

KYN61-40.5 型铠装移开式交流金属封闭开关设备

Armored withdrawable AC metal-enclosed switchgear



概述 General

KYN61-40.5 铠装移开式交流金属封闭开关设备（以下简称开关柜）适用于三相交流 50Hz、40.5kV 单母线及单母线分段电力系统，主要应用于发电厂、变电所及工矿企业、高层建筑的变配电中作为接受和分配电能之用，并对电路实行控制、保护和检测，满足 IEC60298、GB3906、DL404 等标准的要求，并具备完善的“五防”功能。

KYN61-40.5 Armoured movable AC metal enclosed switchgear (hereinafter referred to as switch cabinet) is applicable to 3-phase AC 50Hz and 40.5kV single bus and single bus single-bus staged power system. It is mainly used as the reception and distribution of electrical energy transformation and distribution in the power transformation and distribution power plant, substation and mining establishment as well as high-rise. It controls and protects as well as monitors the circuit. It meets the requirement of IEC60298, GB3906 and DL404 standards and so on. It has the perfect "5 protections" function.

使用环境条件 Environmental condition

1. 海拔高度：不超过 2000 米
2. 环境温度：上限为 +40°C，下限为 -15°C
3. 相对湿度：日平均值不大于 95%，月平均值平均不大于 90%
4. 地震烈度：不超过 8 度
5. 没有火灾爆炸危险，没有剧烈震动及化学腐蚀等严重污秽的场所

1. Altitude : NO higher than 1000M
2. Ambient temperature: the upper limit is +40°C and the lower limit is -15°C
3. Relative humidity: The daily average value is not more than 95% and the monthly mean value is not more than 90%
4. Earthquake intensity : Not more than 8 degrees.

The location without severe dirtiness such as fire explosion hazard and strenuous vibration as well as chemical corrosion and on.

特点 features

采用热缩绝缘材料及环氧涂覆绝缘工艺，优化电极形状，柜体结构紧凑，缩小占地面积；
开关柜柜体选用优质冷轧钢板经数控钣金加工成形后，通过高强度螺栓螺母和柳螺母连接而成，构件表面采用喷漆或镀锌工艺；
可配用国产 ZN85-40.5(3AV3) 真空断路器和法国施耐德 SF1、SF2 型及阿尔斯通 FP 系列六氟化硫断路器，以满足不同用户的需求；
开关柜各功能小室均采用金属隔板分隔，并设有独立的压力释放通道；
断路器、接地开关等操作均可在开关柜门关闭情况下进行，即可实现关门操作；
开关柜的结构适应性强，主接线方案可以达到 198 种以上，能满足不同用户的需求；
手车，断路器，接地开关和后柜门之间设有防止误操作的机械联锁装置，“五防”功能齐全，安全可靠。

The thermal shrinkage insulating material and epoxy-coated insulating process is used. The electrode shape is optimized. The structure of cabinet body is compact and the floor area is reduced.

For the switch cabinet body, the high-grade cold rolled steel plate is formed by the NC sheet-metal processing and then it is connected by the high-strength bolt and nut as well as riveting nut. For the surface of structural member, the plastic-spraying or galvanizing process is adopted.

It can be equipped with the homemade ZN85-40.5(3AV3) vacuum circuit breaker and French Schneider SF1 and SF2 model as well as Alston FP series of sulfur hexafluoride circuit breaker to meet the demands of different clients.

The metal partition is used to separate among every function chamber in the switch cabinet. The individual pressure relief channel is installed.

Operations of circuit breaker and grounding switch and so on can be performed under the situation that the door of switch cabinet is closed. The door-close operation can be realized.

The structure adaptability of switch cabinet is strong. The main wiring scheme can be up to above 198 types. Therefore, demands from different clients can be met.

The mechanical interlocking device preventing misoperation is installed among trolley, circuit breaker, grounding switch and rear cabinet door, "5 protections" function is complete and safe as well as reliable.

KYN61-40.5 型铠装移开式交流金属封闭开关设备

Armored withdrawable AC metal-enclosed switchgear



主要技术参数 Main technical parameters

开关柜技术参数 Technical parameter of switch cabinet

序号 Serial number	项目 Item	单位 Unit	参数 Parameter		
1	额定电压 Rated voltage	kV	40.5		
2	额定频率 Rated frequency	Hz	50		
3	主母线额定电流 Rated current of main bus-bar	A	1250, 1600, 2000, 2500		
4	分支母线额定电流 Rated current of branch bus-bar	A	630, 1250, 1600		
5	额定绝缘水平 Rated insulating level	kV	1min 工频耐受电压 (有效值) 1min power-Frequency withstand voltage (Valid value)	相同、相对地 Interphase & phase to ground	一次隔离断口 Primary separation fracture
	雷击冲击耐受电压 (峰值) Rated lightning impulse withstand voltage (peak value)		95	115	
	辅助控制回路 1min 工频耐受电压 1min power-Frequency withstand voltage in the auxiliary control circuit		185	215	
			V	2000	
6	额定短路开断电流 Rated short circuit breaking current	kA	25,31.5		
7	额定短路关合电流 (峰值) Rated short-circuit making current(peak value)	kA	63,80		
8	额定短路耐受电流 (4s) Rated short-time withstand Current(4s)	kA	25,31.5		
9	额定峰值耐受电流 Rated impulse Withstand Current	kA	63,80		
10	辅助控制回路额定电压 Rated voltage of auxiliary control circuit	V	-110,-220,-220		
11	防护等级 Protection degree		外壳为 IP4X Housing IP4X 隔空间, 断路器室门打开时为 IP2X Among compartments and when the door of circuit breaker room is opened:IP2X		
12	外形尺寸 (宽 × 深 × 高) Physical dimension(W × D × H)	mm	1400 × 2800(3000) × 2800(* 括号内数字为 SF6 手车方案) (*the number in parenthesis is scheme of SF6 trolley)		
13	重量 Weight	kg	约 2300 bout 2300		

结构 Structural

结构

KYN61-40.5 型金属封闭开关设备主要由柜体和断路器手车等两大部分组成。柜体分为断路室 (也称手车室)、母线室、电缆室和继电器仪表室等四个单独隔室。外壳防护等级为 IP4X, 断路器门打开时防护等级为 IP2X。产品具有电缆进出线、架室进出线、联络、计量、隔离及其它功能方案。

Structure

KYN61-40.5 metal enclosed switchgear mainly consists of two parts, namely, cabinet body and trolley. The cabinet body is divided into 4 individual compartments, namely, circuit breaker compartment (it is also called trolley compartment), bus-bar compartment, cable compartment and relay instrument compartment. The protection degree of casing is IP4X. the protection degree is IP2X when the door of circuit breaker is opened. The trolley of circuit breaker consists of two parts, namely, circuit breaker and chassis trolley. It has leading in and outlet of cable, leading-in and outlet of rack chamber, contact, counting and isolation and other function schemes.

柜体

柜体是选用优质冷轧钢板或敷铝锌板经过数控钣金设备加工折弯成形, 通过高强度螺栓、螺母 (8.8 级) 或拉铆螺母组装而成。柜体各构件采用喷塑或表面镀锌工艺, 这样使柜体不仅具有很高的精度, 而且与同类设备相比具有重量轻、机械强度高、外形美观的特点。同时由于采用了组装式结构使零部件通用性强、加工周期短、生产占地面积小, 可以根据订货情况便捷地组织生产。

Cabinet body

The cabinet body is made from the high-strength cold-cooled steel plate or aluminized zinc plate. It is assembled through the high-strength bolt and nut (grade 8.8) or riveted nut after the plate is machined and bent as well as formed by the NC sheet metal equipment. For every structural member of cabinet body, the plastic-spraying or surface galvanizing process is used. Therefore, the cabinet body not only has the very high height but also it can have such features as lightweight and high mechanical strength as well as beautiful appearance comparing with the similar equipment. At same time, there are such features as strong versatility, short machining period, small floor area for production of component because the assembly-type structure is adopted. The production can be organized conveniently depending on the ordering condition.

手车

1. 手车骨架由优质钢板折弯焊接而成。根据用途手车可分为断路器手车、隔离手车、电压互感器手车和避雷器手车等。同规格手车可以互换。
2. 手车之推进装置采用丝杠螺母推进结构, 与超越离合器和联锁机构等组成。丝杠螺母推进机构可轻便地使手车在试验位置和工作位置之间移动。借助丝杠螺母自锁性可使手车可靠地锁定在工作位置, 而防止因电力作用引发事故。超越离合器在手车移动退至试验位置和进至工作位置时使操作轴与丝杠自动脱离而空转, 可防止超限操作损坏推进机构。

Trolley

1. The framework of trolley is bent and welded by the high-grade sheet steel. The trolley can be divided into the trolley of circuit breaker, separation trolley, trolley of voltage transformer and trolley of lightning arrester and so on according to the purpose. Trolley of same specification can be interchangeable.
2. The pushing device of trolley consists of leading screw nut pushing mechanism, overrunning clutch and interlocking mechanism and so on. The leading screw nut pushing mechanism can operate easily to make the trolley move between the testing position and working position. The self-locking property of leading screw nut can be utilized to lock the trolley at the working position reliably and prevent the accident from play of trolley due to action of electrical force. The overrunning clutch will enable the operating shaft to separate from the lead screw automatically and the operating shaft runs idly when the trolley moves back to the testing position and advances to the working position, and thus avoid damage to the construction.

KYN61-40.5 型铠装移开式交流金属封闭开关设备

Armored withdrawable AC metal-enclosed switchgear



隔室

KYN61-40.5 型金属封闭开关设备设有独立的隔室，即断路器室，母线室，电缆室和继电器仪表室。而且断路器室，母线室和电缆室都设有泄压通道。

1. 断路器室

断路器室底部装有导轨，对手车在试验位置和工作位置间平衡运动起正确导向作用。触头盒前装有活门，上下活门在手车从试验位置移动到工作位置过程中自动打开，当手车反方向移动时自动关闭并形成有效的隔离。上下活门联动，检修时可锁定，以保证检修人员不会触及带电体。柜门关闭时手车可以操作，门面开有紧急分闸操作孔，供手动分闸操作。通过门上的观察窗可以观察观察到手车所处位置、断路器分合位置指示器及合闸弹簧储能状态。

2. 母线室

主母线、分断母线，通过分支母线和触头盒固定，不需要其它绝缘子支撑。主母线、分支母线及联络母线均为紫铜母线。相邻柜间用穿墙套管隔开，能有效防止事故蔓延，同时对主母线启动辅助支撑作用。母线室的主绝缘采用复合绝缘技术，确保绝缘的可靠性。

3. 电缆室

每相可并接 1-3 根电缆，最多并接 6 根单芯电缆。手车移开后，安装维修人员可从正面进入电缆室，对其电流互感器、电压互感器、接地开关、避雷器等元件进行维修安装。柜底配置开缝的卡拆卸式封板，方便电缆的施工。

4. 继电器仪表室

继电器仪表室供安装继电保护控制元件、仪表以及特殊要求的二次设备。小母线室位于继电器仪表室内的顶部，供敷设控制小母线用。

Compartment

The individual compartment, namely, compartment of circuit breaker, bus compartment, cable compartment and compartment of relay instrument, is installed in the KYN61-40.5 metal enclosed switchgear. The pressure-relief channel is installed in the compartment of circuit breaker and bus compartment as well as cable compartment.

1. compartment of circuit breaker

The guide rail is installed at the bottom of circuit breaker compartment to function as the correct guidance for the smooth operation of trolley between the testing position and working position. The valve is installed in front of the contact box. The upper and lower valve opens automatically during the process that the trolley moves to the working position from the testing position. When the trolley moves oppositely, the valve closes automatically to form the effective separation. The upper and lower valve can be locked while overhauling so that it can ensure that the maintainer will not contact the charged body. The trolley can be operated when the cabinet door is closed. The emergency switching-off operating hole is installed at the door face for manual switching off. The position where the trolley is located at and on/off position indicator of circuit breaker as energy-storage state of switching-on spring can be observed through the observation window on the door.

2. Bus compartment

The main bus and staged bus is fixed through the branch bus and contact box and the support from the other insulator is not necessary. The main bus and connecting bus as well as branch bus is the red copper bus. The wall sleeve is separated between adjacent cabinets so that it can prevent the accident from spreading effectively. At same time, it functions as the auxiliary support for main bus. The compound insulation technique is used for main insulation in the bus compartment to ensure the insulation reliability.

3. Cable compartment

1-3 cables can be connected in parallel in every phase. Maximum 6 single-core cables can be connected in parallel. After the trolley is moved away, the installer and maintainer can enter into the cabinet from the front side to repair and install such elements as current transformer, voltage transformer, grounding switch and lightning arrester and so on. It is equipped with the slotted dismountable sealing plate for easy cable construction.

4. Compartment of relay instrument

The relay protection and control element and instrument as well as secondary equipment with special requirement can be installed in the compartment of relay instrument. The small bus is located at the top of compartment of relay instrument for laying and control of small bus.



开关设备结构图 Structural diagram of switchgear

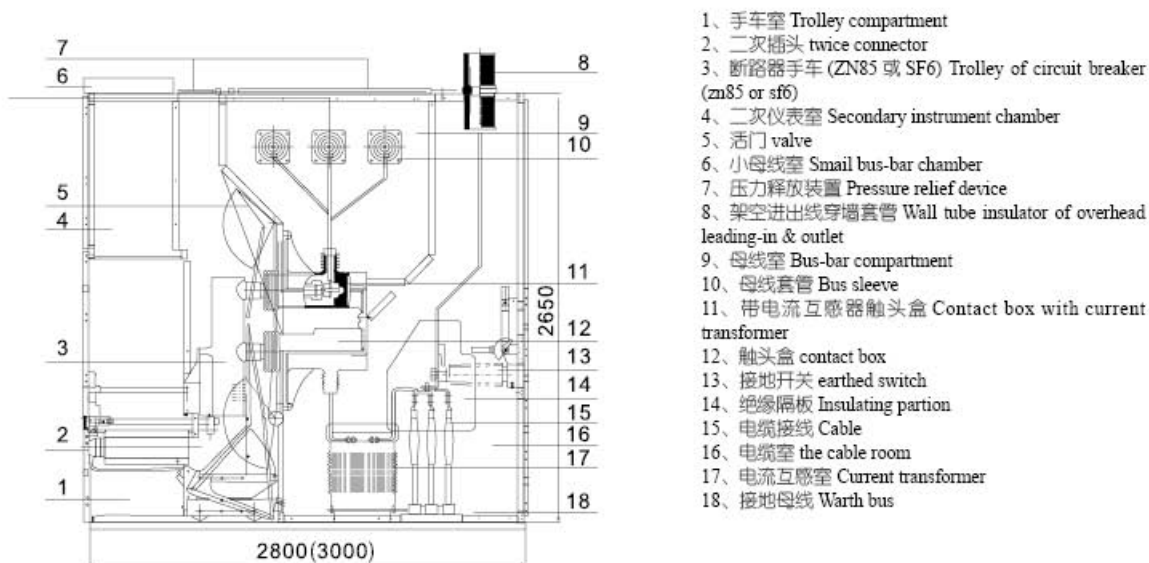


图 1、KYN61-40.5 开关柜内部结构示意图

Figure 1 schematic diagram of internal structure for KYN61-40.5 switch cabinet

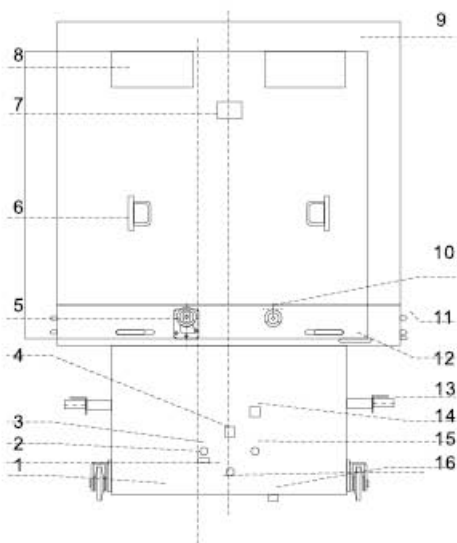


图 2、ZN85-40.5 真空断路器与手车面板布置图

Figure 1 Layout plan of panel for ZN85-40.5 vacuum circuit breaker & trolley

- 1、手车室 Trolley compartment
- 2、二次插头 twice connector
- 3、断路器手车 (ZN85 或 SF6) Trolley of circuit breaker (zn85 or sf6)
- 4、二次仪表室 Secondary instrument chamber
- 5、活门 valve
- 6、小母线室 Small bus-bar chamber
- 7、压力释放装置 Pressure relief device
- 8、架空进出线穿墙套管 Wall tube insulator of overhead leading-in & outlet
- 9、母线室 Bus-bar compartment
- 10、母线套管 Bus sleeve
- 11、带电流互感器触头盒 Contact box with current transformer
- 12、触头盒 contact box
- 13、接地开关 earthed switch
- 14、绝缘隔板 Insulating partition
- 15、电缆接线 Cable
- 16、电缆室 the cable room
- 17、电流互感器 Current transformer
- 18、接地母线 Warth bus

- 1、手动储能孔 Manual energy-storage hole
- 2、机械计数表 Mechanical counter
- 3、手动合闸按钮 Manual switching-on button
- 4、储能指示牌 Indicating plate of energy storage
- 5、摇进机构孔、活门 Hole & valve of swing-in mechanism
- 6、拉手 Handie
- 7、断路器铭牌 Nameplate of circuit breaker
- 8、观察窗 Observation window
- 9、手车面板 Trolley panel
- 10、紧急跳闸按钮 Emergency tripping button
- 11、横梁栓舌 Beam embolus
- 12、接地开关联锁杆 Interlocking rod of grounding switch
- 13、活门开启装置 Valve opening device
- 14、分 / 合位置指示牌 Off/on position indicating plate
- 15、手动合闸按钮 Manual switching-off button
- 16、接地触头 Grounding contact