感器 CT/LZZB12-36 | | | | | |
| 电压互感器 PT/JDZX11-35R | | | | | |
| 高压熔断器 H.V.fuse/XRNP1-35 | | | | | |
| 接地开关 ES/JN15 | | | | | |
| 避雷器 Surge arrester | | | | | |
| 带电显示装置 Voltage indicator | | | | | |
| 用途 Application | | | | | |
| 备注 Remarks | | | | | |

7.1 开关柜基础埋设

开关柜基础的施工应符合电力建设施工及验收技术规范中的有关条款的规定。

开关柜安装须依据本公司提供的典型图样，以便保证土建孔洞的预留和基础框架敷设的准确度。

为了使安装工作顺利进行，敷设基础框架时，应与土建方面密切配合，尤其是本说明书中对基础直线度和平面度的要求。

- 为了达到要求的基础框架表面水平度，基础框架焊接部件，应按规定程序与钢制预埋件焊接。

- 根据配电室的安装布置图，将基础框架准确地放置在混凝土地坪的规定位置上。

● 使用水平仪仔细调整整个基础框架的表面水平度，并保证其正确的高度。基础框架的上表面应高于完工后的配电室地坪 2mm ，以便开关柜安装和调整。在配电室地坪二次灌浆时，填充层的厚度一般应与基础框架保持在同一平面，但柜前若须敷设绝缘橡胶时，应躲过柜门开启的高度。

- 框架敷设允许公差应遵守如下规定：

水平度允许公差为 $\pm 1\text{mm/m}$ 。

垂直度允许公差为 $\pm 1\text{mm/m}$ 。但在框架总长度内的总偏差应不大于 2mm 。

- 当配电室地板二次灌浆压光后，应注意回填基础框架下部，不要留下任何间隙。

- 基础框架不能遭受任何具有危害性的冲撞与压力，特别在安装过程中。

如果上述条件没有完全满足，可能影响开关柜的安装、手车室门及电缆室门的打开。

基础框架应有可靠的接地。接地必须用 $30 \times 4\text{mm}$ 的镀锌钢带。当一组开关柜排列较长时，基础框架应有两端接地。

The floor for the installation shall conform to the rules of Electric Power Engineering Work and Receipt Specification.

Switchgear must be placed on the base framework embedded under distribution room floor and fabricated according to typical graphic of our company.

To facilitate installation, when erecting the foundation, relevant civil rules, especial requirements on foundation flatness and straightness must be abide by.

- To achieve required surface levelness of foundation framework, the welding part of which must be welded at predetermined connecting point as required.

- According to installation and arrangement drawing, foundation framework should be placed at stipulated position of concrete terrace.

● Carefully adjust surface levelness of the whole foundation framework with level meter to assure its height. The upper surface of foundation framework should be 2mm higher than the finished distribution room terrace for easy installation and adjustment of switchgear, if additional layer should be applied to distribution room terrace, the thickness of which should be individually considered. The acceptance tolerance of framework foundation should be in accordance with GB standard:

Surface acceptance tolerance is $\pm 1\text{mm/m}$.

Straightness acceptance tolerance is $\pm 1\text{mm/m}$. The total deviation out of the whole length of framework should be more than 2mm .

- After additional layer of distribution room floor is finished, no gap should be left at bottom of foundation framework.

- No hazardous impact or pressure should be applied to foundation framework, especially during installation.

- If the above-mentioned requirements are not fully satisfied, switchgear installation, cradle moving and opening of cradle room door and cable room door may be affected.

Connect the foundation frame with the $30 \times 4\text{mm}$ steel coated Zn earthing busbars. If there are more than 10 panels, there should be two earthing connection points.

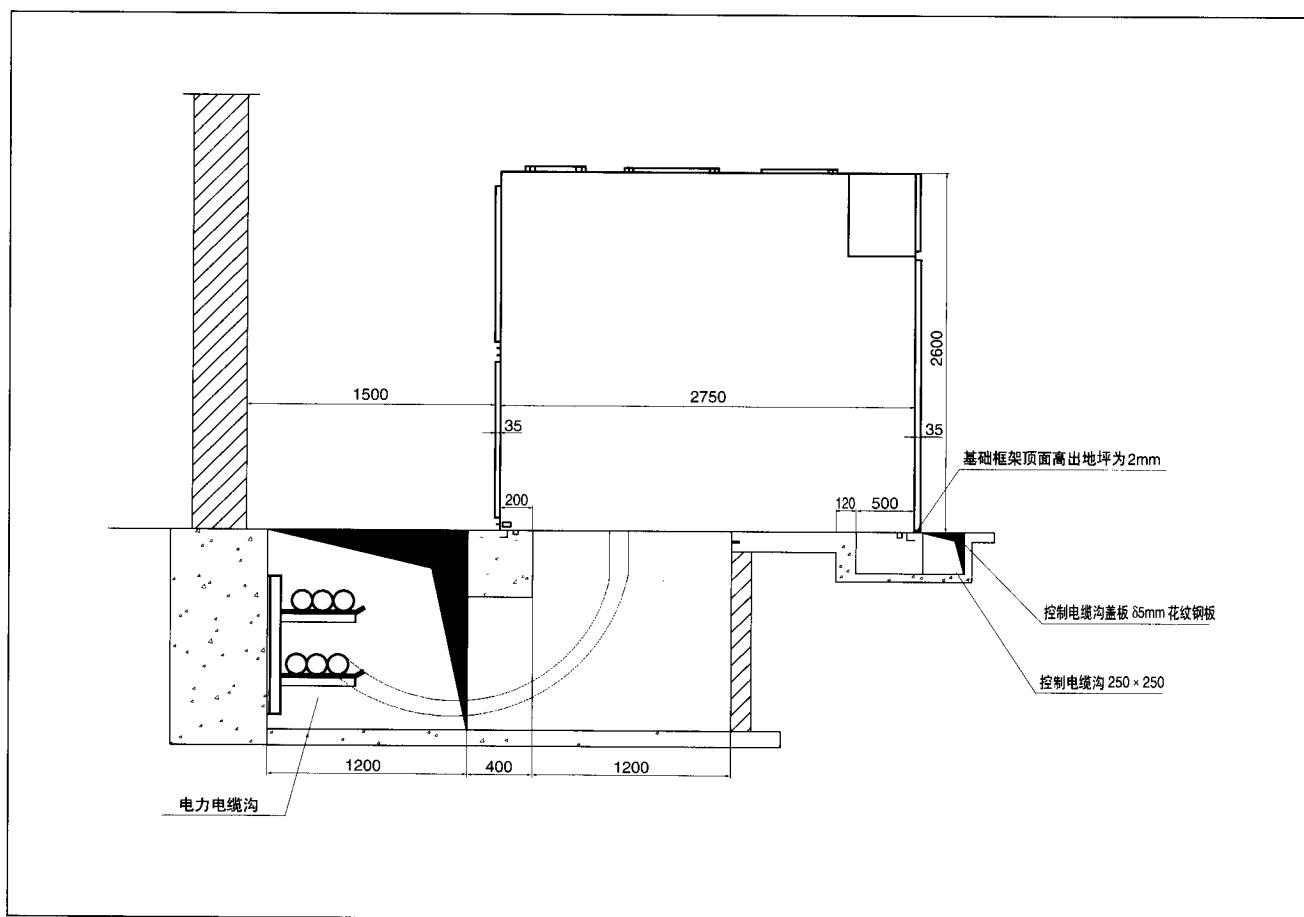
7.2 开关柜的安装

UR7开关柜应安装在干燥、整洁、空气流通的配电室里。安装时，要求配电室内开关柜的基础框架及室内地坪已竣工验收，且配电室内的门窗装修及室内照明通风工程应基本完成。

UR7 should be installed in dry, neat and well-ventilated distribution room, installation may be performed after foundation framework of switchgear and indoor floor in distribution room have been finished. What's more, windows and doors in distribution room, indoor lighting and ventilation work should be basically furnished.

图7.1.1 配电室典型剖面图布置 (利用电缆沟连接时)

Fig.7.1.1 Typical sideview of distribution room arrangement (when connection through cable channel)



7 开关柜布置及安装

Arrangement & installation

图7.1.2 配电室典型剖面图布置 (有电缆夹层时)

Fig.7.1.2 Typical sideview of distribution room arrangement (when cable interlayer available)

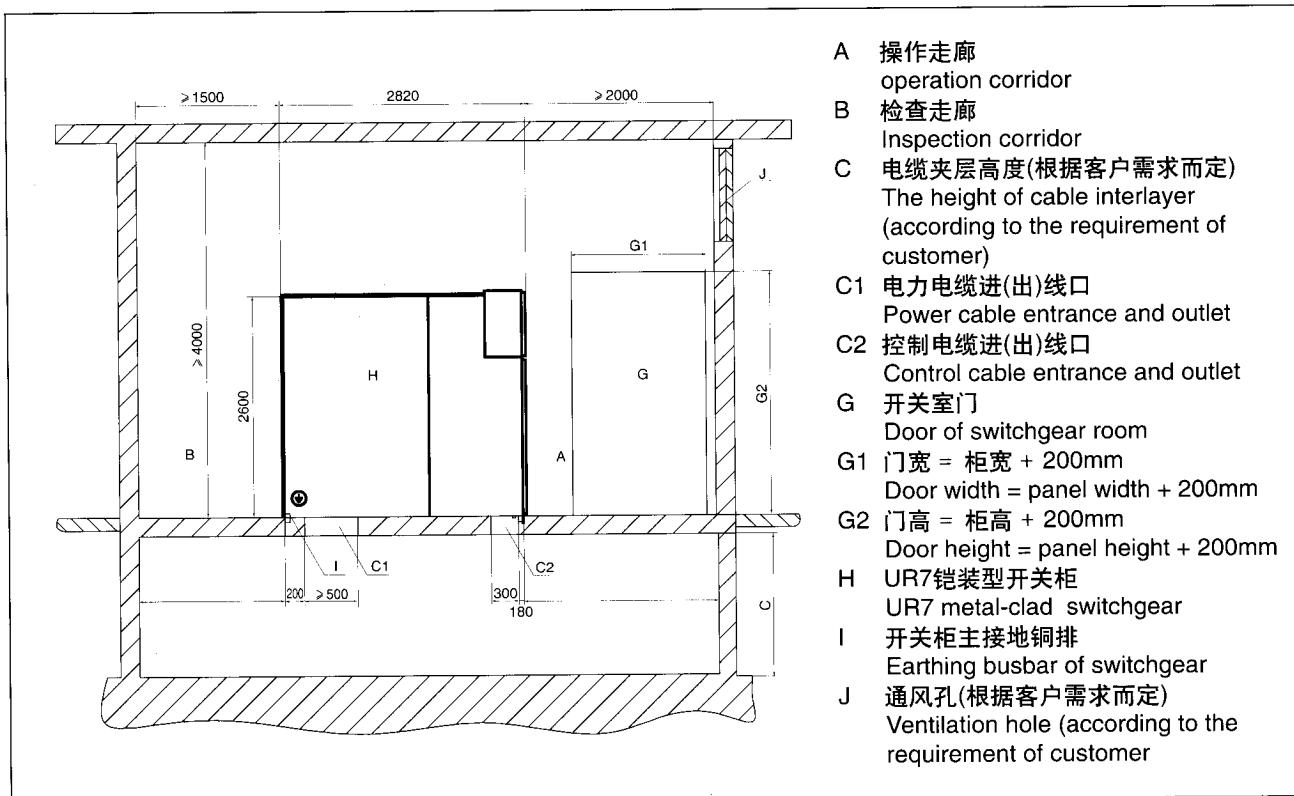
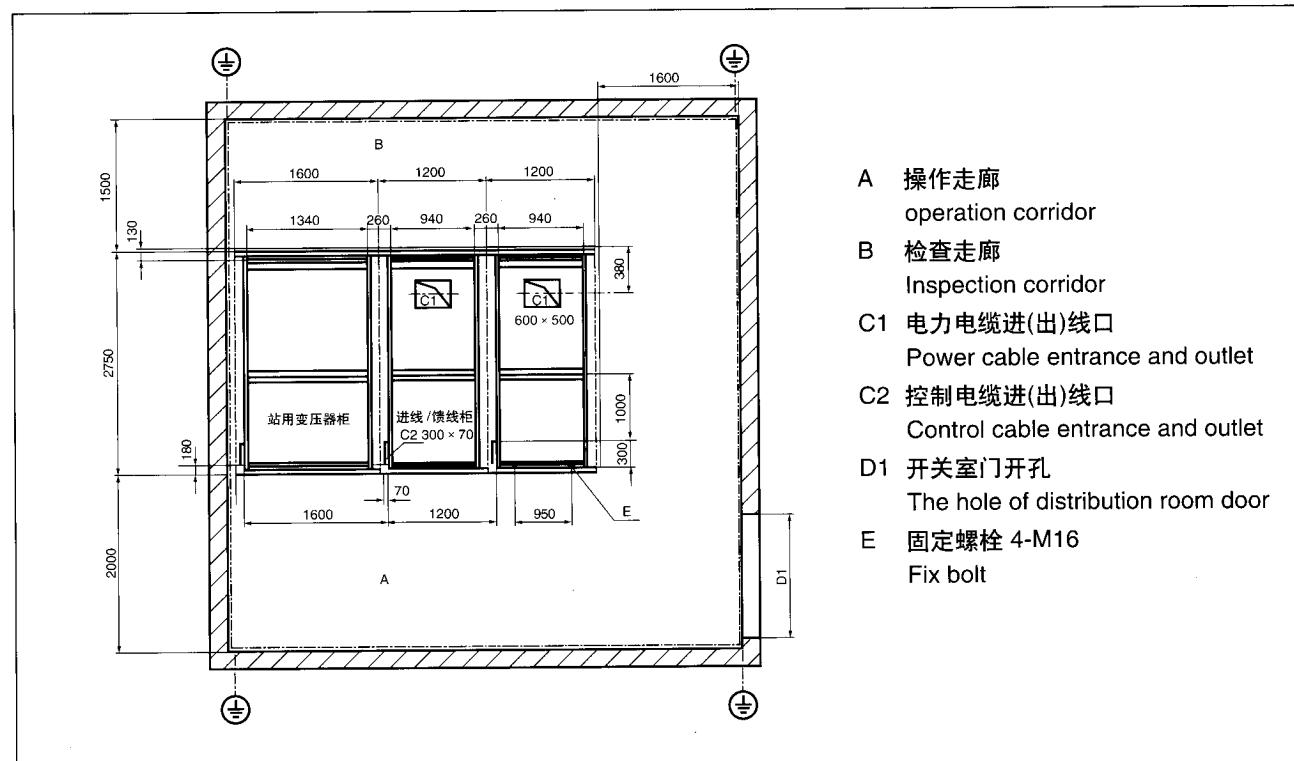


图7.1.3 开关柜平面布置图

Fig.7.1.3 Arrangement of the switchgear



8.1 应提供的技术资料

- 主接线方案图编号、用途和单线系统图、额定电压、额定电流、额定短路开断电流、配电室平面布置图及开关柜的排列系统图等。
- 如使用电力电缆进出线，应详细注明电力电缆的型号及根数。
- 开关柜控制、测量及保护功能的要求以及其它闭锁和自动装置的要求。
- 开关柜内主要电气元件的型号规格及数量。
- 二次回路操作电源的类型及电压等级。
- 开关柜使用在特殊环境条件时，应在订货时详细说明。
- 其它特殊要求。
- Number and usage of main wiring scheme, single line drawing, rated voltage, rated current, rated short circuit breaking current, layout of distribution room and arrangement drawing of switchgear.
- If incoming and outgoing power cable is used, the type and number of witch should be indicated.
- Requirements on switchgear control, measuring and protective functions and requirements on other latching and automatic devices.
- Type, rating and number of main electrical components in switchgear.
- The kind of secondary circuit operation power and voltage class.
- Please specify if switchgear will be used under special environmental condition when place an order.
- Other special requirements.

8.2 设计配合

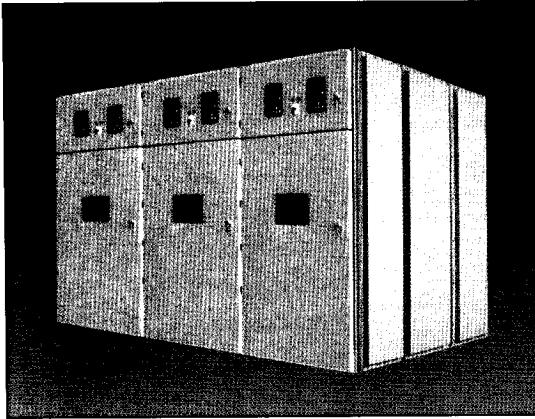
- 本公司可与设计单位密切配合，按设计的要求提供二次原理图。
- 对电气专业委托土建开孔、预埋件的图纸进行确认。
- 可提供一、二次元件的详细资料。

Design cooperation

- Our company can cooperate with designing department. nearly in providiy the secondary diagram according to the designing requirement.
- Can confirm the drawing of foundation Holec and frame work consigned by electric speciality.
- Can provide particular document of main and secondary compunent.

本文件未尽事宜，请随时与公司业务部门详细垂询。

For more details, please contact our sales department.



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